SEVEN
PUBLICAÇÕES ACADÊMICAS
2023



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Human sciences

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International Cataloging in Publication (CIP) (Câmara Brasileira do Livro, SP, Brazil)

Pathways to knowledge [electronic book] :
exploring the horizons of education /
organization Seven Editora. -- São
José dos Pinhais, PR : Seven Events, 2023.
PDF

Various authors.
Bibliography.
ISBN 978-65-84976-49-8

1. Anthropology 2. Articles - Collections
3. Early childhood education 4. Homeschooling 5.
Teachers - Professional training

23-174400 CDD-370

Indexes for systematic catalog:

1. Education 370

Eliane de Freitas Leite - Librarian - CRB 8/8415

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Crossref doi ***https://doi.org/10.56238/ptoketheeducati-085***

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Preparation and validation of theoretical-illustrative e-book on pelvic endometriosis: Assessment of learning and diagnostic sensitivity associated with the surgical approach

https://doi.org/10.56238/ptoketheeducati-001

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ABSTRACT
In Endometriosis is a chronic gynecological disease characterized by the anomalous implantation of endometrial tissue outside the uterine cavity, which may compromise pelvic and distant organs. It is estimated that about 5 - 20% of the world's female population has the disease in question. Clinically, it is characterized by infertility and pelvic pain, among other symptoms, and the treatment must be multidisciplinary, depending directly on clinical staging and imaging tests. The aim of this study was to construct and validate a theoretical-illustrative e-book on radiological and surgical aspects of pelvic endometriosis. The study was conducted in two stages: instrument construction and product validation. To determine content validity, a minimum Content Validity Index (CVI) of 0.80 was considered acceptable. The overall CVI result obtained was 0.957, indicating high validity of the e-book. The "Structure and Presentation" criteria obtained a CVI of 0.952 and 0.923, respectively, demonstrating good validity in these aspects. The topic "Objectives" obtained the maximum score of CVI (1.000), indicating a complete approval in this criterion. the e-book was prepared and validated according to the established criteria. The creation of a practical product, containing direct information about the diagnostic and surgical aspects of endometriosis, has been shown to have a positive impact on learning and updating knowledge in this area.

Keywords: Endometriosis, Surgery, Medical education, Diagnostic imaging, Pelvic pain.

1 INTRODUCTION

In 1860, in Germany, Carl Von Rokitansky reported for the first time endometriosis, which consists of a chronic gynecological disease characterized by the anomalous implantation of endometrial tissue outside the uterine cavity, which can compromise pelvic and distant organs.[1,2]

The form of development of the disease is still a challenge. There are several theories that try to explain the development of the disease, however, the most accepted theory is of abdominal ectopic implants due to retrograde menstrual reflux through the fallopian tube (Sampson's theory)[1,3]. The prevalence of the disease is estimated at 5-20% in the female population, being clinically marked by pain, infertility, dyschezia, constipation and tenesmus, which may influence the quality of life of

patients4. Between 2010 and 2019, 138,641 hospitalizations for endometriosis were recorded in Brazil5.

Endometriosis can be classified according to the depth of the implants, which can be superficial, when its depth is less than 5 mm, and deep when it has a thickness greater than 5 mm3.

The importance of clinical and imaging diagnosis for therapeutic initiation in most cases should be emphasized, based briefly on the patient's clinical history, physical examination and complementary tests. To the detriment of scientific efforts in the area, there is still a global diagnostic delay of 10.4 years and a time interval of 7.7 years from the gynecological consultation due to symptoms of pelvic pain or subfertility until the final diagnosis6,7.

The main diagnostic methods of the disease are transvaginal ultrasound (TVUS) and pelvic magnetic resonance imaging with specific protocol, both with bowel preparation. In cases of involvement of the ureters and bladder, excretory urography may be indicated, but with limitations to detect small bladder lesions. The gold standard method for diagnosis is laparoscopy, as it allows direct inspection of large surface areas of intra-abdominal organs, as well as directed biopsies and histological confirmation6,7.

The treatment of the disease should be individualized, always taking into account the patient's symptoms and the impact of the disease and its treatment on her quality of life, as well as the patient's desire for pregnancy. Whenever possible, a multidisciplinary team specialized in the area should be involved, in an attempt to provide a treatment capable of covering all biopsychosocial aspects of the patient8,9.

2 METHOD

This is a methodological research, carried out in two stages, namely: (a) construction of the instrument, theoretical-illustrative e-book on pelvic endometriosis, and (b) validation of the product. The instrument was developed by medical radiologists specialized in the field of women's health and surgeons experienced in the field of endometriosis, taking into account a thorough review of the available literature.

The e-book discusses the diagnostic bases of pelvic endometriosis by magnetic resonance imaging and directed surgical management, under nine domains: (1) Introduction, (2) Pelvic anatomy on magnetic resonance imaging, (3) Examination technique, (4) Anterior compartment, (5) Middle compartment, (6) Posterior compartment, (7) Abdominal wall, (8) Surgical treatment of pelvic endometriosis and (9) Appendages.

Regarding the validation process of the face and content of the product, the content was submitted to psychic evaluation and statistical analysis (Likert Scale) by a validation committee composed of 1 coloproctologist surgeon, 1 gynecologist, 6 radiologists working in the area of internal

medicine and 15 radiology and diagnostic residents. Each judge was able to evaluate the following questions: "Objectives", "Structure and presentation", "Relevance" and "General comments" (Chart 1).

Chart 1 - Description of the items evaluated in the content by specialists in the management of endometriosis.

Items	**Content evaluation**
1 - Objectives	It refers to the purposes, goals or ends that one wishes to achieve with the use of the manual.
2 - Structure and presentation	It refers to how to present the guidelines. This includes your overall organization, structure, presentation strategy, coherence, and formatting
3 - Relevance	It refers to the characteristic that evaluates the degree of significance of the material presented.

Source: Authors (2023).

The intention was to validate the product as a teaching instrument for physicians in training and update knowledge among subspecialized professionals involved in the subject, being obtained through an adapted questionnaire with *Likert* type score, organized with closed questions, in order to attribute satisfaction regarding the content presented by the digital book, using 3 (three) satisfaction criteria verified from a table of notes of 1 to 5, being: 1= (Totally Inadequate), 2= (Partially Inadequate), 3= (Neither Adequate nor Inadequate), 4= (Partially Adequate) and 5= (Totally Adequate).

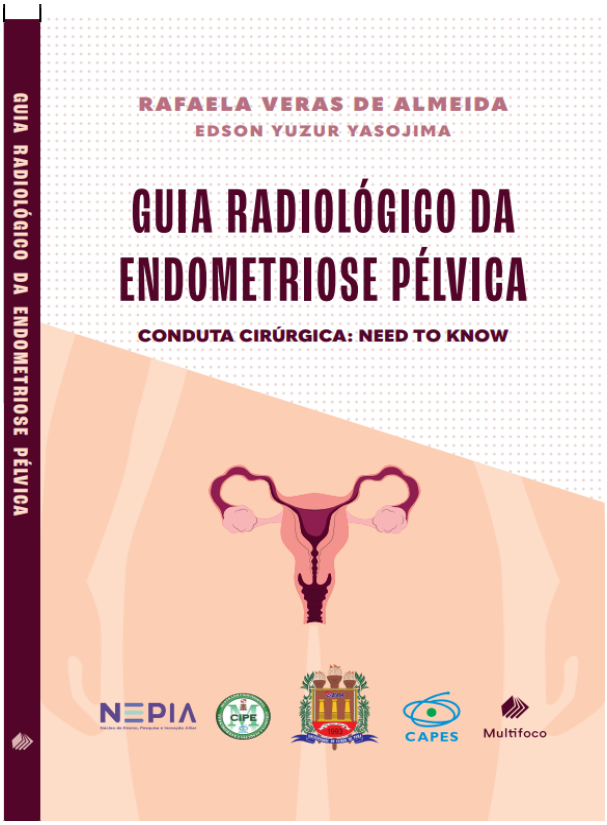
The database was structured using Excel *software*. The analysis was descriptive, through tables and graphs, performed in the *BioStat software,* version 5.4, and validated through the Content Validity Index (CVI), which should be equal to or greater than 0.78. The IVC measures the agreement between the opinions of the experts, evaluating the objectives, structure and presentation, and relevance of the book, giving a positive score for each question in the validation.

3 RESULTS

The final version of the digital book was registered with ISBN number of 978-65-999763-6-0, published in Multifoco. It consists of 109 pages with the title "Radiological guide to pelvic endometriosis. Surgical Approach: Need to Know". The material was divided into eight chapters with the following themes: 1- Introduction; 2- Pelvic anatomy on magnetic resonance imaging; 3- Examination technique; 4- Anterior pelvic compartment; 5- Middle pelvic compartment; 6- Posterior pelvic compartment; 7- Abdominal wall and 8- Surgical treatment of pelvic endometriosis.

It contains 86 images ranging from illustrative magnetic resonance imaging maps to photographs from the authors' personal collection. The key MRI images were edited and standardized in Adobe Photoshop.

Figure 1 - Digital book cover.



Source: Authors (2023).

This version received positive evaluation from the target audience and expert committee. The content refers to the imaging diagnosis and surgical aspects of the various forms of presentation of pelvic endometriosis.

Regarding the epidemiological characteristics of the judges (Table 1), it was observed that the majority were male (70%), according to Graph 1. Among them, 8 were medical specialists with more than 5 years of medical experience, and 15 physicians in training (residents).

Table 1 - Characterization of the Committee of Judges, Belém-PA, 2023.

Characterization of judges	n
Sex	
Female	7
Male	16
Training	
Medical experts	8
Doctors in training (residents)	15

Source: Authors (2023).

Briefly, table 2 shows the validation of the e-book performed by the committee of judges, obtaining as a general result of CVI the value of 0.957. The items "Structure and Presentation" obtained CVI of 0.952 and 0.923 respectively. The topic "Objectives" reached the maximum approval level (IVC of 1,000).

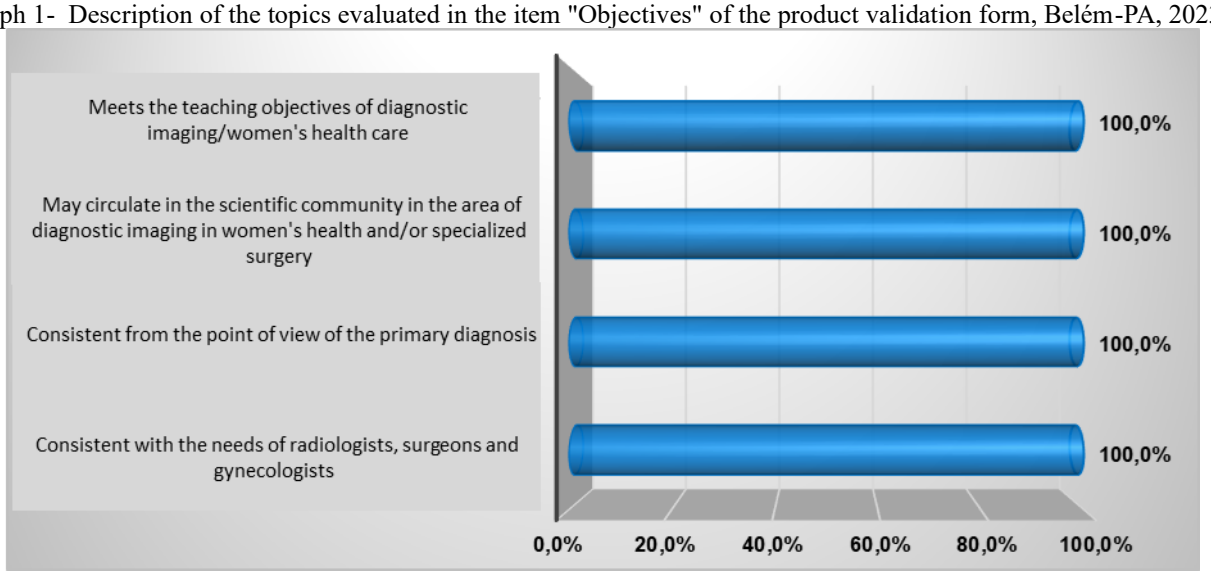
Table 2 - Criteria for validation of the pelvic endometriosis radiological guide. Surgical management: Need to Know, Belém-PA, 2023.

Criteria for validation of the guide	Score Received	% Approval	IVC
Objectives	120	100,0%	1,000
Structure and Presentation	267	98,9%	0,952
Relevance	118	98,3%	0,923
General	**505**	**99,0%**	**0,957**

Legend: CVI - content validity index.
Source: Authors (2023).

The item "Objectives" obtained maximum valuation in all topics, as shown in graph 1.

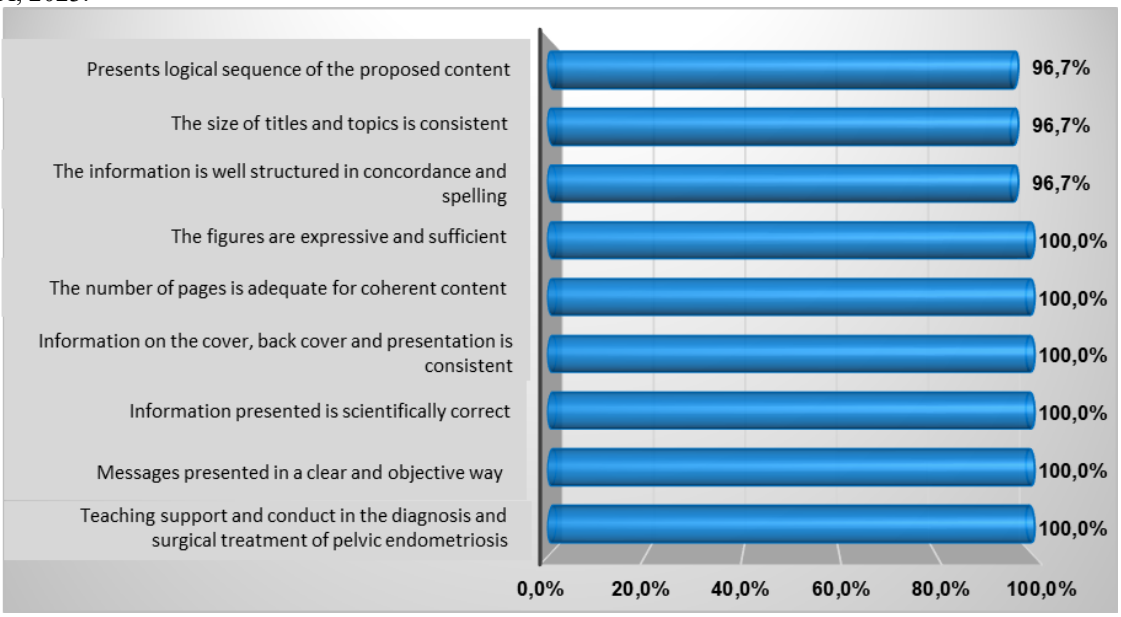
Graph 1- Description of the topics evaluated in the item "Objectives" of the product validation form, Belém-PA, 2023.



Source: Authors (2023).

Concordance and spelling, reached a level of approval among the judges of 96.7%.

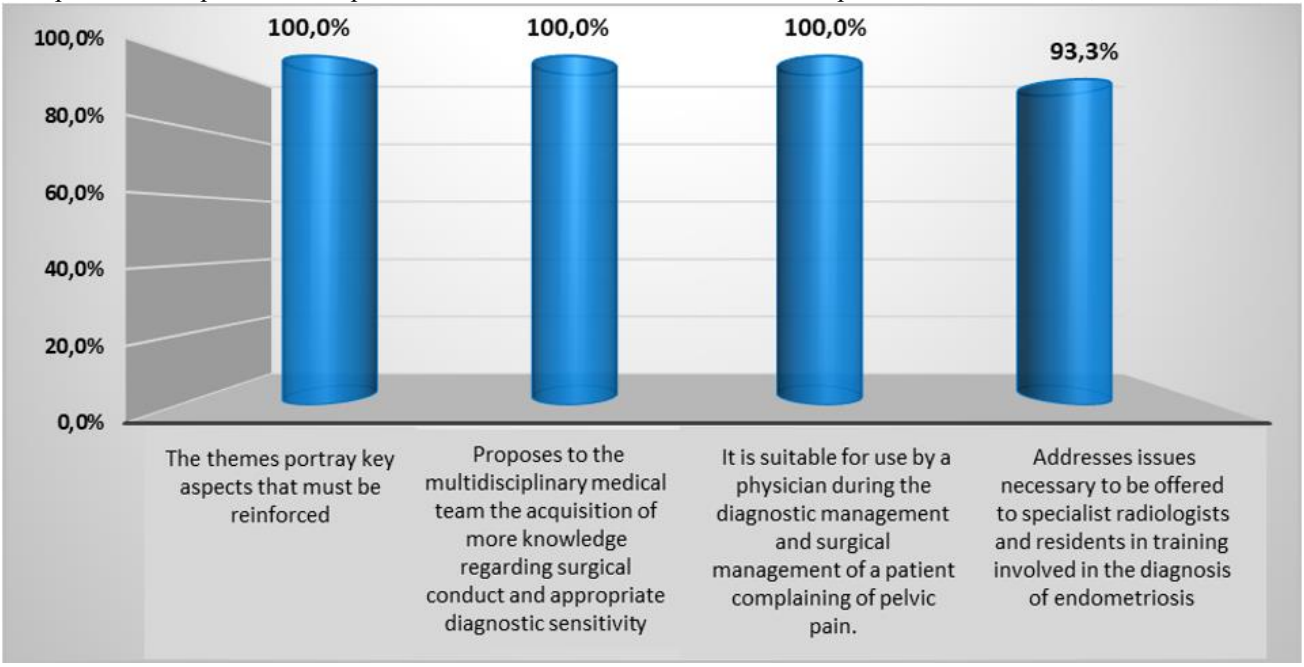
Graph 2 - Description of the topics evaluated in the item "Structure and presentation" of the product validation form, Belém-PA, 2023.



Source: Authors (2023).

The last topic evaluated in the validation form discusses the relevance of the product in question. 93.3% of the evaluators totally agreed on the topic "Addresses necessary subjects to be offered to radiologists specialists and residents in training involved in the diagnosis of endometriosis". On the other hand, the other points analyzed showed maximum valuation.

Graph 3 - Description of the topics evaluated in the item "Relevance" of the product validation form, Belém-PA, 2023.



Source: Authors (2023).

As for the general comments, there was a suggestion regarding the spelling correction of the word "intense" in Chart 1, located on page 11, being duly corrected. Rest of the e-book with no suggested changes or fixes.

4 DISCUSSION

Through this methodological study, a theoretical-illustrative e-book on imaging diagnosis and surgical techniques involved in the various types of pelvic endometriosis was developed and validated. The CVI analysis, which evaluates the agreement between the questions and the answers given by the evaluators, received a score of 0.95, ensuring that it is a valid instrument for study. It is noteworthy that the validation of materials is an important step for the elaboration of educational materials10,11.

Historically, the digital book emerged with the development of personal computing and expansion of the internet, thus, in the 90s, as a way to replace the printed book, its commercialization emerged, and thus it spreads in commerce12,13.

As mentioned in two studies on the use of digital books in teaching, alternative methods to the printed book, when developed by specialists in the field and based on scientific research, contribute to a better understanding of diseases and their treatments, being attractive and useful to the public13,14.

Digital books have advantages such as multi-user access, agility in technical processing, ease of portability, permission to integrated research through links and ease of sharing, proving satisfactory to the objective of this study14.

In accordance with Reis and Backes15 who concluded familiarity of teachers, students and researchers with digital teaching methods, the product in question meets the teaching objectives of diagnostic imaging (valuation = 100%), and can serve as an effective teaching object in specialized educational institutions (medical residency). The fact that we are discussing an important and current subject, which directly impacts the quality of life of the patients involved and requires accurate diagnosis, also reflects the positive results acquired.

As stated by Faria *et al.*[14] and Vieira *et al.*[16], it is indisputable the importance of the image for a greater understanding of the written message, serving as an attraction to the reader. The validation of this e-book, combining two subjects directly related to images (diagnostic imaging and expertise in surgical detection of endometriotic lesions) showed agreement of opinion among the validation judges on the topic "Structure and presentation" (questions "The figures are expressive and sufficient, "Messages presented in a clear and objective way" and "Support for teaching and conduct in the diagnosis and treatment of pelvic endometriosis").

The information presented was considered scientifically correct and the number of pages was considered adequate for the proposed content, which reinforces the positive value of the digital book in question, since it was evaluated and validated by medical specialists working in the area and residents in training with the minimum of basic knowledge in the subject.

Still on the evaluation of the structure and presentation of the digital book, the result of the topic "The information is well structured in agreement and spelling" reflects the grammatical error in Chart 1, located on page 11, which was evaluated and accepted the immediate correction.

The chapters of the e-book were organized in an unprecedented way, according to the anatomical pelvic compartments, in order to facilitate general learning. Because it is a classification usually used in the area of diagnostic imaging, it may have represented exceptional content for evaluators from other medical areas, reflecting the agreement on the topic "Presents logical sequence of the proposed content". However, formally recognized by the judges in view of the positive values obtained in the study, the importance of multidisciplinary knowledge in the management of endometriotic disease is highlighted.

Therefore, all value judges fully agreed with the relevance of the content in the topics "The themes portray key aspects that should be reinforced", "Proposes to the multidisciplinary medical team the acquisition of more knowledge regarding the appropriate surgical procedures and diagnostic sensitivity" and "It is suitable to be used by physicians during the diagnostic management and surgical management of the patient complaining of pelvic pain", revealing that it is a plausible method not

only in the scope of teaching, but also as an instrument of clinical management in the daily practice of the disease. Regarding the statement "It addresses necessary subjects to be offered to specialist radiologists and residents in training involved in the diagnosis of endometriosis", we observed agreement of 93.3% on the subject, in line with Reis and Backes15, reflecting the high degree of significance to assist in the learning curve of the diagnosis of the disease.

5 CONCLUSION

The e-book was developed and validated according to the criteria used: objectives, structure and presentation and relevance. The development of a practical product with direct information on the diagnostic and surgical aspects of pelvic endometriosis demonstrated a positive impact on the learning and recycling of knowledge in the area. It is believed that the e-book is, in addition to an educational material, an instrument to improve the diagnosis of pelvic endometriosis, and finally, to improve the therapeutic management of the patients involved.

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Anthropology of Health: Contributions to the Construction of New Educational Practices

https://doi.org/10.56238/ptoketheeducati-002

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ABSTRACT
This article intends to analyze in depth the directions on the contributions of health anthropology to the construction of new educational practices in health, addressing the development of this area of knowledge and its contribution to a more conscious practice of health professionals and society as a whole. Therefore, we intend to answer the following question: To what extent can Health Anthropology contribute to the use of health education practices in different cultures, based on the literature review? As a form of research, it was used as a method, the bibliographic research that aims to gather information and data that will serve as a basis for the construction of this article. In this analysis, we seek to conceptualize and contextualize the Anthropology of Health and education, pointing out its social aspects that address society and its various cultures, making a panoramic analysis of the main transformations that the Anthropology of Health has been experiencing in the world, establishing connections between space and its relationship with the environment, associated with global cultures and science. As a result, it was found that new requests for education were imposed by the significant advances of the productive forces, which came to generate a new culture centered on scientific and technological knowledge, considered today as the most effective factor of production in the capitalist world. In conclusion, it was shown that, in recent times, the opportunities and intrinsic risks in the global exchange of data, information, and knowledge have become a social issue, being in constant movement and renewal.

Keywords: Anthropology, Education, Educational Practices.

1 INTRODUCTION

The formation of knowledge is one of the fundamental pillars in developed countries and receives more and more prominence in organizations. This confirms that knowledge has become a basic element in the dynamics of the new world order. The knowledge connected to the lines of information constitutes one of the main strategic resources and transforming agents of society, including in the areas of education and health.

Anthropology is the study of man in his physical, biological, social, and cultural dimensions. Man, in his totality, receives influences from various areas when discussing the teaching-learning system, including the area of health. In turn, Anthropology in Health, since the '70s, has been interested in the study of research, especially in the field of Collective Health. (LANGDON *et al.*, 2012).

As Libâneo (1990) points out, the teaching process is defined as a breath of a sequence of activities that involve the educator and the students, with the proposal for the assimilation of knowledge and development of skills through which the students refine the cognitive capacities, such as independent thinking, observation, synthesis analysis, and others.

Health education, especially in Primary Health Care, is a strategy used by health professionals and focused on the community, seeking to cope with diseases through the prevention of risk factors that weaken men's health. The most vulnerable layers of the population are those who do not have access to information and knowledge, have low socioeconomic status linked to inadequate food consumption and sedentary lifestyle, use or abuse of legal and illicit drugs, and are more prone to diseases, especially chronic diseases such as systemic arterial hypertension (SAH), diabetes mellitus (DM) and cancer. (WALNUT *et al*., 2020).

The activities developed by health professionals are based on groups and lectures in health units, without the empowerment of the individual and the collectivity. Health Education confers self-care to the individual, who is capable, responsible, and autonomous to preserve the quality of life and choose appropriate alternatives for their well-being and that of the community. (TOSSIN *et al.,* 2016).

Based on this analysis, the present study seeks answers to the following question: To what extent can the Anthropology of Health contribute to the use of health education practices in different cultures?

Given this explanation, it is proposed as a study objective to investigate and deepen the importance of the Anthropology of Health in education and its influence on the construction of new educational spaces.

This approach deals with qualitative, exploratory, and descriptive research using the systematic review of the literature; it was defined to go through three stages: entry, research planning, and output.

Qualitative research follows paths in the search to understand a phenomenon, without the use of statistical methods in the analysis of the data collected but using theoretical and empirical knowledge as a basis. The exploratory method expands the knowledge and facts related to a given phenomenon. The descriptive method, on the other hand, goes through the reality of the study and its characteristics, accurately describing facts and phenomena found about the object of study. (ZANELLA, 2013).

2 DEVELOPMENT

2.1 EDUCATION IN BRAZIL

It is to be considered that the educational policy should guarantee the right to education for all citizens, along with other social policies that ensure their respective rights. Educational policy, finally, must grant equal conditions of life, providing equal opportunities of existence for all.

The Statute of the Child and Adolescent (ECA), created on July 13, 1990, through Law 8.069/90, establishes the rights and duties of the child and adolescent, the responsibilities of the State, society, and the family with the future of the new generations. Children and adolescents are now considered, within a new paradigm and conception, people in a peculiar condition of development and absolute priority about public policies, including the allocation and release of financial resources. (BRAZIL, 1990).

Due to the considerations about education, Scriptor (2005) argues that a school oriented to citizenship has, consequently, as its purpose, a formation focused on democracy. The school should enable children and adolescents strategies to build and develop experiences directed to their formation, such as the understanding of the society where it is inserted, the knowledge of democratic principles and values, the analysis of problematic social situations that require solutions aimed at the well-being of all and not only that of some, the identification and discussion of interpersonal conflicts and values present in daily life. (BARBOSA, 2019).

The implementation of the School Health Program (PSF), instituted in 2007, is a public policy of the federal government, meeting the articulation between education and health or between the school and Primary Health Care. (BRAZIL, 2021). The PSE, through the actions developed in intersectionality between the educational system and the health system in the collective area, plans and develops themes of disease prevention and health promotion with children and adolescents in the school environment of the public educational network. (SAINTS *et al.*, 2021). Those involved in the process of learning about health/disease at school learn principles of citizenship and become multipliers of information about health and public policies in families, social and cultural groups of the community. (BARRETO *et al*., 2020).

The Family Health Team (FHT) is the model of reorganization of the health system in Primary Health Care, created in 1994 in Brazil. The health professionals who are part of the FHS work with programs that address promotion and prevention, with themes on healthy lifestyle habits, healthy eating, physical exercise, vaccination, routine examinations, etc. Educational actions developed in collective health, especially with children and adolescents, need to be presented playfully and creatively. An example is presented in the study by Nobre *et al.* (2020), where students of an undergraduate course in Medicine use comic books or comic books in the discipline of Physical Activity in Health Promotion to address the theme of sport, physical activity, and health with users of a health unit.

Public educational policies can happen with the mass dissemination of educational advertisements in various social and electronic media, reaching not only health professionals but also users of the Unified Health System (SUS), covering the entire Brazilian education system. However,

the school and its members need to be integrated and cared for in a differentiated way when we talk about collective health.

The considerations collected by Gee (2009), when he states in his thesis that the teaching and learning methodology should follow to facilitate the performance of the student, considering as an active subject in the learning process, are included in the health question. For the author, the use of games (video games) and their similarities should be seen as an important learning process and should, in this follow-up, be present in the school environment. At this juncture, the student must have a basic role in the questions of thinking, discussing, operating, and, above all, creating his own identity, clearly aiming to be able to solve the problems that he incurs. (ARAÚJO *et al.*, 2021).

According to Moita *et al*. (2011), the use of new technologies in the school environment privileges the format of the construction of the educational process, adding the variety of resources inserted into it and making up a unique model of knowledge.

It is emphasized more that it should, above all, consider that the use of activities that predisposes to print good deeds becomes a dominating agent of knowledge, citing, in this follow-up, the games of sizes, which are actions that can be designed and coupled in the school space, serving as a peculiar and effective instrument, with the use of technological modalities, where, In this linear, it becomes a support to learning in a meaningful and playful way. (ARAÚJO *et al*., 2011).

2.2 HEALTH/DISEASE APPROACH IN EDUCATION: NEW EDUCATIONAL PRACTICES

Being **healthy goes beyond not being affected by a type of disease since it can be related to other factors, such as: congenital, genetic, social, environmental, and psychological, linked to the history of each individual. (CARRAPATO *et al.*, 2017). It is for this reason that education must be above any goal set by society because it is through it that collectivity can set objectives to promote health, combating the evils that happen to appear.**

The health/disease theme is imperative when we pay attention to the need for major conceptual changes about the permanent training of health professionals who work in this segment, and, without a doubt, with the direction of the inclusion of the collective focus in the approach to the concept of health, as well as the social and contextual determinants.

In the same sense, Benevides (1996) argues that education involves the formation of the human being to develop the potentialities of knowledge, judgment, and choice to live consciously in society. Motta (1997) adds that education is a process that man goes through to achieve learning, which provides knowledge, the development of cognitive and psychomotor skills, and effectivity. For the author, it always involves two or more interlocutors, designated educators, and learners, using an educational method in a constant movement of the transmission.

The areas of health and disease are producers of knowledge applied in the lives of both interlocutors. The educational activities that socialize information about health promotion and disease prevention, developed in the educational system, promote the integration of the community with the health system. (PAES; PASSION, 2016).

For Martins (1993), the educational policy acts on education but does not have, as it may seem at first, dominion over it. In the author's view, it is seen as a contrary definition, where, for him, it is education itself that can act and interfere in educational policy.

Ordinance MS/GM No. 399/2006, which establishes the operational guidelines of the Pact for Health and its worsening: the Pact for Life, the Pact in Defense of SUS, and the Pact of SUS Management. The ordinance should be updated according to the renewal of new health practices implemented in the Brazilian territory, which comes, every year, expanding the grouping and implementing new insurance measures, making available both for the population and also for health professionals, thus meeting the principles of the SUS. (BRAZIL, 2006).

The Pact for Life includes Health Promotion (healthy habits), Primary Health Care (consolidating the FHS), among others. It is included here as a work territory of the FHS by the Pact for Life, the school, an environment where actions aimed at health promotion should be developed. The school environment contributes to health promotion by bringing together a large number of SUS users, contributing to the critical training of those involved, and addressing themes of the educational process by age groups. For example, topics related to the phases of growth and development of the human body by gender, nutrition, and eating disorders differ by age group, sport/physical, mental, and social activity. (PAES; PASSION, 2016).

Recalling that the National Curricular Parameters (PCN) present the theme of health as transversal to basic education, a highlight that brings together the area of education and the area of primary health care. (MARTINS, 2019).

2.3 ANTHROPOLOGY OF HEALTH: CONTRIBUTIONS TO THE CONSTRUCTION OF NEW EDUCATIONAL SPACES

The Anthropology of Health emphasizes that there are possibilities to rethink public health policies so that they are humanity and punctual in the search to meet specific population groups and society in general. (LARRUBIA; SMITH JUNIOR; FREITAS, 2019).

Education is one of the vital needs of a democratic society because it conceives of the only legitimate means of participation for all. When dealing with education, which must be propagated from generation to generation, educational policy is interfering with the body of social rules that constitute the morality of a group, and may include or exclude values, and ends up delimiting, thus, the very

process of subjective formation of the human being, which comprises the feelings and emotional dispositions that will regulate his conduct.

It is revealed beforehand that education is paramount in the organization of a nation that is characterized by the way of being and acting. It is observed that the human being endowed with qualities is a being that is in constant search, overcoming new challenges, seeking through its capabilities, to expand and perfect the world around it. For this is how Santomé (1998, p.84) defends, otherwise let's see:

> Interdependence is one of the most indispensable words in the new models of life and society. Power and, therefore political, economic, cultural, religious and military issues are increasingly interrelated, and, in addition, their scenarios are more international.

Inherent to health education, in short, it assumes a fundamental role in the lives of citizens and society as a whole, taking into account the combination of the implementation of programs aimed at health promotion and disease prevention, especially in the applications of more humanitarian health policies, in addition to enabling the resignification of the daily activities developed by health professionals.

In the long journey of the process of education and prevention in the collective health of a society, it was sought, in its constructive scenario, the implementation of healthcare models of various segments. From the format of assistentialism physicians to sanitarians, based on the model of individualized assistentialism, which, in a peculiar way. It has been verified over the years that they have not been enough to solve all the health problems of the population. (MARTINS, 2019).

In Brazil, this reality is not very different, even with the implementation of large projects and publications of new legislation that, by the way, in some cases, confuse or hinder the entire process of the processes, especially in the micro models (prefectures and municipal secretariats).

The approval of Primary Health Care, as it is known in Brazil, came from Ordinance No. 2,488 of October 21, 2011, which establishes the rules and norms for Primary Health Care, the Family Health Strategy (FHS) and the Community Health Agents Program (PACS). (BRAZIL, 2012).

It is believed that only after the implementation of the Community Health Agents (CHA) and the Family Health Teams (FHT) in the Basic Health Units (BHU) there was a great advance in the process of promotion and prevention, referring to healthcare. However, nevertheless, all UBS must have sufficient numbers of professionals to promote health in the ascribed territory and avoid the departure of individuals from the communities to the large centers of treatments and diagnoses.

Regarding the work process performed by the Family Health Teams (FHT), Merhy (1997, p. 71-112) states:

> The specificities of health work demarcate a specific field of practices, and these are developed in a space of encounter and intervention called an intercessory space, as a space where the production of health actions is processed and where each worker can potentially decide things that is, exercise a certain self-government.

Finally, it is considered that, to have major changes in the scenario of public policies in Brazil, there must be a renewal in the cultural sphere of the concepts of education and health. Both sectors are interconnected, because, in addition to the implementation of public educational and health policies, it is necessary to increase the number of health professionals in the FHS, envisioning health education as a primary tool in health promotion and disease prevention.

3 FINAL CONSIDERATIONS

The Anthropology of Health seeks, in the social and cultural context, educational spaces to address the problems related to health/disease. One of the spaces is public health, a context that proves to be fruitful for the development of educational practices on self-care and health education.

Health education should be pointed out that it assumes a fundamental role in the lives of citizens and society as a whole, taking into account the combination of health promotion and disease prevention, which encompasses the physical, mental, emotional, and social well-being of individuals.

The educational activities, carried out creatively and playfully, are presented as the best way to approach aspects related to health care and disease prevention. The school, by aggregating individuals in different age groups, is a broad social and cultural universe for the performance of the professionals of the Family Health Teams (FHT).

Public policies in the three spheres of government and the planning of health actions in Primary Health Care must comply with the principles of the SUS, providing for health education to achieve self-care and quality of life of the population enrolled in each FHS care territory. Also, it is worth emphasizing the importance of the permanent education of FHS professionals, with the articulation between public institutions and municipal health departments, for the consolidation of the service and improvement of health actions in a constant movement of learning in service.

It is important to emphasize that more studies need to be conducted to advance on the subject. Studying the relations between health and education, as well as educational spaces and educational practices, will provide relevant information about the collective health model that society wants.

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Introduction to teaching anthropology

https://doi.org/10.56238/ptoketheeducati-003

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ABSTRACT
Education, in the final analysis, consists of the vital process of personality development and formation; Education is not to be confused with the mere adaptation of the individual to the environment. It is a creative activity that encompasses man in all his aspects; it begins in the family, continues in school, and continues throughout human existence. Anthropology, for its part, collimates exhibiting the diversity of human beings to better understand human ontology. Thus, this discipline tries to understand humanity in all its complexity without simplifying and denying autonomy. This is the reason why she is interested, above all, in the difference between cultures, historical periods, groups, and individuals. Education and Anthropology are intricately connected, as a human being means being able to graduate.

Keywords: Education, Teaching, Anthropology.

1 INTRODUCTION

For Benevides (1996), Education involves the formation of the human being to develop the potentialities of knowledge, judgment, and choice to live consciously in society.

In this same sense, it corroborates MOTTA (1997) that Education is a process that man goes through to achieve learning, which provides knowledge, the development of cognitive and psychomotor skills, and effectivity. It always involves two or more interlocutors, designated educators and learners, uses an educational method, in a constant movement of transmission.

Education consists of action, by which a person or groups of people acquire general, scientific, artistic, technical and specialized knowledge, to develop their capacity or aptitudes. In addition to knowledge, the person also acquires, through Education, certain habits and attitudes.

It can be developed in educational establishments specially organized for this purpose, such as elementary schools, colleges, musical conservatories, universities, or through everyday experience, through personal contacts, reading newspapers, magazines, books, appreciation of paintings, sculptures, films, musical and theater plays, trips and conferences.

In line with the teaching of Wulf (2005), anthropological knowledge has an important role both in the field of educational sciences and in the field of Pedagogy.

Immediately, a new dimension of pedagogical knowledge emerges called pedagogical anthropology or, to put it more precisely, the historical and cultural anthropology of Education.

2 ANTHROPOLOGY OF EDUCATION

This designation opens the scene of one of the most innovative and challenging debates in Education today: the overcoming of fixed and closed systems of principles and values, by a historical and cultural perspective and, therefore, always provisional and relative to pedagogy.

In the 60s and 70s, Educational Anthropology was interested only in the child seeing in him only a *homo educandus*. It highlighted general aspects about the Education of children, their vocation, inferring historical-cultural conditions about them (SANTOS; Regert, 2020). The different cultural and historical aspects among children from all over the world, as already analyzed in Cultural Anthropology, in the Anglo-Saxon region, seemed until then the least interesting (WULF, 2005).

At the beginning of the 90s, when the double historicity and the domain of historical anthropology were unveiled, a change of tactics could be effected. In the 90s, several attempts were made to use this discovery to advance historical-pedagogical anthropology (SANTOS; Regert, 2020).

One comes to understand the meaning and scope of comparative anthropology, which consists in the articulation of a general perspective with a particular vision of approach to human nature.

According to the conception of Von Humboldt, comparative anthropology has its particularity in the fact that it deals with an empirical matter in a speculative way, a historical fact in a philosophical way and human nature in the sense of its possible development (WULF, 2005).

Anthropology is therefore no longer solely empirical or solely philosophical. It is, on the contrary, a matter of reconciling the philosophical and the empirical, of understanding a historical fact within a philosophical perspective, to discover a possible evolution of human nature.

In establishing this relationship between philosophy and empiricism, between the transcendental and the historical, Von Humboldt[1] engages in a historical-anthropological study guided by philosophy.

To the extent that this study has as its task to highlight the possibilities of development, the objectives of anthropology are added to those of Education. Therefore, the gaze is directed to explore the differences between culture, historical periods and individuals, without establishing a fixed and ultimate norm.

Thus, Anthropology seeks to expose the particularities of the moral characteristic of man by comparing them between the different origins of the human being, not forgetting that man lives in groups and forms societies as a whole (SANTOS; Regert, 2020).

Knowledge of the moral characteristic seems to be the main goal of anthropology. The task of anthropology is to explore the cultural differences between individuals and society.

Although the difference between human types is very important, it is also indispensable to recognize that individuals and societies form a whole (SANTOS; Regert, 2018).

[1] Alexander Von Humboldt was a naturalist who developed and specialized in several areas (ANDRADE, 2019).

Therefore, such a Science aims, on the one hand, to explore the differences between societies, cultures and individuals; on the other, it is about understanding the ideal of humanity in all its diversity and contingency.

In addition to anthropological research is responsible for discovering the diversity of characteristics in societies, of different individuals and human groupings, it is necessary to define the notion of characteristic.

Comparative Anthropology tends to reconstruct the character of the human being from his expressions and his manners (SANTOS; Regert, 2018).

It is about understanding your traits, the relationship of forces that move you and your inner strength and perfection, much more than your outer attitudes and ends.

When analyzing the individual, it is necessary to distinguish what is essential from what is accessory, from understanding in time and history, as well as his openness to the future.

Finally, it is necessary to synthesize the diversity of phenomena into the highest unity. Thus, anthropology has the task of analyzing the scope of the diversity of men without disregarding identity.

The knowledge of the human being and his Education are intrinsically linked. Practicing Education with the human being is impossible without knowing him, without anthropological studies being carried out. For its part, anthropology aims to educate man and the entire human species (SANTOS; Regert, 2020).

The relationship between anthropology and the theory of Education is contingent, there are many possibilities to determine the link between the two and to realize one of its possibilities, after making a choice (SANTOS; Regert, 2020).

If the relationship between anthropology and Education is considered as contingent, this relationship requires a thorough and cautious investigation, being open and variable, with positioning to each new situation (SANTOS; Regert, 2020).

This opening of possibilities requires a choice, for it must be delimited in each specific historical situation.

As previously presented, man as an individual has his culture and lives in groups, anthropological knowledge is acquired through the investigation of different cultures and societies. It helps to understand specifically each culture, each group and each human being (SANTOS; Regert, 2020).

According to Wulf (2005), the effort to understand man globally, advancing beyond the individual and including differences and contingencies, becomes a challenge for historical and cultural anthropology. Education aims to link external conditions of society with internal conditions of the individual (SANTOS; Regert, 2020).

For such processes to result in success, it is necessary that man be free and that society allows sufficient access to Education. Only in this way can a complex culture be produced.

The results of these education processes are open to the future. This means that Education believes in the infinite character of the process of educating and forming man, counting on the unknown and the uncertain future (SANTOS; Regert, 2020).

For Von Humboldt, language unifies his conception of anthropology and his theory of Education, also adding new dimensions on the themes (WULF, 2005).

Thus, as for anthropology and the theory of Education, the historical-empirical diversity of languages is for Von Humboldt a richness of the world and of man. However, such diversity does not prevent the process of communication between men (SANTOS; Regert, 2020).

In the same way that in anthropology, the investigation of different cultures increases knowledge about the human being, the exploration of differences between languages increases knowledge about the linguistic phenomenon (SANTOS; Regert, 2020).

It is through language that makes the world human; it translates the world that inhabits man into the world of man. Its boundaries are the limits of each culture and each social individual (SANTOS; Regert, 2020).

Given the importance of the role of the economy of labor and the economy of time in the effort to create universal man, the anthropological question is the resumption of an acceleration of time and a decrease in labor (SANTOS; Regert, 2018).

Meaning and perceived objects intersect, not only when one sees, but also when one touches, when one hears and tastes. Man does not see without presuppositions (SANTOS; Regert, 2018).

On the one hand, the individual begins to perceive the world in an anthropomorphic way, that is, they start from its physiological bases. On the other hand, perception is oriented according to historical-anthropological and cultural data.

According to Wulf (2005), Education requires the work of interior representations. I work in discourse, but also the search for its genuine content.

Education must therefore make human beings capable of better managing tensions and conflicts to build a common future for humanity. It is necessary to consider Education as a value in itself and as a process that lasts a lifetime.

Since Education seeks to meet the new demands of society, economics and politics, it is necessary to avoid reducing it to something tied to these demands.

Education and training need to become flexible, and to bridge the diversity and heterogeneity of the world and its regions. It is about teaching the human being to live together, peacefully and constructively (SANTOS; Regert, 2018).

By teaching oneself to live together, one hopes to develop knowledge of others and creativity. Among the forms of knowledge, much importance should be given to the sciences, because they contribute to social development (SANTOS; Regert, 2018).

Education and training must, above all, be attentive to the development of memory, reflection, imagination, health, aesthetic and communicative faculties and the concrete needs of individuals.

The anthropological knowledge of Education works in a double historical and cultural contextualization. On the one hand, for the one who produces the knowledge, on the other hand, for the one who, in the researches, relies on this knowledge, produced in a certain context (SANTOS; Regert, 2018).

This double historicity and culturality makes the content of anthropological knowledge relative. In addition, Educational Anthropology becomes a historical and cultural anthropology of Education, which takes into account the historicity and culturality of the researcher and his object.

The historical and cultural anthropology of pedagogy also seeks to relate its perspectives and methods with the perspectives and methods of its object (SANTOS; Regert, 2018).

For Wulf (2005), the Anthropology of Education has as its task the analysis, organization, reevaluation and production of knowledge through the sciences of Education, as well as the deconstruction of the concepts of Education, in an anthropological perspective.

Finally, it can be said that the Anthropology of Education also includes reflection on both the competencies and the limits of one's knowledge (SANTOS; Regert, 2018).

It analyzes the difficulties of man's self-definition and Education, which arise with the disappearance of universal reference points. It shows how the consequences of these difficulties depend on the relationship with their conditions of production.

3 ANTHROPOLOGY AND THE THEORY OF EDUCATION

Harmom and Jacobs teach (apud Reis (1996, p. 46),

> Education is much more than just a process to acquire useful knowledge. Education makes the common mind more active and alert. [...] Education trains the mind to consider many possibilities, to see things through a new and broader perspective, to question and challenge the *status quo*, to think and imagine, to innovate and invent, to make decisions and act on their initiative.

For Pinto (1987, p. 29), "education is the process by which society forms its members in its image and function of its interests".

Reis (1996, p. 58) defines that,

> [...] to educate is to allow man to construct his identity. This construction will allow you greater pleasure (personal energy), when sharing life in society, making adaptations and personal and reciprocal transformations.

Émile Durkhein stated that Education is a social fact (FERRARI, 2008). This statement does not contain anything surprising for today, because the study of sociological aspects of Education and its different theoretical-methodological approaches circulates widely in the academic field, give subsidies to the planning of educational actions and public policies in this sector, and are often published by the mainstream press.

In the study of the historical context in which the slow and progressive constitution of the educational system took place, Durkhein took as a basis the observation that even in the simplest societies educational practices were instituted to transmit to children and young people their accumulated knowledge, norms, customs, values and histories of the group (FERRARI, 2008). This gives the educational system a common - social - essential character.

Educational actions should not be understood as isolated from other social practices, since, despite the relative autonomy of each social system, they are always parts of a whole with which they integrate in the achievement of a common end.

To distinguish the character and nature of Education, Durkhein ([1922], 1978, p.41) defined it as:

> The action exerted by the adult generations on those generations that are not yet prepared for social life; it aims to arouse and develop, in the child, a certain number of physical, intellectual and moral states, demanded by political society as a whole, and by the special environment to which the child, in particular, is destined.

Education is confused with the process of humanization itself, because it is the empowerment of the individual both to live civilly and productively, as well as to form his code of behavior and to act coherently with his principles and values, with openness to review them and modify his behavior when changes become necessary (MOTTA, 1997).

According to Freire (1977, p. 76) "education, whatever the level at which it takes place, will become all the truer the more it stimulates the development of this radical need of human beings, that of their expressiveness."

Education both has an individual side, which involves the formation and development of the personality of each individual, and has its social side, since all school education, analyzed as a sociocultural process, is usually related to a national project.

Concerning national Education, we can highlight the ideas of Sucupira (1963, p. 21):

> The idea that we make of national Education starts from this evident truth that in reality there is no formation of abstract man, there can be no education detached from the concrete motivations and objectives of a given society. One cannot think of the process of humanization of man independently of a people, of a culture, of a historical circumstance, of a national community. Therefore, to each historical-cultural configuration corresponds a self-understanding of man and, consequently, every Education that is elaborated in it, even aiming at the realization of man in his universal dimensions, necessarily reflects the spirit of his time, the life and soul of his culture.

Education, being par excellence the process of systematic and conscious changes that is done in a planned and organized way, tends to establish itself as the most effective instrument that the state has to effect the development of a people, because it involves all the processes aimed at preparing people for external and internal changes (MOTTA, 1997).

It is necessary to anticipate the development and leave them able to accept, understand the challenges of the future with the capacity to mold them to their principles, values and individual and social interests (MOTTA, 1997).

The primary objective of Education is to provide man with cultural instruments capable of promoting the material and spiritual transformations required by the dynamics of society.

Education increases man's power over nature and, at the same time, seeks to conform him to the goals of progress and social balance of the collectivity to which he belongs.

In the light of the reflections of Motta (1997, p. 81), it is highlighted that,

> The primary objective of Education is to awaken and provide the growth of criticality (understood as the capacity for criticism of history, reality and ideologies and self-criticism) and creativity, which impel man to try to conquer, by himself and with his fellow men, his freedom and to evolve, in the world and with the world, discovering the micro and macrocosm, inventing interferences and transformations in reality, and transcending oneself, tending towards its full realization.

According to Benevides (1996), the educational process implies a succession of acts in time, a sense of continuity, which can be considered integrally.

Thus, it will accompany the human being throughout his life. It can still be considered in stages, or aspects; or periods; or formal episodes, such as those relating to the teaching of Education in specialized institutions.

The good sense of formation, transformation or change of behavior points to a goal to be achieved in the educational process.

Through the educational process, the human being incorporates the relevant knowledge and the postures elected by society, so that every educational process always makes a transmission of values and the achievement of objective, which can even be to enable submission to a dominant political system and prevent an attitude of criticism of the ideology that sustains this same political system (BENEVIDES, 1996).

Finally, it is necessary to synthesize the diversity of phenomena into the highest unity. Thus, anthropology's task is to analyze the scope of the diversity of men without disregarding the identity of the individual cell.

The knowledge of the human being and his Education are intrinsically linked. There is no educational process without knowing man, so the need for anthropological studies is the first step for the process to develop. In turn, Anthropology enables the Education of the collective and social man.

4 FINAL CONSIDERATIONS

As a social dynamic, the educational process must provide the elaboration and mastery, by individuals and groups, of new models or forms of inquiry of reality, of evaluative and normative models for action and of forms of communication and expression that strengthen the bond and cohesion of the group or community.

In essence, the educational process consists in the permanent transformation of behaviors for an increasingly integral understanding and an increasingly solidary action on the world, in its physical, biotic and anthropic totality (CRUZ, apud CASAS ARMENGOL, 1986).

Finally, according to the magisterium of Maria Montessori, which is concerned with the preservation of a broader heritage "the education of human beings" (MONTESSORI [1977] apud RÖHS, 2010).

As a tool in the educational universe, Anthropology unveils and explores the cultural particularities of the human being, in addition to studying the society where he is inserted.

In short, the Anthropology of Education has the role of analysis, organization, reevaluation of the educational process and production of knowledge, respecting cultural and anthropological perspectives, in the construction of knowledge by humanity.

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Health education group with preschool children: Experience report of nursing students

https://doi.org/10.56238/ptoketheeducati-004

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ABSTRACT
The school environment is ideal for developing health education actions, which seek to teach and expand the knowledge of healthier daily practices. Thus, the objective of this report was to describe the experience of nursing students facing an educational action on oral hygiene for preschool children. This is a descriptive experience report produced through the experience with children aged 4 to 5 years from a school in the city of Santo Ângelo. The educational action was carried out by nursing students during the discipline of Collective Health Nursing I in the second semester of 2022. The activity was developed with 24 children of early childhood education on oral health and the importance of tooth brushing with the use of an educational theater and a practice accompanied by tooth brushing. Nurses have an important role in health education, as they propose new methodologies and interventions to face health problems that affect populations. Health education aimed at children allows learning, integration, and stimulation to do the correct brushing of the teeth, preventing future problems.

Keywords: Health Education, Oral health, Nursing.

1 INTRODUCTION

Health education is an important means to expand the knowledge of practices that are related to healthy behaviors on the part of individuals. Given this context, their actions have a persuasive character, as they seek to precept certain behaviors considered pertinent to the prevention or minimization of health problems (GUETERRES *et al*., 2017). In this scenario, the school environment

is the most conducive to developing health activities since, in the first years of school life, children are vulnerable to various infectious diseases because they are unaware of recommended ways of prevention, including correct hygiene of the hands and mouth structures. (ALMEIDA DE OLIVEIRA *et al*., 2021).

As a policy that is based on the articulation between School and Primary Health Care, in 2007, the School Health Program (PSE) was created, which aims at the integration between health and education for the development of citizenship and the qualification of Brazilian public policies. Health and education policies aimed at children, adolescents, young people, and adults in Brazilian public education come together to promote health and integral education. (BRAZIL, 2007). The PSE aims to contribute to the integral formation of students through actions of promotion, prevention, and health care to face the vulnerabilities that compromise the full development of children and young people in the public school system. (MINISTRY OF EDUCATION, 2018). Among the actions recommended by the PSE, it is worth mentioning the Promotion of Oral Health, given its great importance in the development of a good quality of life, because having a healthy mouth avoids and prevents various diseases such as caries. According to the Ministry of Health, "The caries disease is the most prevalent disease in the world, non-infectious, non-transmissible, sugar-dependent and bio-social character." (BRAZIL, 2018 p. 52).

Inserted in this context of Health Promotion, such as oral health, is the nurse's performance, focused on the action of care, valuing the well-being of the patient and, therefore, assuming great responsibilities when performing educational activities to help the user and the community through health education. According to Pinheiro:

> "Health education is inserted in the context of nursing performance as a means for the establishment of a dialogical-reflective relationship between nurse and client, in which the latter seeks to reflect on their health-disease situation and perceives themselves as subjects of transformation of their own lives." (PINE, 2011)

Thus, the importance of nursing as a profession of social commitment, sensitive to problems and human rights, and as a science that proposes new methodologies and interventions is highlighted. In this way, the nurse uses health education as a strategy to cope with the multiple health problems that affect populations and their social contexts (PINHEIRO, 2011); among these problems are those related to oral hygiene, which can be prevented through their actions.

2 OBJECTIVE

To report the experience of nursing students during the development of a health education activity on oral hygiene held in a school in the region of Santo Ângelo, Rio Grande do Sul.

3 METHODOLOGY

The present work is an experience report on oral hygiene, through the internship of the discipline Collective Health Nursing I of the Nursing course of the Regional Integrated University of Alto Uruguay and the Missions, with the academics: Maria Eduarda Rosa de Lima, Nátali Gonçalves Rodrigues, Leandra Lia Muller, and Thauana Baldessarini of the fourth semester. Second (CAVALCANTE; LIMA, 2012, p.96), an experience report "is a descriptive research tool that presents a reflection on an action or a set of actions that address a situation experienced in the professional sphere of interest to the scientific community."

The health education activity took place on August 11, 2022; the target audience of the activity was 24 children of early childhood education from 4 to 5 years of age, in the preschool of the municipality of Santo Ângelo, with educational activities: theater and the practice of the technique of correct brushing of the teeth.

4 DEVELOPMENT

Educational activities for children aged 4 to 5 preschool years were carried out by a group of academics to do health education in charge of addressing the theme of Oral Health and the importance of brushing, in a public school in the municipality of Santo Ângelo, RS, on August 11, 2022.

Venâncio D.R. et al. (2011), back as children in the Pre-Operational phase (2 to 7 years), are more influenced by the visual qualities of the objects, where the most accentuated characteristic is the playful activity, accompanied by inquiry and curiosity. Thus, the participants of the group organized themselves to carry out an educational theater portraying the importance of oral hygiene to draw the attention of children and arouse curiosity and interaction. With this, the construction of a cardboard mouth with recyclable pet bottle teeth was carried out to create an object to explain the correct forms of brushing, facilitating the children's visualization.

During the theater activity, the correct brushing techniques were approached through a model of the Ministry of Health (BRASIL, 2012, p. 9), which takes place through some steps. At first, oral hygiene should be performed daily with fluoride toothpaste, by positioning the brush towards the gums and making movements from top to bottom, on the upper teeth and from the bottom up, on the lower teeth as if you were sweeping them. Then brush the inside of each tooth in the same way and the surfaces of the teeth, with gentle, back-and-forth movements. The brush should reach all teeth, including the last teeth of the back of the mouth. After brushing, one should wrap about 40 cm of floss between the fingers and pass between the gums and the tooth to bring the dirt to the tip of the tooth. It is recommended to floss at least twice in each of the spaces between the teeth. Finally, it is important to brush the tongue, making movements with the brush as if you were sweeping the tongue from the inside to the tip.

Soon after the educational theater, which showed the correct techniques of tooth brushing through the model of the Ministry of Health, the children were able to reproduce the brushing of the teeth in the cardboard mouth, as they learned during the presentation. Then, a collective mouth brushing was performed, guided by the participants of the group, with each child present. From this practice, it was possible to individually help each child to perform oral hygiene techniques, being able to identify the difficulties and doubts of each one to provide a better understanding.

During the performance of the activities, one can observe the enthusiasm of the children, who actively participated in the course of the theater and reproduction of brushing, with comments and doubts, showing interest in the theme and willingness to learn. This is evidence, as the school is one of the main institutions where health is incited, especially when it comes to oral health education, where the priority is the child since this type of education should begin as soon as possible. Thus, it is possible to improve knowledge about oral health in preschoolers by using adequate resources for this age group (AQUILANTE; ALMEIDA; MARTINS; XAVIER; SALES PERES; Bastos, 2003)

5 FINAL CONSIDERATIONS

The educational activities carried out in a school environment sought to pass on knowledge and arouse the interest of the preschool public concerning oral health and the importance of hygiene care with the teeth. In addition, the school environment was very conducive to developing educational action, which counted on the collaboration of all, both students and teachers. The children showed interest in the practice and habit of brushing, and many report already adopting such a habit by teaching and encouraging their parents at home.

Thus, the internship group, through the activities developed, aimed to contribute to the community through the propagation of oral health education, encouraging children to adopt hygienic and healthy habits. Thus, it will positively influence their quality of life, considering that this is the role of Nursing through health education.

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Historical approaches to integral education in Brazil

https://doi.org/10.56238/ptoketheeducati-005

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ABSTRACT
This article is a theoretical review of integral education in the libertarian, authoritarian, liberal and liberating sense, which allows us to reach the course of these conceptions to better understand their dimension and reflections in the 20th century in the history of Brazilian education, and 21st century - contemporary Brazil - on the agenda of public policies for basic education with Integral Education. Proposals that, in summary, constitute instruments in the fight against school failure, aiming at social integration. The results reveal that they are conceptions that produced theories and practices for education in an integral perspective. These theoretical currents think about integral formation in peculiar ways with the intention of developing the global formation of the individual. Sometimes the term is associated with full-time, sometimes with social training, sometimes with integral/social protection. Each of the integral education proposals presented here defined the school according to its vision of education, with its symbols and values. We believe that integral education needs more in depth investigations on the procedures and strategies used in federal government programs in order to contemplate the ambiguities, contradictions, needs and problems that Brazilian public schools present today.

Keywords: Teaching conceptions, Historical dimension, Integral education programs.

1 INTRODUCTION

In this text we address several conceptions of Integral education in the search for the right to a quality education. We seek to answer the following questions: What are the guiding principles of these conceptions for the implementation of Integral Education? What are its contributions and implications for Brazilian education? To try to answer these questions, we present the result of studies on experiences of Integral Education of the late nineteenth century in Europe that had repercussions on the experiences that emerged in Brazil, from the beginning of the twentieth century to the present day.

For knowledge of European experiences of Integral Education of the nineteenth century, we present the libertarian conceptions of integral education in the following theorists: Proudhon (1975), Bakunin (1979, 2003), Robin (1901,1981,1989) and Ferrer y Guàrdia (1912). These authors emphasize the educational and cultural dimension for social transformation and liberation. For these libertarians, education, culture and revolution are inseparable dimensions. For knowledge of experiences of Integral Education in Brazil of the twentieth century, we present the integralist, liberal and liberating perceptions. For the integralist approach - authoritarian conception -

we evidence the Brazilian Integralist Movement that had as its creator and its main leader, Plínio Salgado (1935). For the liberal conception, we approach the experience in the perspective of integral education that was propelling for the construction of several other educational projects in some Brazilian states[1]. We will seek theoretical support in Anísio Teixeira (1994, 1999), graduated in Law, main representative of the New School, who sought democracy with educational projects of school with the increase of the school day. In the liberating conception, we are based on Paulo Freire (1980, 1983, 2003, 2014), educator and philosopher, who considered the educational system as a possibility of transforming society by the ideal of liberating conception.

We conclude with the current conception of integral education of the federal government in the More Education and New More Education Program that entered with force in the Brazilian educational policy in the twenty-first century, from the year 2007. We anchor ourselves in official documents, and authors who address the object of study of the text. Among them, Freitas (2015), Cavaliere (2014), Moll (2012) and Algerbaile (2009). With this study we aim to offer some subsidies for the continuity of the debate about the meaning and intentionality of the current proposals of integral education of the Brazilian State in the organization of pedagogical work in public education networks.

2 EXPERIENCES OF INTEGRAL EUROPEAN EDUCATION, NINETEENTH CENTURY

2.1 LIBERTARIAN APPROACH TO INTEGRAL EDUCATION

We bring the libertarian approach of education by observing that it is based on the conception of an education that seeks the autonomy of the subject seeking to develop all his capacities, dealing with the physical, intellectual and moral dimensions. This approach is also called the anarchist movement [2] or the acrate movement[3].

The importance of this approach is that it brought propositions of a new educational program with aspects of integral education, pleading for changes in the social function of teaching that had an authoritarian character, and reserved for the wealthy classes, concentrating power, perpetuating the division of society into classes.

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[1]Integrated Centers of Public Education CIEPs (Darci Ribeiro). Program of Integral Formation of the Child (PROFIC). Centers Linked to Child Support (CIACs) / Centers for Integral Care for Children and Adolescents (CAICs). Full-time Integrated Education Project, in Curitiba in Paraná / Full-Time Schools (FTEs)

[2] Anarchist movement: action of anarchist groups, together or separately, composed of organic cells, communes, groups, study centers, unions and federations. The anarchist movement is not exclusively an organization of workers for workers, it is the action of individuals who oppose and fight capitalism, aiming at the overthrow of the state and the reconstruction of a horizontally self-managed decentralized New Social Order. It is not the revolt of the stomachs, it is the revolution of the consciences! The anarchist movement does not stand on the class struggle or intend to install the governed in the place of the rulers, its aims are to end classes, to make man the brother of man, regardless of color, age or sex. RODRIGUES, Edgar. History of the anarchist movement in Brazil. Piracicaba: Athenaeum Diego Gimenez, 2010. pp. 2-3. Available at: https://we.riseup.net/assets/141914/Edgar%20Rodrigues%20hist%C3%B3ria%20do%20movimento%20anarquista%20no%20brasil.pdf. Accessed 5 Jun. 2022

[3] Educational vision, in school or outside it, as a field of appropriation of culture and instrument of social liberation. SILVA, Doris, A. Anarchists: cultural creation, pedagogical invention. Education and Society, Campinas, v. 32, n. 114, p. 87-102, jan-mar. 2011. Available at:http\;//www.cedes.unicamp.br. Accessed 10 Jun. 2022

Two of the great intellectuals of the libertarian movement are Pierre-Joseph Proudhon (1809-1865), French political philosopher and economist, influential theorist and writer of anarchism. He developed a model of mutualist society of education, and Mikhail Alexandrovich Bakunin (1814-1876), Russian political theorist, one of the basic exponents of anarchism. He developed a socialist model of education.

Proudhon (1975) defended the inseparability of intellectual work, manual labor and leisure. He aspired to work workshops maintained by the industries and that the workers themselves should be the formators so that education would be left out of the domain of the State and the Church.

> What Proudhon defines is a total, complete education without specialization. It is polytechnic and integral (intellectual and manual), and is expressed under the denomination of 'polytechnic of learning'. [...] the privileged place becomes the school workshop [...] where this work is simultaneously formative, completed by an encyclopedic formation that allows us to better apprehend it (ANTONY, 2011, p. 40).

For Proudhon (1975), the workshop-school would unite theory and application. It could not dissociate the workshop from the school because separation would perpetuate class society. Both would develop in the worker the ability to make decisions autonomously.

In Bakunin (1979), we observe the concert of freedom and singularity for the realization of a socialist society supported by the collectivization of the means of production. Bakunin (2003, p. 78) considered that "instruction should be equal in all degrees for all; therefore, it must be integral, that is, it must prepare children of both sexes for both intellectual life and for the life of work, so that all may become complete persons."

Bakunin (1979) perceived the extent of the inequality of access to knowledge. It aimed at a program of libertarian education divided into two axes: the scientific – theoretical – and the industrial – practical. The first, obligatory, should offer the basic knowledge by rational explanation. The second, optional, should provide the specific knowledge that most attracted students to the learning of their professions.

It is understood that for Bakunin (1979) the non-separation between manual work and intellectual work, would avoid the alienation of the worker. In integral education it would be necessary to link science and work so that the social life of each individual would be more complete.

Still, in libertarian education, Paul Robin (1837-1912), French, anarchist, pedagogue, anguished with the proletarian class excluded from education; and Francisco Ferrer y Guàrdia (1859-1909), a Catalan anarchist of the movement opposing the Spanish monarchical regime and the rule of the Catholic Church. Ferrer Y Guàrdia (1912) became interested in educational

problems and established his conception of rationalist teaching – based on science – and integral – based on manual and intellectual development.

The understanding of integral education for Robin "was born from the deep feeling of equality and the right that each man has, whatever the circumstances of his birth, to develop, as completely as possible, all the physical and intellectual faculties" (ROBIN, 1989 apud MORIYÒN, 1989, p.88).

The thought of Paul Robin (1989), was his concern with the educational performance of offering only elementary questions of knowledge because the others would be useless to the practical life of the worker. In his view, only through integral education could each person acquire theoretical – scientific – and professional – practical knowledge – for the most complete possible development.

Robin (1981) experienced experiments in integral education when he took over the direction of the Prévost orphanage in France. He considered integral education as a political necessity and the right of all. It would be the path of a new pedagogical practice to overcome the alienation of the people and educate for freedom and for the change of society.

For Robin (1981, p. 47), teaching should be "[...] a complete, chained, synthetic, parallel progressive set of all kinds of knowledge and from the earliest age." In the conception of Robin (1981), the school should have much more equipment than the classroom. Once the skills were developed, education would take care of intellectual capacity, such as communication; that is, reading and writing. The learning process should be dynamic and creative.

Robin (1981) understood that the child should be encouraged to ask and the teacher should enable the student to produce his own knowledge. Everyone in the orphanage had an equal plan: everyone should respect and be respected. And freedom was the key to the development of critical thinking and autonomy. The orphanage became a center for reflection on education. (ROBIN, 1981)

In the statement of Robin (1981), the quality of life of society would rise from the moment that this teaching prevailed over political and dogmatic instruction. He pointed out that the school, as it was set, repressed the child physically, morally and intellectually with the intention of dominating his mind and controlling him as he wished. It is presented the finding that, in the understanding of Robin (1981), the education provided by the family and the school was full of dogmatisms, prejudices and traditions, which made the subjects insert themselves in society morally unbalanced.

Influenced by the ideas of Robin (1981), Ferrer y Guàrdia (1912) disseminated liberal thought and fought for an education before statesmanship. In the understanding of Ferrer Y Guàrdia (1912), individuals should not overwhelm each other, so he considered rebellion rational and natural. "[...] The exploited have to be rebellious, because they have to claim their rights

until they reach their complete and perfect participation in the universal patrimony." (FERRER Y GUÀRDIA, 1912, p. 35).

Ferrer y Guàrdia (1912), excelled in social co-education. Social co-education - both sexes - would form the free and autonomous individual of an exclusive education, subject to credulity and submission and also of exclusive education, favorable to the permanence of privileges.

Ferrer y Guàrdia (1912), created the Escuela Moderna de Barcelona. At Escuela Moderna, punishment and reward were rejected. The work would need to be collective and solidary, oriented to emancipation – political, libertarian and statesmanlike – and to well-defined practical learning. The games would be composed as pedagogical resources to help build values. Ferrer y Guàrdia (1912), realized that:

> [...] the individual; formed in the family in its atavisms, with the traditional errors perpetuated by the ignorance of the mothers, and the school with something worse than the error, which is the sacramental lie imposed by those who dogmatize in the name of a supposed divine revelation, entered the deformed and degenerate society, and could not demand of it; by logic of cause and effect, rather than irrational and pernicious results (FERRER Y GUÀRDIA, 1912, p. 12).

We observe, in view of the above, a purpose: integral education, as a proposal that comprises education as an element of social emancipation and constitution of equality, would constitute a complete education, would not allow that above the masses could exist any class that could achieve more than them, dominating and exploiting them.

These libertarian ideas were widespread in Brazil in the late nineteenth century.

3 BRAZILIAN EXPERIENCES OF INTEGRAL EDUCATION IN THE TWENTIETH CENTURY

The revolutionary ideas of education came to exist in Brazil with European immigration, which was lodged in this territory at the end of the nineteenth century.

> From the old world came the revolutionary ideas of ship, in books published in Europe. They entered through the ports of Rio de Janeiro, Santos, crossed the borders invading Brazil a little in the head of each immigrant who came in search of freedom and fertile land to sow anarchism (RODRIGUES, 2010, p. 1).

Anarchists in Brazil[4] sought the constitution of a society that would modify the social reality of oppression. They scrutinized ways to treat the problem. Passetti and Augusto (2008, p. 54) indicate in their writings that "[...] Courageous they took to the streets with their families,

[4] (RODRIGUES, Edgar, 2010, p. 16). History of the anarchist movement in Brazil. Athenaeum Diego Gimenez 2010. Available in: https://we.riseup. Net/assets/141914/ Edgar%20Rodrigues% 20 hist% C3%B3ria%20do%20movimento%20anarquista%no%20brasil.pdf. Accessed 15 Jun. 2022

building marches, strikes and unions." They sought to confront the problem of oppression with the creation of class associations, proposing schools for workers and their children.

According to Rodrigues (2010):

> More concerned with ideology, anarchists developed an educational work. They saw in the human element the most important "piece" to prepare, both in the professional and cultural fields so that each militant was able to manage himself without religious, employer or police crutches (RODRIGUES, 2010, p. 4).

The anarchist libertarian school in Brazil defended self-management and, by pedagogical principles, freedom and mutual teaching. To this end: "[...] The anarchists founded free schools, popular universities, social theater groups, developed intense educational, sociological, general culture, libertarian propaganda." (RODRIGUES, 2010, p. 4)

It is worth mentioning the Popular University of Education (UPEL), in Rio de Janeiro, which had a short duration, from March to October 1904. However, it was fundamental as a space of intense movement of workers and intellectuals in carrying out activities, courses, conferences, higher education courses, in addition to having a library and an administration and propaganda committee.

3.1 INTEGRALIST APPROACH TO INTEGRAL EDUCATION

Due to the economic and political changes that Brazil went through in the early twentieth century, in the 1920s and 1930s, as a result of the change from an agrarian-exporting society to an urban-industrial society, structured in the capitalist model, education was composed from a new capitalist structure and directed to an integralist intentionality increasingly explicit in the formation of habits and values.

The integralist movement[5] emerged in the 1930s and had as its creator and its main leader, Plínio Salgado[6]. Salgado (1935) pointed out the cultural elevation of the masses through reading. I felt that literacy was not enough for this. The primary goal was not literacy, but "[...] cultural elevation of the masses" (SALGADO, 1935, p.145). He disseminated and circulated through a simple and accessible language, the Integralist Manifesto of 1932. Document also known as the October Manifesto. In the Integralist sense:

> God directs the destiny of peoples. Man must practice on earth the virtues that elevate and perfect him. Man is worth for his work, for his sacrifice in favor of the Family, the Homeland and Society.He is worth it for his study, for his intelligence, for his honesty, for his progress in the sciences, in the arts, in technical capacity, with the aim of the well-being of the Nation and the moral elevation of the people. (OCTOBER MANIFESTO, 1932, p. 1)

[5] Available in: www.integralismo.org.br. Accessed 18 Jun. 2022
[6] Brazilian politician, writer, journalist and theologian. Founded and led the Brazilian Integralist Action (AIB)

In this mention, the integral formation of man is in the perspective of instituting and maintaining the current national order, that is, maintaining the security and order imposed by the Integral State. The integral education of the Integralist ideology contemplates the individual in a spiritualist and Christian conception. Integral formation would overcome man's ignorance and maintain the national order.

The Integralist movement proposed to develop the whole man. And the complete man is the contiguous of the physical, intellectual, civic, and spiritual man. It was based on spirituality, discipline and civic nationalism from conservative political principles as already explained of salvation of the acculturated multitudes. We perceive, in this movement, the integral education for the development of man as a whole, without references to the extension of school time, since this factor was not a condition of the proposal.

3.2 LIBERAL APPROACH TO INTEGRAL EDUCATION

Supporters of the liberal conception understand the intervention of the State as very limited, defending individual and collective freedom in the economy, politics and social life. These liberal ideals emerged in Brazil around the beginning of the twentieth century from the educational ideology called the Movement of Pioneers of the New School[7] that defended the right to life, property and freedom. This idea appeared previously in Brazil, in Europe and the United States.

The Movement of the Pioneers of the New School created the Manifesto of the Pioneers of the New School that aspired to a free, compulsory and secular integral education. In the text of the manifesto, it is observed the aspiration of education requesting an integral education:

> [...] c) The school system must be established on the basis of an integral education; in common for pupils of both sexes and according to their natural aptitudes; unique for all and lay, with primary, free and compulsory education; education should progressively tend to the obligation until the age of eighteen and to gratuity in all grades (AZEVEDO *et al., 1932, p.113).*

Given what the authors expose, the school should be a common educational institution, equal for all, definitively removing the idea of monopoly of education. We can observe that it is a renewal of education in the promotion of the single school, the free school and secular education, and the State has the duty to provide it to the entire population, in a general and equal way for all. The equity advocated for both sexes in the New School was not aimed at overcoming the society divided into classes. It would be the organization of society embodied in liberal values, such as: love of country, altruism, solidarity and development of national wealth.

[7] On the New School Movement, see AZEVEDO, F. et al. (1932) and the educators (1959), XAVIER, M. do C. [Org.] (2004).

Anísio Teixeira[8] (1900-1071) was one of the most significant educators of the New School. Teixeira (1999) considers the New School "especially practical, of initiation to work, of formation of habits of thinking, habits of doing, habits of working and habits of living and participating in a democratic society whose sovereign is the citizen himself" (TEIXEIRA, 1999, p. 63).

While traveling in the United States of America, Anísio Teixeira met several educational systems and participated in courses that made him come into contact with the theory of John Dewey[9]. What helped Anísio Teixeira to identify with Dewey's pedagogy was "[...] American pragmatism, focused on the development of the individual, democratization, freedom of thought and the need for experimentation, with science, art and popular culture" (CHAGAS; SILVA; SOUZA, 2012, p. 73).

According to Saviani (2000):

> Although following Dewey, he was attentive to Brazilian conditions and did not simply transplant the American system. Therefore, unlike the American experience, he advocated in our country the organization of centralized services to support education. In other words: if Dewey never worried about the national education system and also never sought to build instruments to measure learning and school performance, Anísio Teixeira had this concern and sought, based on Brazilian conditions, to direct the issue of public schools in the direction of an articulated system. (SAVIANI, 2000, p. 173)

Understanding the power that the school exercised over the students and their families and in order to modify the function of the school with a view to developing the integral man, Anísio Teixeira gave the school a prominent social role, by spreading the expansion of its social function and its strengthening as an institution focusing on integral education in the school institution, in the sense of extending the school day.

Teixeira (1994) saw education as capable of forming intelligence, character, will, habits of living together, thinking and acting. Capable of developing man in his multiple aspects and needs. He also defended education as a strategic component of change and modernization of society. He wanted administrative decentralization, as well as being concerned with the planning and training of teachers.

[8] Anísio Spínola Teixeira (1900-1971) was born in Caetité (BA). Educated in Catholic doctrine, he studied in Jesuit colleges. He graduated in law, became Inspector General of Education in the city of Salvador in the State of Bahia, and came into contact with education. He desired the development of Brazil through education. He had an extensive production, where he defended his principles. As an intellectual he held various public offices putting into practice his principles. He worked at the head of the National Institute of Pedagogical Studies and was one of the founders of the University of Brasília (UnB), founded in 1961. BRIZA, Lucita. Anísio Teixeira: the defender of public schools in theory and practice. New School Magazine No. 178. São Paulo, p. 1-3, dec, 2004.

[9] John Dewey was an American thinker who accused his country, the United States of America, that the threat of democracy lay within its institutions, in the attitudes of the people, not outside the country. He influenced the elite of Brazil with the New School movement. DEWEY, J. Life and education. 3 ed. Trad. Anísio Teixeira. St. Paul. Improvements, 1952.

Seeking a more economical model of school, he founded the Carneiro Ribeiro Educational Center, in Bahia. The activities carried out were aimed at artistic, physical and recreational development, as well as initiation to work. The idea was "[...] to join the teaching itself of the classroom, with the self-education resulting from activities in which the students participate with full responsibility" (TEIXEIRA, 1994, p. 167).

In the Educational Center functioned the school-class and the school-park. Each school-class with a minimum of 12 classrooms and one park school, containing work pavilion, gymnasium, social activities pavilion, theaters and library. Receiving 4000 students in shifts of 2000 in the morning and 2000 in the afternoon; and restaurant and administration buildings.

Following the proposal of the Carneiro Ribeiro Educational Center, an experiment called the Integrated System of Public Education of Brasília was implemented, at the end of the 50s and beginning of the 60s, with the objective of offering schools that were "[...] example and demonstration for the Brazilian educational system" (TEIXEIRA, 1994, p. 165). The experience implemented in Brasilia covered elementary education, middle education and the University of Brasilia.

Elementary education consisted of primary education, kindergartens, for children aged four to six. On the other hand, the class schools, intended for intellectual education, were offered to children between seven and fourteen years of age, totaling six years of schooling. The experience of Brasília was discarded almost at the beginning, due to the fact that, in order to succeed, it would be necessary, in the words of Teixeira (1994):

> To mature the feeling that social justice will only be effective, in a free regime, with equal educational opportunities, and that this will only be realized with a school that offers the poor and the rich an education that puts them on the same level before the prospects of life. (TEIXEIRA, 1994, p. 169):

3.3 LIBERATING APPROACH TO INTEGRAL EDUCATION

From the middle of the twentieth century Paulo Freire[10] (1921-1997), educator and philosopher created an educational path focused on schooling, critical and political awareness of reality. He argued that dialogue was capable of unveiling reality. The dialogue, for Freire (1983, p. 29), corresponds to the "[...] a loving encounter of men who, mediated by the world, "pronounce" it, that is, transform it, and, transforming it, humanize it for the humanization of all".

[10] Paulo Reglus Neves Freire (1921 — 1997) Brazilian educator and philosopher, created an innovative method in teaching literacy to adults, working with words generated from the reality of students. His method was taken to several countries. For his work in the educational area, Paulo Freire was recognized worldwide. He received honorary doctorates from several universities, including Harvard, Cambridge and Oxford. He has published several books. Available in: https://www.ebiografia.com/paulo_freire/. Accessed July 2. 2022

In Freire's (2014) perception, dialogue is capable of provoking revolution. Without dialogue in education, what will take the place is passivity, domestication and welfare. Dialogue has as its conception the liberating education for change and transformation. And so he argues:

> For this reason, dialogue is an existential requirement. And, if it is the encounter in which the reflection and action of its subjects addressed to the world to be transformed and humanized is solidarized, it cannot be reduced to an act of depositing ideas of one subject in the other, nor can it become a simple exchange of ideas to be consumed by the permutants (FREIRE, 2014, p. 109).

For Freire (1983), dialogue, implicitly, may require the absorption of the world and not the absorption of one over the other in the process of liberation. Through it, people are able to reflect and act in order to overcome the oppressive, unjust, domesticating, manipulative and anti-dialogical situation in which they live. I had the understanding that the contents worked would be problematized through generating themes.

According to Freire (1983): [...] in the problematization, each step towards deepening the problematic situation, given by one of the subjects, opens new paths of understanding the object of the analysis to the other subjects (p. 57).

Freire (1983), valued an education that would stimulate collaboration and awareness. Education not as a privilege, but as a right not only capable of reorganizing, but of transforming society, that is, a society of workers without exploiters and exploited. For Freire (1980), awareness has a profound meaning in liberating education. For him it means:

> [...] A reality check. The more awareness, the more reality is unveiled, the more one penetrates the phenomenal essence of the object, in front of which we find ourselves to analyze it. For this same reason, awareness does not consist in facing reality by assuming a falsely intellectual position. Awareness cannot exist outside of praxis, or rather, without the action-reflection act. This dialectical unity permanently constitutes the way of being or transforming the world that characterizes men. (Freire, 1980, p. 26).

Freire (2014, p. 80) seeks a problematizing education and not an education "[...] in which the learners are the custodians and the educator the depositor." In the depositing practice:

> Instead of communicating, the educator makes "announcements" and deposits that the students, mere incidences, patiently receive, memorize and repeat. This is the "banking" conception of education, in which the only margin of action that is offered to students is to receive deposits, keep them and archive them. Margin to be collectors or fixers of the things they archive. Basically, however, the great archived are men, in this (at best) mistaken "banking" conception of education (FREIRE, 2014, p. 80-81).

Freire (2014) valued an education that stimulated and challenged the ability to do, think, be and create. Not of transfer of facts as something absolute, finished and that should be accepted without challenge. The most important aspect was to get out of innocence, naivety and to insert oneself in a critical perspective of awareness for the emancipation of classes. "Awareness is not

based on consciousness on the one hand and the world on the other; on the other hand, it does not want a separation. Rather, it is based on the consciousness-world relationship." (Freire, 1980, p. 26-27). In this way:

> The education of children, young people and adults is of great importance in the formation of the new man and the new woman. It has to be a new education as well, which we are seeking to put into practice according to our possibilities. A completely different education from colonial education. An education through work, which encourages collaboration and not competition. An education that values mutual aid and not individualism, that develops critical thinking and creativity, not passivity. An education that is based on the unity between practice and theory, between manual work and intellectual work and that, therefore, encourages students to think right (FREIRE, 2003, p. 86).

These words express the author's desire to always assume a vigilant posture in the face of the strength of the ideological discourse of a neutral education which he characterizes as domesticating education.

Passing through Freire' s thinking of education, Henz (2012) brings excerpts that point out the contributions of Paulo Freire on the possible paths of integral education. Henz (2012) grouped them into five dimensions:

a) Ethical-political dimension: implies the awareness of the political-pedagogical role of the teacher in the perception of the intentionality of the educational action, in order to seek the overcoming of domination, silence, subalternity and obedience to achieve the school humanized by citizenship, by dialogical action;
b) Technical-scientific dimension: scientific content must be lived, unveiled, recreated and not just transmitted. They must always be taken as a starting point of what is already known, lived. It implies understanding, intervention and transformation of the world.
c) Epistemological dimension: the construction of new knowledge takes place in the plurality of interrelations between students and educators. In this way, new knowledge comes to have meaning through questioning, boldness, courage, criticism, indignation, autonomy and problematizing dialogue;
d) Aesthetic-affective dimension: it is an education that captures the world through emotions, feelings, dialogue, sensitivity, admiration, amazement, curiosity, responsibility, participation and affectivity, that is, knowing the world with the whole body.
e) Pedagogical dimension: through dialogue and problematization, educators and students unveil reality and human existence itself. It is the responsibility of the educator to conduct the teaching-learning process walking alongside the learner,

reflecting, challenging, taking care that he himself can develop his skills and sensibilities that become imperative in understanding his own human complexities.

These five dimensions, provided in a dialogical relationship between the subjects, ground a new design of education. A design that resizes time and space in an integrated educational proposal, where the school, a place of learning, considers a time and a space of people and relationships. It is about the development of the subject in its totality. It is a conception of integral education to the extent that it enables emancipation and citizenship.

4 BRAZILIAN EXPERIENCES OF BASIC EDUCATION WITH INTEGRAL EDUCATION IN THE XXI CENTURY

4.1 THE MORE EDUCATION PROGRAM

Integral education in contemporary Brazil began to be built from the More Education Program[11] and the New More Education Program[12]. The More Education Program was disseminated through normative and operational documents that are part of the agenda of the Brazilian policy of integral education (MEC/SECAD, 2010). Among the documents, we expose:

a) Interministerial Ordinance No. 17 of 2007;
b) Decree 7.083 of 2010;
c) Text Reference for the National Debate - More Education Series;
d) Intersectoral Management in the Territory - More Education Series;
e) Rede Saberes Mais Educação - elaboration of pedagogical projects - More Education Series;
f) Step by Step More Education
g) Knowledge networks More Education
h) CENPEC Notebooks

The More Education Program (PME) was dedicated to the constitution of intersectoral and intergovernmental partnerships around a simple principle: the place of children, adolescents and young people is in school. Therefore, government programs and actions aimed at this public should anticipate dialogue with education networks to improve the quality of public education. The PME motivated a wide adhesion of these networks to the proposal under construction. For the More Education Program, Integral Education requires more than commitments:

[11] More Education Program: Step by step (BRAZIL, 2009); More Education Series: Integral Education: reference text for the national debate (BRASIL, 2009); Ways to elaborate a proposal for integral education in extended hours (BRASIL, 2011) and Cadernos Pedagógicos – Territórios educativos para a educação integral (BRASIL, n.d).

[12] The New More Education Program, created by MEC Ordinance No. 1,144/2016 and governed by FNDE Resolution No. 17/2017, is a strategy of the Ministry of Education that aims to improve learning in Portuguese language and mathematics in elementary school, through the expansion of the school day Available at: http://portal.mec.gov.br/programa-mais-educacao

> It also imposes and mainly pedagogical project, training of its agents, infrastructure and means for its implementation. It will be the result of these starting conditions and of what is created and built in each school, in each education network, with the participation of educators, students and communities that can and should contribute to expand the times and spaces of formation of our children, adolescents and young people in the perspective that access to public education is complemented by the processes of permanence and learning. (BRAZIL, 2009a, p.6)

In the face of social injustices, especially for the confrontation of inequalities and for the affirmation of the right to differences and to affirm education as a right, the criteria for defining the target audience of Integral Education in the PME are established:

> Students who are at risk, socially vulnerable and assisted;
> • Students who bring together their peers – encouragers and positive leaders (anchors);
> • Students in grade/age gap;
> • Students of the final grades of the 1st phase of elementary school (4th/5th grades), in which there is a greater evasion in the transition to the 2nd phase;
> • Students of the final grades of the 2nd phase of elementary school (8th and/or 9th grades), in which there is a high dropout rate;
> • Students of grades where dropout and/or repetition rates are detected (BRASIL, 2009b, p. 13).

In the view of Algerbaile (2009), by prioritizing students who are at risk, social vulnerability and without assistance, the proposal does not aim to serve all students and does not in fact offer an integral education. In general, what is perceived is that the proposal contains:

> Action slogans, whose main effects are the displacement of teaching from its central position in the school and the dissimulation of the absence and omissions of the State, so as to appear that social, economic and health problems, among others, result from the educational lack of the people. (ALGERBAILE, 2009, p.27).

The PME aims in addition to expanding the time and school space, to offer educational opportunities that are shared by the school with the school community and sectors of society. In view of the above, it expresses the objectives contained in Article 3 of Decree 7083 of 2010:

1- Formulate national policy of full-time basic education;
2- Promote dialogue between school content and local knowledge;
3- Promote coexistence between teachers, students and their communities;
4- Disseminate the experiences of schools that develop integral education activities;
5- Converge policies and programs of health, culture, sports, human rights, environmental education, scientific dissemination, confrontation of violence against children and adolescents, integration between school and community, for the development of the pedagogical political project of integral education. (MOLL, 2012, p.135.)

Moll (2012), when dealing with the objectives of the More Education Program, recommends that "it is necessary to reflect on the transition period from a school organized in shifts to a full-

time school, with differentiated demands in terms of teaching work. Such a process will require continuous efforts and time for its realization." (MOLL, 2012, pp. 134-135).

4.2 THE NEW MORE EDUCATION PROGRAM

By order of Ordinance No. 1,144, of October 10, 2016, the New More Education Program was constituted. The program should prioritize students who have more learning disabilities and schools with low indicators of quality in education. Visa:

> The expansion of the school day of children and adolescents, through the complementation of the workload of five or fifteen hours per week in the school shift and countershift that should be implemented through the realization of pedagogical monitoring in Portuguese language and mathematics and the development of activities in the field of arts, culture, sport and leisure (BRAZIL, 2016, p. 3).

Cavaliere (2014) observes that the expansion of the school day by the incorporation of a "countershift", understood as "complementary", basically distinct from regular time and proposed to only some students, may be a mistake in advancing the quality of Brazilian education.

The New More Education Program, being an offshoot of the PME, aims to expand the school day, however, diverges in its conception of integral training by prioritizing the improvement of the Basic Education Development Indexes cooperating to:

> I - Literacy, literacy and improvement of performance in Portuguese language and mathematics of children and adolescents, through specific pedagogical monitoring;
>
> II - Reduction of dropout, failure, age/year distortion, through the practice of pedagogical actions to increase performance and school performance;
>
> III - Advancement of learning outcomes of elementary school, in the initial and final years – 3rd and 9th grade of regular elementary school. (BRAZIL, 2016)

The purposes described lead us to believe that the subject of the process, the student, is no longer the focus. The procedure of investigation, experimentation, the different fields of knowledge and other activities, contained in the first moment of the program become reduced with emphasis on performance and school performance. The purposes are reinforced in the following guidelines New More Education Program:

> I - The integration of the Program to the educational policy of the education network and to the activities of the pedagogical political project of the school; II - The priority attendance of both the students and the schools of the most vulnerable regions and of the students with greater learning difficulties, as well as the schools with the worst educational indicators;
>
> III - The agreement of goals between the MEC, the federated entities and the participating schools; IV - The monitoring and periodic evaluation of the execution and results of the

Program; and cooperation between the Union, States, Federal District and Municipalities. (BRAZIL, 2016, p. 3- 4)

The perspective of integral education created in this current program culminates in preparatory time for Brazilian systemic assessments. According to the Pedagogical Notebooks:

> What do you want to evaluate? II. How will it be evaluated? III. How to know if the student has understood (or not) the new knowledge? IV. How to know if the procedures were the most appropriate? V. How to measure the acquisition of learning? VI. What instruments to use? VII. Were the procedures and instruments the most coherent for this or that objective? VIII. Were the procedures and instruments the most coherent for this and that student? (BRAZIL, 2018, p. 40).

Freitas (2015), makes an inference about the guidelines of the new program in the perspective of improving learning anchored in ranking. For him, the way the program presents itself, there is a distorted conduct in the sense of the term:

> Not knowing how to deal with education (a broad relationship between learners and educators) they [the reformers] reduced learning (a student outcome, measured by their performance on tests of skills and competences). With this reduction, the notion of quality is also reduced to the score that the student obtains. All the complexity and richness of educational action disappears and with it, magic solutions and recipes take the place of good education. (FREITAS, 2015, n.p.)

And Freitas (2015), also adds that "the improvement of the school is measured by the increase in the average of students in these disciplines. It is so much devotion to the averages that if one shows that there is an increase in the averages in these disciplines when the moon is full, they will propose to teach only at the full moon." (FREITAS, 2015, n.p.)

We observed some similarities of the More Education and New More Education Program with the other theoretical approaches on integral education. It is observed that the two programs of the federal government think the integral formation in order to develop the global formation of the individual, as well as, present us the importance of the role of the school in the life and in the formation of the student. These are proposals that, in a summary way, constitute instruments in the fight against school failure, aiming at social integration. They also explain a problem of education and conceive of integral education to overcome the educational crisis. They approach the Brazilian experiences of the twentieth century by conceiving education linked to the State.

The two programs differ from the other conceptions of integral education by maintaining a welfare character, by prioritizing schools in more vulnerable regions, which can cause a reduction in social policies, since they migrate to schools tasks that are the responsibility of other organs of the State.

5 CONSIDERATIONS

The ideas of integral education in this text have been dealt with by various propositions of education. Each of the ideals of integral education presented here deliberated the school adopting its vision of education, with its symbols and values to reach points and perspectives of life and the world.

The libertarian conception of integral education in the view of Proudhon (1975), must be outside the domain of the State, the Church and outside the school, directed by the community providing intellectual and manual development. Integral education should be polytechnic and encyclopedic.

In the perception of Bakunin (1979), integral education promotes the emancipation of the working classes without the intervention of the State through technical rationality. In this way there is no privileged or proletarian class and intellectual, physical and psychological advances are common for both sexes.

The understanding of Robin (1981), is that integral education must take care of the co-education of the sexes in a secular and rationalist way. Education as a right of all to listen, read, speak and write from practice towards theory developing the physical, the intellectual and the moral. Educate for the freedom and change of society.

Ferrer y Guàrdia (1912), understood integral education without prejudice, without distinction of sexes and as the development of autonomous, critical and solidary subjects. In the view of Ferrer y Guàrdia (1912), it overcomes limitations and dogmatisms through observation and rational deduction in the natural sciences.

In the authoritarian approach with the involvement of the State, family and religion, integral education serves to expand social control and distribution of hierarchical individuals. It aims at the cultural elevation of the masses through reading, spirituality, discipline and nationalism. It consists in the formation of man in physical, civic and spiritual conduct.

The liberal conception, in the view of Anísio Teixeira, indicates integral education as a contestation of the historical configurations of social domination. It expands social and cultural tasks for training and information through scientific knowledge, secularism and politicization of workers. Its point of view is the administrative decentralization, the training of teachers, the expansion of the functions of the school. Finally, it evidences the expanded school education as a right to public, free, quality, compulsory education requiring the development of the students' potential.

Integral education, in the thought of Freire (1983), of liberating education, combating exclusion, promotes citizenship practices, dialogue and freedom. It promotes awareness in action-reflection for the development of the subject in its totality.

These proposals, each with its own characteristics, were conceived and implemented in an attempt to contribute to the improvement of the quality of education and, even without a consensus as to their applicability and results, had the purpose of offering children and young people an education that was as complete as possible.

From the study of the conceptions of integral education presented in this text, we consider that the libertarian, liberal, liberating experiences and even the authoritarian experience of education, have repercussions in the Brazilian educational scenario through the proposals of the More Education Program and the New More Education Program of the federal government.

We verified that some criteria established both in the two moments of the Program, to meet the students, seek the integral development, confer to the school, educate and protect the learner, employ a new organization of school times and spaces, and present themselves as proposals based on the right to education and quality education. However, we observed that there was an ideological reductionism in prioritizing the disciplines of Portuguese Language and Mathematics in the reformulation of the Program in the New More Education.

We consider that the proposals of Integral Education of the Brazilian government adopted the guarantee of the right to integral development. However, we note that there should be an expansion of the debates and more research and academic production on the subject. We emphasize that there is still much to be ascertained about the integral concept. It is essential to reflect on the procedures and strategies of integral education to understand if they have sought to solve the difficulties encountered for the acquisition and construction of knowledge; or if only the conditions and possibilities that prioritize certain aspects of global society are being taken into account.

ACKNOWLEDGMENTS AND SUPPORT

The authors thank the Foundation for Research Support of the State of Minas Gerais and the State Department of Education of Minas Gerais for carrying out the study.

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Project-based learning: Design labs in afterschool

https://doi.org/10.56238/ptoketheeducati-006

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ABSTRACT
This article aims to present teaching practices from Design as a curricular tool that is part of the school shift. These teaching practices have as a method the Learning Based on Projects of Active and Active Learning Tools that use the Student. The context of the research application took place in a public elementary school of the state network in the city of Porto Alegre/RS. The theoretical path was based on the studies of Fontoura (2002), Bender (2014), Bacich and Moran (2018), as well as the concept of participatory design by Sanders and Stappers (2008). It presents main activities developed and in the installed Design studies, being Graphic Design, Design for Permaculture of Product Project and counts on the school of students' experiences, in these practices. A conclusion aimed at teachers who make use of design skills as instruments of education. Furthermore, it is corroborated by studies such as that of Fontoura (2002) that point out as possibilities of design to break out of academia and the formal job market and reach educational environments.

Keywords: Project Based Learning, Design, Afterschool.

1 INTRODUCTION

Within Freire's inspiring perspectives, loving-kindness materializes in relationships that prioritize polyphonic learning, supported by mutual respect, in which the construction of knowledge and culture are connected with values supported by welcoming.

Starting from the idea that it is in everyday life that the subtleties of life happen, we choose this space/time to perceive the world and its complexity. Paraphrasing Alves et al. (1998) seek to understand, in a different way from the learned, the activities of everyday school or common daily life, requires that we are willing to see beyond what others have seen and much more: that we are able to immerse ourselves entirely in a given reality seeking references of sounds, being able to swallow feeling varieties of tastes, walk touching things and people and letting yourself be touched by them, smelling the smells that reality is putting at each point of the daily path.

Seeking to understand the reality of everyday life in the school environment and new possibilities for the "use" of Design, this article begins. The objective of this research was to understand how students perceived learning from the design process experienced through Design laboratories inserted in the school routine. With this, we present some reflections on the possibilities of

implementing Design laboratories as tools in the elaboration of educational projects aimed at Elementary School II.

We believe that Design can assume responsibilities consistent with the school reality, discussing issues such as accessibility, income generation and stimulation of local culture from the graphic and material language in the urban fabric.

For Bonsiepe (2011) Design can present a humanist perspective since it assumes the exercise of design capacities capable of interpreting the needs of social groups and elaborating viable, emancipatory proposals, in the form of instrumental artifacts and semiotic artifacts. Design thus goes beyond the condition of an aesthetic and functional tool in the creation of products and services to gain potential for individual and social development.

Going to meet these possibilities Bonsiepe (2012) emphasizes: it is necessary to practice the "pedagogy of project". This was a personal conviction of the author about the benefits that the knowledge of Design can bring to a general formation.

This article aims to understand the applicability of the methodology of Project-Based Learning (PBL) in the Design laboratories inserted in elementary school II. The students had the opportunity to participate for ten months in three Design laboratories implemented in the school countershift. In these laboratories were developed projects oriented to Product Design, Graphic Design and Design for the

Permaculture. The collaborative spaces aimed at the transposition of the teaching of Design from higher education to elementary school, seeking language adequacy, implementation of the methodology and review of the research problems suggested by the students. The theoretical support was based on the reading of several authors, indispensable for the understanding of the themes addressed and the construction of a scientific approach.

The research that originated this article was submitted to the Ethics and Research Committee of the Federal University of Rio Grande do Sul, being approved in all the documentation presented, including the presentation of the Term of Free and Informed Consent to the parents and guardians of the students and Term of Assent to the students.

2 ACTIVE LEARNING METHODOLOGIES: FROM STUDENT AUTONOMY TO PARTICIPATORY DESIGN

We have learned since we were born from concrete situations that little by little we can expand and generalize through induction. We also learn from ideas and theories to test them later in the concrete world, from deduction. Learning can also occur when someone more experienced speaks to us, or even when there is a direct development by experimentation from questions, research, activities and projects. What we mean by this is that learning is active, from the context in which each person finds themselves (BACICH and MORAN, 2018).

To elaborate any reflection about the autonomy of the student in educational environments we will consider as the first aspect the current model of education in Brazil, a reflection of the era in which it was conceived: the industrial revolution. In this model students are educated as on an assembly line, to make standardized education efficient. In this way they sit in rows of neat wallets, listen to an "expert" in the exposition of a topic and still need to remember the information received to respond to evaluative tests. In this environment and educational model all students should receive the same education. The weakness of the traditional method is that not all students come to the classroom prepared to learn. Some lack adequate training regarding the material, have no interest in the subject or simply do not feel motivated by the current educational model (BERGMANN, SANS, 2016. p. 6).

Parallel to the "industrial" model of teaching, what is seen in Brazil over the years is a constant deterioration of the working conditions of educators and, consequently, of the teaching offered, especially in public schools. For many decades there has been a favorable discourse in relation to the valorization of education, however, as Gadotti & Romão (2004) points out, what is seen in practice is a series of questions about the management of resources and the lack of community participation in the definition of school priorities.

For Gadotti & Romão (2004) the paradigmatic crisis reaches the school and it asks itself about itself, about its role as an institution in a postmodern and post-industrial society, characterized by the globalization of the economy, communications, education and culture, by political pluralism, by the emergence of local power. In this society there is a growing demand for participation and autonomy against all forms of uniformity and the desire to affirm the uniqueness of each region, each language, etc. How to translate this in school?

It is the teacher's duty or, more broadly, the school, not only to respect the knowledge with which the students, especially those from the popular classes, come to it – knowledge socially constructed in community practice – but also, as I have been suggesting for more than thirty years, to discuss with the students the raison d'être of some of this knowledge in relation to the teaching of the contents. Why not take advantage of the experience that students have of living in areas of the city neglected by the government to discuss, for example, the pollution of streams and streams and the low levels of well-being of the populations, the dumps and the risks they offer to people's health. Why aren't there dumps in the heart of the rich and even purely remedied neighborhoods of urban centers? This question is considered in itself demagogic and reveals the ill will of those who ask it. It is a subversive question, say certain defenders of democracy (FREIRE, 1987, p.16).

From these attentive looks at the way of learning, in contrast to passivity in learning, active methodologies and hybrid learning gain space in research and application in classrooms (BACICH and MORAN, 2018).

The active methodologies emphasize the protagonist role of the student, his direct, participatory and reflective involvement in all stages of the process, experimenting, drawing, creating, with guidance from the teacher; hybrid learning highlights the flexibility, mixing and sharing of spaces, times, activities, materials, techniques and technologies that make up this active process (BACICH and MORAN, 2018, p. 48)

In addition to the appropriate use of active methodologies for learning, the preparation of school environments for the use of children and adolescents are also capable of generating autonomy, since the student is able to access materials and take responsibility for educational spaces together with educators. For there to be this accountability, the spaces must be adequate, respecting ergonomic issues inherent to the age of the users.

Another important aspect for autonomy in school is the possibility of including diverse materials in learning. Leaving the place of the same daily classroom practices and perceiving materials that can be reused can be a power in experiments and educational practices.

With these examples, one can raise a question: what relationships do these active methodologies have with Design processes? It is believed in the importance of the participation of the subject in the construction of environments for its use, whether physical or intellectual uses, especially in the context of the child and educational spaces. Thus, active teaching and autonomous learning are articulated with Participatory Design, since the potential of action in both spheres imprints a change from passive relationship to engagement in experiences that are meaningful.

As in the active learning methodologies, Participatory Design has a less hierarchical and centralized focus for the development of projects. Within the new perspectives of the Design process co-creation also emerges as a new proposal, in this area the emphasis is on the customization of products and services that includes the active participation of the client. These are involved in the generation of ideas and decision-making pertinent to Design (SANDERS AND STAPPERS, 2008, p. 8).

In practice, we see industrial designers with many years of experience in product development who are taking on new roles as design researchers. Joint project teams will be much more diverse than they are today. The future Codesign will be close collaboration between all stakeholders in the Design development process, along with a variety of professionals with hybrid design/research skills. These team participants will vary in several types of culture simultaneously: disciplinary culture, company culture, ethnic culture, worldview, mindset, etc.

It is believed, with this, that designers will be an integral part of the creation and exploration of new tools and methods for the generative thinking of Design, and useful also in learning processes carried out in formal education. In the future, it will be these professionals who will create the tools for non-designers to be able to express themselves creatively.

3 DESIGN METHODOLOGY FOR LEARNING FROM DESIGN

In this research the pedagogical potential of Design is explored through the crossing of information between design practices for pedagogical instrumentalization and practices that have in view the resolution of everyday problems, inherent to Design. Believing in the pedagogical potential of Design is possible since previous experiences have followed similar paths. The experience of EdaDe – Education of young people and children through Design, elaborated by Fontoura (2002) in Florianópolis (SC), gives us significant support in conducting this project. For this author teaching with Design as a tool allows, among other things, to develop in children skills applicable to the real world, such as critical and creative thinking; sensitivity; problem solving; measurement; written, verbal and graphic communication; negotiation and conflict resolution; leadership and group work, in addition to creating opportunities for building new knowledge and understanding; as well as teaching thematically and making use of an interdisciplinary pedagogical approach.

As a methodological guideline adopted in this research, Project-Based Learning (PBL) developed by Bender (2014) was used, as can be seen in Figure 1.

Figure 1: Synthesis of the Project-Based Learning (PBL) method



Source: Bender (2014)

The following are the main steps of the PBL methodology:

- Project anchor

  Typically, some kind of anchor is used to introduce a project and to let students get interested in the topic. Anchors can be simple narratives that describe a problem or a project to consider, or something more engaging, such as excerpts from a book or video.

- Driving Question

  The driving issue is the main focus of the PBL experience. It can be developed in advance by the teacher or can be carried out from teams of students developing these questions as part of the project. In conjunction with the anchor, the driving question should both arouse

students' attention and focus their efforts on the specific information they need to address the problem.

- Student Voice and Choice

When students are engaged in a learning experience of this nature, they are much more likely to actively participate in all phases of the learning process if they have considerable discretion over which issues will be addressed and which activities will be undertaken.

- Research

Teachers use a wide variety of teaching procedures in the research phase or stage. Some of these procedures are structured teaching from videos, labs and demonstrations, learning by observation, semantic maps, guest speakers, peer reviews, group discussions, journaling and thoughts out loud.

- Innovation

Taking on the role of facilitator, teachers should use all available means to stimulate inquiry and reward innovative thinking as students advance in their planning, research, and development of artifacts.

- Teamwork

Knowing how to work collectively in problem solving is, in many ways, one of the most important skills that any young person can develop, since it is a crucial skill for virtually all jobs of the twenty-first century. As students gain experience in teaching at PBL, they also become more experienced in group work, as they are accustomed to planning activities together, specifying roles for various group members, supporting each other's ideas, and offering each other appropriate and useful peer assessments.

- Reflection

Reflection on one's own work is a powerful tool for improvement, and for this reason, creating opportunities for students' reflection within the PBL experience is something emphasized by virtually all proponents of the teaching model. Reflective thinking prepares students to more actively develop skills of this type of thinking and thus approach problems in innovative ways.

- Feedback and review

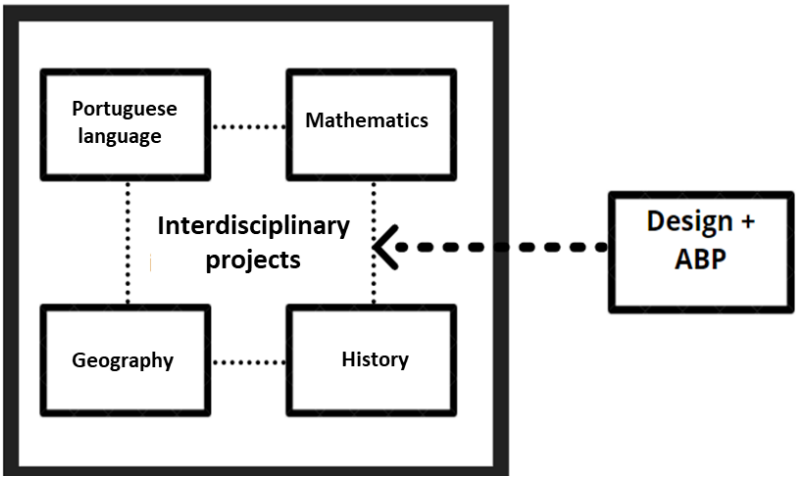
Feedback can be based on teacher assessments, self-assessment, or peer evaluations. As students mature, the importance of self-assessments and peer assessments increases, as these skills are likely to be necessary for many students' vocational future.

- Public presentations of project results

The presentation of the work developed in the classroom to other people in the community is a way to show the value of this work. Perhaps this is the main reason why student engagement tends to be much higher in PBL learning experiences.

In the research that originated this article there was the option to incorporate Design as an extracurricular discipline, offered in the school countershift, in a model conceived and developed in such a way that there is integration of contents and simultaneous dialogue between the activities of the curricular disciplines. In addition, Design has also been incorporated as a method of design development in all disciplines, from a structuring of problem-based activities. With this the Design process is instructed from specific attributions of the area, and as a method of design organization, simultaneously (figure 2).

Figure 2: Model for inclusion of Design as a teaching tool



In the structure of this project there are three distinct roles for the realization and orientation of the activities towards the students, they are the articulators, mediators and facilitators. The team members (mediators and facilitators) are students and professionals from areas of knowledge such as product design, graphic design, visual arts and environmental engineering. The articulators are always school employees interested in maintaining a link with the Pedagogical Political Project.

The structuring and organization of the activities was under the responsibility and supervision of the author of this article, as well as the presentation of the research method to the project team.

Figure 3: Project Team Structure



The establishment of the target audience involved in this research was based on the fulfillment of some requirements such as: students at risk and social vulnerability; in distortion with age/school year; with incomplete literacy; repeating students; in a situation of nutritional risk. It was also predicted that the groups would be heterogeneous, in order to enable peer learning. This meant that students were also selected who were not necessarily in any of the above groups, but who showed interest in participating in the proposed activities and spending more time in school. Thus, one hundred students who showed interest in adherence, and who were inserted in the defined groups, were invited to participate in the project.

4 FINDINGS

The arrival of the research group and the first months of work at the school brought to the researcher and the monitors objective issues such as the organization of activities from weekly meetings, creation of a conversation group and exchange of files in social network, in addition to the joint study of the teaching plans of the 6th to 9th grade.

Subjective issues also arose along this journey, we pointed out some: the formation of group consciousness between researchers and students represented a circumstance to be transposed at the beginning of the project. At the same time that the young people showed interest and motivation for the project, they also expressed some discomfort in sharing "territory" and routine with the group of new monitors. There was, during practically the entire year of the project, the attempt to suppress manifestations of violence by the monitors among the students – the aggressive and sexualized behavior was often naturalized among the students.

For the planning of the activities, it was reflected on the role of the educator in the project and in the resolution of unstructured problems from the Design approach. Having as guiding methodology the Project-Based Learning, the activities were defined after a period of experiences with the students to understand what sharpened the curiosity of the children. From the verified interests, the project team began to delineate, weekly, ways to interact with the knowledge, materials and technological tools that were pointed out as the focus of interest by the students.

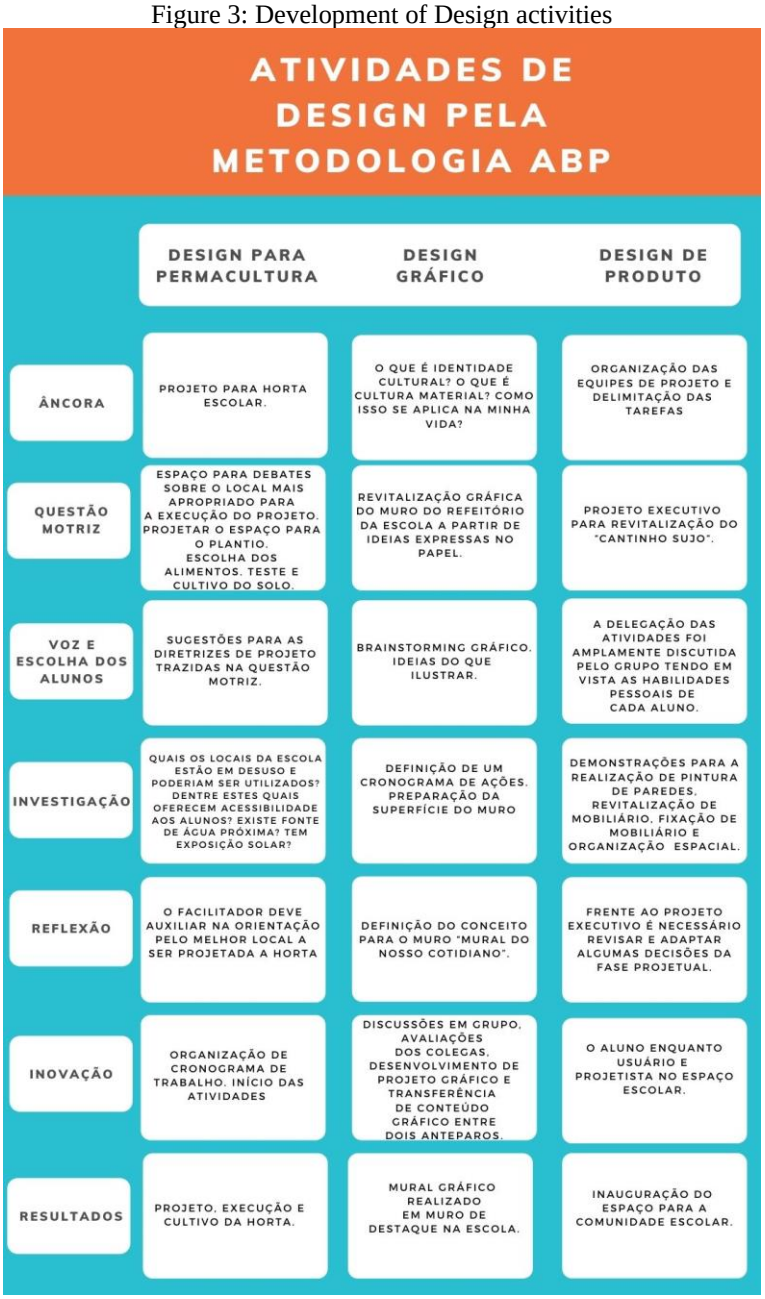
The non-preliminary structuring of the project, with delimitation of themes and tools, has always been part of the team's purpose. The intention was to construct driving questions spontaneously, from the students' own learning interests with a focus on problems and real-world issues, exactly as Bender (2014) proposes for the conceptualization of Project-Based Learning.

The team of monitors and facilitators, occupying a place of observation and listening, invited the students to dialogue on various themes, tours of the school and surroundings, with a look directed to the resolution of problems from the Design.

After the development of the anchor question, mediators and facilitators drew together a roadmap for the execution of the activities with pre-defined goals from the planning of the methods and techniques to achieve each objective.

It is presented in Figure 3 the planning of the pedagogical actions of this work and the compilation of significant actions both for the resignification of the spaces of the school from that of Graphic Design, Design for Permaculture and Product Design.

Figure 3: Development of Design activities



Source: Author of the article

4.1 PERMACULTURE DESIGN LAB

The Design for Permaculture laboratory aimed to propose reflections and practices that sought to address education through permaculture and social protagonism. Activities of walks in the forest

surrounding the school, collection and construction of a seed bank, construction of composting units and restoration of the land in the space of the old school playground for the preparation and management of the school garden were proposed.

The school garden was born from a joint project, from reflections of the students in conversation circles, in the walks through the forest surrounding the school and in the classroom. The project consisted of presenting the benefits of the initiative to the school community, as well as verifying the technical feasibility for this task from the acquisition of materials and inputs. After the approval of the project, the team chose the location of the garden and the area to be used for planting. Some elements were considered for the realization of this choice, thus, we thought of a nearby water source, sun exposure, evaluation and optimization of the soil, and, finally, request in the school community some seeds to be planted to optimize the school menu.

It was decided that melons, strawberries, corn, cucumbers, black-eyed peas, black beans and radish would be planted. The space of each bed was defined and the maximum dimensions of each species were studied, as well as the main characteristics of each one regarding the care necessary for its maintenance. Before the cultivation were carried out tests for the verification of the soil, in addition, the students were performing the fertilization from the development of efficient microorganisms, bacteria, fungi and yeasts that exert the decomposition of the organic matter, increasing the fertility of the land. Figure 4 (A) shows the students fertilizing the garden, installing signs figure 4 (B), and executing the beds, figure 4 (C, D).

The school garden began to bear fruit six months after planting. Already in the first harvest the food was directed to the school canteen and incorporated into the diet of the students.

Figure 4: Development of activities in the Permaculture Design Laboratory



(A) Students sowing the garden. (B) Development of signage for the garden. (C) Creation of flowerbeds. (D) Students building the flowerbeds

4.2 GRAPHIC DESIGN LABORATORY

In this project we sought an adaptation of the academic teaching of Design for the teaching of children and young people. In this way fundamental issues to Graphic Design were worked in the final years of elementary school, such as initiation to color theory, graphic expression through drawings, illustrations, types of strokes, exercises to stimulate creativity and introduction to photography. The monitors brought questions about cultural identity and the basic premises for the execution of a graphic project.

As an activity selected for presentation in this work we show here the graphic revitalization of the wall of the school cafeteria. This space is located in a place of constant circulation, characterized by old artistic manifestations of students who once occupied that place. Thus, the paint was quite worn, the humidity of the environment was also in charge of making its own illustrations, and, in addition, the overlapping of old graffiti damaged the notion of belonging of the students who are now in the school.

At first, brainstorming was carried out in the classroom so that the students could graphically manifest what they would like to illustrate on the wall, as can be seen in Figure 5 (A). After this activity the group came up with a concept for the characterization of the space. Thus, it was defined that there would be inscribed images and texts that characterized the daily life of the students. All the themes worked on in the Laboratories served as inspiration at this time. Thus, Permaculture, resignification of spaces, art, Design, gender, race, urban violence, moral harassment were some of the issues that were present in the great "Mural of Our Daily Life" title of this project.

The word "Google", for example, occupied a prominent position in the design of the wall, was inscribed centered, it is seen in figure 5(B). For most of the students of this project access to technology is still quite scarce, few students had, at other times than in the project, the opportunity to carry out any type of research on the internet, one sees the fascination provoked after this contact.

The words "Nêgo" and "Favela", figure 5 (C) were also chosen by the group to adorn the wall. This choice refers to issues such as honor and pride in relation to skin color and place of origin, and more, concerns the unity of struggle against racism and the right to life, ensuring the maxim that reverberated in the project - representativeness matters!

After the preparation of the space, the students were able to experience the awaited moment of performing their graphic expressions on the wall. For a week all the laboratories gave way to this activity.

Figure 5: Development activities Graphic Design Laboratory



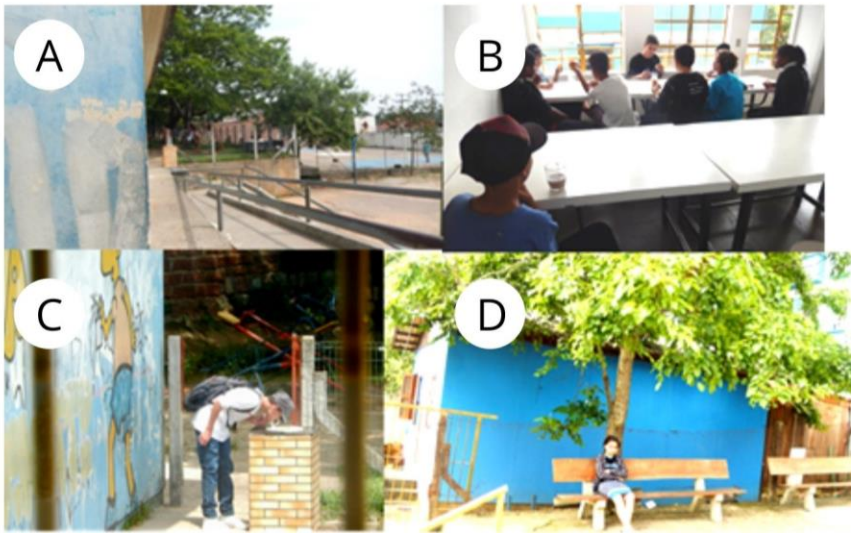
(A) Illustrations worked in collective brainstorming. (B) Beginning of the illustrations on the wall. (C) Students finishing their work

4.3 PRODUCT DESIGN LABORATORY

In the Product Design Laboratory there was a concern to explore with the students practices anchored in problem solving, going through the design phases characteristic of Design, such as: acquisition of information, search and definition of concepts, morphological, aesthetic, technical and structural detailing, production and post-production of product.

Thus, after the subjects that should guide the progress of the Laboratory, the group defined that it would carry out an investigation about the spatial problems of the school (figure 6). For two weeks the classes, divided into project teams, took notes, recorded images and some verbalizations with the users – colleagues and themselves – about the use of the school spaces and the problems related to the lack, accessibility and safety and comfort found in these places.

Figure 6: Development of activities in the Product Design Laboratory



(A) Ramp access to the courtyard. (B) School cafeteria. (C/D) Common spaces

With the awareness of the comfort, well-being and safety to which the students were or (were not) exposed daily, the project problem was defined: to develop a living area in the space commonly known by everyone in the school as "Dirty Corner" (figure 7). This place, located in a recess in the

courtyard, was used by the school management for a long time as an open-air warehouse, where classes, chairs and all kinds of material that could be reused were being thrown.

Figure 7: Choice of the place to be restored, the "dirty corner"



The students designed and described alternatives to improve the chosen space, so, after the diagnosis of the environment and possible improvements, a compilation of actions was organized by the group. Models were developed to assist in the visualization and understanding of the concept of scale from the aid of mathematics classes (figure 8).

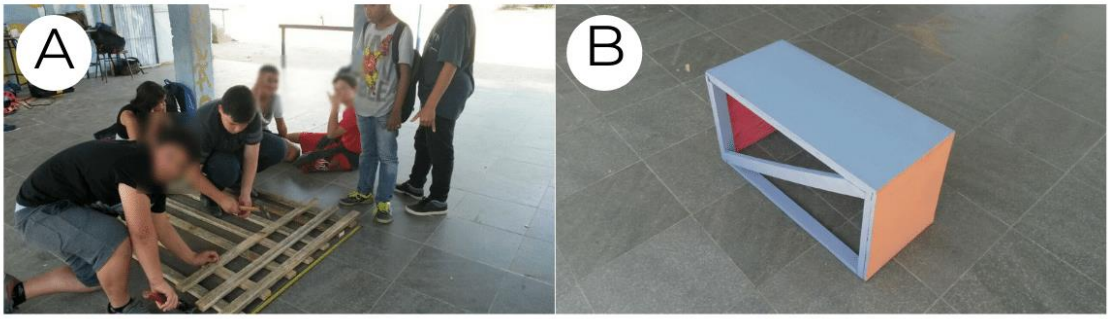
Figure 8: Development of models from the project definition



(A) Student developing model. (B) Group assembling elements in the model

The development of the furniture was carried out by the students in partnership with the Product Design monitors who carried out the processes of wood cutting, sanding of the pieces, fixations from fittings, collages and painting (figure 9).

Figure 9: Furniture development



(A) Students producing elements for the designed space. (B) Student produced stool

In line with the assembly of the furniture, another group of students was responsible for preparing the area of the new space (figure 10).

Figure 10: Group preparing the space, with cleaning, sanding and painting of walls



(A) Students preparing paint (B) Student painting the walls

The "new corner" as soon as it was finished generated commotion and pride in the group of students, who can present the new space to the school community, and enjoy it for a few days. Figure 11 shows the result of the resignified space.

Figure 11: Space produced by students



5 DATA GENERATION

After seven months of project and research activities installed in the State School of Elementary Education, it was necessary to give voice to the students in relation to the educational path experienced. Fifty students (twenty-five girls and twenty-five boys), among the one hundred enrolled in the after-school activities, were invited to compose the focus group, all enrolled between the 6th and 9th grade of elementary school.

The choice of the participants of the focus group was carried out aiming to form a heterogeneous group, representative of the enrollees, where gender, race and diverse economic situations were contemplated. The students were given a questionnaire (chart 1) with the questions and alternatives for answers, in addition to the possibility of describing answers that diverged from those presented.

One can verify issues such as repetition rates, plans for the future, relationship with colleagues and rules of coexistence stipulated by the project monitors.

Still about the laboratories and direction of this research some inquiries about Design for Permaculture, Graphic Design and Product Design were carried out, as well as the perception of the participation of students in the activities in the school countershift.

Table 1: Questionnaire for quantitative research

Questionnaire for quantitative research
1 - Have you ever repeated any school year?
2 - In which year/series did the repetition occur?
3 - Why do you think this repetition occurred?
4 - What are your plans for when you finish elementary school
5 - In relation to our project, how did you perceive the relationships between colleagues?
6 - What about the relationship between students and teachers?
7 - How were your impressions about the rules of coexistence?
8 - Regarding the laboratories presented in this project, which did you most identify with?
9- What do you mean by Design for Permaculture?
10 – What do you understand by Graphic Design?
11 – What do you mean by Product Design
12- What do I consider most important in relation to the project activities in the school countershift?

The use of this instrument proved to be useful since it brought tangible answers about important characteristics of the target audience of the research. Issues such as school failure and its causes were evidenced from the students' point of view, in addition to the plans for the future. Aspects related to the understanding of Design and its applications were also put on the agenda. We know with this instrument new nuances of the students involved in the research, and we value these results for decision-making in modeling future research. In addition, we can understand some behaviors during the learning process, thus improving our daily listening, reflecting on the possibilities of continuous improvement in the school environment.

6 DISCUSSION OF RESULTS

The results showed that the number of non-repeating students was higher among the students enrolled in the project. We saw that 36% of the students who responded never repeated the year. Still, a sizable portion had repeated the year at another school and migrated to that institution. Among the respondents, 30% repeated the year once, and 34% students repeated the year more than once.

When investigated in which year the students had repeated, it was noticed an increase from the 3rd year of elementary school, among those who repeated some year 16% did so in the 3rd year of elementary school. There were similar results among the repeaters for the 5th and 6th grades, and for

the 7th and 8th grades of elementary school. Among the repeaters, 26% repeated between the 5th and 6th years, and another 26% repeated between the 7th and 8th years.

The reasons for failures, according to the students, are mainly related to family problems, with 30% of the answers, followed by the lack of understanding of the explanations, attribute this factor to the lack of adequate explanations on the part of the teachers (20% of the answers). The lack of organization in relation to the study routine itself was also pointed out as one of the reasons for the failures, with 12% of the answers.

When asked what the students' plans would be for when they finish elementary school, the vast majority of students reported that they intend to study and work (20% of the answers), while 18% of students admitted that they intend only to work.

The students answered about their relationship with their peers. Of the respondents, 30% stated that the level of relationship with their peers is "bad". For 25% of the students, however, living with their colleagues is considered good. It is seen in this question the reflections of the violence commonly felt by students at school, manifested in various ways among all those involved in the educational process. On the other hand, it is perceived the importance of the school for the formation of affective bonds and its importance for the development of the emotional intelligence of the students.

The student-teacher relationships are presented according to the duality – love x hate – typical of these relationships on the students' gaze. Among the students who answered this survey, 27% consider the relationship with teachers as "good". Among those who consider this relationship as "very bad" are 24% of respondents. The web of feelings, emotions and subjectivities that involve the relationship between teacher and student can determine the quality of schooling and the learning process. Paradoxically, however, it is not always easy to bring this perception to light, which can transform the affective aspect according to some absences experienced by young people, such as the lack of other spaces of conviviality, absent parents. The lack of bond with the teacher can, however, lead to violence, indiscipline, demotivation and difficulty in maintaining attention. In this aspect, we see the challenges to transform a rational school into an affective school

The rules of coexistence were judged as "reasonable" – 33%, "good" – 25%, and "very bad" – 17%. They considered in this topic that the teachers and the coordination are firm when necessary and enforce issues related to respect and order.

The students also left their impressions about the Permaculture Design Lab. Among the alternatives presented, 28.8% of the respondents believe that Permaculture is about "knowing the natural species and adapted to the conditions of the soil and the surrounding climate". For 25.4% of the students, Permaculture is about "studying ways to conserve and expand the biodiversity of the ecosystem of which I am a part." Still, 22% said that this area of knowledge deals with the care of the living conditions of the soil and help with the maintenance of its soil fertility. In a smaller number,

20.3% said that Permaculture refers to a sustainable production of crops without using chemical inputs, and finally, in a small way, 3.5% of respondents said that the discipline is about the use of the environment for their own benefit.

Regarding what the students understood about Graphic Design, the alternatives expressed were very concentrated between "translating ideas with written messages and forms" and "organizing my ideas (drawings, paintings, texts) from a survey, and thinking of ways to communicate it", with 28.3% and 26.7% of the responses, respectively. Still, learning exclusively to draw and write in different spaces received 18.3% of the answers, followed by the use of computer programs, with 15% of the answers and "draw what comes to mind", with 11.7%. As the answers could be combined we realized that there was the internalization by the students of the possibilities of Graphic Design, as well as the breadth of this design area.

Questions pertaining to the Product Design Lab were also conducted. Asked what they meant by Product Design, 25.8% of respondents said they understand it to be about creating products from the disposal of materials. Still 22.6% of the students said they understand the design of products as the observation of users, research for similar products, sketching of alternatives, planning, production and use of discarded products. Still, another 22.6% said that designing products concerns the analysis of the different people who occupy the places and their needs to stay comfortably and safely. A smaller group, 21% of respondents, say that Product Design is responsible for conducting tests and adjustments on existing products to discover the possibility of improvements in new products. Still, the alternative with less adherence concerns the creation of beautiful products, with the aesthetic issue as the main focus, among all 8.1% chose this alternative.

Finally, in this data collection instrument, we asked the question "What do I consider most important in relation to the project activities in the school countershift? Among the participants 28.8% said they learned to structure projects, 25.4% of respondents said they learned new things, for 22% of students the social ties developed were important because they said that the most important thing was to meet new friends. There were also those who found the activities tiring and boring, 15.3% said they found it tiring and make better use of the shift outside of school, while 8.5% said the experience was boring and would not participate again.

7 FINAL CONSIDERATIONS

The designer, in the words of Margolin (2006) is not only a citizen, he is also a collaborator responsible for the future paths of his society. Freire (2000) in his reflective incursions declared that for him it was not enough to have consciousness, but to produce awareness, and this means to go beyond the spontaneous vision of reality and experience a critical exercise of the same reality, demanding, with this, a position and action.

In the first investigations of the research group at the school, what was sought was the understanding of that context. The multiple realities that involve a primary and elementary school (approximately 800 students enrolled), in a peripheral region of the city, lacking in human, social and economic resources. The designer is responsible for reflecting on his practice, for this he seeks answers to the understanding of the "other" – other, this, different from our cultural parameters, fixed, above all, to the academy and the labor market. At this point in the project there is a displacement towards the universe of others.

The presentation of the craft of Design needs to be translated into an accessible language, valuing above all the culture of people's daily lives, of popular manifestations, of the segments pulverized in society as integral parts of the social construction. In that context – needy children, susceptible in all sorts of ways – "Design" is probably just a pretty word. It is necessary to build a revaluation of the popular, opening new horizons for the communication of material and symbolic activities.

The knowledge of reality, slang, greetings, the resignification of fashion, the predominant musical style, involves respect for the usual symbols in the peripheral schools of Porto Alegre, and more, in the peripheral schools of the eastern zone of Porto Alegre, improving this cut for the context of the neighborhood and the school.

In this project it was up to us, as a team, to see the object of research not simply as an object, but as a human action with symbolic representations. With this, little by little the individual abilities of the elementary school students involved in the research were manifested, from the presentation of a design culture, where the actions are oriented through the acquisition of information and data.

At the end of the project what is sought is to identify ways that show the formation of cultural identity in the school, in the figure of the students participating in the project. This identity translates the profile of the people who live in that peripheral zone – peripheral areas in the political and geographical sense – seeking the inclusion of local particularities in the form of products and services that present universal quality, and enabling, even if occasionally, the construction and valorization of characteristics intrinsic to the community.

Through the quantitative instrument developed we verified that the rates of repetition in elementary school of that school are still expressive. According to the personal interpretations of the students, the reasons related to this repetition were due to family problems and the lack of understanding of the explanations given in the classroom.

In addition, we can see that the students perceived the attributions of each Design nucleus presented, articulating these with other areas of knowledge, such as mathematics in the implementation of planting areas in the development of the garden, Portuguese language and arts for the construction

of graphic panel and also mathematics with notions of scale, for the feasibility of the reading corner project.

We can, with this, believe in the possibility of including Design in the school curriculum of that school as an area of knowledge and as an integrating theme among other disciplines.

In any case, we must recognize that Design as a discipline or area of knowledge in a formal curriculum of regular education would require an amendment to the current Law of Guidelines of Bases of National Education (LDB), in addition to a broad national debate, involvement and political mobilization. It would also be necessary a movement of dissemination of educators about the potentialities of Design, in addition to the training and qualification of these for the application of specific themes. We do not disbelieve, with this, that Design is viable as a curricular area in a national teaching scenario, but I understand that more studies will be needed in this sense so that there is the stimulus of Design as a practice in elementary school.

The inclusion of Design as an integrating theme among the curricular disciplines, starting from a design bias, as a complementary and non-formal program may represent an initial and viable possibility in the short term. This alternative also presented and discussed in this project, sought to coin integrative dynamics in formal disciplines with a project-based learning approach allied to Design, thus amplifying its potentialities of structured organization for the resolution of problems experienced in school thus allowing another childhood culture, different from the logics of reproduction that other generations experienced in the educational environment.

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The cultural identity of São Borja in the region of the Seven Peoples of the Missions in Rio Grande do Sul

https://doi.org/10.56238/ptoketheeducati-007

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ABSTRACT
This article aims to identify the representation of cultural identity in the public space of the city of São Borja whose historical evolution and development justify the existence of artifacts that represent the cultural diversity of the place. The research pointed to the potential that the city has to contribute to the appreciation of local, regional and territorial cultural historical heritage through historical and cultural tourism. The research identified the need for alignment of public policies for the economic, social and cultural development of the city of São Borja with the other cities of the Region of the Seven Peoples of the Missions, as well as pointed to the development of tourism as an alternative for territorial development. The study was developed in three stages, the first being through a bibliographic and documentary research followed by a field research that used the participant observation method to collect primary data. The third stage was data analysis, selection of information and theoretical construction in the form of an article containing the research and the results obtained.

Keywords: Regional Development, Cultural Heritage, Tourism.

1 INTRODUCTION

The lands of southern Brazil, northeastern Argentina and Paraguay once belonged to a territory historically formed from the development of the Jesuit-Guarani Missions. From 1500, with the arrival of the Iberian colonizers in these lands, it was identified the existence of an autochthonous population, called Guarani, who lived in small communities occupying fertile soils near the river valleys, whose hunting and fishing resources allied to the possibility of growing food allowed them to survive harmoniously with environmental resources.

In this period little attention was paid to the fact that the lands were already occupied, but rather the ambition to exploit them which allowed Portugal and Spain a process of delimitation and possession of the territory through disputes that generated agreements and treaties that would result in domination, demarcation of lands, settlement and possession. With the arrival of the priests of the Society of Jesus in this territory was carried out the reduction or union of this autochthonous population in places where one could teach the customs lived, especially in Spain, and Christian beliefs practiced by the Catholic Church. The tasks of the Society of Jesus were grouped into two basic areas: "In Europe, pedagogical care, in schools teaching. In the colonies, missionarism was the main objective" (SEBE, 1982, p. 8).

Cattle raising and the development of agriculture allowed trade between the Jesuit-Guarani reductions and Europe. Soon yerba mate and cotton, tallow, horn and animal leather would be exported. From Europe came industrialized products such as tools, clothing, among others that by the adoption of the customs brought by the Jesuits and by life in reductions became necessary.

In the territory currently belonging to Rio Grande do Sul, the Historical Region of the Seven Peoples of the Missions is formed by cities established by the priests of the Society of Jesus and Guarani Indians, during the Spanish rule of the region, constituting the "Second Missionary Cycle" of the Jesuit-indigenous colonial past in the territory of the current State of Rio Grande do Sul. The foundation of the cities, according to Nogueira (2007, p. 38) began with "São Francisco de Borja (1682)," followed by: "São Nicolau (1687), São Luiz de Gonzaga (1687), São Miguel Arcanjo (1687), São Lourenço Mártir (1690), São João Batista (1697) and Santo Ângelo Custódio (1706)".

Disputes over land ownership in South America between Portugal and Spain allowed the signing of the Treaty of Madrid (1750), the Guaranite War (1754-1756) and the Treaty of San Ildefonso (1777). Guaranitic War, whose outcome occurred in the battle of Caiboaté (1756), culminating in the death of the leader Sepé Tiaraju, forcing the departure of more than thirty thousand Guaranis of the Seven Peoples of the Missions to occupy other regions in Rio Grande do Sul and Uruguay, contributing to the cultural formation of the gaucho and Uruguayan territory. The Guarani

> [...] departed from the reductions of São Miguel Arcanjo, São Nicolau, São Borja, São Luiz Gonzaga, São Lourenço, São João Batista and Santo Ângelo to nuclei/villages on the Paraná River, villages of São Nicolau do Rio Pardo (Rio Pardo), Nossa Senhora dos Anjos (current Gravataí, 1760), Santo Antônio da Guarda Velha (Santo Antônio da Patrulha, 1758), Nossa Senhora da Conceição do Estreito (Rio Grande, 1763), also originating the parish of Viamão (1747), Triunfo (1756) and Santo Amaro (NUNES, 2014, p. 5).

According to the author, those Guarani who went to Uruguay participated in the foundation of the villages of Bella Unión, Melo, Tacuarembó, Durazno, São Borja Del Yi, Víboras, Maldonado, Minas, Paysandu, Salto, Artigas, Montevideo, Colonia de Sacramento (in addition to Buenos Aires, on the other side of the Río de la Plata).

According to Flôres (2012, p. 54) The expulsion of the Jesuits from the Seven Peoples of the Missions and the other missions of America was not an isolated fact, determined solely by the American conjuncture, but is part of a European historical set, in which the followers of the Enlightenment and the absolutists considered the Church as an obstacle to their reforms, because it represented the old structure [...].

Although the outcome of the Guaranite War occurred in the Battle of Caiboaté in 1756, the Region of the Missions is only brought to the domain Portuguese in mid-1801 when, in São Borja, a

> [...] conjuration of Portuguese military forces, with the support of Guarani Indians, under the leadership of "native tug-of-war" Manuel dos Santos Pedroso, Gabriel Ribeiro de Almeida, José Borges do Canto and the brothers Francisco, Felipe and Luiz Carvalho, succeeded in this attempt (FLÔRES, 2012, p. 56).

After the end of the Jesuit-Guarani reductional period, private ownership of the land in the pampa was installed, mainly through the blocks of sesmaria de campo (a form of occupation that made possible the origin of the latifundia dominated by an individual southern elite), the reiuna (a type of state property administered by public officials) and the estancias (system formed by the main house, residence of the foreman or caretaker, slave quarters and shed). In the sheds were the pedestrians, free workers of indigenous or Gaucho origin, men for the campeiro work. Thus, from the eighteenth century onward, the lands of the Pampa Region became the property of a few and it is not surprising to realize that there are no indigenous lands today in the region of the campaign (GOLIN, 1999; GONZALEZ and VARESE, 1990. apud NUNES, 2014, p. 5).

The Pampa Gaúcho Region is one of the six geographic regions of the state of Rio Grande do Sul, located in the southern portion of Brazil. The Pampa Gaúcho is characterized by a vast plain, with a predominant vegetation of grasses, coxillas and fields. This region is marked by a humid subtropical climate, with hot summers and cold winters, as well as frequent occurrences of strong winds. Under this region during the Jesuit-Guarani reduction period they were exploited for cattle breeding.

Three decades after the elevation to the status of Vila (1834), São Borja suffered the invasion of Paraguayan military troops during the Paraguayan War or War of the Triple Alliance (1864-1870). At the time, Argentina, Brazil and Uruguay united against Paraguay, which had claimed, as its own, part of the territories of Argentina and Brazil.

Since the arrival of the Society of Jesus and the beginning of the reductional period in the region, there have been historical facts that have contributed to the development of a cultural identity linked to the territorial disputes that formed the border between the Portuguese and Spanish and, after the independence of Brazil, Argentina and Uruguay, between Brazilians, Argentines and Uruguayans.

From 1889, a policy of colonization of the Northwest Region of the State of Rio Grande do Sul began during the government of Borges de Medeiros. This policy added, in the region, a cultural heterogeneity brought by European settlers, among them: Italians, Poles, Portuguese, Spaniards, Germans, Latvians, Swiss, etc. This occupation of the territory has consequently brought a significant change in economic, social and cultural development (WBATUBA; et al., 2017).

Due to its formation and development, the city of São Borja is considered by the government of the State of Rio Grande do Sul a "Historic City", according to Decree No. 35,580, of October 11, 1994. Not unlike the other cities of the Region of the Seven Peoples of the Missions, the city of São Borja has in tourism an alternative to contribute to economic, social and cultural development.

One of the important actions for the tourism sector is to identify the representation of cultural identity in the public space of the city, to know the periods and historical facts that justify the existence of artifacts that represent the diversity of cultural identities of the place. The public space of the city presents part of the Cultural Heritage whose artifacts, statues and monuments preserve in themselves, the local history and culture, in addition to contributing to the local and regional tourist offer.

2 METHODOLOGY

Through the historical evolutionary method, the study presents a bibliographic and documentary research of qualitative and descriptive approach whose purpose is to identify the materialization and representation of the predominant cultural identities in the city of São Borja. Soon after a field research was carried out that used as a strategy the participant observation (GIL, 2008) for the collection of primary data carried out through photographic records and qualitative notes using field notebook detailing comprehensively (VERGARA, 2006; MICHEL, 2009), consistent and coherent that would allow a description of the "state of the art". In the final stage of the research, data analysis, selection of information and theoretical construction in the form of an article containing the research and the results obtained were performed.

3 SÃO BORJA IN THE REGION OF THE MISSIONS

The municipality of São Borja, is located in the border strip bordering Argentina. According to §2 of article 20 of the Federal Constitution, the Border Strip corresponds to an area of up to 150 km wide, located along the 15,719 km of border of the Brazilian territory. In Rio Grande do Sul, it covers areas bordering Argentina and Uruguay that, along with Santa Catarina and Paraná, are part of the so-called Southern Arc of the Brazilian border. The definition is given by Federal Law No. 6,634/79, regulated by Decree No. 85,064, of August 26, 1980.

The IBGE currently uses a new model of regional division for the country that inserts the municipality of São Borja in the Intermediate Geographic Region of Uruguaiana belonging to the Immediate Geographic Region of São Borja, comprising the Southwest Mesoregion of Riograndense and Microregion of the Western Campaign, bearing in mind, still, that the Brazilian territory has been undergoing an intense process of transformation, that needs to be identified in its diversity (IBGE, 2017). The estimated population of São Borja, in 2021, is 59768 inhabitants, its territory is formed by 3,616.690 Km² and its distance from the state capital, Porto Alegre, is 585 km (IBGE, 2023).

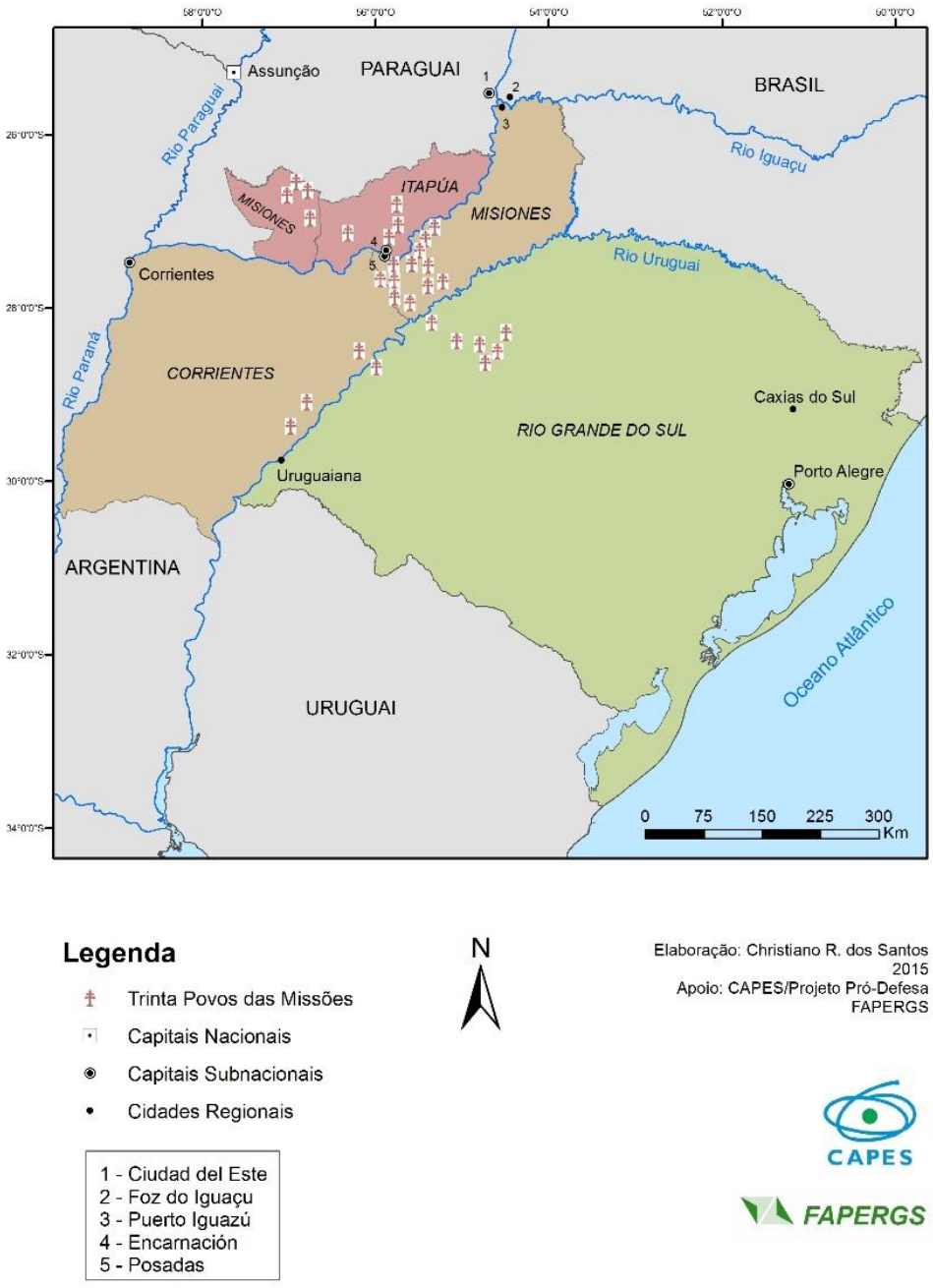
Among the Seven Peoples of the Missions, with the exception of São Borja belonging to the Planning Region of the Regional Council for the Development of the Western Frontier (COREDE-FO), the other cities of this historical region belong to the Planning Region of the Regional Council

for the Development of Missions (COREDE-Missions) of the State of Rio Grande do Sul. COREDE-Missões is currently formed by 25 municipalities (COREDE-FO, 2017).

The region covered by COREDE-Missões has as its economic base, agriculture, especially the cultivation of corn, wheat and, mainly, soybeans. Cattle breeding also stands out among other animal species raised in the region. Regional development is also favored by its historical evolution and location on the border of Brazil and Argentina generating an important asset for historical cultural tourism, amidst natural resources, in part, untapped mainly for tourism.

In this region, São Miguel das Missões and Santo Ângelo, have stood out in the tourist activity for the preservation of history, cultural heritage and the commercialization of regional tourist itineraries (Rota Missões, Caminho das Origens, Caminho das Missões) in addition to participation in international projects (Iguassu-Missiones, International Circuit of Missions, Project 30 Guarani Peoples) aimed at the development of tourism in the territories of Brazil, Argentina and Paraguay (Figure 1). The city of São Borja has regional prominence, being the starting point for the itinerary "Path of the Missions", whose participants walk through roads and cities of the region, remaking the routes used in the reduction period.

Figure 1: Region of the Missions.



Source: Graduate Program in Geography – UFRGS. Prepared by Cristiano R. dos Santos (2015)

Due to its historical and cultural importance, the Archaeological Site of St. Michael the Archangel was declared a World Heritage Site by UNESCO in 1983, along with the ruins of San Ignacio Miní, Santa Ana, Nuestra Señora de Loreto and Santa María Mayor located in Argentina. While São Miguel das Missões annually receives about 80,000 visitors, 225 km away is the reduction of San Ignacio Miní that annually receives more than 200,000 tourists (WBATUBA; et al., 2017).

According to Nogueira and Burkhard (2008) the Missions Region lacks investments in infrastructure. Hotels and restaurants offer few conditions to meet a large number of visitors and there

are no other leisure options and tourism modalities, besides cultural historical tourism. WBATUBA et al. (2017, p. 191-192) also consider that the "infrastructural fragility is latent for the development of the region and regional tourism, and the lack of an identity and regional unity for the attraction of tourists is one of the main bottlenecks".

The cultural identity represented in the city of São Borja is related to the geographical location itself, which in the past was the scene of territorial disputes. The development of the city is marked by events that even alternated the domain and possession of land between Spain and Portugal.

The Historical Region of the Jesuit Missions in Rio Grande do Sul was formed through a process of ethnic and cultural miscegenation, which provided the development of a regional cultural identity. Pinto (2011) notes that:

> [...] the remnants of the reductional period together with the European cultural elements are factors that contributed to the construction of a regional identity, which is represented through elements materialized and symbolized in the Historical and Cultural Heritage (PINTO, 2011, p. 92).

The construction of the cultural identity of the city of São Borja took place from autochthonous ethnicities, whose influence of the Jesuit priests, during the Spanish colonization, formed a new culture from the social organization in the Jesuit reductions. Soon after the Guaraní War (1754-1756), the culture brought by the Portuguese dominated the territory, through military superiority and political organization. At the end of the nineteenth century, other ethnicities arrived in the Region of the Missions, to also leave their marks on history through their symbols and cultural values, allowing the construction of the identity perceived today.

Thus, in the construction of a cultural identity of belonging, of the "I", one resorts to the distinct periods of the history of the place to identify the elements and symbols that represent each period. According to Pinto the identity may be:

> [...] conceptualized as the source of meaning and experience of a people, marked by difference and by symbols in general materialized. This materialization of identity ends up generating products of human feeling, thinking and acting, that is, it potentiates assets of the historical-cultural, material and immaterial heritage (PINTO, 2010, p. 8).

From this concept, it is understood that the identity of the place is formed from the union of elements of the material and intangible heritage, contained in the stories transmitted from generation to generation, in the legends and folklore of the place; in the history contained in books, in architecture, in works of art, in the way people relate to their fellow men, to nature and to cultures and creations. Even if the process of globalization adds characteristics in language and signs, in cultivation and production techniques, in architecture, in machinery and equipment, and in materials and trends, each place has its peculiarities: climate, relief, history, culture and beliefs.

However, these differences become attractive for people to seek positive experiences through contact with different cultures to which they belong

> Tourism transforms the cultural assets that are part of the cultural heritage – historical and educational – into a potential economic resource, which implies the need for greater protection of these assets so that they guarantee the continuity and sustainability of their economic exploitation (DIAS, 2006, p. 48).

The geographical location of São Borja and its historical evolution marked the place allowing the emergence of cultural identities that provided the construction of a cultural heritage that materializes and represents such events. The recognition and preservation of the Jesuit-Guarani cultural heritage materialized and represented along with other identified cultural identities may stimulate the creation of public policies to encourage culture and education that contribute to the preservation of the Historical and Cultural Heritage of São Borja.

4 CULTURAL IDENTITY

The tourist attractions of the city of São Borja present themes that meet the arrangement of cultural identities present in the place. This arrangement consists of fragments of the material and intangible cultural heritage arising from its origin, historical evolution and the geographical location of the municipality itself.

Identity as the essential center of a person's or locality's "I" is often contradictory or unresolved. In the existence of a multiplicity of identities there will also be a profusion of constructions about symbols and references on the part of people. Identity can be "gained" or "lost" changing according to how the subject is questioned or represented (HALL, 2014).

While Hall (2014) states that there may be a change in the identity of a place as part of a process of exchange or succession, Yázigi (2001) states that the place may present more than one cultural identity. The arrangement of different identity traits components for the formation of a personality or the set of identities of the place, "related to everyday life, institutions, architecture, urbanism and all material culture; customs and various other items that are repeated everywhere, as sociology, anthropology and ethnology tell us" (YÁZIGI, 2001, p. 30).

By agreeing with both authors, either by the succession of an identity or in the arrangement of identities present in the locality, the tourist place presents itself as the space and the unique moment of a real and direct experience. This place presents different shapes, colors, textures, sounds, light and contrasts at different times, and can characterize the value given to ethnic, religious, labor culture, values and customs practiced and accepted by all the residents or only by a part of them, forming cultural niches.

> Identity fills the space between the inside and the outside, between the personal world and the public world. The fact that we project "ourselves" into these cultural identities, while internalizing their meanings and values, making them "part of us," contributes to aligning our subjective feelings with the objective places we occupy in the social and cultural world (HALL, 2014, p. 11).

The human being acquires a cultural identity the moment he is surrounded by a set of values and meanings that he begins to desire for himself, accepting and becoming part of the local culture. The locality yearns for an identity that shapes its existence and guides the rescue of its history, being able to explain its relationship with the environment where it is inserted today. Hall (2014) states that identity is.

> [...] defined historically, not biologically. The subject assumes different identities at different times, identities that are unified around a coherent "me." Within us there are contradictory identities, pushing in different directions, in such a way that our identifications are being continuously displaced (HALL, 2014, p. 12).

Cities are producers of ideas and knowledge, history produces memories while memories reconstruct the past. For Yázigi (2001, p. 189), "the perception of the place can be scientific or cultural, but its physical configuration takes place, especially through architecture and urbanism, in them including the landscape sense."

For Santos (1996), the landscape is that fragment of space that is seen in a given historical moment from a specific observation plane, being constituted by its forms, its smells, its movements, its flavors, its temperature, its interrelations, its contradictions and other aspects that can be captured by the physical, intellectual and emotional senses of the observer.

Among the preserved buildings of the Jesuit-Guarani period are the fountains of St. Peter and St. John the Baptist that, in addition to composing the material cultural heritage, offer "fertile field" for the intangible or intangible cultural heritage, allied to the profane celebrations that attract many people to these places.

Another important architectural element for the representation of local cultural identity is the square. This element is usually in a public area with few or no buildings. The squares are formed by natural and architectural elements, expose artifacts, form landscapes giving life and color to the environment. Santos (1996, p. 83) states that "the landscape is a set of forms that, at a given moment, express the inheritances that represent the successive localized relations between man and nature".

The street and the square together contribute to the urbanity and landscape of the city, offering cozy environments sometimes shaded or sunny that contribute to the hospitality of the city. The squares can offer places to practice sports, leisure and recreation, places to sit, talk and contemplate.

4.1 THE REPRESENTATION OF CULTURAL IDENTITY IN THE PUBLIC SPACE OF THE CITY OF SÃO BORJA

Despite the losses to the historical and cultural heritage of the city, there is recognition of its importance in the local, regional and national scenario. Considering the duty of the State to promote and protect the historical and cultural heritage, guaranteeing the memory of the various nuclei that form the society of Rio Grande do Sul and spreading the knowledge of its expressive values; whereas São Borja, after almost three hundred and forty years of existence, has been the scene of important episodes in the territorial, social and political formation of nationality; considering that, between October 1st and 10th of each year, the city celebrates the date of its Patron Saint St. Francis of Borja, facts that led the Legislative Assembly of the State of Rio Grande do Sul, to declare São Borja "Historic City" (Decree No. 35,580 of October 11, 1984)

4.2 THE MISSIONARY CULTURAL IDENTITY

Analyzing the missionary cultural identity in São Borja allows us to carry out a historical construction since the occupation of the Guarani, Kaingang and Charrua ethnic groups in the territory where the reductions by the Jesuit priests of the Society of Jesus developed. This territory went through numerous disputes between the Portuguese and the Spanish that modified the belonging of the lands and mobility of these borders. However, nowadays, the public space where the materialization and representation of cultural identity occurs in the city of São Borja has as a highlight the works exhibited in the Apparício Silva Rillo Municipal Museum, known as the "Missionary Museum", which keeps in permanent exhibition artifacts from the Jesuit-Guarani reductional period and religious motifs in Baroque art. According to Retamozo et al. (2015, p. 27) "there are still in São Borja 83 pieces made in the reduction period, seven of which are owned by the church, 40 by the Apparício Silva Rillo Museum, 35 by private individuals and one is missing or was burned."

The museum was installed in the building located at Travessa Albino Pfeiffer nº 84, Centro, in 1969, with the aim of being a space of protection to the exhibition of pieces related to the history of the city. In 1974, it was renamed the Division of Library, Museum and Municipal Archive. According to the Municipal Law n. 2559/1997, it was renamed Apparício Silva Rillo Municipal Museum, as a way of honoring the poet, composer and historian who dedicated himself to the history of São Borja continuing to use the same building used for the Getúlio Vargas Municipal Library.

The interaction of the museum with the society of São Borja, in a dynamic and contemporary way, promoting access to Jesuit-Guarani history and culture while favoring exchange between people, cultures and knowledge. The museum underwent requalification in 2006 gaining illuminated exhibitors and space for temporary exhibition of contemporary art collections, photography shows and other cultural events.

According to Pinto (2010) the importance of Baroque art contained in the statuary present in the missionary territory, has "prominence in the reduction of St. Francis of Borja, which is a show of the artistic works of one of the greatest sculptors of the time, the Italian Brother Brasanelli". Colvero (2009) also points out that the missionary statuary found in the Apparício Silva Rillo Museum and in the other Jesuit reductions, can be equated with the great centers of artistic production in Europe.

> [...] important participation of Brother Jose Brasanelli, religious who spent nine years of his life in this reduction, leaving a baroque legacy of great importance. It is of his authorship, the carved image of the patron saint of the ancient reduction: Father Francisco de Prada e Gandia; in addition to the building of the old church. Brasanelli was so important for artistic development in South America that many scholars have synthesized him as the greatest artist that had existed among the Thirty Peoples of the Society of Jesus (COLVERO, 2009, p. 5).

In addition to the Apparício Silva Rillo Museum, the city of São Borja presents other public spaces whose materialization and representation of the missionary cultural identity can be recognized. One of the symbols that refer to the Jesuit-Guarani period is the Missionary cross, which was adopted by all missionary peoples, becoming a regional reference, making a link between the current city and the reduction of São Francisco de Borja.

The Missionary cross has its double arms and trifoliate ends with its medial leaves cut straight and resembles the cross of Caravaca and the cross of Lorraine itself, having historical importance for the city. However, it was not used during the making of the Coat of Arms of São Borja.

> The cross of Caravaca, Patriarchal and the cross of Lorraine have as a differential the existence of double arms symmetrically crossed by the rod, located near the top. Its resemblance to the cross of Lorraine brings the understanding of its constitution, because the older version of this cross had both arms of the same size, and that, when, later, overcoming this homology the upper arm became smaller than the lower one with the function of implying the instruction "INRI", this variation received the denomination of Patriarchal cross, however, only of ecclesiastical use restricted to archiepiscopal or patriarchal distinction and meant, by its very particular disposition, redoubled faith, protection and devotion (O'DONNELL, 2015, p. 48-49).

Thus, the same meaning and understanding of the importance of the "redoubled faith" was used in the symbol adopted by the Jesuit reductions. However, unlike the cross of Lorraine and the Patriarchal cross, whose ends are trifoliate, the cross of Caravaca has unique differentiation at its ends, whose leaves are cut vertically.

The mode of fixation of the cross also interferes with its meaning, for O'Donnell (2015), being the cross:

> [...] fixed on three steps, it referred to Jesus' ascent to Calvary, or the cross of the Archangels (in reverence to the triad of St. Michael, St. Gabriel and St. Raphael) or symbolized three theological virtues—faith, hope, and charity; if, however, it had trifoliate mixed ends, it symbolized the trinity; if it finally cut trifoliate ends, it became indicative of the military spirit of the Jesuits (O'DONNELL, 2015, p. 53).

As noted by O'Donnell (2015), in the wide variety of works of the reductional period – sinks, tombstones, bells, porch bas-reliefs, portals and numerous decorative carvings – there are numerous forms of use of the cross. The cross existing in São Miguel da Missões is similar to the cross of Caravaca, while another specimen from São Lourenço, is in everything the same as that of São Miguel das Missões, without trifolios and without cut in the medial leaves and the stem. Thus, the various forms of the cross used in the region of the Seven Peoples of the Missions made the commission formed to create the Coat of Arms of São Borja have as an option a posteriori for the cross of Lorraine not signed on the sides of the shield (O'DONNELL, 2015).

The Missioneira cross as a symbol of the reductional period did not find room to materialize, in the Coat of Arms of São Borja, instituted by Municipal Law n. 381, of November 13, 1962, a period that coincides with the presidential term of João Goulart. However, behind the coat of arms, crossing diagonally, two Indian spears and, sotopostas, two cavalry. Remaining, the missionary cross, materialize in the present day next to the Mother Church, in front of Praça XV de Novembro, next to Porto, in the Bairro do Passo; also in the clovers of access to São Borja, in the Cabeleira neighborhood and in the access to the International Bridge of Integration.

4.3 THE CULTURAL IDENTITY OF THE GAUCHO

According to Pinto and Maurer (2014) from the 1750s São Borja suffered the impacts of the decay of the Jesuit Guarani reductions, concretizing the decadence of the project in a general sense.

> The post-missions marked the exchange of territorial ownership of the areas belonging to the Spanish Crown to the Portuguese domain. This process of Portuguese colonization ends up contributing to the development of the large rural properties of Samborjense through the division of the lands of the sesmarias. The development of cattle ranching ended up constituting some social types such as the landowner, estancieiro, figure of the gaucho (PINTO; MAURER, 2014, p. 146).

The territory that corresponds today, roughly, to Rio Grande do Sul, initially occupied by Spaniards and Portuguese, used for cattle breeding in the model of the estancias, which provided the emergence of the figure of the gaucho, with peculiar clothes and customs, among them: the use of the bombacha and the habit of drinking chimarrão. The cultural influence made the term "gaucho" come to designate every person born in the state, and the typical dress – also known as pilcha gaúcha – was the subject of state law No. 8,813 of January 10, 1989, which officializes as a costume of honor and preferential use in Rio Grande do Sul, for both sexes, its use being authorized in official solemnities in the State.

The figure of the gaucho arises from the landowner who raises cattle first in Argentina and Uruguay and later in Brazil providing the development of customs, knowledge and cultural traditions related to the social type in question. The traditions and culture of the gaucho have materialized and

perpetuated in the resorts through the campeiras and in the Gaucho Tradition Centers (CTGs) through music, dance and other cultural activities (PINTO; MAURER, 2014).

From the 1930s, Brazil lived a moment of intense urbanization, at the same time that it also lost its agrarian vocation amid the deepening of relations with the USA. During the Brazilian dictatorship, of Getúlio Vargas, the Department of Press and Propaganda (DIP), aimed to disseminate the ideology of the Estado Novo to the population in general, having sought to build the image of a developed country by promoting new cultural references in the country as a way to eliminate regionalisms.

> The Getulist State needs, after the implementation of the dictatorship, to say for what and why it dominated the State apparatus and to choose who will be its main interlocutors. For this, he created, in 1939, the Department of Press and Propaganda – DIP, as an instrument capable of centralizing and directing the ideology of the "Estado Novo" with the population in general and the workers in particular (SANTOS FILHO, 2007, p. 2).

After the fall of Getúlio, the government adopted a less centralizing stance in relation to regionalism, but the disregard for regional symbols – such as the flag of Rio Grande do Sul and the devaluation of the rural way of life – made Paixão Côrtes and his companions, from 1947, seek to recreate the past through traditionalism. This gaucho identity, ideologically directed, is based mainly on the rural agropastoral past that merges in its conception the role of the pawn and the boss around the resorts, idealizing and valuing the handling of the countryside, in front of a society in a frank process of urbanization, having as its main reference the Farroupilha revolution, which opposed, from 1835 to 1845, the local republican troops to the Brazilian imperial government (SOUZA, 2017).

> The identity reconstruction given in Rio Grande do Sul at the beginning of the second half of the twentieth century revalues the gaucho. The gaucho, once a symbol of wandering pawns, landless plunderers, aimless and unethical, is now identified as the Farroupilha hero, a positive reference and common ancestor of the people of the state, who now identify themselves as gaucho (SOUZA, 2017, p. 4).

The organization of gaucho traditionalism gave rise to a differentiation on the part of regional artists who, having a different vision from the traditionalism defended by Paixão Cortes, gradually built a new meaning to their own regional cultural identity. From the 1970s/80s the missionary cultural identity gains strength valuing the cultural and economic aspects of the Jesuit Missions Region, the Guaranite War and Sepé Tiarajú, a political and military character.

> Gradually, the acceptance of the reminiscence is due to the historians and archaeologists who triggered the patrimonial education, associated with other professionals, provoking the great turn in the memory of the Missions. Music contributed immensely, especially when popular artists such as Jayme Caetano Braun, Noel Guarany, Cenair Maicá, Pedro Ortaça and the Grupo de Arte Nativa Os Angueras, among others, began to publicly call themselves "missioneiros" (GOLIN, 2011, p. 288).

Created by local artists in the city of São Borja, the Amateur Art Group "Os Angueras", on October 10, 1982, created the Estancia Ergological Museum[1] whose objective is to promote knowledge about the importance of the work and techniques employed throughout history, as well as to celebrate the skill and the material and immaterial heritage of the campeiro people who lived in the cattle ranches.

At the museum, visitors can learn about the tools and techniques used in different work activities including interactive exhibits and demonstrations of how the tools are used, as well as displays of historical artifacts, photographs and documents that illustrate the evolution of human labor. The collection was formed from the donation of the friends of the group, who gathered in the hall "Os Angueras", for balls and colonial cafes whose entrance was an old object. With the passage of time, utensils, furniture, machinery and even animal traction vehicles began to be donated, which are currently kept on permanent display.

The taste for music and dance evidenced in São Borja, contributed to the State Law Project n. 91/2017, which declares the municipality of São Borja, "Gaucho Capital of Fandango". This tribute is justified in the recognition of the numerous gaucho dances held in the "Farroupilha Week".

4.4 THE CULTURAL IDENTITY OF PRESIDENTS

In the mid-twentieth century, São Borja would become the "cradle of laborism" because it was the birthplace of presidents Getúlio Vargas and João Goulart, whose political rise would mark local history and imprint identity characteristics in the lives of many people. This fact came to be confirmed through State Law No. 13,041 of September 25, 2008, which declares the city of São Borja "Land of Presidents".

The Cultural Identity of Presidents refers to the appreciation of the politics and history of former presidents Getúlio Dorneles Vargas and João Belchior Marques Goulart who, annually, receive prominence in the commemoration of the dates of birth and death with the holding of solemn tribute sections in the City Council. The tributes follow through statues, busts, monuments, museums and names of streets and squares of the city.

4.5 THE FRONTIER CULTURAL IDENTITY

The geographical location of the city of São Borja, on the edge of the border with Argentina, has provided in the past, a river connection between the two countries through the ferry pass linking the "port of the pass" on the Brazilian side to the "port of the anthill" on the Argentine side. Before the

[1] An ergological museum is a type of museum that aims to preserve, study and display objects related to human labor and its techniques throughout history. The term "ergological" comes from the Greek "ergon," meaning work, and "logos," meaning study.

construction of the International Bridge of Integration was intense the movement of people crossing the river, bringing goods in bags carried in their arms and their backs.

From the year 1997, with the construction of the International Integration Bridge, São Borja/Santo Tomé, "there was the end of the transfer of vessels in the old local port, due to the fact that it was built in another space" (PINTO; MAURER, 2014, p. 144). From this construction, "there were cultural and economic changes in this riverside region, since the flow was intense every day of the week" (PINTO et al., 2014, p. 15).

The inauguration of the International Integration Bridge took place on December 9, 1997, by the presidents of Argentina, Carlos Menem, and Brazil, Fernando Henrique Cardoso, opening a new page in trade relations between the two countries. Currently, the flow of tourists and bilateral international trade, has as an option to cross the Uruguay River the International Bridge of Integration contributing to the local economy, in addition to bringing Brazilians and Argentines through cultural aspects experienced on both sides of the river.

The geographical location on the border with Argentina, the physical limit represented by the Uruguay River and its relationship of union and separation of the peoples of São Borja and Santo Tomé provide the identification of various social practices and cultural manifestations identified with the Pampian, riverside and border culture. This relevant historical-cultural trajectory has built symbols, narratives and cultural elements that are represented through cultural heritage and diverse border identities (PINTO et al., 2014).

5 FINAL CONSIDERATIONS

The existing cultural heritage in the city of São Borja includes natural and cultural assets that involve the human being part of its historical past and its present, its cultural, civic, religious and folkloric manifestations, preserved or rescued. Thus, the manifestation of this cultural heritage formed by goods and values, tangible and intangible, represented in the words of those who tell their story, in the images reproduced, in the monuments, in the artifacts contained in the museums and in the archaeological site, which surrounds the center of the current city, contribute to a sense of belonging in the people residing there forming cultural niches and identities presented and discussed here.

The representation and materialization of cultural identity in the city of São Borja as currently constituted is identified through architecture, landscape, artifacts, clothing and people's way of life. The valorization of the Missionary Cultural Identity refers to the origin of the city in the "Second Missionary Cycle" and formation of the Seven Peoples of the Missions.

The Missionary Cultural Identity is enhanced by the movement of regional and local artists who, in the 1970s/80s, rescued the missionary cultural identity valuing the culture and economic aspects of the Jesuit Missions Region, the Guaranite War and Sepé Tiarajú, a political and military

character. It is also important to emphasize that the spatial occupation of the region underwent profound changes after the reductionist period when the colonizing process of the territory took place that contributed to the ethnic-cultural and identity characteristics of the population today.

The Cultural Identity of the Gaucho that values the culture that emerged from the owner of land cattle breeder first in Argentina and Uruguay and later in Brazil have kept alive customs, knowledge and cultural traditions until the present day. This cultural identity has materialized and perpetuated in the resorts through the campeiras and in the Gaucho Tradition Centers (CTGs). Due to the proximity of the border and cultural aspects developed by the relationship between Brazilians and Argentinians, the Border Cultural Identity is also perceived in the representation and materialization that also covers cultural aspects in the communication with the common use of the Portuguese language and the Spanish language, as well as in dances and international trade.

The Cultural Identity of Presidents refers to the appreciation of politics and the history of former presidents Getúlio Dorneles Vargas and João Belchior Marques Goulart who annually receive prominence in the commemoration of the dates of birth and death with the holding of solemn tribute sections in the City Council. The tributes follow through statues, busts, monuments, museums and names of streets and squares of the city.

The city of São Borja originated within a process of occupation and territorial development of interest to the Kingdom of Spain, currently fragmented in Brazil, Argentina and Paraguay giving rise to the creation of cities first occupied by the original peoples of the region and the priests of the Society of Jesus. Although human occupation in the region has brought other ethnicities and other cultures, it is necessary to consider regional development beyond borders and recognize the importance of the territory as a basis for economic, social development and for the preservation of natural resources.

Although the strengthening and economic development of the region is based on the agricultural and agro-industrial sector, it is possible to believe in the potential of tourism as an activity that generates wealth and promotes income distribution. The existence of bottlenecks for the development of tourism in the region does not prevent the existence of investments aimed at changing this reality.

Currently the region has received public investments in infrastructure (highways, roads and Santo Ângelo airport) that combined with private investments give new opportunities for the development of the region. Thus, it is believed in the potential of local and regional tourism, and in the need to offer sustainable products, with regard to economic and social development, aimed at the preservation of natural resources and development of inclusive forms of tourism in harmony with the appreciation of cultural identities and a cultural heritage full of history, knowledge and curiosities that mech with the imaginary of visitors.

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Chocolate mousse: Physical chemistry in the formative itinerary of the new high school

https://doi.org/10.56238/ptoketheeducati-008

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ABSTRACT
The teaching of Natural Sciences becomes increasingly demanding in the sense that students can assimilate scientific knowledge. The experimental activity of Physical Chemistry, in the school environment, constitutes a space that enhances the cognitive and educational aspects of the students. In this sense, the formative itineraries must guarantee the appropriation of knowledge, as well as the use of methodologies that favor the protagonism of youth. For the development of this work, a documentary research was carried out in the references that guide the teaching of physical chemistry, considering the New High School. For this, the study of the National Common Curricular Base and the Gaucho Curricular Reference was carried out, as well as the research in scientific articles about the teaching of physical chemistry in basic education. This proposal fits into the curricular arrangement Natural Sciences and its technologies, in the structuring axis Scientific Investigation, and aims to teach the concepts of physical chemistry, through the production of a classic chocolate mousse. The target audience was students of the 2nd year of High School. In this work it was decided to produce a classic chocolate mousse, as an experimental strategy to learn and teach physical chemistry. Within the three specific competencies of the Area of Natural Sciences and its Technologies, it can be observed that Chemistry is present in all specific skills, whether in the form of Organic Chemistry, Inorganic Chemistry, Physical Chemistry or Analytical Chemistry. Thus, chemical experimentation in the school environment provided the student to relate the objects of study of physical chemistry through observations, comparisons, generalizations and conclusions, integrating theoretical knowledge into the context of everyday life.

Keywords: Teaching, Formative Itinerary, Physical Chemistry, Chocolate Mousse.

1 INTRODUCTION

The teaching of Natural Sciences becomes increasingly demanding in the sense that students can assimilate scientific knowledge. In this scenario, the practical-experimental activity of Chemistry in the school environment constitutes a space that enhances the cognitive, educational and motivational aspects of the students, as well as integrates theory and practice, thought and action.

Rionda Sanchez (2009), describes that scientific knowledge is the product of direct or indirect human action on objects and phenomena at a given time.

The relationship between teaching and learning is intense, because when you teach something, you learn more, stimulating and strengthening knowledge. Physical chemistry is one of the three main

branches of chemistry. Several daily actions involve physical-chemical knowledge, from cooking a food, producing a sweet, personal hygiene, making a bread, among others.

The great difficulty on the part of high school students in understanding many important concepts of Chemistry compromises the learning of these students (SANTOS et al., 2013).

According to Silva et al. (2017), this difficulty is further aggravated when it comes to physical chemistry, an area of chemistry that is studied by high school students. This is partly due to a lack of mathematical basis. The difficulties with simple calculations compromise the assimilation of the concepts of Physical Chemistry. A part of the learning process is broken by a lack of skill with mathematics.

With this, this work aims to teach the concepts of physical chemistry, through the production of a classic chocolate mousse.

2 THEORETICAL CONTRIBUTION

2.1 HIGH SCHOOL NORMATIVE DOCUMENTS

According to Brasil (2017), the curriculum of the new high school is composed of the National Common Curricular Base (BNCC) and Formative Itineraries, which were organized through the offer of different curricular arrangements, according to the relevance to the local context and the possibility of the education systems, namely:

I – languages and their technologies;

II – mathematics and its technologies;

III – natural sciences and their technologies;

IV – applied human and social sciences;

V – technical and professional training.

All BNCC skills were defined taking as reference the limit of 1,800 hours of the total workload of each stage (LDB, 1996). Figure 1 represents the general competencies of basic education according to the BNCC.

Figure 1: General competencies of Basic Education – New High School



Source: prepared by the authors, adapted from Brazil (2017).

The curricula, competencies and skills of BNCC, constitute the basic general formation, articulated to the Formative Itineraries as an inseparable whole, under the terms of DCNEM (Opinion and Resolution CNE / CEB No. 3/2018).

2.1.1 National Common Curricular Base and Training Itineraries

Considering the changes in the LDB, due to Law No. 13,415/2017, there is the transition from the single model of high school curriculum to a diversified and flexible model, which is composed of Formative Itineraries.

In this context, it is necessary to reorganize curricula and pedagogical proposals, which are essential to education systems, school networks and schools.

The Formative Itineraries are strategic for the flexibility of the curricular organization of High School, because they allow options of choice to the students, since they can be structured with a focus on an area of knowledge, in the technical and professional training or, also, in the mobilization of competences and abilities of different areas, composing the integrated itineraries, in the terms of the DCNEM. The Formative Itinerary of the area, which has interlocution with physical chemistry, is described below:

> III – natural sciences and their technologies: deepening of structuring knowledge for the application of different concepts in social and work contexts, organizing curricular arrangements that allow studies in astronomy, metrology, general, classical, molecular, quantum and mechanical physics, instrumentation, optics, acoustics, chemistry of natural products, analysis of physical and chemical phenomena, meteorology and climatology, microbiology, immunology and parasitology, ecology, nutrition, zoology, among others, considering the local context and the possibilities offered by education systems (BRASIL, 2017).

The Formative Itineraries must ensure the appropriation of cognitive procedures and the use of methodologies that favor youth protagonism and must be organized around one or more of the following structuring axes (BRASIL, 2017):

> I – scientific investigation: supposes the deepening of foundational concepts of the sciences for the interpretation of ideas, phenomena and processes to be used in research procedures aimed at coping with everyday situations and local and collective demands, and the proposition of interventions that consider local development and the improvement of the quality of life of the community;
>
> II – creative processes: suppose the use and deepening of scientific knowledge in the construction and creation of experiments, models, prototypes for the creation of processes or products that meet the demands for the resolution of problems identified in society;
>
> III – mediation and sociocultural intervention: suppose the mobilization of knowledge from one or more areas to mediate conflicts, promote understanding and implement solutions to issues and problems identified in the community;
>
> IV – entrepreneurship: supposes the mobilization of knowledge from different areas for the formation of organizations with varied missions focused on the development of products or provision of innovative services with the use of technologies (Resolution CNE / CEB No. 3/2018).

Figure 2 shows the proposed articulation for the Formative Itinerary with the discipline of Chemistry, according to the Gaucho Curricular Reference for High School (2021).

Figure 2: Articulation of Chemistry and the Formative Itinerary, according to RCG.

NEW HIGH SCHOOL	
Specific Disciplines	Formative Itinerary
Workload to fulfill the content of the general training	Work contextualized with the specific discipline
Chemistry	Opt for a Structuring Axis
Workload: 1st year: 2 hours/week 2nd year: 2 hours/week 3rd year: indefinite	

Source: Prepared by the authors, adapted RS (2021).

2.1.2 The Area of Natural Sciences and its Technologies

In Basic Education, it can be stated that the Area of Natural Sciences and its Technologies should contribute to the construction of contextualized knowledge, which encourage the protagonism of students, in order to create alternatives to make judicious use of various technologies.

Chart 1 describes the specific competencies and skills of high school, according to the BNCC (BRASIL, 2017).

Table 1: Specific competencies and skills of High School.

Specific competence	Specific skills
Analyze natural phenomena and technological processes, based on the relations between matter and energy, to propose individual and collective actions that improve production processes, minimize socio-environmental impacts and improve living conditions at the local, regional and/or global level.	(EM13CNT101) Analyze and represent the transformations and conservations in systems that involve amount of matter, energy and movement to make predictions in everyday situations and productive processes that prioritize the rational use of natural resources. (EM13CNT102) Perform forecasts, evaluate interventions and/or build prototypes of thermal systems aimed at sustainability, based on the analysis of the effects of thermodynamic variables and the composition of natural and technological systems. (EM13CNT103) Use knowledge about radiation and its origins to evaluate the potential and risks of its application in everyday equipment, in health, in industry and in the generation of electricity. (EM13CNT104) Evaluate potential damages of different materials and products to health and the environment, considering their composition, toxicity and reactivity, as well as the level of exposure to them, positioning themselves critically and proposing individual and/or collective solutions for the proper use of these materials and products. (EM13CNT105) Analyze the cycling of chemical elements in soil, water, atmosphere and living beings and interpret the effects of natural phenomena and human interference on these cycles, to promote individual and/or collective actions that minimize harmful consequences to life. (EM13CNT106) Evaluate technologies and possible solutions to the demands that involve the generation, transportation, distribution and consumption of electricity, considering the availability of resources, energy efficiency, cost/benefit ratio, geographical and environmental characteristics, waste production and socio-environmental impacts.
Construct and use interpretations about the dynamics of Life, Earth and the Cosmos to elaborate arguments, make predictions about the functioning and evolution of living beings and the Universe, and ground ethical and responsible decisions.	(EM13CNT201) Analyze and use scientific models, proposed in different times and cultures to evaluate different explanations about the emergence and evolution of Life, the Earth and the Universe. (EM13CNT202) Interpret forms of manifestation of life, considering its different levels of organization (from molecular composition to biosphere), as well as the favorable environmental conditions and the limiting factors to them, both on Earth and on other planets. (EM13CNT203) Evaluate and predict the effects of interventions on ecosystems, living beings and the human body, interpreting the mechanisms of life maintenance based on the cycles of matter and the transformations and transfers of energy. (EM13CNT204) Elaborate explanations and predictions regarding the movements of objects on Earth, in the Solar System and in the Universe based on the analysis of gravitational interactions. (EM13CNT205) Use notions of probability and uncertainty to interpret predictions about experimental activities, natural phenomena and technological processes, recognizing the explanatory limits of the sciences. (EM13CNT206) Justify the importance of the preservation and conservation of biodiversity, considering qualitative and quantitative parameters, and evaluate the effects of human action and environmental policies to ensure the sustainability of the planet. (EM13CNT207) Identify and analyze vulnerabilities linked to the contemporary challenges to which young people are exposed, considering the physical, psychoemotional and social dimensions, in order to develop and disseminate actions of prevention and promotion of health and well-being.
Analyze problem situations and evaluate applications of scientific and technological knowledge and their implications in the world, using procedures and languages specific to the Natural Sciences, to propose solutions that consider local, regional and/or global demands, and to communicate their findings and conclusions to varied	(EM13CNT301) Construct questions, elaborate hypotheses, predictions and estimates, employ measuring instruments and represent and interpret explanatory models, data and/or experimental results to construct, evaluate and justify conclusions in coping with problem situations from a scientific perspective. (EM13CNT302) Communicate, to varied audiences, in various contexts, results of analyses, research and/or experiments – interpreting graphs, tables, symbols, codes, classification systems and equations, elaborating texts and using different media and digital information and communication technologies (TDIC) – in order to promote debates around scientific and/or technological themes of sociocultural relevance. (EM13CNT303) Interpret texts of scientific dissemination that deal with themes of the Natural Sciences, available in different media, considering the presentation of the data, the consistency of the arguments and the coherence of the conclusions, aiming to build strategies for the selection of reliable sources of information.

audiences, in various contexts and through different media and digital information and communication technologies (TDIC).	(EM13CNT304) Analyze and debate controversial situations about the application of knowledge in the area of Natural Sciences (such as DNA technologies, stem cell treatments, armaments production, forms of pest control, among others), based on consistent, ethical and responsible arguments, distinguishing different points of view. (EM13CNT305) Investigate and discuss the misuse of knowledge from the Natural Sciences in the justification of processes of discrimination, segregation and deprivation of individual and collective rights to promote equity and respect for diversity. (EM13CNT306) Evaluate the risks involved in daily activities, applying knowledge of the Natural Sciences, to justify the use of equipment and safety behaviors, aiming at physical, individual and collective integrity, and socio-environmental. (EM13CNT307) Analyze the specific properties of materials to assess the suitability of their use in different applications (industrial, everyday, architectural or technological) and/or propose safe and sustainable solutions. (EM13CNT308) Analyze the functioning of electrical and/or electronic equipment, computer networks and automation systems to understand contemporary technologies and assess their impacts. (EM13CNT309) Analyze socio-environmental, political and economic issues related to the dependence of the current world on fossil resources and discuss the need to introduce alternatives and new energy and materials technologies, comparing different types of engines and production processes of new materials. (EM13CNT310) Investigate and analyze the effects of infrastructure programs and other basic services (sanitation, electricity, transportation, telecommunications, vaccination coverage, primary health care and food production, among others) and identify local and/or regional needs in relation to these services, in order to promote actions that contribute to improving the quality of life and health conditions of the population.

Source: prepared by the authors, adapted from Brazil (2017).

According to Chart 2, it can be observed that the specific skills can be worked during the three years of High School, corroborating with the Gaucho Curricular Reference (RS, 2021).

> From the three specific competencies, which should be worked in the light of the ten general competencies of Basic Education, the skills of the area are developed, which are proposed in the BNCC and which are brought in Chart 1, complemented by the skills suggested for the gaucho curriculum, which can be worked in one, two or three years of High School, according to the suggestions below or at the discretion of the teacher in his planning, with a view to the specificities of the territory and which are listed in the column Skills RS (RS, 2021).

Considering that the main objective of high school is to deepen the learning of elementary school, train students for the exercise of citizenship and prepare them for the selection processes, the new High School has a greater focus on the disciplines of Portuguese and mathematics. In the second year of high school the discipline of Chemistry, seeks to direct knowledge about gases, solutions, colligative properties and thermochemistry in addition to the study of inorganic reactions and stoichiometry. It is popularly stated that physical chemistry is inserted in the contents of the second year of high school.

Thus, Chart 2 describes the specific skills to be developed in the 2nd year of high school within Physical Chemistry.

Table 2: Specific skills to be developed in the 2nd year of High School within Physical Chemistry.

Specific skills
(EM13CNT101) Analyze and represent the transformations and conservations in systems that involve amount of matter, energy and movement to make predictions in everyday situations and productive processes that prioritize the rational use of natural resources. (EM13CNT102) Perform forecasts, evaluate interventions and/or build prototypes of thermal systems aimed at sustainability, based on the analysis of the effects of thermodynamic variables and the composition of natural and technological systems. (EM13CNT103) Use knowledge about radiation and its origins to evaluate the potential and risks of its application in everyday equipment, in health, in industry and in the generation of electricity. (EM13CNT104) Evaluate potential damages of different materials and products to health and the environment, considering their composition, toxicity and reactivity, as well as the level of exposure to them, positioning themselves critically and proposing individual and/or collective solutions for the proper use of these materials and products.
(EM13CNT203) Evaluate and predict the effects of interventions on ecosystems, living beings and the human body, interpreting the mechanisms of life maintenance based on the cycles of matter and the transformations and transfers of energy. (EM13CNT205) Use notions of probability and uncertainty to interpret predictions about experimental activities, natural phenomena and technological processes, recognizing the explanatory limits of the sciences. (EM13CNT206) Justify the importance of the preservation and conservation of biodiversity, considering qualitative and quantitative parameters, and evaluate the effects of human action and environmental policies to ensure the sustainability of the planet.
(EM13CNT308) Analyze the functioning of electrical and/or electronic equipment, computer networks and automation systems to understand contemporary technologies and assess their impacts. (EM13CNT309) Analyze socio-environmental, political and economic issues related to the dependence of the current world on fossil resources and discuss the need to introduce alternatives and new energy and materials technologies, comparing different types of engines and production processes of new materials. (EM13CNT310) Investigate and analyze the effects of infrastructure programs and other basic services (sanitation, electricity, transportation, telecommunications, vaccination coverage, primary health care and food production, among others) and identify local and/or regional needs in relation to these services, in order to promote actions that contribute to improving the quality of life and health conditions of the population.

Source: prepared by the authors, adapted from Brazil (2017).

3 METHODOLOGY

3.1 RESEARCH METHODOLOGY

For the development of this work, a documentary research was carried out in the references that guide the teaching of physical chemistry in the New High School. For this, it was based on the study of the National Common Curricular Base and Gaucho Curricular Reference, and on other documents of normative character of teaching.

In addition, research was carried out in scientific articles about the teaching of physical chemistry.

The proposal fits into the curricular arrangement of Natural Sciences and its technologies, and the structuring axis Scientific Research.

3.2 TEACHING METHODOLOGY

The target audience was students of the 2nd year of High School.

In this work it was decided to produce a classic chocolate mousse, as an experimental strategy to learn and teach physical chemistry, in the New High School.

Next, in Table 3, we have the recipe, containing the ingredients and method of preparation of the classic chocolate mousse.

Table 3: Recipe and method of preparation of the classic chocolate mousse.

Makings	2 creams 400 g chopped dark chocolate 6 egg whites 10 tablespoons sugar
Method of preparation	1º) Add the egg whites to the mixer dish. 2º) Beat the egg whites in snow point.  3º) When the egg whites are at the foam point, add the sugar.  4º) Beat until it looks like meringue, in the form of an emulsion.  5º) Chop 400 g of chocolate in smaller portions. 6º) Place the chocolate in a container that can go to the microwave.  7º) Insert in the microwave and heat at low power until melting. 8º) Stir the chocolate from the container, slowly. 9º) Add 01 sour cream and stir slowly. Insert 01 more cream.

	  10º) If you still have pieces of chocolate without melting, insert another 1 minute in the microwave. 11º) Add the white in snow, slowly, next to the chocolate, stirring from bottom to top, slowly.  12º) Serve the mousse in jars and refrigerate for 3 hours.  13°) The mousse is ready!

Source: Prepared by the authors and own record.

For the production of the classic chocolate mousse, a set of planned activities in the form of moments is suggested, which favor the pedagogical practice, according to Chart 4.

Table 4: Moments and description of activities.

A MOMENT	DESCRIPTION
First	**Student instigation** In this first moment, a dialogue about the recipe of the classic chocolate mousse is suggested, as well as a reflection on the quantities of ingredients, calories, preparation time and measurements. Also, photos of the previously prepared mousse are presented.
2nd	**Contextualization of the theoretical content** The contextualization of the theoretical content can be done using a traditional and expository class of topics about physical chemistry, such as chemical equilibrium, types of dispersions, chemical kinetics, thermochemistry, stoichiometry and chemical reaction.
Third	**Production of classic chocolate mousse** The production of the classic chocolate mousse should be carried out according to table 3.

4th	**Interlocution of the activity with the guiding documents** At this point, it is suggested a reflection of the specific competencies and abilities of the New High School that may be associated with the experimental activity.

Source: Prepared by the authors.

4 RESULTS AND DISCUSSIONS

In this chapter, it is emphasized that table 4 highlights a set of planned activities in the form of moments, which can be used in pedagogical practice.

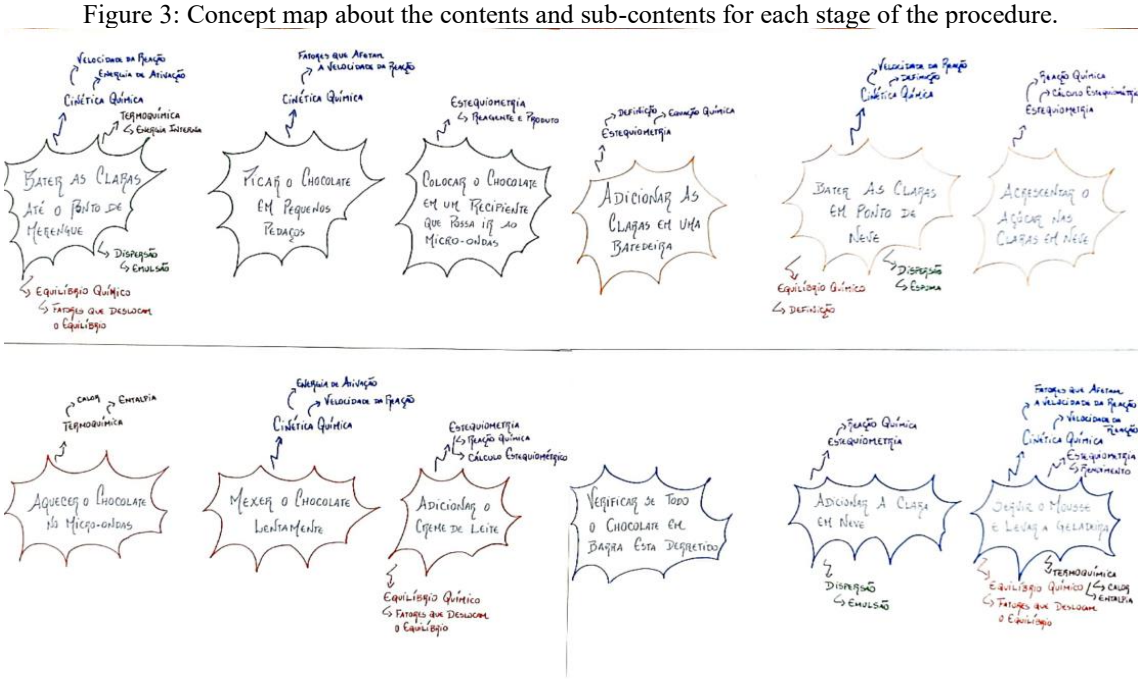
The recipe of the classic chocolate mousse was prepared by the authors, according to table 3, as a previous test, in order to verify the details of each stage of the preparation.

At the moment of instigation of the student, the dialogue will stimulate reflection, the need to confront ideas and to position oneself in the face of difficult subjects, contributing to the resolution of problems and to the cognitive development of the students.

Considering the specific skills, possible to be developed in the 2nd year of High School within the Physical Chemistry, from the production of the classic chocolate mousse, some contents and sub contents were listed, which are related to each stage for the experimental activity and contextualized with the proposal.

Figure 3 represents an illustration of the concept map, made by the professor, professor of the discipline of Chemistry.

Figure 3: Concept map about the contents and sub-contents for each stage of the procedure.



Source: Own authorship.

Chart 5 outlines the contents and sub-contents of physical chemistry addressed at each stage of the chocolate mousse manufacturing process.

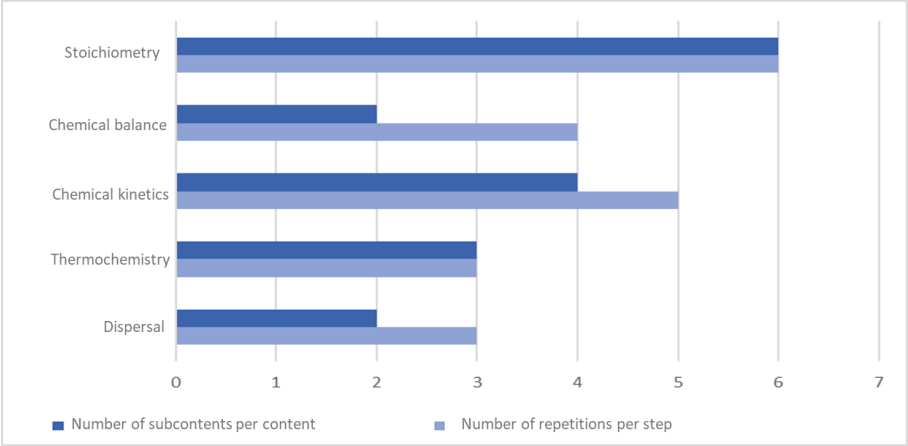
Table 5: Contents and sub-contents of physical chemistry in each stage.

STAGE	CONTENT	SUB CONTENT	
Beat the egg whites to the point of meringue	Dispersion	Emulsion	
	Thermochemistry	Internal energy	
	Chemical kinetics	Reaction speed	Activation power
	Chemical equilibrium	Factors that shift the balance	
Chop the chocolate into small pieces	Chemical kinetics	Factors that affect the speed of the reaction	
Put the chocolate in a container that can go to the microwave	Stoichiometry	Reagent and product	
Add the egg whites in a mixer	Stoichiometry	Definition	Chemical equation
Beat the egg whites in snow point	Chemical equilibrium	Definition	
	Dispersion	Foam	
	Chemical kinetics	Definition	Reaction speed
Add the sugar to the egg whites in snow	Stoichiometry	Chemical reaction	Stoichiometric calculation
Heating chocolate in the microwave	Thermochemistry	Heat	Enthalpy
Stir the chocolate slowly	Chemical kinetics	Activation power	Reaction speed
Add the sour cream	Stoichiometry	Chemical reaction	Stoichiometric calculation
	Chemical equilibrium	Factors that shift the balance	
Add the white in snow	Stoichiometry	Chemical reaction	
	Dispersion	Emulsion	
Serve the mousse and take the refrigerator	Thermochemistry	Heat	Enthalpy
	Chemical equilibrium	Factors that shift the balance	
	Stoichiometry	Yield	
	Chemical kinetics	Reaction speed	Factors that affect the speed of the reaction

Source: Prepared by the authors.

Graph 1 shows the interpretation of table 5, according to the contents and sub contents for each stage of the activity.

Graph 1: Interpretation according to the contents and sub contents for each stage of the activity.



Source: Own authorship.

4.1 INTERLOCUTION OF THE ACTIVITY WITH THE GUIDING DOCUMENTS

Table 6 below highlights the interlocution of the proposed activity with the specific skills of BNCC, which can be achieved after developing the practice.

Table 6: Interconnection of the contents of physical chemistry in with the specific skills.

Content	**Specific skills**
Dispersion	EM13CNT101
Thermochemistry	EM13CNT101 - EM13CNT102 - EM13CNT203
Chemical kinetics	EM13CNT101 - EM13CNT102 - EM13CNT203
Chemical equilibrium	EM13CNT102
Stoichiometry	EM13CNT101

Source: Own authorship.

It is worth mentioning that this proposal also has the potential to be applied in the final years of elementary school, since it contemplates some specific skills related to the curricular component sciences.

5 FINAL CONSIDERATIONS

The Physical Chemistry of Traditional High School is concentrated in the 2nd year, but in the New High School it is dispersed over the three years.

Within the three specific competencies of the Area of Natural Sciences and its Technologies, it can be observed that Chemistry is present in all specific skills, whether in the form of Organic Chemistry, Inorganic Chemistry, Physical Chemistry or Analytical Chemistry.

Thus, chemical experimentation in the school environment provides students with the ability to relate the objects of study of Chemistry through: observations, comparisons, generalizations and conclusions, integrating theoretical knowledge into the context of everyday life.

According to Borges (2002) and Laburú (1999), the central aspect in learning from practical activities is not where it happens, but how and for what they are performed. For, according to the authors, more important than a sophisticated and specific experimental apparatus, is the definition of objectives to be achieved with this type of class and clarity regarding the role of experimentation in student learning.

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Vocal transcreation processes, remote and face-to-face teaching

https://doi.org/10.56238/ptoketheeducati-009

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ABSTRACT
We approach hybrid forms of creation in process with students from PUC-SP, from the pandemic until now. The objective is to reflect on experiences of creating interpretation in voice and singing, together with technological resources, after the pandemic. We dialogue with the transcreation in H. de Campos and resources from the Critique of Processes by C. Salles. This resulted in recordings in Audacity, emphasizing vocal dynamics. We conclude that the hybridity of remote and presential provided the emphasis on realization of vocal dynamics.

Keywords: Transcreation, Creative processes, Spoken voice, Singing.

1 INTRODUCTION

During the pandemic period and after it, we developed vocal creation processes with poetic texts and songs, with students from PUC-SP.

In the classes, the Audacity recording and editing program was used. The interactions of the oral voice with its resources resulted in transcreation processes marked by them. We will present and discuss them in the light of the neologism transcreation, conceptualized by Haroldo de Campos, reflecting on aspects of transformation of texts and songs, from the written to the oral text and the song taken as a reference, for interpretation by each student.

Resources of the Critique of Processes *of Cecilia Salles were also studied with the students, and along with the theoretical aspects of transcreation, are brought here in the first item of the article, to measure about which the discussions were developed, showing the themes selected by us for reflections on processes of creation and transcreation in the work of the interpreter.*

The class dynamics installed in the period of remote classes, with frequent searches on the internet, as well as the use of the *Audacity program,* spilled over into face-to-face classes, on its return in 2022. The study of the theoretical texts, which in the remote period were done along with the preparation of a common text of the students in Google Drive, aligning what they were discussing, was maintained in this way. Then, being together in person in the classroom, the students composed an article directly in Google Drive, using this technological service that favored and facilitated the writing together.

The behavior of the use of vocal dynamics (in which vocal sounds are performed from the lowest sound, which is called the piano, to the strongest sound, which would be the fortissíssimo), was

shown to be forceful, in view of the hybridity arising from technological and face-to-face aspects, both in the use of the spoken voice and in that of the sung voice, because its presence was striking in both cases.

Approaching and developing vocal dynamics in face-to-face vocal experiments has always been more difficult in classes in previous years, in the period before the pandemic. With this technology, the face-to-face work of vocal dynamics in the post-COVID 19 period has become more productive.

We will see below how the work with the students took place, reflecting on the hybridity in their transcreation processes.

2 TRANSCREATION OF WRITTEN TEXT IN REMOTE AND FACE-TO-FACE STATE

In the *Body Arts course* at PUC-SP, we taught the discipline *Sound Languages* from before the pandemic until this year. Before the pandemic classes were in-person, from 2020 to 2021 they were remote and from 2022, they returned to in-person.

Initially, in remote classes, for the purpose of identifying expressive meanings in the voice, the students chose sound poetry texts from the book *Poesia Sonora – Poéticas Experimentais da Voz no Século XX, by Philadelpho* Menezes.

But before the beginning of this work of interpretation, we proposed to the students a theoretical study about interpretation as transcreation.

Some excerpts from the texts and concepts discussed are brought here to understand the content of the reflections of perspectives about creation as transcreation, which underlies a relational mode between interpreter and source text (whether written or musical). And we, as a teacher, consider fundamental the discussion about this relationship, before practically carrying it out. We thought it was important to think about what was being done, about the relationship established in terms of creation.

At the time of remote classes, this study was done with extra-class readings and subsequent in-class discussion, online. From these reflections the students began to write in Google Drive, a text together about the text read, critically concatenating the points they considered important. This joint writing in a Google service, was one of the resources that spilled over to the period of face-to-face classes, and there it was also used, so that students could compose a reflective and critical text together, about the original text. Thus, even though they were in person together in class, the text was written together in Google Drive.

At the beginning of the theoretical study, the students pored over a text by Cecilia Salles about creation processes, which contained some of the resources of her *critique of processes*: ***poetic project, cultural networks*** and ***communicative act***. Through them, the author indicates relational instances

from the cultural, social and communicative point of view, which have already introduced students to other perspectives in the relationship of creative translation:

> The tendencies of the creation process can also be observed from the point of view of its social aspect. The work under construction carries the unique marks of the poetic project that directs it, which is part of complex cultural networks, to the extent that it is inserted in the emphasis of time and art, science and society in general. The communicative aspect of the creation process also involves a great diversity of inter and intrapersonal dialogues: of the artist with himself, with the work in process, with future receivers and with criticism. (SALLES, 2010, p. 89).

To discuss interpretation as transcreation, the students first addressed the most famous question in the common sense, of translation against the well-known Italian proverb in the area of literary translation: *traduttore traditore*, that is, *traitor translator*. It was also brought the speech of Laplantine & Nouss indicating another view of the issue, that is, the otherness in dynamic diversity inscribed in the translation:

> Translation could and should, instead, mark the distance between languages, show that there are different languages. The notion and the term translation only appear in the sixteenth century, when the linguistic and national delimitations are created. Its role, therefore, is to remind the readers of a particular language that it is possible to say the world in another way, with another pronunciation, with other colors; to make the language of others heard in their own language and to let into it a strangeness that will enrich the possibilities of expression and the identity of the subject. The same only exists when it recognizes the other, both outside oneself and in one's bosom (LAPLANTINE & NOUSS, 2002, p. 41, 42).

Thus, the "other" would be, in the case of our class, the text that would be interpreted by the students, chosen by them. .

It began here, the first contact of the students with a perspective of otherness, which could be incorporated as a vision of creative reciprocity with the source text, to be interpreted by them.

The comprehension of the processes of creation of interpretation in its dimension of transcreation, initially raises a space of the 'indefinable' to the question and it was presented to the students. In a movement contrary to the discussion of *interpreter as executor*, some notions of Albercht Fabri contextualized the discussion made later with them:

> ... "every translation is critical, for it is born of the deficiency of the sentence," of its insufficiency to be effective in its own right. "One does not translate what is language into a text, but what is non-language." (FABRI apud CAMPOS, 2006, p. 32).

But if you don't translate the language of a text, be it an essay or a poem, or even a musical text, what does it translate? We then brought the speech of the poet Haroldo de Campos, pointing out the fact that the term translation does not necessarily concern the translation of meaning, but what gives it **its aesthetic force as a work**, which, in its new language can also be observed, that is, in the new creation:

> I will only emphasize that I do not seek in my Bible translations a supposed textual 'authenticity' or 'truth'. My commitment is to achieve in Portuguese, according to lines and criteria advised by my long and varied practice as a translator of poetry and suggested also by the very nature of the original, a reconfiguration - in terms of 'trans-creation' - of the phonosemantic and syntactic-prosodic articulations of the source text. I aim to obtain, through the translator operation, a comparative and coextensively strong text, as poetry in Portuguese. (CAMPOS, 1993, p. 17).

Boris Schnaiderman had a text of his studied, in which he indicates a type of precision in the work of translation, the 'precision of tone', which "requires a concern with artistic effect and a certain lightness, which implies, not infrequently, relative freedom as to semantics pure and simple." (SCHNAIDERMAN, 2011, p. 31).

Therefore, the predominance of semantic fidelity in a translation process such as transcreation was called into question.

Paulo Ronái brought an important dimension to the discussion: "the theoretical impossibility of literary translation implies the assertiveness that translation is art." (CAMPOS, 2006, p. 34).

Delimiting a little more the question of semantics, Haroldo indicates that "the semantic parameter will be only and only **the demarcation beacon** of the place of the recreative company. It is therefore in reverse of the so-called literal translation." (CAMPOS, 2006, p. 35, emphasis added).

Thus, it was discussed with the students the issue that, considering the untranslatability of the text on the one hand, and the "semantic beacons" on the other, the field of transcreation in vocal interpretation opens up to broader aspects that any type of reproduction practice could indicate. Therefore, it would not be possible to speak of reproduction of the author's ideas, but rather, of a transcreation from them.

The centrality of the reflections was treated quite clearly by the poet Haroldo de Campos, considering the translation of creative texts as a creation of an artistic character, reciprocal, implied in autonomy, in some way. The neologism transcreation created by him, introduces clearly in the word translation, the dimension of creation. What could be considered an intrinsic fault, as commented on a translation process, the impossibility of pouring its original originally, becomes a propulsion to creation, to **translation-creation**.

From this perspective, the students went to the written texts they would like to interpret, which were chosen by them. About the songs, we will deal with in the following topic.

After selecting the poetic texts of sound poetry, the students carried out a study to recognize the "semantic beacons" present there and to observe the aesthetic forcefulness of the works.

After this study, each student began their transcreation of the chosen poem.

The *Audacity* program was used by everyone, and its recording and editing features acted directly on the transcriptions. The feature of folding the same sound was used in order to provide the sound increase of words chosen by an interpreter. Another student worked predominantly with echo

resources, which were suggested to him by the chosen poem. The recording in five overlapping tracks was used with identical and different words, resulting in a poem with tracks of similarity and differences, emphasizing the aspects that the interpreter desired.

But the realization of a vocal dynamic, where the students created with more intense sounds (strong, half strong) and less intense (piano, half piano), with sonorities that grew and decreased, was present in all the works. This unanimity of this vocal resource combined with the presence of the microphone and consequent fine capture of the vocal emission, proved to be a novelty in this practice, and surprised us. In the other years we had already proposed transcriptions of texts to the students, but without the use of a recording and editing technology, everything was done in an acoustic way, and as the vocal emission of the dynamics is difficult to perform, it was not performed by them. The use of the technological apparatus facilitated and propitiated its appearance in the horizon of vocal expression, in the transcriptions with *Audacity,* enriching its expressive dimensions.

Many other resources were used by them creatively, composing their transcriptions of the poems in which, artistically, the aesthetic force of the starting work was taken into account for the creation of the arrival work.

The use of *Audacity* has remained for in-person classes, a fact that as we noted above, did not occur in in-person classes in the period before the pandemic.

Some chose the same poem and it was possible to make a comparative study of the two transcriptions, highlighting similarities and differences. About these, the class can ask each of the two interpreters, the whys of the choices made by them and in this way, it was possible to know directly from them, which personal singularities were present in their transcriptions. If they had studied only the recordings, they would not have had access to the creative whys who participated in the transcreation processes, they could only indicate them, but they would not know how the singular filters of each interpreter had acted in their transcreative decisions of the poem.

3 HYBRIDITY IN THE WORK WITH THE SINGING VOICE

Before starting with the students the processes of transcreation in the sung voice, in songs, we used the exercise of reflections about the same song interpreted by two different singers. In the remote period, the fact that all students were already on the internet, via computer or cell phone, optimized the practice of this study of different interpretations, which revealed different expressions.

First, the texts that the students built together in Google Drive about transcreation were resumed, now in discussions with the focus of the following question: What is the creative dimension that we singers imprint with what comes from the composer?

And from then on, each of them chose a song, starting to reflect critically on the interpretive differences of the various singers. First, the structures of each one were identified, as to the musical

elements and the lyrics of the songs. Musical elements are understood as rhythms, heights, movements, harmonies, dynamics, arrangements. Next, expressive meanings from the identified structures were verified. To this end, the fact that they are, in general, on Youtube contributed, because the video can be paused easily and restarted several times, so that the musical ideas were observed and also, along with the gesture that was performed in the assisted performance. The corporeality of each singer can also be included in the observations about each interpretation. Then, the lyrics of the songs and how the singers behaved in relation to her and the music in each interpretation were analyzed.

From all the observations and reflections, the students also began to write together, a text in Google Drive, as they had done with the oral text, highlighting and critically discussing how the elements of the songs created by the composer (including the lyrics of the song chosen or composed by him), can be transcreated in similar and diverse ways, by the interpreters.

What we wanted to emphasize with the students, was the "how", but from the whys. And to get into the universe of whys, we proposed that they make transcriptions of the same song, the same for everyone. They chose the song *Cajuína* by Caetano Veloso and used *Audacity* in this transcreative process. From the semantic beacons identified, each student dedicated himself to using resources in recording and editing, transcreating in a unique way the music of Caetano. These classes were taught both remotely and in person, again overflowing the use of the already more popularized editing technology.

And again it was intense, the use of dynamics by the students. The dynamics created also emerged here, due to the *Audacity program*, as well as in the transcriptions with written texts. And in the singing voice, the realization of dynamics is even more demanded in terms of vocal emission than in the spoken voice, the nuances in the vocal flow are numerous and must be precise.

The results were surprising and the resulting *Cajuínas* were compared, in reflections made by the students, focusing on the whys of the transcreative decisions.

4 CONCLUSION

From 2020 to 2022, when we taught *Sound Languages,* it was possible to work with the students on the concept of transcreation, having as an ally the technological support of the *Audacity* program, elevated to creative vocal instances. In the years prior to 2020, vocal creations were performed only live, and thus, the many features that *Audacity* offers for broadening the creative horizon with the voice, were not used. Admittedly, there was a degree of experimentation in the acoustic performances, but the addition of the technological program's resources offered more of a perspective to the vocal transcriptions, broadening their horizons. It's not about replacing one with the other, but rather about adding features in vocal transcreation.

The intense appearance of the realization of dynamics by the students, both in oral texts and in

the songs, was a grateful revelation of the techno hybridity in the classroom. The importance of the presence of the dynamics in the transcriptions occurred by broadening their expressive horizons and this vocal practice has difficulty in its emission, the *Audacity program* made it possible in a forceful way.

Still, the use of Google Drive for the joint writing of students on the issue of transcreation, proved to be another resource that brought hybrid practice in the classroom. With the students present in the class and working together in Drive, writing a text about the theoretical and practical reflections on transcreation, hybridity proved to be creative. From our teaching practice, we are moving towards the future use of more technological resources that can be creative, we will be investigating in the coming years, experimentations of the audiovisual allied to *Audacity.*. Responding to the Seminar's interrogative appeal this year, "What is built in these other ways of living together?", we would say that in class, in the discipline we have taught in these pandemic and post-pandemic years, techno-vocal hybridity has produced transcriptions of the students, who have transformed their views on creation, text, music and voice.

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Application of mathematical modeling in the construction of the ecological house and the teachers' perspectives in this teaching trend

https://doi.org/10.56238/ptoketheeducati-010

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ABSTRACT
The investigation was carried out in a public school in the Federal District, located in the Structural Administrative Region, in the period of one year, to verify the perspectives of the teaching trend Modeling and a reflection of mathematics interacting with an environmental conscience. The article intends to disseminate the results of the research carried out on Mathematical Modeling and promoted with the incentive of the Scientific Initiation Program (PIBIC) of the Federal Institute of Education, Science and Technology of Brasília – structural campus. The investigation aimed to identify the methodology most used by mathematics teachers and how the discipline was approached, as well as to carry out the creation of an ecological model. The methodology was bibliographic reviews, questionnaires for teachers, intervention through the production of a model and reinforcement strategies for students in mathematics content, aiming to promote a different perspective on how to solve the proposed activities and introduce the basic concepts of geometry , with the vision of applying several objects with different geometric shapes for the construction of the model. Regarding the teaching trend of Mathematical Modeling, the teachers who answered the questionnaire stated that they did not know this methodology, at least with this name. Furthermore, it was identified that most of the classes were transmitted in the traditional way, that the teachers did not feel comfortable using new methodologies and/or methods, so that the meetings and the production of the model collaborated effectively for the student and teacher learning in the contents related to the recycling of sustainable materials, in order to innovate activities proposed in the classroom.

Keywords: Geometry, Mathematical Education, Mathematical Modeling.

1 INTRODUCTION

The project was based on outlining the process of teacher education in relation to trends in the teaching of mathematics making use of mathematical modeling, given that modeling allows the application of activities and research that develop the creative thinking of students, giving room for criticism and the expansion of the understanding of mathematics for the daily life of students.

It is widely recognized that the role played by teachers is strategic in any curricular proposal, as they are the ones who organize, decide and orchestrate classroom activities. "It is known that teachers interpret and implement new proposals in the light of their knowledge and conceptions." (THOMPSON, 1992).

It is then up to the teacher to stimulate through this thought the learning of his students showing how teaching can be different from repetitive and similar formulas and exercises, because for Almeida and Dias (2004, p. 2), "taking into account that it is also up to school education to prepare critical, conscious and integrated subjects to society, teaching should take place in environments where learning happens in a significant way". Above all, in the context of mathematics, learning must make connections with actions so that the student has the "opportunity to experiment, model, analyze situations and develop a critical spirit about the solutions found."

The creation of the model then stimulates the students' learning, promoting the idea of the formation of future conscious citizens, bringing them not only the opportunity to build, but to understand the world around them and to which their contribution belongs.

According to CASTROGIOVANNI (2000, p. 74), "The model is a three-dimensional example of space, works as a laboratory, promotes the social interactions experienced by students and teachers on a daily basis, are perceived in the context and produces a systematic activity in geographical representations."

The project was outlined on the process of teacher education in relation to the Trend of Teaching Mathematical Modeling that adds significant learning. Modeling allows the application of creative activities through models, formulas, images, visual processes that activate learning, to quantify through visual learning.

The research had its direction in two questions **:** – What is the level of knowledge in relation to the Mathematical Modeling of the Mathematics Teachers of Basic Education and the performance of the transversal themes? How many teachers know about this teaching trend?

Teaching and learning have gone through several historical moments with many pertinent contributions that have made a relevance in learning. But, currently, it is still reported facts in which teachers can not elaborate association of the content to what is already known. This process is defined by AUSUBEL (1982) "as mechanical learning, without interaction with important concepts inserted in cognition, promoting learning through memorizing formulas or mechanical processes".

For AUSUBEL (1982), the significant learning is related to the content directed in a synthetic way, promoting the interaction of a certain aspect of the previous cognitive structure, being the conceptual antagonistic the mechanical or repetitive learning.

This learning process connects the mathematical contents with a construction model to make the connection of what is learned in contextualized situations. Thus, meaningful learning presents enrichment in the cognitive structure of the student through previous and new knowledge.

In addition, the Mathematical Modeling provides this learning, especially in the situation of the project, directed to the creation of the **model -** ecological house **-** promoting a contextualization, because the model is known by all.

In this sense, "mathematical knowledge must go beyond the simple resolutions of mathematical questions, often without any meaning for the student, and lead him to acquire a better understanding of both the theory and the nature of the problem to be modeled." (BIEMBENGUT; HEIN, 2000, p. 18).

Thus, the creation of the model promotes the interaction of the previous cognitive structure with the mathematical contents. Emphasizing one of the competencies present in the current BNCC for elementary education "Use mathematical processes and tools, including available digital technologies, to model and solve everyday problems, social and other areas of knowledge, validating strategies and results."

Thus, Mathematical Modeling creates situations that model the transmission of knowledge, facilitating the teaching and learning process and promoting a teaching capable of involving current situations and close to our conviviality in the models presented and suggested for the assimilation of what is learned. Defined by Biembengut and Hein (Apud SANTOS; OLIVE TREE; ALVES, 2013, p. 6):

> The idea of modeling evokes the image of a sculptor working with clay, producing an object. This object is a model. The sculptor armed with material – clay, technique, intuition and creativity – makes his model, which in the right represents something, whether real or imaginary.

The model becomes the learning model with the transmission of teaching and learning through various perceptions, involving learning by cognitions. Because when approaches are promoted with different subjects, introducing motivating aspects such as games, models and others, they create situations that involve the student to arouse interest in the content and the conception of the reality of a whole, especially their own role in this reality.

Therefore, the project outlined a study on the knowledge of teachers in relation to the trend of teaching Mathematics, focusing on Mathematical Modeling through the model to verify the use of teaching trends in the teaching and learning process. The result served as an indicator of how the

procedure of future graduates should be in relation to the trends in the teaching of Mathematics in professional performance, elucidating the dynamics of teaching and learning in the discipline of Mathematics, since the research was developed by the Scientific Initiation Program.

The development of this research and results contributed to the Center for Research in Mathematics, Education and Society **— IFB/CNPQ** and NEPECS — IFG/CNPQ .

The investigation had as general objective to identify if the teachers of the discipline of Mathematics of the basic education of the school located in the Structural know the trend of Teaching of Mathematics, Mathematical Modeling and if they use interdisciplinary.

In order to achieve the general objective, the respective specific objectives were directed:

1. To question the professors of the discipline of Mathematics about the Mathematical Modeling and its application with transversal themes;
2. Present the model, ecological house, with recyclable materials;
3. Evaluate the comparative results before and after the presentation of the model.

In addition, the model through the intervention research promoted new conceptions regarding the mathematical and environmental contents and presented a contribution to future studies in relation to the students' conception of the environment. It indicated the possibility of directing an improvement in the quality of teaching in relation to the environment, in an interdisciplinary and transdisciplinary way, according to the results presented.

2 METHOD

The research made a bibliographic review of qualitative and quantitative application, as well as an intervention, because the bibliographic methodology based the intervention and the conception of the model with recyclable materials. (MARCONI; LAKATOS, 2003).

The quantitative processes were delineated through the results in relation to the numbers of teachers who know the trend of teaching Mathematical Modeling and its application in the interaction of teaching and learning significantly. As for the qualitative data, questions of conceptions of Mathematical Modeling were applied to teachers and students.

Initially, the intervention was proposed only at the time of presentation of the model to students and teachers, because the mathematical modeling in the form of a model in the presentation of an ecological house fosters conceptions about environmental education, mathematics education, meaningful learning and other questions during the process. For the intervention provides, according to MOREIRA (2008), "the consideration of social and everyday realities and the ethical and political commitment of the production of innovative practices".

The intervention was carried out in an educational institution in Estrutural, in the context researched, triggered by the question and cooperating in the solution of problems. The scholarship

holder acted as a mediator who articulated, organized meetings, provided opportunities for the interaction of knowledge, old and new knowledge, fruit of the subjects involved in the research, valuing the daily knowledge and practices of the collective, systematized, admitting discoveries and methodological theoretical elaborations.

There was a proposal that the scholarship holder offer the intervention in the opposite shift to better help the content, however, the vast majority of students chose not to attend because there was no obligation. Then the intervention and all the activities related to research were done with the students that the teacher made available, either for the good performance, or for the need for content review.

Thus, the intervention did not occur only in the presentation of the model, but also at other times, especially on Thursdays and Fridays, almost every week, with the exception of holidays, recesses. And when the teachers responsible for the classes needed the time directed to the intervention, during the period of one school year, starting in March with a duration of 6 hours available per week.

In this process, several moments of interventions were applied with mathematical activities that included actions with concrete materials, kits of flat figures, various manipulable geometric shapes, such as: *tangram*, pyramids with triangular and square bases, cylinders, quadrangular prism, triangular prism and rectangular prism. The mentioned kits (wood material) were purchased because the school did not have them. But, it is suggested to make the planned objects with EVA material (Ethyl Vinyl Acetate).

At other times of the intervention, the mathematical activities applied to the students were through drawings with various formats, so that they could create the geometric shapes and identify each shape of the drawing, with A4 sheets, colored pencils, colored pens, pencils, erasers, scissors and others.

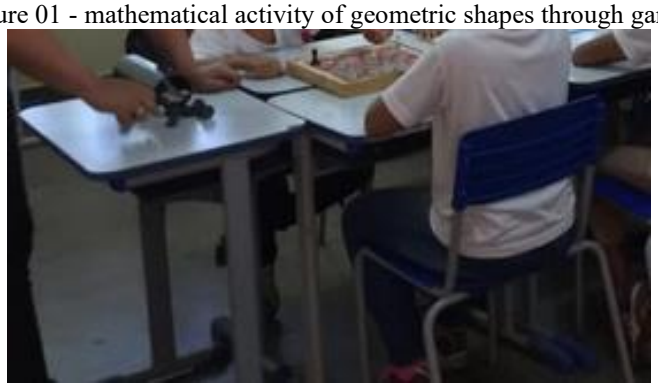
In addition to these activities, the scholarship holder used objects in some interventions for students to identify and relate to the geometric shapes in the proposed activities. Example: Rubik's Cube, binoculars, ball, milk carton, oil can, among others.

In addition, the students were asked to identify some objects at home and to be able to recognize which geometric shapes were present.

Two types of games were also provided, because the games present geometric shapes through the board itself and the pieces, such as chess and lady, and in some moments, the sweets were the prizes.

At first, the intervention would occur only in the presentation of the model, and the mathematics teachers were perceiving the actions of the research, thus, they asked the scholarship holder to provide other activities with diversified resources, as shown in Figures 01 and 02.

Figure 01 - mathematical activity of geometric shapes through games



Source: Author.

Figure 02 - mathematical activity of geometric shapes through technological resources



Source: Author.

We also used the application designed by the scholarship holder himself in partnership with a researcher and undergraduate student of the Mathematics Degree Course of IFB – Structural Campus. The application is called *GEAR*, being developed for the learning of mathematics, in which one can visualize objects in 3 dimensions (3D), which uses augmented reality for the visualization and study of polyhedra, and construction of geometric figures using the basic concepts of plane and spatial geometry.

Above all, for the creation of the model was made with recyclable materials used at home and with some purchased materials, such as: cardboard boxes, colored cardboard sheets, recyclable plastics, barbecue sticks, caps of pet bottles, pencils, pens, liquid glue and stick, adhesive tape, colored papers (sulfite paper, wax paper) and newspaper and / or brochures (ads).

It is concluded that the model provided new conceptions in the relationship of teaching and learning and achieved the objectives expected in the research carried out. According to the perception in the results of the questioning and participation of the students, it promoted an environmental awareness, practices that should be recurrent in school units, with the intention of producing a broad and diversified knowledge only with a teaching resource, through mathematical modeling.

2.1 THE PROCEDURES ESTABLISHED IN THE INVESTIGATION

In this section, the results of the research applied to the Mathematics teachers who were teaching the discipline in the analyzed years of the study will be presented. Mathematics teachers of the sixth and seventh grades of elementary school in which there was contact with a scholarship holder, from the morning shift.

Chart 1 presents the questions asked to the teachers.

Table 01 - questions and answers in relation to teacher training

	Questions directed to teachers
1.	What year did you graduate?
2.	What is the predominant methodology that you use most in your teaching praxis?
3.	In your training (Degree in Mathematics) was presented the Trends in Teaching Mathematics?
4.	Do you know some of the Trends in Mathematics Teaching?

Organization: Author.

The teachers used the traditional teaching model and did not have or do not remember that there was an approach of different methodologies in teaching being presented in their graduation. According to Caldeira (2009, p. 45): "What Mathematical Modeling, as a teaching-learning method does, supported by subject-object epistemology, is to give quantitative understanding to problems of the student's reality, seeking meanings in everyday experiences."

Just like all other markets, education also undergoes some changes over time. So there is an importance in updating the methodologies that teachers should use in the classroom, because to attract the attention of students. Currently, it is necessary to change the dynamics of the traditional classroom and put them at the center of the process, as a way to involve them and still showing the importance of future teachers to be prepared to use such methodologies and new technologies to aid the teaching of mathematics.

One should also consider the great demand for research on school subjects of students with doubts, individuals who are looking to acquire new knowledge and how much the level of knowledge, which can be found through online.

Young people are increasingly using and mastering technologies such as mobile phones, computers, games and other media. "Thus, an opportunity arises for education professionals to understand such technologies and use games to instigate and channel students' attention to educational games." (GHENSEV, 2010).

The incredible amount of platforms and applications developed for learning and the diversity of choices brings a wide variety of didactics, enabling a choice of user preference.

It is **speculated** that in the initial training of some teachers this methodology is approached superficially, leading to graduates more as information through readings and punctual texts.

It was noted that the trend of teaching Mathematical Modeling was not applied. Above all, regardless of the time in which they graduated, in relation to the teachers interviewed. The approach of updated methodologies based on teachers in their way of working the students' knowledge through activities in which they could develop theories, using the knowledge of these elements of daily life or any type of activity, was not effective.

Thus, a more detailed investigation would be important, only directed to this perspective of Mathematical Modeling, to verify if in fact it is usual, or is usual and its denomination is unknown.

> The presence of these trends in the classroom is only a prescription of official documents, since there seems to be no effective work with them, even when it comes to a policy of continuing education [...]. There is only an initial discourse about the adoption of them in the classroom, without there being with the teachers a work that seeks to provide a more in-depth knowledge, both with regard to theory and pedagogical practice. (TAMBARUSSI; KLUBER, 2017, p. 857).

Therefore, stimulating research that analyzes teaching trends in school environments is necessary, because there will be a parameter for these trends to be usual, or just a pretension in school environments.

2.2 THE CREATION OF THE MODEL

The first day was used to make all the elaboration of the model, which stated: what would be the type of construction to be done? What would be the necessary and ecologically sustainable materials to be used and also easy to handle?

The type of model was the construction of an ecological city with shapes. Above all, using basic notions of plane and spatial geometry in order to recognize, compare and name polygons and polyhedra, consider vertices, faces and sides of the figures presented, and then all the knowledge used during the proposed activities to make the model.

The assembly of the model was on a thick cardboard plate with measures of 30×30 cm, built gradually, once a week, in each meeting with students of the sixth grade classes on **Fridays**. Because there were more classes that day and they were students who did not have much difficulty with the subject and who absorbed better the content taught by the professors and the interventions of the scholarship holder. Three students from each class were chosen to carry out the confection.

In the weeks following the beginning of the making of the model, the following were made:

- Trees with popsicle sticks and monolucent paper;
- Houses with tea boxes and matchboxes;
- Small buildings with paper packaging;
- Water tank with cardboard roll;
- Simulated solar panels with popsicle sticks glued to cardboard surface;

- Walls and fences made with toothpicks;
- Simulated terrain with coconut fiber.

The preparation took place at each meeting after the end of the reinforcement and revision activities, but initially it was necessary to present the geometry content to the students, according to the previous interventions.

The geometry contents addressed were:

- Basic geometric figures;
- What are vertices, sides and faces;
- Calculating areas and volumes;
- Related Issues.

With the help of the figures of the *tangram and the* polyhedra obtained with the project, the absorption of the content by the exposed students took place quickly and intuitively.

The main idea was to teach students to recognize geometric shapes and their particularities in their daily lives and relate to the construction of the model, promoting the idea of sustainability and recycling and developing mathematical reasoning in relation to the space and materials used in the making of the work.

For Barbosa (2001), "Modeling contributes to the understanding of mathematical concepts, develops research and experimentation skills, takes into account the sociocultural context and, finally, enables interdisciplinarity".

During the meetings, while the students were making the items used in the model, they were constantly asked about the shapes of the objects that were being used and how their areas and volumes could be calculated, because at that moment the process of how to calculate the figures questioned by the scholarship holder began.

Initially there was great difficulty, because although the students identified some figures, knowing how to calculate through them required more than one operation, and even among the students with greater ease, there was difficulty in identifying and differentiating the flat figures and polyhedra in the application of the activities.

In the weeks that followed, there was an improvement in the answers related to the areas of the figures, because the operations used were the same as those used by the students in the classroom. However, there was still great difficulty in remembering which operation was used in each of them. What helped them was the recollection of previous activities with manipulation of polyhedra and *tangrans*. The moment the students could see and manipulate the figures, instead of just seeing them drawn on the board or on worksheets, it was identified that it contributed to the improvement of learning.

After completion of the model and, even near the end of its completion, there was a significant improvement both in the students' knowledge about the activities performed in the classroom, referring

to basic mathematical operations (addition, subtraction, multiplication and division) and logical reasoning problems, as well as the geometry content.

3 RESULTS AND DISCUSSIONS

What was initially proposed were ways of relating the construction of the ecological model with the teaching of mathematics. The great challenge was to develop the project with children who lived in a region of low HDI and who in many cases sought school as a refuge. An important observation of the teachers of the classes where the scholarship holder had contact was that the difficulty resided, even in advanced years, in learning the initial operations.

Many materials for use by the students were used, initially with the help of the school, but some were replaced with the feasibility of the PIBIC Program funding, it is perceived the importance of these financial aids, but other materials could not be replaced due to the budget being limited.

It was noticed that without the participation of the school this research could not be carried out successfully, because the institution contributed with excellence in the demands of the research project.

Using geometry was the best way because there was constant work with shapes seen and used in the construction of the model and use of basic operations.

There was great difficulty in several aspects such as time, availability of students and even in learning, because students were not used to questioning. If an activity was passed, they tried to do it, but depending on the degree of difficulty, some gave up or were easily distracted.

The fact that the number of students was adequate per class, facilitated the possibility of controlling, assisting and observing each one better, and it was noticeable that the students did not have much confidence, so they were insecure when answering each question, even having performed similar procedures in previous activities.

Through the concepts adopted**,** interdisciplinarity and transversality can be worked on, showing the student how mathematics/geometry is directly related and how it can be useful in their lives, in the school environment and outside it, and how it interacts with other areas of knowledge.

The interest of the students in general was ratified, a good part was attentive to the explanations and the performance in the activities that were proposed to them and, according to the reports of the mathematics teachers of the classes involved, there was an improvement in their performance in the discipline.

Keeping in mind that governing a group of students who need more thorough assistance requires a lot and, being aware that students are learning the subject is the greatest prestige to have achieved. For the same is the main goal to keep in mind when working in the classroom.

Therefore, there is no doubt about the use of the teaching trend Mathematical Modeling that actually produces learning, however, in some situations more financial resources, more classes and

time available from the teacher for planning are needed, perhaps it is for this reason that this methodology is little used. In a way, these observations stand as suggestions for future research.

Given the above, investments are needed in the training of qualified teachers to enable an adequacy of the use of methodologies and the financial resources that many of them demand.

4 CONCLUSIONS

The investigation produced results that there was no application of the trend of teaching Mathematical Modeling in the classes taught and evidenced the lack of knowledge of it in the teaching and learning process, at least with this denomination.

It was concluded that the use of the model led to mathematical knowledge and an ecological and sustainable awareness, as well as an interaction of the students and the scholarship holder. But, it was considered that the use of the trend of teaching Mathematical Modeling as a methodology requires a much greater logistics than a traditional class, because it requires financial resources and more hours of planning to be applied.

It was noted that the trend of teaching Mathematical Modeling that, applied also through the design methodology, can create manipulable objects that can contribute to the production of a written material for visually impaired students and sighted. This result was presented at the *XII Summer Workshop in Mathematics* 2020.

Above all, for contribution in the area of knowledge, it was evidenced that the trend of teaching Mathematical Modeling produces a more consistent learning, because it is not only an abstraction, in the case of models, and it was confirmed that a certain financial aid was necessary for the action to occur.

It was found that the two teachers who were teaching the discipline of Mathematics in the years that were part of the investigation, did not use in the classroom the contents through mathematical modeling, being perceived that they do not know the methodology, as previously mentioned, at least with this denomination.

Above all, mathematical modeling provides the opportunity to create materials for visually impaired students and also for sighted students. It was realized that several models can be created and that the design methodology can be applied to the creation of mathematical models, being a methodology in the teaching of mathematics, by enabling a concrete learning, in this case, in the creation of objects such as a model. There is importance in verifying the methodologies used and the perceptions of teachers in relation to the new teaching methodologies, because in the school in question it was verified that there were resources such as computer room and functional computers for all students, but it was little used.

In addition, it is suggested to apply this research to other public educational institutions in the Federal District, preferably in schools with less financial resources and in a way that can build materials for the teaching and learning process for visually impaired students and also sighted.

ACKNOWLEDGMENT

To the Scientific Initiation Program (PIBIC – IFB) for the investment in science, especially in education. It is well known that science is the most obvious way to improve the evolution that surrounds the world.

To the Federal Institute of Brasilia for having provided opportunities to participate in research projects and have agreements with public schools in the Federal District, in addition to offering undergraduate courses.

To the school located in Estrutural that always receives the undergraduate students of the IFB with great respect, collaboration and attention, because without the participation of this institution, it would certainly not be possible to carry out this research.

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SEVEN
publicações acadêmicas

The concept of language and grammar in the National High School Exam – ENEM

Crossref doi
https://doi.org/10.56238/ptoketheeducati-011

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ABSTRACT
The objective of this article is to discuss and analyze the concept of language and grammar that guides the elaboration of the Portuguese Language test, a curricular component of the area of Languages and Codes of the National High School Examination, in order to foster discussions about the teaching and learning of languages. Methodologically, a theoretical discussion on the concept of language and grammar and the analysis of an ENEM question are proposed. As a theoretical framework, the contributions of (SAUSSURE, 1970), (BAGNO, 2002), (MARCUSCHI, 2008), (ANTUNES, 2007/2009), (GERALDI, 1984), (MENDONÇA, 2006), among others, are presented. The study revealed that the ENEM is based on an interactionist-sociodiscursive perspective of language and grammar; It also reinforced the need for a functional look at language teaching, that is, language and grammar as a function of use.

Keywords: Language and Grammar, ENEM, Language Teaching.

1 INTRODUCTION

It is not now that the concept of language and grammar has been discussed in Literature, especially by theorists of Applied Linguistics, considering the understanding of such concepts and their repercussions on language teaching. It is considering, therefore, this issue that the main interest of this article is configured in: discuss and analyze the concept of language and grammar that guides the elaboration of the Portuguese Language test, curricular component of the area of Languages and Codes in the National High School Examination (hereinafter ENEM), in order to raise reflections focused on the teaching and learning of languages.

For this, methodologically, this study is organized and produced as follows:

- ✓ before entering into the basic theory of this study, a subsection is suggested that can contextualize about the ENEM and its importance for the country;
- ✓ Still in the theoretical foundation, in a more conceptual and epistemic section, the concept of language and grammar is revisited and discussed aiming at the construction of a section that both works and deepens the key concepts that should be treated in this study and the construction of a space of reflection that allows a critical-reflective understanding of the

concepts of language and grammar and the implications of this in the teaching and learning of languages;

- ✓ after weaving this theoretical discussion, we move on to the data analysis section, in which a question of the ENEM will be analyzed; This issue was removed from the event held in 2001. Since it would not be possible to analyze all the tests and questions of all the events (from 1998 to 2022) in this text, a question was chosen, as an excerpt, that minimally suggested the need to understand the concept of language and grammar to understand it; And concomitantly, reflections on how to make language teaching and learning more productive and meaningful are raised.
- ✓ Finally, a conclusion is made to synthesize the study developed in this article, in addition to pointing out possible developments for future research, which could not be contemplated in this investigation.

2 THE NATIONAL HIGH SCHOOL EXAM – CONTEXTUALIZING THE ENEM

In Dodó's thesis (2020), the theorist contextualizes ENEM. According to the scholar, the ENEM was created in 1998 by the Ministry of Education (MEC) and has as one of its objectives to evaluate the performance of students at the end of basic education, that is, at the end of the 3rd year of High School. Currently, the event is held annually by the National Institute of Educational Studies and Research Anísio Teixeira (Inep).

> By way of explanation, the test consists of 180 questions, distributed in the four areas of knowledge and their respective disciplines. They are: 1) Natural Sciences and their technologies: disciplines evaluated: Chemistry, Physics and Biology; 2) Human Sciences and their technologies: disciplines evaluated: History, Geography, Philosophy and Sociology; 3) Languages, Codes and their technologies: subjects evaluated: Portuguese Language, Literature, Foreign Language (English or Spanish), Arts, Physical Education; 4) Mathematics and its technologies: subjects evaluated: Mathematics (Algebra and Geometry); and 5) the proof of textual production (DODÓ, 2020, p. 41).

According to this same author, the result of the ENEM: 1) also began to be used as a selection criterion for students who intend to apply for a scholarship in the University for All Program (ProUni); 2) allows admission to higher education in private institutions as a gateway; 3) allows, since 2012, the law that guarantees the obtainment of the certification of completion of High School for over 18 years; 4) in addition to allowing, as of 2011, students who wish to enter higher education in universities in other countries to do so.

We agree with Dodó (2020), when he presents the importance of ENEM for access to university and its use to evaluate the quality of education in the country. In this sense, it is understood the need and relevance of this study, since it proposes to reflexively analyze the concept of language and

grammar that guides the elaboration of the Portuguese Language test, which is part of the area of Languages and Codes of ENEM, aiming to foster discussions related to language teaching.

2.1 CONCEPTUALIZING LANGUAGE FROM A STRUCTURALIST PERSPECTIVE

Before starting the discussion of language from the structuralist view, it is pertinent to clarify that, although Saussure is known as the father of structuralism, he was aware of the interactionist/communicative dimension of language. However, the concept that is presented in this section concerns the concept of strictly structural language, whose concern was form and not use, according to the Course of General Linguistics (hereinafter CLG), published in 1916.

It should be noted that it is not intended to discredit this contribution to Science, since this postulate was important to create the foundations of Modern Linguistics; To deal with language here only as form, as structure, aims to show that, in the field of teaching, there are losses, when it privileges form to the detriment of use, that is, when it empties into the structure of language.

In the CLG, language is conceptualized as: "a social product of the faculty of language and a set of necessary conventions, adopted by the social body to allow the exercise of this faculty in individuals" (SAUSSURE, 1970, p. 17). Language, therefore, "exists in the collectivity in the form of a sum of signals deposited in each brain, more or less like a dictionary whose copies, all identical, were distributed among individuals. It is, therefore, something that is in each of them, although it is common to all and independent of the will of the depositaries" (SAUSSURE, 1970, p. 27).

Although language is conceived as a "social phenomenon" in the CLG, according to Marcuschi (2008), in this concept of language defined as system, form, the structure was contemplated by the structure, disregarding its use in social and discursive practices.

On the other hand, this same theorist points out that Saussure, although in the CLG does not present concerns to the aspects of language use, the Genevan recognizes that the language must be analyzed in use, in the service of interaction through the production of texts. It is, therefore, about this perspective that the following section deals.

2.2 LANGUAGE IN THE HISTORICAL, SOCIAL AND INTERACTIVE PERSPECTIVE

It was seen, in the previous section, that in order to elaborate the foundations of Modern Linguistics, in order to make it a Science, Saussure's contribution was very decisive, when he established the dichotomy *Langue* and *Parole* highlighting that one instead of this one. However, Saussure did not rule out the need to consider the conditions of language use, that is, its interactive-communicative context, since understanding the linguistic phenomenon as an activity

> pulled language studies into consideration of the socio-communicative intentions that put interlocutors in interaction; It also ignited the interest in the effects of meaning that the interlocutors intend to achieve with the words in their activities of interlocution, brought to the

> scene of the most relevant studies the discourse and text, unfolded in their relations with the active subjects, with the social practices and with the different properties that ensure their status as macro-unit of verbal interaction (ANTUNES, 2009, p.20).

Corroborating the thought of Antunes, (SOLTES and RAUPP, 2009) argue that

> language comes to be seen and studied (...) in its contexts of use, which implies saying in the linguistic manifestations – production and expression – of each community of speakers, ceasing to be seen only as a contained sign of signifier and meaning, and even a set of grammatical rules. It becomes a bridge in which we interconnect with other cultures, people, stories, because it is inserted in the lives of all speakers. What unites us to all other linguistic communities is language. The interesting thing about all this is that the language contains its own peculiar characteristics and, therefore, becomes like all of us, human beings, who follow the evolution, the walk of humanity. Faced with so many changes, one cannot imagine an intact, immobile, inflexible language (SOLTES and RAUPP, 2009, p. 7).

In order to deepen the discussion, we bring the contributions of Bagno (2002), who pointed out some considerations about language in a socio-interactionist and discursive perspective. To the author:

> a) the language presents a systematic internal organization that can be studied scientifically, but it is not reduced to a set of well-formed rules that can be determined once and for all as if it were possible to make calculations of infallible prediction. Natural languages are hardly formalizable. b) The language has stable and unstable aspects, that is, it is a variable, indeterminate and not fixed system. Therefore, the language presents systematicity and variation at the same time. c) Language is determined by immanent and transcendent values so that it cannot be studied autonomously, but must be resorted to the environment and the situation in the most varied contexts of use. The language is therefore situated. d) Language is constructed with conventional symbols, partially motivated, not random, but arbitrary. Language is not a natural phenomenon nor can it be reduced to neurophysiological reality. e) Language cannot be taken as a simple instrument of representation of the world as if it were a mirror of it, because it is constitutive of reality. It is much more of a guide than a mirror of reality. f) Language is an activity of a socio-cognitive, historical and situationally developed nature to promote human interaction. g) Language is given and manifested in oral and written texts ordered and stabilized in textual genres for the use of concrete situations. h) The language is not transparent, but opaque, which allows the variability of interpretation in the texts and makes comprehension a special phenomenon in the relationship between human beings (...) (BAGNO, 2002, p.24,25).

Thus, we can conclude that the language is versatile and impossible to be studied in isolation, since it is a tool of communication and interaction to all speaking beings (SOLTES and RAUPP, 2009, p. 8).

Having conceptualized language in the perceptual structuralist and interactionist-sociodiscursive, it is pertinent now to review the concept of grammar(s), since, in this study, this concept is also analyzed in the ENEM test.

3 RENOWNED GRAMMAR

Since the focus of this work is to also analyze the concept of grammar in the aforementioned event, it is necessary to discuss what is meant by grammar.

Franchi (1991) conceptualizes normative grammar as "(...) the systematic set of norms for good speech and writing, established by specialists, based on the use of the language consecrated by writers" (FRANCHI, 1991, p. 48). Traditionally, what is said about this conception of grammar is that knowing grammar means saying that we have mastered and know how to use this set of rules to speak and write. This concept of grammar sees, however, only a possibility of variation of the language, the standard or cultured language, considering the other forms of speech as poorly structured, as deviations, as errors (DODÓ et al., 2020, p. 105).

As for the concept of descriptive grammar, Travaglia (2008) classifies it as one that, unlike normative grammar, makes a description of how the structures of a language work, describes its forms and functions. This concept of grammar, for Franchi, "[...] is a system of notions through which the facts of a language are described, allowing to associate with each expression of that language, a structural description and to establish its rules of use, in order to separate what is grammatical from what is not grammatical" (FRANCHI, 1991, p. 52-53).

It is seen, therefore, that the interest of this type of grammar is not in prescribing how the language should work, on the contrary, descriptive grammar understands and recognizes variations in the system, seeking to analyze and describe the functioning of these linguistic structures (DODÓ et al., 2020, p 105).

There is also the concept of internalized grammar. For Franchi, this kind of grammar: "[...] corresponds to the linguistic knowledge that the speaker of a language develops within certain limits imposed by his own human genetic endowment, in appropriate conditions of a social and anthropological nature" (FRANCHI, 1991, p. 54). Travaglia (2008) conceptualizes this concept as a

> [...] conception of grammar considering the language as a set of varieties used by a society according to what is required by the situation of communicative interaction in which the user of the language is engaged, perceives grammar as the set of rules that the speaker has actually learned and that he uses when speaking (TRAVAGLIA, 2008, p. 28).

Irandé Antunes (2007) suggests the following concept of grammar:

> When one speaks of grammar, one may be talking about: a) the rules that define the functioning of a given language, as in: 'the grammar of the Portuguese'; in this sense, grammar corresponds to the intuitive knowledge that every speaker has of his own language, which has been called 'internalized grammar'; b) the rules that define the functioning of a given norm, as in: 'the grammar of the cultured norm', for example; c) from a study perspective, as in: 'the generative grammar', 'the structuralist grammar', 'the functionalist grammar'; or a historical tendency of approach, as in: 'traditional grammar', for example; d) of a school discipline, as in: 'grammar lessons'; e) of a book, as in: 'the grammar of Celso Cunho (ANTUNES, 2007, p. 25-26).

Finally, the concept of functional grammar is presented, which is the generation of (...) "a theory of the grammatical organization of natural languages that seeks to integrate into a global theory of social interaction" (NEVES, 1997, p. 15).

Analyzing the concept of functional grammar, one can perceive a strong relationship between it and the concept of language in the interactionist-sociodiscursive perspective. This exchange suggests a reflection on the teaching of grammar in the classroom, evidencing that this teaching will only be productive and relevant if its primary objective is to develop in students

> the mastery of oral and written expression in situations of public use of language, taking into account the situation of social and material production of the text (social place of the speaker in relation to the recipient(s); recipient(s) and their social place; purpose or intention of the author; time and place, material of production and support) and select, from this, the appropriate genres for the production of the text, operating on the pragmatic, semantic and grammatical dimensions (PCN, 1998, p. 49).

This last concept of grammar dialogues closely with what Geraldi (1984) proposed to call linguistic analysis, since he understood that there must be an articulation between the axes of mother tongue teaching, which are: reading, text production, orality and linguistic analysis. For this scholar, the use of this expression:

> it is not due to the mere taste for new terminologies. Linguistic analysis includes both work on traditional issues of grammar and broadens them on the text, among which it is worth mentioning: internal cohesion and coherence of the text; adequacy of the text to the intended objectives, analysis of the expressive resources used (metaphors, metonyms, paraphrases, quotations, direct and indirect discourse, etc.); organization and inclusion of information etc. Essentially, the practice of linguistic analysis cannot be limited to the sanitization of the student's text in its grammatical and orthographic aspects, limiting itself to 'corrections'. It is about working with the student his text so that he achieves his objectives with the readers that it is intended (GERALDI, 1984, p.74).

Therefore, this article assumes the concept of linguistic analysis instead of grammar, since we agree with Mendonça (2006), when proposing the difference between "grammar teaching" and "Linguistic analysis practice[1]", evidencing that this presents a more productive and significant perspective. Consider the following table:

[1] With the National Common Curricular Base, this terminology remains, but with the addition of the term semiotics, remaining: "linguistic analysis/semiotics", thus expanding the concept of text. It is suggested to read in full the BNCC and the article by LEURQUIN, E. Theoretical-methodological conceptions defended by the National Curricular Parameters, by the National Common Curricular Base and by the Sociodiscursive Interactionism related to the teaching of linguistic/semiotic analysis. In: GUIMARÃES et al. The Sociodiscursive Interactionism in focus: reflections on a theory in continuous construction and a praxis in movement. Araraquara: Letaraia, 2020.

Grammar teaching	Linguistic analysis practice
Conception of language as system, inflexible and invariable structure.	Conception of language as situated interlocutive action, subject to the interference of speakers.
Fragmentation between teaching axes: grammar classes are not necessarily related to reading and text production classes.	Integration between the teaching axes: linguistic analysis is a tool for reading and producing texts.
Transmissive methodology, based on deductive exposition (from the general to the particular, that is, from the rules to the example) + training.	Reflective methodology, based on induction (observation of particular cases for the conclusion of regularities/rules.
Privilege of metalinguistic activities.	Parallel work with metalinguistic and epilinguistic skills.
Emphasis on grammatical contents as teaching objects, approached in isolation and in a more or less fixed sequence.	Emphasis on uses as teaching objects (reading and writing skills), which refer to various other teaching objects (structural, textual, discursive, normative), presented and resumed whenever necessary.
Centrality of the standard norm.	Centrality of meaning effects.
Absence of relationship with the specificities of the genres, since the analysis is more of a structural nature and, when normative, disregards the functioning of these genres in the contexts of verbal interaction.	Fusion with the work with the genres, to the extent that it contemplates precisely the intersection of the conditions of production of the texts and the linguistic choices.
Privileged units: the word, the phrase and the period.	Privileged unity: the text.
Preference for structural exercises, identification and classification of morphological units/functions and correction.	Preference for open questions and research activities, which require comparison and reflection on adequacy and effect of meanings.

Source: Table taken from Mendonça (2006).

Considering this, analyzing the concept of language and grammar in the ENEM tests is a relevant study, since, from such analyses, reflections are suggested for the teaching and learning of languages, fostering the cultivation of a critical, reflective and active practice of the language teacher when working with language in the classroom.

In the following section will be analyzed a question of ENEM, aiming to find out what concept of language and grammar guides the elaboration of the proof of Languages and Codes of the Contest.

3.1 DATA ANALYSIS: THE CONCEPT OF LANGUAGE AND GRAMMAR IN ENEM

The analysis is organized as follows: first, the issue is analyzed, taken from the ENEM 2001 event. A descriptive analysis is made and, subsequently, a reflective analysis, aiming to identify the concept of language and grammar that guided its elaboration. In the third analytical movement, reflections are suggested to (re)think language teaching in Brazil.

Here's the selected question.

Analysis of the issue - (ENEM 2001)

The world is big

The world is big and fitsIn this window over the sea. The sea is big and fitsIn bed and on the mattress to love. Love is great and fitIn the brief space of kissing.

(ANDRADE, Carlos Drummond de. Poetry and prose. Rio de Janeiro: Nova Aguilar, 1983. Adapted).

In this poem, the poet made a stylistic choice: the reiteration of certain linguistic constructions and expressions, such as the use of the same conjunction to establish the relationship between the sentences. This conjunction establishes, among the related ideas, a sense of:

a) addition.b) conclusion.c) opposition.d) alternation.e) purpose.

The question brings a poem by the writer Carlos Drummond de Andrade, poet of Brazilian Modernism. To understand what is being asked, when reading the statement, the student will need to make use of the following points:

- ✓ 1) the understanding of what stylistic features are;
- ✓ 2) the concept of conjunction and its function when linking sentences; it is also necessary to understand the meaning that it establishes when it connects the prayers;
- ✓ 3) the understanding of the concept of traditional/normative grammar vs. functionalist grammar; (remembering that the latter considers the influence of use on linguistic structures).

Considering this, first the student must identify which conjunction is this that is repeated throughout the text and that connects the prayers. Read the text again, noting the highlighted connective:

The world is big

The world is big **and** fitsIn this window over the sea. The sea is big

and fitsIn bed and on the mattress to love. Love is great

and fitIn the brief space of kissing.

He would have to say that the conjunction that repeats itself in the poem is the connective."**and**". Traditionally, it is learned, according to normative/traditional grammar, that the "**and**" is a conjunction that establishes a sense of sum. However, in the text the student should identify that its use does not establish this sense, but a sense of opposition, the same as in the following strip:

Figure 1: Example of the conjunction "But" with a sense of opposition



Source: https://app.estuda.com/questoes/?id=302065. Accessed: September 15, 2022.

Consider the communicative situation: the son writes a letter to his father; he weaves a list of spelling-grammatical errors, saying, "It's full of spelling, punctuation, and agreement errors..." What is expected in the next prayer is that the father will reject the letter, since it has many errors. However, the exact opposite happens: "...**But** it's the most beautiful card I've ever won in my life!" This idea of opposition is established by conjunction **"But."**

This same sense of opposition was established by the connective "**and**" in Drummond's poem. Note that, the lyrical self states:

The world is big **and** it fits in this window over the sea.	Analyzing the first prayer, one has the following idea: the greatness of the world. Following this reasoning, since the world is large, it is hoped that it will not fit in the window over the sea. However, the opposite happens: the fact that the world is big does not prevent it from fitting in the window, which is much smaller.
The sea is big **and** fits on the bed and mattress to love.	This same reasoning applies to the second use of this connective. In the first prayer it is stated that "The sea is great"; soon, it is hoped that he will not fit in the bed and mattress of loving; But it fits.
Love is great **and** it fits in the brief space of kissing.	Finally, in the latter case, the lyrical self affirms, in the first sentence, that "Love is great"; however, the fact that love is great still allows it to fit into the brief space of kissing; it may be understood that the statement of the second sentence gives an idea of something small; One has an idea of opposition, therefore.

It is observed that the conjunction, in this context of use, loses its meaning "crystallized" by traditional grammar and assumes a new meaning: de *opposition* instead of sum. However, in order for the student to be able to mark the correct item of the question, which is item C, he would need to consider the **tongue** no longer as a simple structure, but as an instrument of interaction/communication. Therefore, the student would need to consider, in addition to the linguistic elements, the extralinguistic elements, such as: *Situation interactants*, *The textual genre* used as well as its *communicative purpose*.

Since the text is a poem, its comprehension cannot be limited to what is prescribed by traditional/normative grammar. (By the way, perhaps, in no text, should one limit its analysis based only on the prescriptions of normative grammar.) One must take into account the stylistic resources of the language to construct the meanings of the text. Thus, the **functionalist grammar** It helps to understand how the context of production can influence the use of linguistic structures in the poem.

Thus, to understand the issue, the practice of **linguistic analysis** It is necessary, since it gives the student the opportunity to develop his epilinguistic skills. Therefore, the student:

- ✓ must understand language as a socially and historically situated interlocutive phenomenon;
- ✓ it should not be limited to identifying the conjunction that repeats itself;
- ✓ should analyze and reflect the information contained in the prayers, considering the communicative context, to understand the meaning that the conjunction establishes when connecting the prayers;
- ✓ Attention will be paid to the effects of meaning constructed in the text by influence of the communicative context, that is: it considers the elements of communication and how they intersect to construct the text and its meaning.

By analyzing the question that served as an excerpt for this study, it could be concluded that the concept of language and grammar that guides the elaboration of the ENEM Languages and Codes test is based on the assumptions of interaction and communication. In this case, it is understood that in ENEM, language is understood, according to Antunes (2009), as a linguistic phenomenon, as an activity, that is, as an interlocutive event, in which those involved in this interaction are considered, the text produced, the purpose of the text, etc. That is, language is dynamic, interactive, dialogical.

In this conjuncture, if the language is seen as a "meeting point", of interaction (ANTUNES, 2009), this implies that the concept of grammar that guides the ENEM test is based on the functionalist perspective of the language, since such a look considers the use in function of the linguistic-structural choices (NEVES, 2008).

Considering what has been seen so far, the discussions converge to what the National Curriculum Parameters prescribe regarding language teaching:

> By taking the mother tongue as an object of teaching, the dimension of how the subjects learn and how the subjects develop their discursive competence cannot be lost. The teaching of Portuguese Language must take place in a space in which the practices of language use are understood in their historical dimension and in which the need for analysis and theoretical systematization of linguistic knowledge stems from these same practices, (...) because it is in the practice of reflection on language and language that the construction of instruments that will allow the subject to develop the discursive competence to speak can take place, listening, reading and writing in the various situations of interaction (BRASIL, 1998, p. 33).

Language teaching being organized in this way becomes a productive and meaningful practice, capable of developing students' linguistic-discursive skills. Consequently, the grammatical approach

that should guide the work with the language in school needs to be based on the commitment to develop and expand the language skills of students.

4 FINAL CONSIDERATIONS

The focus of this article was to analyze which concept of language and grammar guides the elaboration of the ENEM Languages and Codes test. To achieve this goal, a cut was made that selected a question from the event. Data analysis revealed that the concept of language and grammar adopted in the test is epistemologically based on the view that conceives language as a function of interaction, communication; Therefore, grammar is also seen by this dialogical bias.

These findings imply a series of reflections related to language teaching that need to be always considered by the teacher when working with language in the context of the classroom, namely:

- ✓ the concept of language that guides and bases its practice;
- ✓ the privileged grammatical approach in language classes;
- ✓ the importance of external tests (ENEM, for example) and their repercussions in the classroom;
- ✓ the need for continuing education; But not that type of training that treats the teacher as a mere viewer: the search for this continuous formation must make the teacher a researcher, a critical-reflective agent of his practice.

Recognizing that many pertinent questions are no longer contemplated in this study due to space issues, it is suggested, as future research, studies that expand the number of questions analyzed, to refute or corroborate this research, in addition to extending this analysis to other external tests, such as the vestibular (UECE, among others), the *Basic Education Evaluation System* – SAEB and, more specifically for Ceará, the Permanent System of Evaluation of Basic Education of Ceará - SPAECE etc. Such investigation is important, since it can yield reflections and questions in order to improve and (re)guide the work with language practices in the classroom.

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Homeschooling and brazilian education under siege in the domestic interior

https://doi.org/10.56238/ptoketheeducati-012

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ABSTRACT
This article discusses homeschooling in Brazil and presents the consequences of its approval in the legal statute of national education for public policies, as well as for the effectiveness of the social function of basic education institutions. It starts with the Critical Theory of Society as a theoretical-methodological framework to analyze the recent approval of homeschooling in the Chamber of Deputies, which is currently being considered by the Federal Senate. Preliminary research results point to the advance of conservative groups on Brazilian public education, besieging educational processes within the bourgeoisie that degrade sociability and make the experience of young people and children unfeasible, whose consequence in the medium and long term is narcissistic and solipsistic formation. This process further aggravates the framework of semi-formation [Halbbildung] instituted by modernity, analyzed by Theodoro Adorno and Walter Benjamin, in relation to the decay of narrative, experience [Erfahrung] and communicability, giving way to the trivialities of experiences [Erlebnis] each increasingly lonely, making a liberating and emancipatory education unfeasible. Thus, homeschooling is conceived as a phenomenon derived from the increasingly accentuated process of interiorization of bourgeois society, which retracts to the private sphere one of the most important achievements of the liberal revolutions: the modern universal public school. This phenomenon deepens the crisis of Brazilian education, suffocated by neoliberal reforms that, in recent decades, have caused a retraction in public investments and made its conditions for expansion and qualification even more precarious.

Keywords: Homeschooling, Conservative education, Bourgeois interior, Experience, “Experience”.

1 INTRODUCTION

Following the regressive tendencies and neoliberal guidelines to meet the interests of the market, Brazilian education has been the target of constant attacks in order to conform it to the ideology of the flexible mode of production. Since the publication of the current Law of Guidelines and Bases of National Education, Law No. 9394/96, "reformist" groups, aligned with neoliberal interests, have become hegemonic in the elaboration and approval of public policies aligned with what Saviani (2011) calls neoproductivism, that is, with a perspective of adaptation of national education to the regime of production and accumulation of Toyota, materialized in the discourses of "total quality", "skills", "flexibility", etc. In fact, the National Common Curricular Base (BNCC) for basic education and the National Common Base – Training (BNCC-Formation) are nothing other than the practical implementation in school curricula of the pedagogical of competences, whose bases are the dogmas of the administrative and productive reengineering of the last decades.

In the set of these (neo)conservative and (neo)liberal attacks, we saw in 2022 the approval of *homeschooling* or homeschooling, something hitherto not allowed by educational legislation. Still in the approval phase in the Federal Senate, the law of home education presents itself as a real obstacle to the development of national education, as well as to the development of children and adolescents, as we will argue below.

The present work is part of a broader research project, entitled "Current Events of the Critical Theory of Society for Contemporary Educational *Thought: Bildulg* and *Halbbildung* in the Tracks of Modernity", which proposes to investigate the contributions of the Critical Theory of Society to contemporary education. This research focuses on the current education crisis and the corresponding retractions of Brazilian public policies, putting at risk its constitutional principles, such as universality, gratuity and secularity. In this text, now presented at VIII CONEDU, we focus on the analysis of the phenomenon of *homeschooling in Brazil, its* legitimation process in the framework of national education, as well as its consequences in the retraction of public educational policies and in the general formation of children. Based on the Critical Theory of Society, the investigation of home education, recently approved by the National Congress, involves the analysis of the hegemony of conservative groups, of reactionary bias, which are currently in control of Brazilian education. Preliminary results of the study point to a conception and political-pedagogical praxis of a besieged education in the bourgeois interior, whose consequences in the medium and long term lead to the narcissistic and solipsistic formation of children and young people. This process further aggravates the framework of semi-formation [semi-culture] instituted by modernity, analyzed by Theodoro Adorno and Walter Benjamin in relation to the decadence of narrative, experience *[Erfahrung*] and communicability, giving way to the trivialities of increasingly solitary experiences [*Erlebnis*], and making a liberating and emancipatory education unfeasible. Thus, *homeschooling is conceived* as a phenomenon derived from the increasingly accentuated process of internalization of bourgeois society, which retracts to the private level one of the most important achievements of the liberal revolutions: the modern universal public school. This phenomenon tends to deepen the crisis of Brazilian education, already asphyxiated by neoliberal reforms that, in recent decades, have caused a retraction in public investments and made its conditions of expansion and qualification even more precarious.

As the aspects that involve the phenomenon are broad, we will limit ourselves to three elements that we consider most harmful of the approval of homeschooling: *Homeschooling* in the context of neoliberalism; *Homeschooling* and the atrophy of contemporary experience; *Homeschooling* and semi-training. These aspects will be analyzed according to the contributions of two main authors of the Frankfurt School: Walter Benjamin and Theodor Adorno, without neglecting to consider other references that help us interpret the phenomenon on screen.

1.1 *HOMESCHOOLING* IN THE CONTEXT OF NEOLIBERALISM

Neoliberalism, as a regime of accumulation of financial hegemony (CHESNAIS et al., 2003) became dominant from the end of the 1970s, from the crisis of the Fordist model. Since then, it has controlled public policies as a way to control the State and, consequently, the social offer of education. In the 1980s, the conservative governments of Tacher, in the United Kingdom, and Regan, in the USA, dictated the policies of restructuring the state on neoliberal bases, due to the great crisis that plagued the European and American *welfare state*, considered "too heavy" and demanding limitations on public investments and exemption from the state machine. Having as a historical landmark the Washington Consensus, in 1989, the meeting of large financial corporations and hegemonic capitalist countries aimed to condition public policies, cooperation agreements and loans to the restructuring of national economies from a broad movement of state exemption, privatizations, fiscal and tax reforms and drastic reduction of operating and personnel costs. The golden rule became: more market and less state. In the Brazilian case, as in all peripheral capitalist countries, it could not pass indifferent to this true avalanche, conditioning educational policies to programmatic neoliberal reforms, something that has only intensified over time, especially in the last decade with the resurgence of conservative thought organized in economics and politics. In this regressive context, the public school has been the main target of the propaganda of disqualification, contingency of resources, inhibition of public investment and encouragement of *charter* school initiatives, vouchers and *homeschool* proposals, leveraged by a progressive wave of minimum state policies, defended by market defenders in partnership with the hegemonic media.

As neoliberalism sees the public school and its investments as a "burden" for the State, several initiatives of bills and even initiative of filing by families for approval and regulation of *homeschooling* have emerged in recent years. Such initiatives, especially American-inspired, have attracted new adherents, usually linked to conservative thought, which found in the Bolsonaro government an important partner in the relaxation of educational legislation, until now restrictive to this type of education.

However, the problem is not new, because the disregard for public education, universal, secular and mandatory, has always been on the agenda of the old liberalism. The *laissez faire*, claimed by Adam Smith in the period when the bourgeoisie found itself in turmoil against the regulations imposed by the mercantilist economy of the European monarchies, is at the origin of liberalism and is reissued by the (neo)liberals against the regulations of the Welfare State, as ardently defended by its greatest modern exponents, such as F. Hayek and M. Friedman. The central Smithian question, however, remains the same: to remove from the State the monopoly of sectors that are of interest to the private initiative through flexibilization and deregulation, leaving the "invisible hand" of the market to act freely. In the case of education, the proposals of the school *vouchers* of the modern authors coincide

with the proposal of financing of education defended in Smith's *The Wealth of Nations*, because, for him, the financing of the masters is up to the students, not falling this burden on the State. Even considering the difference of historical time, the proposal is the same, that is, the subtraction of the State in the production/maintenance of public policies and the establishment of free competition, not only commercial, but between individuals, surviving the strongest, in a chaotic save who can. On the adequacy of *homeschooling* to neoliberalism, Brewer and Lubienski (2017, p. 33) point out that:

> In this [neoliberal] context, homeschooling may well be the closest embodiment of neoliberalism, as it probably represents the closest form of education that is based on self-regulation, decentralization, and elevation of the individual/private over the collective/public.

In difficult times such as these, the more the State moves away from education, the more it falls into the private domain, always seeking excessive profits, whether they come from the collection of tuition or funds transferred from the public coffers, which puts at risk the founding principles of Brazilian education, rights to harsh penalties won in the Constitution of 1988, such as universal, secular, free education, democratic management, pluralism of pedagogical conceptions, equality of conditions for access and permanence in school and others no less important.

1.2 Or *HOMESCHOOLING* AND ATROPHY OF CONTEMPORARY EXPERIENCE

The ideas of Walter Benjamin (2012) help us to understand that from modernity the human faculty of exchanging experiences through narration goes into decline. The hurried life, the shock of the tumultuous life and the sharpening of the loss of spaces of sociability have made the subjects mute, alien to dialogue and narcissistic confinement.

The way of living in bourgeois society tends to make what Benjamin conceptualized as *Erfahrung* unviable, the true experience. In its place, due to the frequent shocks, life is based on what he called *Erlebnis,* that is, the quick and fleeting experience. About this contradiction, Ventura (2020, p. 10) recalls that:

> *Erlebnis* is the fleeting modern experience, the individual experience, exhausted in itself, cannot be transmissible because it lacks content and even because it has no roots in the past or in a tradition that would claim the condition of transmissibility. While *Erfahrung* dispenses with the communicability of what has been lived and transmitted to others, requiring perenniality and attribution of meaning in time, *Erlebnis* is content with the dryness of the act lived and consumed in the present moment. The German word Fahen, which gives rise to *Erfahrung*, means travel; thus, experience is something that accumulates from knowledge that travels, that comes from afar, in time and space. So much so that the classic Benjaminian narrator is the sailor or old peasant, both travelers in his own way or 'as one who comes from afar'.

The Benjaminian analysis is from the 1930s, and although almost a century of his reflections has passed, it seems to talk to us in the present time, because individualism has not only intensified by the internalization of life and family, but also by the subsumption of society to contemporary technique, increasingly focused on private use, including *home-office* work, labor model on the rise, further

atrophying the experience of sociability, while *Erfahrung*. From the art of storytelling, perceiving one's fellow man in the world, to the consideration of the ancestral tradition, which falls into disuse, the capitalist machine originated in modernity grinds the most genuine human practices, which can only assert themselves and make sense if they have the other as a parameter of existence.

If we look closely, one of the few social spaces of encounter with the other and of experimentation of heteronomy, with all its mishaps and problems, is the school. This is still the privileged place to see the other, for constitution and exchange of experiences, for self-telling and exercise of empathy, to put oneself in the place of the other against the winds of liquefaction of affections and relationships (BAUMAN, 2001, p. 14). Going back to the domestic, *homeschooling* is the condemnation of education to the poverty of living [*Erlebnis*] in the bourgeois interior. And in this case, it is not about education as training *(Bildung), but rather as what Adorno (1995) called* Halbbildung *(semi-formation).*

2 HOMESCHOOLING AND SEMI-TRAINING

The loss of experience and the muting of the subjects, as studied by Benjmain, a phenomenon that only deepens in contemporaneity, leaves its mark on the process of human formation (*Bildung*). The lack of reference of the other in the formative process tends to the constitution of narcissistic personalities who can only see their private interests. Studying the formation of personality and language, the Russian philosopher and linguist Bakhtin came to the conclusion that without dialogue we cannot constitute ourselves with humans. He said, "... as for me, in everything I hear voices and dialogical relations between them" (BAKTHIN, 2003, p. 409); and this is because the search for the voice of others, of polyphony, is what gives us meaning to existence, since "life is dialogical by nature" (BAKHTIN, 2003, p. 348). Therefore, without dialogue, there can be no complete human formation, only what Adorno called semi-formation (*Halbbildung*).

If the narrative, as Benjamin argued, is a condition of humanization to the extent that we communicate our experiences in social relations, domestic education not only atrophies social polyphony, by keeping the child hostage in his own home, but also retracts his ability to become a "social being", in the Aristotelian sense of *zoon politikon*, that is, a being that can only exist in community. On this issue, Ventura (2020, p. 11) points out that:

> The full formation of the personality can only take place in contrast to its reverse, the 'other self' with which it identifies itself or not and from which it constitutes itself as individuality (*Selbstbildung*). As well as in the sense of translation, as studied by Antoine Berman (1983), in the essay Bildung *et Bildungsroman*, in which *Bildung* means openness to the stranger (foreigner), one throwing himself out of himself in order to understand the other. It is in this cyclical movement of coming out of oneself and returning that consists of one of the main aspects of formation. This gives much to think about, because, it seems, the loss of modern communicability, so well described by Benjamin and already mentioned earlier, lies mainly in the decline of the faculty of 'translating' (understanding) the other, whether in our own language or in another. This can also be seen in the sense of *Bildung as a* journey, which

> Berman identifies in the classics of German Romanticism, whose formative process also has the 'other' as a parameter of self-constitution.

The risk of home education lies not only in the poverty of the experience and the process of semi-formation to which children would be subjected, since pedagogical mediation is fundamental for the process of acquiring significant and non-instrumental knowledge, but also for the production of unhealthy, introspective and solipsistic personalities. Elliot (2018, p. 472) reminds us that "A generation of people is emerging that can be called the 'instant generation' and that treats individualism and purchases on the same level: quickly consumed and with immediate results." This is the new version of what Freud (2020) called the "pleasure principle" that, if not realized, can easily become a "death drive" in repressed egocentric and repressed personalities.

Still on the relationship between semi-training *and homeschooling,* there is still the risk of production of an entire generation that sees itself subjugated to the mechanisms of the market and consumption, because there is no way to perceive counterpoints of otherness, other ways of being and existing that the school provides. In this process, as Adorno (2005, p. 16) states, "Consumers of psychotic prefabricated products feel protected, thus, by all those equally isolated, who, in their isolation in a radical social alienation, end up united by a common insanity."

The process of schooling, as we know, is not an antidote to trauma and frustration. However, the school experience has numerous possibilities of training that precedes adult life, coming to the unusual, conflicts and challenges of living in society. At home, only the event can occur the everyday, the immediate, the repetition of isolated, narcissistic experiences, when the desires come ready as a canned, a finished product, but not conquered, although satisfied in the domestic universe. The problem is that one hour this guy will come out of the dome of the domestic interior and his reactions to community life will be unpredictable.

3 FINAL CONSIDERATIONS

We live in a time when the demands for a lifestyle aimed at privacy are deepening and Benjamin called it "bourgeois intèrieur", when the domicile becomes the last ivory tower of the individual and individualism.

During the almost a century and a half of the Republic, the school has presented itself as an important counterpoint to the purely family designs, even conflicting with them many times, whether from the point of view of religiosity, habits or even ideologies. This counterpoint is very important for the child to appropriate non-domesticated scientific knowledge, other ways of life and other ideas, in addition to having to share with others, "outsiders", part of his own life, decentralizing his positions, controlling his desires and impetus for the collective "good". *Homeschooling* is the reverse of this and means the alienation of the child from the pluralism present in society, because the interior represents

the monologue, the non-contradiction, isolating it from real life. In this case, the chances of the child getting used to conspiracy theories*, fake news,* flat earthism and other aberrations, is great, because it will only so read what is repeated at home without another parameter. What's more, it tends to get used to the idea that what counts are personal opinions, "post-truths" and sectarian doctrines. Not that the school can guarantee that this does not happen, but it is fundamental to have the contradictory to "test" our beliefs, knowledge and values.

Thus, the approval of *homeschooling in the* National Congress [heading to the Senate] represents another fissure in the Brazilian school and another advance against the public financing of education, its universality and gratuity. In addition, it also represents an affront to the poorest and most vulnerable population, which could never afford such an expensive model. As if the various social apartheids were not enough*, we will now have the educational, separating those who will have access to an elitist modality of education, in the form of preceptorship of teachers* delivery, *from those who remain dependent on a historically scrapped system that, despite everything, insists on resisting.*

The implications, however, are many of the approval of homeschooling, here we point out only the tip of the *iceberg.*

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SEVEN
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The use of informatics as a mediator and facilitator of the pedagogical process in the teaching of biology

Crossref doi
https://doi.org/10.56238/ptoketheeducati-013

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ABSTRACT
Educational practices in general have proven to be an interesting alternative in the teaching and learning process. Among these practices, the use of various dynamics and games stands out. However, despite the advancement of information technology in education, games and practices for biology teaching have had limited migration to this technological realm. To address this issue, this study aimed to survey mobile applications and electronic games focused on biology education. Additionally, several useful scientific software tools for biology studies were identified, encompassing areas such as molecular visualization, sequence alignment, database search for similarities, phylogenetic analysis, genetic sequence analysis, programming, and statistical analysis of biological data, visualization of biological networks, image processing, and protein stability analysis. A total of 14 mobile applications were selected, all available for the Android platform, along with 8 applications for iOS. Regarding electronic games, four games were found, including two in the form of Android applications and two for personal computers. These findings underscore the need to develop biology-focused games and applications, both collaborative and individual, to support elementary science and biology teachers, as well as the potential of using scientific software to enhance basic education.

Keywords: Applications, Games, Scientific Software, Pedagogical practices, Biology Teaching.

1 INTRODUCTION

The current society is inserted in a powerful communicational structure that, gradually, has surpassed the capacity with which we are accustomed to give answers to the messages of our daily lives (BENFICA, 2014).

For Silva (2011), "students no longer learn in the same way in the face of the attractions of digital culture". Schools seek, through technological mediations, to develop tools that assist in the teaching and learning process. Thus, it is perceived the existing efforts in education, to transform classrooms into motivating and meaningful environments for students.

Considering the context of the teaching and learning process, it is important to evaluate that it is a social experience, with the intermediary of instruments and signs. For the child this process is a spoken or written language, so knowledge is a social experience in which the relation of language is action. Oliveira (1997) states that "in its most elementary form the sign is an external mark, which

assists man in tasks that require memory or attention", complementing this idea Benfica (2014), states that it is necessary to involve actions that transform the teaching and learning process into an attractive and interesting model to the school environment.

2 PRACTICES IN THE TEACHING OF BIOLOGY

Vygotsky, during his observations, elaborated the so-called theory of intervention in the proximal zone of development (ZPD), where the child needs the relationship between the real and the playful, that is, one must consider not only the level of concrete development, but also its potential level. "This possibility of alteration in the performance of one person by the interference of another is fundamental in Vygotsky's theory" (OLIVEIRA, 1997, p 59).

Thinking in this sense and in line with the Law of Guidelines and Bases of National Education No. 9394/96, which emphasizes the importance of the student's contact with science and technology, providing him with knowledge pertinent to his daily life, the right of access to scientific knowledge is perceived, not being restricted only to systematized contents through pre-defined teaching programs. This decentralizes learning, making it an active rather than a passive process in teaching and learning.

Thus, although the student is considered an active being in the teaching-learning process, the changes related to teaching practices should normally be carried out by the teacher. By having a vision of the future and an open mind to reflect critically on their practice in the teaching-learning process, the teacher becomes an active agent in the educational system (TAJRA, 2012).

Examples of dynamics for teaching biology subjects, such as genetics and molecular biology, use simple materials available in schools. An example is the work of Moul (2017) entitled "Modelling in Genetics and Molecular Biology - Teaching Mitosis with Modeling Mass". Another example is the work of Pereira-Ferreira (2017), who mentions some activities carried out in the workshop of the VI National Meeting of Biology Teaching and VIII Regional Meeting of Biology Teaching (Regional 3), in Maringá (PR) in 2016. These activities can be seen in Chart 1.

Table 1 - Description of the materials used in the workshop "playing with genetics: Use of models and didactic games in learning"

Practice	Description
Representation: Genotype x Phenotype	Simple activity in which plastic cups are used to simulate chromosomes with adhesives to be used in the inscription of genes, which in the process of meiosis separate and later unite to form the genotype of an individual. Genes related to parts of a head are represented. The genotype resulting from fertilization and a guide frame of possible phenotypes serve as the basis for assembling the head of a generated individual, using plastic parts with Velcro.
Unwinding Chromosomes	It consists of letters with illustrations of specific karyotypes and related organisms/individuals. This activity can be used in several ways, and in the workshop in question, it was experienced as a memory game, to form pairs. The activity was carried out in groups, so that the participants had to turn a card from each group.
NEDICoid	It consists of a model in kits with several items: magnetized pieces that represent chromosomes to adhere to the metal plate and simulate meiosis, union of gametes. Several plasticized boards guide the understanding of the phenotypes that can be transferred, according to frames, to a three-dimensional biscuit model, representing the parts (antenna, tongue, type of food, paws, color, coating, etc.) of the hypothetical organism called NEDICóid. This model is more complex than the activity "Representation: Genotype x Phenotype" and addresses the different types of genetic inheritance.
Heredogram is a family thing	Activity in which participants assemble heredograms of widely known film families (The Lion King, The Flintstones, The Simpsons, Harry Potter) using pieces magnetized on a metal plate following tips.
Gene Flow Cord	Activity in which participants assemble a triple necklace using colored cords (3 colors), EVA pieces with specific colors and shapes that represent the nitrogenous bases (nucleotides) of DNA and RNA and codons simulating the processes through which information is transferred from DNA to proteins. Complementary forms associating the parts with the chemical structures, indicating correlations between the bases and the genetic code helped in the assembly process. The sequences to be represented were taken from real examples of known genes, contextualizing them.
Genetic tapon	The game consists of cards that form pairs and plastic hands with suction cups and rods to hold. In each pair, one card displays a drawing and another, a text that identifies it. The cards with drawings are on the table facing up and a mediator reads a text letter. Upon identifying the corresponding drawing displayed on the table, the player attempts to pick up the card using the plastic hand. In the end, the player who manages to pick up the most cards wins the game.

Source: adapted from Pereira-Ferreira (2017)

Another relevant work is the extension book Practices of Cellular and Molecular Biology for High School of Sepel (2017) published by the Federal University of Santa Maria (UFSM). Where the author makes use of the space to comment on good practices within the laboratory and proposes a simple technique of DNA extraction. Another interesting project is the Experimentoteca project (TOMAZELLO, 2000), a project carried out at USP that provides pedagogical practices for various

areas and teaching modalities. The examples of science practices aimed at Elementary School (EXPERIMENTOTECA, 2019) can be seen in Chart 2.

table 2 – Practical activities for elementary education proposed by the experimentoteca project for science discipline

Themes	Total practices
Air, water and soil	14
Living beings	10
Chemistry	6
Human body	8
Physics	10

Source: Authors

For high school, taking into account the topics related to biology, the portal (EXPERIMENTOTECA, 2019) as practices can be seen on the Board 3.

table 3 - Practical activities for high school proposed by the experimentoteca project for biology discipline

Theme	Goals
Plant Metabolism	- Identify the factors that contribute to the occurrence of the process of photosynthesis; - Observe the process of transpiration in plants and discuss its importance; - Observe how the transport of nutrients and other substances occurs in plants; - Discuss the relationship that exists between these three processes.
Evolution	- Understand how adaptations interfere with the survival and perpetuation of species.
Microscopy: animal and plant cell	- Observe the plant cell: its shape, chloroplasts, nucleus and stomata; - Observe the shape, size and nucleus of an animal cell and compare it with a plant cell; - Observe animal cells, fungi, bacteria, algae, protozoa, etc.
DNA	- Understand the structure of DNA and the processes of extraction, duplication and transcription.
Game: Synthesizing protein	- Understand how the process of protein synthesis occurs through a simulation; - Understand how proteins act on physiological processes; - To know the locations of the cells in which the processes of protein synthesis occur.
Gene expression and cell differentiation	- Understand the principles of gene expression and cell differentiation by analogy with origami.
Molecular biology	- Organize chronologically events and researchers of the history of Molecular Biology; - Relate this history to the stages of establishing a new science; - Check how the different areas of knowledge contribute to this process.
General Biology	- Bank of questions with the following themes: Biotechnology, Botany, Cytology, Ecology, Embryology, Evolution, Physiology, Genetics, Microbiology, Health, Zoology.
Games: Biomes	Game that simulates naturalists traveling continents in search of information.
Germination	-Compare the germination time of different seeds under the effect of different treatments; -Check the amount of germinated seeds under the effect of different treatments;

	- Compare natural situations of dormancy breakage of the seeds with the treatments performed.
Classification Systems	- Understand the importance of Linnaeus' classification system; - Identify organisms using a classification key.
Zoology	- To know the morphology and physiology of the different animal groups; - Compare the systems of the different classes of animals; - Understand how systems work; - Know the organs that make up the different systems.

Source: Authors

With this, it can be noted the importance of practice as part of the teaching process, since many initiatives have emerged over the years, making it fundamental for success in obtaining knowledge from the student, causing him to leave the comfort zone in a natural and spontaneous way.

2.1 GAMES AS PRACTICES FOR TEACHING BIOLOGY

The recreational activities over the years have gained more and more space, because these unite leisure to challenge (RIZZO, 1996). Of the various educational playful practices can be highlighted the use of games as a mediating tool in the teaching and learning process since games are a form of pastime and fun, even if they are subject to rules, acting simultaneously between more than one intelligence (ANTUNES, 2012).

Considering that games have this characteristic of stimulating multiple intelligences, it is possible to base it on the classification (Chart 4) of Gardner (1985) on the theory of multiple intelligences. This theory proposes that each student learns in different ways, and it is up to the teacher to evaluate and seek teaching and learning alternatives that help in the development of students' competencies. This challenge of the teacher, combined with the difficulty of teaching certain contents of biology, evidences the need for activities that enable effective learning (MORATORI, 2003).

Table 4 - Types of intelligence

Linguistic intelligence	Ease of use of oral and written language
Logical-mathematical intelligence	Interest in problems involving logical sequences and ordering
Spatial intelligence	Interest in puzzles (flat and solid figure shapes)
Intrapersonal and interpersonal intelligence	Ability to relate in the group
Musical intelligence	Mastery of sounds, pitches and tones
Kinesthetic body intelligence	Ability to assimilate large and small movements

Source: adapted from Gardner (1985)

In this sense, considering the games as an established form of playful activity, Passerino (1998) lists some indirect benefits provided by this practice, they are: memory, temporal and spatial orientation, visuomanual motor coordination, auditory perception, visual perception, logical-mathematical reasoning, linguistic expression and planning and organization. It can be highlighted that:

> [...] Games can be employed for a variety of purposes within the context of learning. One of the very important basic uses is the possibility of building self-confidence. Another is the increase in motivation (FERNANDES, 1995).

According to Krasilchik (2004), didactic games are simple forms of simulation, whose function is to help memorize facts and concepts, differentiating themselves from the pedagogical material by containing the playful aspect (CUNHA, 2012). Taking into account the above, Kishimoto (1996), treats the game as a means and not as an end of the didactic process. Considering the above aspects it is possible to evaluate that:

> [...] the use of models and the development of playful activities can help the teacher to arouse the interest of students in the subject of genetics, in which visualization becomes easier, so that students can interact with the material. The class becomes more enjoyable, motivating students to participate and get involved in the process. It is also important to use problem-questions, which lead students to seek solutions, building their knowledge with the mediation of the teacher (HERMANN, 2013).

In a survey of articles conducted by Hermann (2013) in the Journal of Genetics at School that dealt with didactic games in the teaching of genetics between the years 2006 and 2012, 29 articles were found categorized as follows: Board (7), Representative Models (13), Domino (3), Cards (2), Burnt (1), Virtual (1) and Memory (2), listed in Chart 5. And years after the survey conducted by Hermann (2023), we still see the development of physical dynamics, such as the case of the deck developed for teaching genetics by RODRIGUES (2020) in his master's thesis.

Table 5 - Games for teaching genetics

Article	Game type	Theme	Author
"Playing with cracks: to understand protein synthesis"	Board	Molecular genetics	SIQUEIRA (2010)
"Playing with the Blood System: alternative proposal for the teaching of ABO Blood Groups"	Representative Model	Classical genetics	BASTOS (2010)
"Classifying biological diversity"	TemplateRepresentative	Evolution	MORI (2013)
"Combine and recombine with dominoes"	Dominoes	Classical Genetics	KLAUTAU (2008)
"Meiotic track: the game of meiosis and chromosomal and allelic segregations"	Board	Classical Genetics	LORBIESKI (2010)
"Chromosomes, Gene and DNA: Use of a didactic model"	TemplateRepresentative	Classical Genetics	TEMP (2011)
"It contains Phenylalanine, can I eat it?"	Board	Molecular genetics	VALADARES (2010)
"Pin dynamics in the teaching of population genetics"	TemplateRepresentative	Evolution	KLAUTAU (2008)
"Domino of Structural Chromosomal Mutations"	Domino	Classical Genetics	FIELDS (2010)

"Genetics in Everyday Life: The ABO System in Blood Transfusion"	TemplateRepresentative	Classical Genetics	DASILIO (2009)
"Hypertension: A Multifactorial Genetic Inheritance."	TemplateRepresentative	Multifactorial Genetics al	PIZZOLATO et al., (2010)
"Memory Game: Where's the Gene?"	Memory	Classical Genetics	PAES and PARASQUE (2009)
"Burning Game: A Practice for the Teaching of Genetics"	Burn	Concepts of classical and molecular genetics	FREITAS et al., (2011)
"Galapagos Game: The Extinction and Irradiation of Species in the Construction of Biological Diversity"	Model Representative	Evolution	OLIVE (2008)
"Profile in Genetics"	Board	Classical Genetics	ARAUJO (2012)
"Helping to fix the concepts of genetics"	Dominoes and Cards	Concepts of Classical Genetics	RAMALHO (2006)
"Genetics revising and fixing concepts"	Model Representative	Concepts of classical and molecular genetics	JUSTIANINO (2006)
"Playful way of understanding genetic drift"	TemplateRepresentative	Evolution	SOUZA (2006)
"On the Trail of Blood: The Game of Blood Groups"	Board	Classical genetics	VALADARES (2009)
"The deck as a tool in the teaching of genetics"	Letters	Classical Genetics	SALIM (2007)
"Organization of an Olympiad of knowledge with the game evolving genetics"	Board	Concepts of Genetics	PAVAN (2006)
"Genetics Profile: A Fun Way to Memorize Content"	Board	Classical Genetics	Sant'ANNA et al. (2011)
"Burning your head! Understanding Fragile X Chromosome Syndrome"	TemplateRepresentative	Classical Genetics	BIRTH (2009)
"Genetics Show: An Interactive Game for High School"	Virtual	Molecular genetics	MARTINEZ (2008)
"Chromosomal syndromes without a new perspective on learning"	Memory	Classical Genetics	GOMES (2011)
"Blood system without mystery: an alternative proposal"	TemplateRepresentative	Classical Genetics	FIELDS (2009)
"An interactive way to teach genetics in elementary school based on the rescue and playful introduction of molecular techniques"	TemplateRepresentative	Classical Genetics	MOREIRA (2008)
"Use of the game 'Amino acid salad' for the understanding of the degenerate genetic code"	TemplateRepresentative	Molecular genetics	FERNANDES (2011)

Source: adapted from Hermann (2013)

Thus, considering that the teacher, in the interactionist environment, has the function of mediating the resources that lead the student to knowledge and exploring the various cognitive abilities of the students, which vary between each one, the use of games is an alternative to break with the routine of the teaching and learning process.

2.2 THE USE OF APPLICATIONS, ELECTRONIC GAMES AND SCIENTIFIC SOFTWARE AS MEDIATORS AND FACILITATORS OF THE PEDAGOGICAL PROCESS IN THE TEACHING OF BIOLOGY

2.2.1 Applications

Apps have played a key role in the field of education, providing significant benefits to the teaching process. Crompton et al (2016), conducted a review on mobile learning in the area of science, exploring the scope, purpose and extent of research activity in this field. In this study, positive results were revealed in relation to learning, regardless of the specific objectives of the research.

According to Sutisna et al (2020), the use of smartphones can facilitate the teaching-learning and evaluation process for teachers and students. However, the work warns of the impact of smartphone use, which can lead students to have less focus on the teaching and learning process.

These papers highlight the relevance and potential of mobile learning as an effective approach to advancing scientific knowledge and improving students' understanding. However, it is important to emphasize the role of the teacher as mediator of this process so that the dispersion does not end up promoting a contrary sense of the desired goal, which is learning.

In Chart 6 it is possible to observe several applications that can be used in the process of teaching biology in various themes.

Table 6 – List of applications on biology for android and ios

Name	Description	Platforms		Soon
		Ios	Android	
Digital Biology	High School Biology Exercises	x	x	
LookBio - Biology	General biology content and exercises	x	x	
Glossary of Biology	Expressions used in the biological sciences		x	
Total Biology - Video lessons	Video lessons of preparation for ENEM and Vestibulares		x	
Cells	Presentation of content focused on cytology	x	x	
Biology 100 Exercises	Questions about biology		x	
BioApp Pro	Biochemistry Contents		x	
RevisApp	Disciplines charged in High School, Enem and other Vestibular	x	x	
Biology Vestib ENEM Edilson	Biology subjects for college entrance exams	x	x	
Protein Synthesis	Presents an interactive activity on protein synthesis	x		
The Cell	Interactive 3D cell model	x	x	
DCL 3D Biology 1 and 2	3D models of various systems, cells and DNA		x	
Cellular Respiration - A Touch of the World Collection	Cellular Respiration		x	
Khan Academy	Miscellaneous themes	x	x	

Source: Authors

2.2.2 Video Games

The electronic games aimed at teaching biology in Portuguese, as well as the applications, also present low variety (Chart 7). Of the video games (for mobile devices and computers), only two of them are available for computer (Genetics Show and Friend), which, despite having been published, have not you can find the installers of them. Other games involving biology that were possible to be installed were the Biology Quiz and Biology Words & Quiz, which as the name proposes, are only questions and answers. The application The Cell, mentioned above, has a game module in Quiz format

(questions and answers) but, in addition to needing to create an account to use this feature, during the test it crashed at the time of use and the application had to be restarted several times.

Table 7 – List of video games focused on biology

Name	Description	Platforms		Soon
		Android	PC	
Biology Quiz	Questions about Biology in general	x		
Genetics Show: an interactive game for high school. MARTINEZ (2008)	Promote the diffusion and popularization of science using as a tool the recent advances in Genetics and Molecular Biology.		x	-
Amigoacids: a playful proposal for the teaching of molecular biology. VICTORY (2018)	Educational game that aims to help high school and elementary school students to expand their knowledge in the discipline of molecular biology in a playful and fun way		x	-
Biology - Words & Quiz	Assist users in learning the meaning of words related to biology.	x		

Source: Authors

2.2.3 Scientific Software

Several scientific softwares are useful for the study and teaching of biology. These softwares cover a wide range of areas, such as visualization and modeling of molecular structures, alignment of DNA and protein sequences, search for similar sequences in databases, analysis and visualization of phylogenetic data, analysis of genetic sequences, programming and analysis of biological data, visualization and analysis of biological networks, processing of biological images, and analysis of protein stability. These softwares are available on different platforms and offer varied features to assist researchers and professionals in the field.

In any case, although they were not designed for teaching, these softwares appear as tools with high potential to complement the teaching of Biology contents and incite in students the perception of how vast the applicability of scientific technologies are. The goal is to encourage not only a better assimilation of content, but also, through the introduction of students to such software, to deepen their own understanding of the meaning of science (scientific concepts) and the principles that govern it (processes, practices and critical thinking).

Some examples include PyMOL and UCSF ChimeraX for visualization and molecular modeling, Clustal Omega for sequence alignment, BLAST for searching for similar sequences, MEGA for phylogenetic analysis, Geneious for genetic sequence analysis, R and Biopython for programming

and data analysis, Cytoscape for visualization of biological networks, ImageJ for image processing and oldX for protein stability modeling and analysis.

Such software plays a fundamental role in the advancement of research and in supporting teaching and learning in the area of biology, and can be used without the need for large computational resources, being well adapted to the reality of schools where, usually, there is little availability of computers and / or computers with simpler configurations. In addition, the vast majority of the software listed here has a free license and, when not, offer academic licenses, once again facilitating its use. The software in question can be seen in Chart 8.

Table 8 – List of scientific software to support the teaching of biology

Software	Description	Platform	License	Languages	Reference
PyMOL	Molecular structure visualization and modeling software	Windows, macOS, Linux	Commercial	Several	(SCHRÖDINGER, LLC, 2015)
UCSF ChimeraX	Molecular structures visualization and analysis tool	Windows, macOS, Linux	Gratuitous	English	(PETTERSEN et al., 2021)
Clustal Omega	DNA and protein sequence alignment tool	Browser	Gratuitous	English	(GOUJON et al., 2010; SIEVERS et al., 2011)
BLAST	Algorithm for searching for similar sequences in databases	Browser	Gratuitous	Several	(MADDEN, 2003)
MEGA	Software, phylogenetic data analysis and visualization	Windows, macOS, Linux	Gratuitous	English	(TAMURA; STECHER; KUMAR, 2021)
Geneious	Bioinformatics platform that offers several tools for genetic sequence analysis	Windows, macOS, Linux	Commercial	Several	(KEARSE et al., 2012)
R	Programming language and statistical environment used for biological data analysis	Windows, macOS, Linux	Free	Several	(TIERNEY, 2012)
Biopython	Python programming library for biological data processing	Windows, macOS, Linux	Open source	English	(COCK et al., 2009)
Cytoscape	Visualization and analysis tool for biological networks	Windows, macOS, Linux	Free	Several	(SHANNON et al., 2003)
ImageJ	Image processing software used for biological image analysis	Windows, macOS, Linux	Open source	Several	(SCHNEIDER; RASBAND; ELICEIRI, 2012)

oldX	Protein stability modeling and analysis software	Windows, macOS, Linux	Commercial	English	(SCHYMKOWITZ et al., 2005)

Source: Authors

3 CONCLUSION

This review identified a variety of useful scientific software for studies in biology, covering diverse areas and offering specific resources and tools. These softwares play a key role in the advancement of research and also have the potential to complement the teaching of biological contents, offering a number of advantages, such as availability on different platforms and the possibility of use without large computational requirements, which makes them accessible in educational environments with limited resources. In addition, most of the software presented has free or academic licenses, making it easier for teachers and students to use them. However, despite the potential of these tools, it is important to note that their use is still limited in the context of teaching biology, and many teachers may not be familiar with these technologies. Therefore, it is necessary to promote the awareness and training of educators so that they can make the most of these digital resources and enrich the teaching-learning process in the area of biology, including contributing to the understanding of what it is to "do science".

In short, the integration of applications, digital games and scientific software in the teaching of biology represents a valuable opportunity to improve the understanding of concepts and stimulate the interest of students, providing a more dynamic and interactive approach, essential for current times.

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SEVEN
publicações acadêmicas

Religion and its moral contribution in the school space

https://doi.org/10.56238/ptoketheeducati-014

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ABSTRACT
The main objective of this article is to address the relevance of religion in the promotion of ethical and moral values in school and its influence on the history of education in Brazil, where education and religion were the main sources of formation of citizens. The methodology that supported the research is bibliographic of qualitative nature. We perform readings and files for the production of the article. We approach education from the Jesuit period to the present day. The research concluded the need to still point out new directions that lead religion and education to promote ethical and moral values in school in favor of a just, tolerant and egalitarian society.

Keywords: Religion, Education, Ethics, Moral.

1 INTRODUCTION

This article addresses the issue of religion in the promotion of ethical and moral values in school. Today, it is possible to find throughout history, both religious and educational, several accounts that confirm that religion has influenced and still exerts a strong influence on societies and schools. Religious and educational history can be perceived as an important contribution tool that has been contributing over centuries to the construction of societies giving conditions for the creation of new more cohesive social structures, which seek the valorization of the individual. On the other hand, religion has also generated problems due to a traditional excess formation and without valuing the contribution of students in the process. However, it is a fact that religion has directly influenced the history of education in Brazil and it is necessary that it be understood and respected in its differentiated and unique form. Thus we ask: what is the relevance of religion in the promotion of ethical and moral values in school and its influence on the history of education in Brazil?

The main objective of our work was to reflect the relevance of religion in the promotion of ethical and moral values in school and its influence on the history of education in Brazil. The specific objectives were: a) to carry out a bibliographic survey of the theorists that discuss the issue of relevance of religion in the promotion of ethical and moral values in school. b) to analyze the points of view of the selected theorists and to develop a textual production that highlights the relevance of religion in the promotion of ethical and moral values in school and its influence on the history of education in Brazil. c) synthesize the most relevant aspects of this contribution by a literature review.

The guiding questions were: a) what is the relevance of religion in the promotion of ethical and moral values in school? b) what is its influence on the history of education in Brazil? c) what is the synthesis of the most relevant aspects of this contribution by a literature review?

In this case it is necessary to reflect that every society has a vision of the universe that shows that over the centuries human societies have often developed norms of behavior in order to guard against the unexpected, the unpredictable, the unknown, and to establish a certain control over the relations between man and the world around him. However, the historical norms that study the events, facts, and behavior of the individual are based on the uncertainties of life and vary greatly from one society to another.

The research also seeks to point out new directions that lead religion to promote ethical and moral values in union with education, and fulfill its goals of educating for a liberating society, where the individual perceives religion as an act of love and personal surrender, understanding that religion based on an education that transmits respect, Religious tolerance, equality and participation between teacher and student and vice versa can transform the current situation of violence and insecurity that we currently live.

2 CONCEPTS OF ETHICS AND MORALS IN HUMAN SOCIETY

Considering the word ethics, it is derived from the Greek ethos (character, way of being of a person). Ethics is a set of moral values and principles that guide human conduct in society. Ethics serves to balance good social functioning, making it possible for no one to be harmed. Ethics is understood as a reflection on the principles that guide the behavior of man in society.

Etymologically conceptualizing the word moral originates from the Latin Mores, whose meaning is (relative to customs). It is the set of rules acquired through culture, education, tradition and daily life, and that guide human behavior within a society. It is the understanding of how the human being acts from culturally established norms for a community.

In the educational context, ethics seems to be a fashionable phenomenon, as Tugendhat (2000, p.69) states, "among young intellectuals, in the past there was more interest in the so-called critical theories of society". Today, contrary to this, ethics has gained space and has been the subject of various discussions in academic circles and school curricula.

When talking about ethics, a paradox remains: for some researchers, ethics implies universal validity, and for others, it is evidenced as historically and socially relative.

We can understand through the quote author Tugendhat: "The observance of moral norms is something that we can demand of everyone in any way, so it seems to be, and in order to be able to do so, we must also hope that this can be made comprehensible to all." (TUGENDHAT, 2000, p.13). In this way morality needs to be transparent so as not to penalize innocents.

Conceptualizing ethics as well, as morality in educational institutions generates different opinions. It is necessary, in view of the theoretical foundations, not only to point out definitions regarding ethics and morals, but also to establish the difference between the two terms according to some authors.

As we shall see in the course of this work, ethics will be defined in different ways: a science of good and evil and the substance of the rules of behavior, valid for a given group or, universally, for all men; an empirical ethic; or a material ethic of values, founded on values.

Often, morals and ethics are employed as synonyms, representing the idea of a set of principles or standards of conduct. In fact, its origins – mores, in Latin, and ethos, in Greek – go back to the idea of custom. In custom, people create values by elaborating principles and rules that regulate their behavior. These principles and rules, taken together, indicate rights, obligations, and duties that guide the conduct of individuals.

It is necessary to make a reflection on human conduct, and the reality of its origin, customs are inserted in the field of ethics and morals, in this way the author Ferreira states:

> Ethics is the study of judgments of appreciation that refer to human conduct that can be qualified from the point of view of good and evil, either in relation to a given society or absolutely. A set of rules of conduct considered to be valid, either absolutely for any time or place, or for a particular group or person. (FERREIRA, 1975, p.950).

We can make a comparison between morality and ethics by defining it as a guiding basis for human beings collectively or individually. On the other hand, the author (GUIMARÃES, 1996, p.47), distinguishes morality from ethics. For him, "morality is linked to the should-be, while ethics is the will-to-live". Morality determines the ways of an individual, or a society, explaining its existence by a set of laws. Ethics organizes the small daily attitudes of smaller groups, pointing to the relativization of the different values that make up a group.

For Marilena Chauí (1994, p.340), "ethical action is anchored in the integrity of the human being in front of his fellow human beings. From this perspective, the moral subject is, by definition, the one capable of distinguishing between good and evil." Therefore, this subject has the capacity to deviate from the prescribed path, capable of deciding, of choosing, of deliberating for the recognition of the boundary between the just and the unjust.

As stated by Silva (2002, p.92), "ethics constitutes the domain of investigation regarding the notions of happiness and unhappiness, good and evil, just and unjust and the values to which men submit by tradition or adherence". Moral conduct, on the other hand, is determined by three axes: respecting the rights of others, seeking to have a good life and deserving to be the object of moral admiration. (SILVA, 2002, p.80).

The criterion of moral action and ethical codes is a cultural construction, historically demarcated in each society and in each epoch. Universal ethical values correspond to strategies acquired in the survival of individuals of our species, in which language provides the collective means to express the best for all.

Life in society requires the possession of criteria, values and, even more, the establishment of relationships and hierarchies between these values. The responses to conflicts go through the personal decision, influenced by the social representations and by the cultural and political insertion of the individual.

Faced with the conflicts, the complex questions, we can perceive the limits of the answers offered by morality and the need to problematize these answers, to verify the consistency of their foundations.

It serves to verify the coherence between practices and principles, and to question, reformulate or substantiate the values and norms that are components of a morality, without being in itself normative. Between morality and ethics there is a constant movement, which goes from action to reflection on its meaning and its foundations, and from reflection returns to action, invigorated and transformed.

2.1 SOCIETIES AND CULTURES WITH DIVERSE ETHICS

Discussing ethics and morals is quite complex, since such a concept is not yet clear to many people. When ethical expression is placed next to moral expression, it becomes even more difficult to explain it because the concepts are confused. According to Srour (2008, p.7). Ethics is a scientific knowledge that falls under the Social Sciences. It is a theoretical discipline, a conceptual system, a body of knowledge that makes moral facts intelligible. In this perspective, ethics can be understood as the study of the judgment of analysis that refers to human conduct, to the moral behavior of men in society.

The author further says, "But what are moral facts? They are social facts that concern good or evil, judgments about the conduct of agents, historical conventions about what is right and wrong, just and unjust, legitimate and illegitimate, virtue and vice, justifiable or unjustifiable." (SROUR, 2008, p.7).

Morality thus depends on society, on conventions determined by it about what is right and what is wrong. "In this way, the same conduct can be judged as wrong in one society and right in another." Srour (2008, p.8), cites the infanticide practiced in the Roman Empire and contemporary China to regulate the food supply; the human sacrifices of rituals performed in antiquity, among others, as some examples of conduct accepted as correct in the society in which it was committed, but which would put us in a state of shock if performed in our society.

Thus, we can understand that morality refers to specific conducts, at a certain time, in a certain culture, that is, it refers to a conduct of the rule, in a practical way. On the other hand, ethics is constituted by reflection, based on principles that are permanent and universal.

Ethical reflection is concerned with analyzing the choices made by people, considering the culture of which they are part. The foundations of morality are also the object of study of ethics that aims to identify how individuals value these foundations and also how are the conflicts originated and constituent of this valuation.

For there is no way to predict, regulate and prescribe all situations, even because each one presents a unique context. Ethics, as a process of choice, is the exercise that must act with responsibility, freedom and autonomy.

In the Brazilian slave society of the nineteenth century, for example, the imprisonment and the strong punishments to which slaves were subjected by their masters were morally accepted. But, the ethical reflection of some people on this issue made them realize the injustice that was committed, so these people began to fight for a rupture of this situation, creating the abolitionist movement that contributed greatly to the evolution of this moral state, changing society.

By questioning the foundations of morality and its validity for the individual and for the collectivity, ethics, at first, leads the subject to evaluate himself before his values and principles and, later, to evaluate the principles of the other and of the collectivity. Ethics here is understood as a parameter for your consciousness, your philosophical reflection on how to act individually and collectively. As people develop in relation to ethical reflection, they develop their moral maturity; And as they mature morally, they develop their ethical reflection.

For the psychologist La Taille (2005), From the psychological point of view, "the question of the norm, how I should act, and the question of happiness, how I want to live, are related". (LA TAILLE, 2005, p.1), explains that the first question refers to morality and the second to ethics. Thus, although moral and ethical precepts have existed in all times, they have never guaranteed tolerance and understanding among all peoples. Today it is no different, prejudices and violence still dominate. Education seems to be an excellent way to promote the transformations that are necessary in the ethical and moral formation of peoples.

Ethics allows us to reflect, to be happy and, above all, to build and not destroy the society in which we are inserted. The association between the concept of morality and ethics is a subject that requires reflection for the perfect understanding of both in their role in society.

3 SYNTHESES ON THE RELEVANCE OF RELIGION IN THE EDUCATIONAL PROCESS IN BRAZIL: FROM THE COLONY TO THE REPUBLIC.

The Christian cause remains because it rests on the sacrifice of the Son of God and His glorious resurrection. (ACHAIJ, 2010, P.15). The differential of the Christian religion lies in the risen Christ. Therefore, Paul declares: "If Christ is not risen, our preaching is vain, and go to your faith ... and ye abide yet in your sins" (1 Corinthians 15:14,17). And Jesus Himself promised, "Because I live, you also shall live" (John 14:19).

Based on these biblical statements we can better understand why religion remains firm for centuries and why the need to study more the history of religion and education in Brazil, because religious activities have always been present in the educational process even, in the period that extends from 1500 to the present day, is rooted in the centrality of the Portuguese, English and North American Metropolis over the Colony, the Empire and even the Republic.

> It expanded around the sugar mill-the large landowner resorts to slave labor, initially of the Indians and then of the black Africans, Latifúndio, slavery, monoculture patriarchal character of society. Centered on the power of the mill lord (ARANHA. 1996. p. 99).

There is, therefore, an economic scenario complemented by the religious factor, practically inherent in the colonial enterprise. There, the educational coordinates linked to catechesis appear. According to the author, in this context. Education was not a priority goal, since there was no need for special training for the performance of functions in agriculture. Despite that. European metropolises sent religious for missionary and pedagogical work. For the primary purpose of converting the Gentile and preventing the settlers from deviating from the Catholic faith.

What, then, was the metropolitan religious intent for the Colony? Spread religion? The answer needs to consider the link between monarchical absolutism, the pontificate and the nascent Society of Jesus. In a nutshell, real power transforms the Church into an important instrument for guaranteeing the political and unifying unity of faith and conscience. This means an affinity between Ignatian missionary activity and political domination.

In short, to educate was to colonize. Thus, in colonial Brazil, the Jesuits are protagonists of this ambivalent pedagogy, whose synthesis can be this to educate is to colonize. However, its primordial activity is abruptly interrupted by the reform. (ROMANELLI, 2001, P.58).

3.1 EDUCATION IN THE COLONIAL PERIOD

In the Brazilian colonial period education was based between three institutional spheres that were: the School, the Church and the Society involving the political and the economic. At this stage the colonizers wanted in any way to impose their European ideas, thus framing people to the social

values that they defended as being good for society, in this period education merged and confused with the court.

Paraphrasing, with the author (RIBEIRO, 1998, p.39), it is emphasized that everything goes through the issue of Religious Education, as a form of evangelization for slaves, that is, the role of the Church and Education was to catechize, since, this was the agreement between the Pope and the Portuguese Crown.

Public education in this period should be free, secular and for all, but it is quite true that at this moment religion is linked to the ideological thought of the State, which consisted in the bourgeoisie taking the place of the religious hierarchy, and education would come to be thought of as the ideal of the ruling class, with its interests and values.

Still in this period, the school and the educator suffer from a broad and unitary project, which aimed only to dominate the blacks and the Indians to only thus become belonging to the Christian faith, and whose administration was in charge of the State and the Church.

This fact demonstrates very well that the project of the Portuguese colonizers was truly to conquer the Gentiles to the Catholic faith, to only thus keep them in a state of submission to the objectives of the Portuguese crown, since it is known that the Jesuits landed together with the Portuguese colonizers, to impose their religion here converting everyone to Christianity.

3.1.1 Education in the Imperial period

Education in the imperial period did not change much figure, all because the Roman Catholic Religion was the official religion of the Empire, soon education began to be covered up and submitted to the Metropolis as an ideological apparatus, since at that time the Church owned a vast economic and cultural heritage and did not conflict with the court, not to mention that it worked with education, even though it was the role of the State.

It is also worth mentioning that the Church in this period had its interests there, that of evangelizing by preaching or imposing the Roman Catholic apostolic doctrine. In this imperial phase the Religious Teaching continued still in the form of catechesis, aiming to indoctrinate the Indians and blacks, as well as the subaltern classes.

3.1.2 Education in the Republican Period

In the republican period the Catholic Educational Education was going through a crisis, because a new regime that emerged in 1891 calls for the separation of the State and the Church.

This was the first drafting of the first Constitution of the Republic to guide Brazilian Education. This statement wants to show that teaching could or should only be given in some specific establishments, such as religious schools and no longer in those maintained by the Government. That

line of thinking was influenced by the ideals of religious freedom governed by the principle of the secularity of the State, according to the French conception.

This is what is contained in the speech of a large number of parliamentarians who acted in the Constituent Assembly and in the implementation of the new regime. Subsequently, by the leadership of the pioneers of new education, from the 30s, this idea is intensified.

4 ETHICS AND MORALS AS CURRICULAR COMPONENTS

The choices of human beings imply consequences that, in turn, in the collectivity, bring to light the contrast between reality and ideas of reality or behavior. Thus, man, inserted in the social environment, realizes that he must answer for his choices, in the collectivity, from his ethical reflection, before the morality that governs this ethics. For Freire (1996, p.38), "the formative character of the educational exercise requires the embodiment of words by example", so the teacher cannot be inconsistent with what he teaches or in this case the teacher cannot fall into the old saying: do what I say and do not do what I do. This perspective is also contemplated in the Curricular Parameters of the third and fourth cycles of Elementary School, which explain:

> The proposal of the National Curricular Parameters is that the ethics expressed in the construction of the principles of mutual respect, justice, dialogue and solidarity be a reflection on the various human actions and that the school considers the school life as a basis for its learning, with no mismatch between what it says and what it does. From this perspective, the transversal theme Ethics brings the proposal that the school performs a work that enables the development of moral autonomy, which depends more on favorable life experiences than on discourses and repression. (BRAZIL, 1998, p.66).

In this sense, the child, in the first years of schooling, is already awakening to the analysis of the intentionality of his actions and the actions of others. In this way teachers are targets of these analyses between what is said and what is done, it becomes even more relevant to the teacher-student relationship. This requires teachers to maintain, even more, an ethical stance.

Ethics is theory and morality is practice, in this perspective, the teacher must enable students theoretical or practical alternatives, leading them to know values of what is right, of the that is wrong, of what is good, of what is not good, that is, indicating social and cultural values, through their lifestyle.

In this way the value structure is personal and is built by people in their personal history, through the internalization of what they live in their reality. In this case, the school can be the only opportunity for parameter and access to reflection on values, ethics, morals, conducts and possibilities. For Duska and Whellan (1994, p.106). The facts that influence moral development are: the social environment, cognitive development, empathy and cognitive conflict.

All training presupposes time within the social environment of coexistence of the individual and pedagogical intervention, so to grow morally does not only mean to change one's opinion about a

particular problem, but to transform the way of reasoning, expanding one's own vision to include in it criteria of judgment not yet considered (DUSKA; WHELLA, 1994, p.104).

In this perspective, cognitive development enables the student to perceive the multiple variables that involve a phenomenon and how they are articulated and moral development allows the reflection of these variables in the ethical dimension. As values and principles are abstract concepts, it is necessary that the educator enables learners to develop the capacity for abstraction, to understand concepts, knowing how to articulate them to practical life and their experience of the world.

Regarding cognitive conflict, Duska and Whellan explain:

> Creating cognitive stimulation in a moral education program means disturbing the balance of the individual, creating a situation in which he, faced with a problem to be solved, experiences a conflict such that it leads him to the realization that current structures of his reasoning are too limited to include the new perspectives that the conflict presents. Cognitive conflict is experienced only when the new considerations introduced come from a moral stage higher than the usual stage of reasoning. (DUSKA and WHELLAN, 1994, p.106).

In this perspective, the discussions mediated by the teachers, about the ethical and moral dilemmas from problem-situations, leads the student to face issues not yet thought of and singular, therefore, challenging. Thus, the teacher should enable the student to raise hypotheses about the variables implied in the situation, about the possible relationships established between these variables, especially those of cause and consequence; Perform Comparisons; imagine processes that triggered the problem and that can be triggered by it; seek information that validates or not the hypotheses raised; Socialize experiences and points of view, understanding the problem-situation more broadly and more deeply.

Empathy, that is, the ability to emotionally understand another person, to put oneself in the other's shoes, must also be developed. It can be mediated by the teacher at different times, for example, when he dialogues with the student about the actions of this and the consequences of them for his and for other lives; when it enables the student to conjecture actions and their possible repercussions; when the two dialogue about events or experiences that impacted the educator's own life and how he made decisions in the face of the circumstance; when the teacher contributes to the student to perceive and reflect on their own feelings (DUSKA; WHELLA, 1994, p. 110).

In addition, enabling the reading of literary texts and participating in plays and films, discussing about stories, reflecting on the conduct of the characters, can also contribute to the student putting himself in the place of other people (even if fictional) and see life from other perspectives, considering feelings and points of view different from his own. Fostering dialogue, the reading of art and cultural experiences in general is relevant to empathic development.

4.2 ETHICS AND MORALS IN PRESCHOOL

We are currently experiencing a crisis of values. This crisis is identified by the existence of prejudice and discrimination, the lack of respect for people from different groups and intolerance. Parents no longer know how to educate their children, because if they consider the values transmitted by tradition to be outdated, they are also undecided about what values to employ in the education of their children. Usually, they end up handing over their children's education to the school hoping that it will "liberate" them from bad manners.

Children and adolescents are unaccustomed to experiencing and respecting limits that aim to ensure the survival of themselves and the group in which they are inserted, revealing themselves to be selfish and insensitive.

Teachers don't know what to do to set these limits, because the sanctions they once used have become ineffective. In this context, the study of ethics and questions of morality in the formation of the individual is essential as a work proposal of early childhood education offered, especially in school.

For Silva (2002, p. 246), "this virtue is in the reflection of each attitude, subordinating it to the principle of valuing life". Ethics, which can and should occur in the school, requires, both in the classroom and in the whole establishment, and in proportion to the age of the students, that they take an active part in the deliberation and exercise of responsibilities and cultural diversities.

In any school, these crises require a response from the educator, who, through his posture when dealing with the situation, interferes in the construction of the child's moral judgment. These crises generate an insecurity in educators, because they do not want to be authoritarian, imitating the model by which they were probably taught, but they also do not know how to act, without authoritarianism, to establish order in the room. Due to this lack of preparation of teachers, children end up being led to tyranny, for lack of internal limits, or on the contrary, to passivity, a consequence of excessive authoritarianism on the part of adults.

In addition, it is perceived that the fundamental role of early childhood education is not always recognized by professionals working in this area. The training of these professionals is precarious, and often catechizing when ministering religious themes, which leads them to base their pedagogical work on common sense and not on a serious and consistent scientific study based on the National Curriculum Parameters (PCNs), Laws of Guidelines and Base (LBD) and the Curricular Reference of Early Childhood Education (RCNEI).

5 RELIGION, ETHICS AND MORALS IN THE LEARNER'S FAMILY

Starting from the principle that education would be a social and systematic practice, whose purposes and social function would be to form the subjectivity of the individual, so that he internalizes and practically reproduces the socially accepted cultural content, that is, that he is socialized, inserted

in the social and cultural environment where he lives, it can be said that religious education would be, in the final analysis, a process of specific methodical socialization, usually institutionalized, in order to make individuals learn the set of principles, teachings, rules of coexistence, patterns of behavior and conceptions of the world proper to the religious perspectives that circulate in different social spaces, within the family, the literature of a theological nature, in religious institutions, such as: churches, temples, seminaries, community, media and among others.

Another important element to be considered by the school is the religious knowledge acquired by families as a form of mediation in the relationship of individuals with the world. Faced with their conceptions, the different religions existing in a plural society, which guide individuals through codes of moral conduct, establishing different values and forms of behavior. School education is an important element to structure the ethical behavior of individuals in the face of their religious conceptions.

Religions refer to the culture and the first forms of knowledge of the world, relating to human life and survival in relation to the environment in which it is subjected. These systems present peculiar characteristics in relation to their discursive and argumentative structure. Religious knowledge is inspirational, relying on doctrines that contain sacred, evaluative propositions because they have been revealed by the supernatural.

We can observe in this case that religion is one of the appropriate knowledge for the transmission of moral values in the family of the learner. The concept of morality refers to the manner and character of one's own behavior. Morality is the differentiation of intentions, decisions and actions that are more appropriate and those that are inappropriate to a society, with defined historical time and space. Morality connects with the culture and collective consciousness transmitted through the cultural interactions existing between individuals.

In this way the concept of morality carries with it a strong element of static and permanence of values that will be strengthened in religious knowledge based on faith. Individuals, through culture (tradition and customs), acquire moral values. In this case, one can understand religion as a complex knowledge that morals for the transmission of knowledge because it involves the relationship between real and spiritual world.

Morality is associated with the values and conventions collectively established by each culture or by each society, organizing itself from the individual conscience and its attitudes. Principles such as honesty, kindness, respect, virtue, and among others, taught by the family, determine the moral sense of each individual, because they lead human behavior through universal values, guided by the inclusion and harmony of the group or society that built and transmitted these moral values. Morality and religion are also closely related to historical societies of low and medium complexity such as band, horde, tribal, ancient or medieval society (DURKHEIM, 1973, p.79).

At this point, the school has the mission of unveiling naturalized preconceptions in everyday relationships and a world in constant transformation. In addition to ethical conceptions, the school must provide the strengthening of moral values for the construction of character and the strengthening of social ties, affected in the face of major contemporary transformations.

6 METHODOLOGY

The research had a qualitative nature because it intends to seek in theorists the diverse points of view on the theme from the subjectivity of each author. According to Minayo (2010, p.55), in qualitative research: the researcher seeks to reduce the distance between theory, context and action: The personal experiences of the researcher are important elements in the analysis and understanding of the phenomena studied.

The research used hermeneutics as a way to interpret the various texts seeking the vision of each author and their possible contribution. Firstly, we started with a bibliographic search in the UEA library and on the internet looking for books and articles. Second, we read, file and analyze all the material collected. Third, we did the textual production.

These studies also represent a level of ordering and classification analysis. However, based on descriptive studies, they can be used to analyze the role of variables that influence the appearance of phenomena, as well as to identify the specific variables that are important to explain complex characteristics of a problem or behavior (RICHARDSON, 2010, p.66).

It was according to this idea that the bibliographic research was guided, where it was sought to understand through authors related to the theme developed in this work. Based on this perspective, the research was motivated by the interest in better understanding how education based on religion worked and still works in the development of learning, understanding the contribution of the school in the ethical and moral formation of the students.

7 ANALYSIS OF RESULTS

To know the relevance of religion in the promotion of ethical and moral values in school it is necessary to ask what are the most important values among students to be included in the contents of the classes and contribute to their ethical and moral formation?

According to Gunther, (2006, p.34) the means of data representations of any investigation, are closely linked to data collection techniques. When choosing the media, the images or ideas are already concatenated.

The relevance of religion in the promotion of ethical and moral values in school can turn out to be very great. For this it needs to be articulated to the programmatic contents and must

Respect the various cultures existing in the school without imposing rules, but ¸ teach ethical and moral concepts such as: freedom, justice, equality, fraternity, respect.

And what would be the values to be worked on in an interdisciplinary way? The LDB itself (Law No. 9,394/96), strengthens and guarantees to the student the function of the school in teaching values for the formation of citizenship. In its articles 1, 2 and 35 (paragraphs II and III), it states that education should be through the integration of the student with family and social life. Education is the duty of the family and the state, and should be inspired by the principles of freedom, which is developed in the relationship between the student and family life, in human coexistence, at work, in teaching and research institutions, in social movements and civil society organizations and in cultural manifestations, which covers all spheres of educational stimuli to which individuals are subject in the formative process.

In the contemporary world, religion has become an important field of many discussions about the behavior and ethical and moral values of individuals who interact and relate in society. Ethics is its discussion, human praxis presents itself as a questioning and reflective matter about morality. Through religion it is possible to promote discussions about what is or is not, and what is right or wrong, using reason in favor of the common good.

Kant (1974) emphasizes education as the center of the moral field, referring to the idea that to have autonomy it is necessary to produce reason and universality: "how could we make men happy, if we do not become moral and wise."' (KANT, 1974, p.28). In this way, to have a general and uniform conduct from the behavior of autonomous individuals, capable of making decisions to make choices.

According to Kant (1974), the human being has the ability to be the author of his ideas and his acts so that the individual can have autonomy: "when the individual is born he brings with him the understanding necessary to live in society, these being acquired through education". (KANT, 1974, p.15). According to the author, the individual at birth needs a guidance of conduct, which does not define his future. Only reason can free the individual from the lesser age leading him to the greatest age.

According to Freire (1996, p.4) only "A pedagogy based on ethics, respect for the dignity and autonomy of the learner and a progressive teacher". It will have a possibility of social transformation.

In Brazil, the main element for the promotion of autonomy is literacy and awareness of the social condition of individuals. For him, the best way to discuss ethics in the classroom is to promote respect for difference and to value otherness, recognizing that no knowledge is absolute. The school must enable the student to reflect on knowledge and that everyone must assume responsibility for human conduct in society.

The school is an ideal environment for practice and learning of ethics, in addition to forming character, students can work religion, ethics and morals respecting the limits, teaching solidarity, peace, justice and love.

It is essential to apply these themes in the classroom, because the school is directly related to social coexistence, collaborating for the adjustment of society, this will be possible when the school works in a motivational way, as proposals we have:

a) Conceptual activity - What is ethics, morals, religion? By providing this question to students, everyone will be able to speak. It is up to the teacher to establish a teaching method capable of establishing mediation knowledge about the questions posed by him. Activities that involve creative and participatory solutions are ideal.

b) Relational exercise - Is it possible to relate to different people? As people are very different, learn to respect diversity, to obtain good social conviviality, practicing moral and ethical values.

c) Decision initiative - The extremes of a single situation. Reflection instead of delivering ready-made answers of what should or should not be done. We can consider extreme situations such as: embezzlement of money in electoral campaigns, murder, pasting in the test, taking a seat preferences when elderly people stand up, lying on the curriculum and among other extreme cases.

d) Talk about boundaries – can we ask students what they would do if risky situations compromised their family or friends, someone they loved? What rules would they be willing to break to help or save these people? The teacher can help in reflecting on the importance and influence of relationships in their ethical decisions and how others, close or not, can be affected.

e) Establish rules - The teacher can establish in the classroom a code of ethical conduct to provide reflection on what students think they are and what they really do, provoking debates and a lot of interaction between different points of view.

In the context of each classroom, according to the level of training of the students, the teacher should think of situations, in which they themselves can establish a personal rule of conduct with, for example, I will never speak badly or hit my colleagues or anyone else. From this choice, rules are placed to be followed. Ask if, if he is attacked, he will not defend himself? What is the limit of patience not to get angry with the colleague? About speaking ill of someone or disrespecting the teacher? With these tips, in addition to making them more aware citizens, teachers will also be able to pass on to students principles and attitudes such as; solidarity, democratic experience, self-respect and rationality.

We can affirm that it is important an education based on ethical and moral values, prioritizing common rules and values, which enable inclusion, otherness, respect, religious tolerance, justice and

equity. Having as subsidy the National Curricular Parameters in which it presents the transversal themes – Religion, Ethics and Morals.

8 FINAL CONSIDERATIONS

Considering that there are several laws throughout the world with the intention of maintaining the social order, and that even then, not being obeyed, they cause confusion in such societies, as to what can or cannot be done, what is right or wrong, ethical or unethical, moral or immoral, in this way they become ineffective in their main objective.

Therefore, and if, as mentioned in previous topics, the Ethics and Morals promoted by Religion need to be inserted in the pedagogical actions of schools, and in all areas of knowledge, in this way it is possible an education with ethical and moral principles where teaching goes far beyond reading and writing.

Based on the National Curricular Parameters - PCNs, the National Curricular Reference of Early Childhood Education - RCNEI and the Law of Guidelines and Base - LDB informs us how important it is to teach ethics and morals in the classroom, although most of the values and customs of students come from the family, But, it is in school that they will be stoned and oriented to be a citizen of respect, understanding, tolerant, able to interact socially, promoting peace, social equality and love for others, being the same inserted in any religious group, understand by school teachings religious tolerance and plurality of the same.

Thus, as important as it is to contextualize religious freedom as a human right, its proper understanding becomes possible only if combined with a focus that permeates all aspects of religion, seen, here, as necessary for a complete formation of the citizen.

However, there is still much to be done and discussed about the importance of religion in the promotion of ethical and moral values in school, as a transforming agent of concepts and attitudes that aim to guide, instruct so that we have a more just, more cohesive society and less violent, where true social values are highlighted, such as: virtues, love of neighbor and compassion.

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The autonomy of the student of higher education at a distance: In the discipline of methodology of teaching in higher education

https://doi.org/10.56238/ptoketheeducati-015

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ABSTRACT
In this work we seek to discuss and present some issues related to the autonomy of higher education students in the distance learning modality. We begin our discussion seeking to identify and characterize some of the factors that may impair the autonomy of students in their education, and then investigate the aspects that can contribute to motivate, stimulate and strengthen the autonomy of students, both for learning and research, as well as in their continuing education.

Keywords: Higher Education, Student, Learning, Autonomy.

1 INTRODUCTION

For the teaching/learning process to be effective it is necessary to have the commitment and commitment of the teacher to teach and be a cooperator or mediator with him. On the other hand, it is also essential that the student is motivated and interested in knowledge, which ends up generating a certain autonomy, which is essential in teaching/learning and integral formation of the human being. This is one of the goals that education professionals want to achieve, in addition to passing on the knowledge of their area. So the theme The Autonomy of the Student of Higher Education in EAD in the Discipline of Methodology of Education in Higher Education is relevant to the present time, in order to detect the problem, observe factors that hinder and others that can contribute to the collaboration and formation of the individual. In addition, the current emphasis of the teaching/learning process is the competencies to be developed in the student and that becomes the protagonist of their training.

Currently the labor market requires experience and training of professionals. Many worry about earning a title and/or certificate so they can have their job. Others to earn a pay raise. However, there are also many who are not concerned with learning and knowledge and continuing education. They do not seek to deepen their knowledge and skills. Some lean on colleagues, plagiarize, waste a lot of time

on social media, reality TV, games, etc. Many still do not find those who encourage them to study and train, for various reasons.

Society has always had the need to have in its midst people with experiences in various social contexts, such as: integral formation, interested and involved with various issues, who have their opinions formed and there is no different when they are alone or depending on the situations, or according to the people with whom they live. The world and society need people who are aware, critical, and engaged in the common welfare.

The personal motivation in relation to the research is related to the interest in the theme, also the continuing education, the perception of the social, ethical and moral problems of the human being and the continuous search not to annul, forget and break achievements achieved, but increasingly seeking improvement and improvement.

This work will involve Bibliographic Research of renowned authors in the area of education that address the theme directly and indirectly, as well as other authors and articles that can assist in this task. This research wants to address only some aspects on the subject, even knowing that the theme is broad, current and of paramount importance for education and society.

Among the authors to be cited we can find, such as, for example, Freire (1996), who in his book Pedagogy of Autonomy seeks to show that "the human being is inconclusive, constantly needs curiosity, in a permanent movement of search and search". He does not conform to self-indulgence or to the thought that we can do nothing against social reality.

Another author researched is Moacir Gadotti (1997), who in his book Escola Cidadã talks among several subjects related to school and learning that it should also be involved with the autonomy of students, preparing them to be autonomous citizens, changing a little the emphasis of current education, which seems to still be contentist and functionalist.

In the same way will be pointed out the LDB itself, Laws of Guidelines and Bases of National Education, number 9,394, of December 20, 1996, in its Article 43, item IV, says that "knowledge is the heritage of humanity and that it must be disclosed". It is also interesting to analyze item V, because it shows us that it is necessary to "arouse the permanent desire for cultural and professional improvement in the individual, incorporating and integrating into the world and life", as one of the primary purposes of education.

2 THE IMPORTANCE OF THE FAMILY IN THE INTEGRAL FORMATION OF THE INDIVIDUAL

According to Medeiros (2003), dealing with early childhood education and analyzing the family, which also has an influence on students of higher education, addresses an important issue. According to her, the family has undergone changes, because they have also happened in the

socioeconomic fields, especially with the rise of capitalism, the arrival of globalization and the advancement of digital technologies, thus also affecting the molds of the family, morals, ethics.

In society the family still remains indispensable and the center of education, reference, love and support, is the *mater cell*, where values are initiated and practiced through daily life. It is in the family where the first teachings begin, although not systematized and programmed as in formal education, but no less important, although when the individual enters the professional field informal education becomes insufficient, because for the emancipation of the citizen it is necessary to have a systematized learning.

In the education and training of individuals, the family and the school are very important, as stated in the LDB of National Education, Law number 9,394/96, in its Article 2, which says that together with the State education is also the responsibility of the Family. Both are engaged in this role. However, the functions of the State and the family are different, however, one does not cancel out the other, nor do they compete or diverge from each other, nor do they replace, but they should add, add and complement teachings necessary for the formation and life of each student of Higher Education. Although, according to WEIS (2005), the family is sick, increasingly distant, does not really assume its role and is losing its authority. This factor undoubtedly implies the autonomy of the students.

We also know how much the mass media have an influence on individuals and households. It is enough to observe how much people are updated with the news that passes on television, however in many other relevant aspects of life and society they are totally alienated.

3 THE BRAZILIAN SOCIOECONOMIC AND EDUCATIONAL SITUATION

Although there have been many changes in Brazilian society, unfortunately still a large part of society is in very low socioeconomic conditions, even though there are social programs in Brazil to eradicate poverty. Consequently, the level of education and learning is conditioned or linked to these factors. We know that all this influences people's awareness and critical spirit in the face of reality and social problems. In addition, we constantly see problems in politics and ethics, as well as with licit and illicit drugs and in people's morals. This sum of factors is an aggravating factor to the individual, because it can lead to self-indulgence, discouragement and to act in the same way, because around him apparently everyone acts in the same way.

Another factor that affects society is the devaluation of teachers, which automatically affects education, including at the higher level. These should be prepared, have a continuous and adequate training, have didactic materials and resources available so that they can perform their function and meet the needs of students. It would be necessary to have a more intense policy of incentive for education professionals to make a continuation of their training, which would have practical results in the classroom and resulting in a much better education.

Some teachers to be able to receive more at the end of the month and meet the family budget accumulate functions and jobs. In this way they are often tired, disinterested and unmotivated when it comes to working in the classrooms. We need to invest in education and education workers so that future generations can enjoy an improved society.

4 EAD: A NEW MODALITY OF EDUCATION

In the current world, according to BELLONI (2008), changes have occurred at a very fast pace, including in the field of information and communication. With globalization, it brought changes at all levels of society and interfered in the structures of education, still changing lifestyles, consumption, creating different ways of seeing the world and new ways of learning.

From the 90s, with the social and economic transformations, a gap was created between the educational systems and the social demands and the EAD was a way to reach the social demands and the particular search for formation. This form of teaching/learning has consolidated itself as a new way of teaching and learning. To do so, it was necessary to reformulate curricula and methods, without neglecting the scientific spirit and research skills, according to Belloni (2008, p. 5).

Currently there are many courses offered by EAD. Although there are tutors and the website of the teaching entity itself has a lot of support material, it is perceived that there should be a much greater interest, self-discipline and autonomy on the part of the student than perhaps in the face-to-face courses.

5 THE ROLE OF EDUCATION IN HIGHER EDUCATION

Education is the means by which the human being is trained, instrumentalized, becomes able to be inserted in professional sectors, to participate in the development of Brazilian society, and to collaborate in its continuous formation. The informal education received on a day-to-day basis is not enough to qualify citizens to perform their profession well. For this, Higher Education Institutions are organized and seek to adapt their curricula and methods according to current laws and social demands. According to LDB:

> To train graduates in the different areas of knowledge, able to enter professional sectors and to participate in the development of Brazilian society, and to collaborate in their continuous training. (LDB, Art. 43, II, 1996)

We have already seen that new discoveries of knowledge, technologies and so many other factors make people need constant learning, updating and improvement, so that they can be active, competent, aware, critical and determined citizens. In this way they can learn about the knowledge already achieved by science, which is the patrimony of humanity, and contribute to the environment

in which they live, whether in the family, society, NGOs, governmental, philanthropic or private entities, churches, etc.

> To encourage the work of research and scientific investigation, aiming at the development of science and technology and the creation and diffusion of culture, and thus develop the understanding of man and the environment in which he lives. (LDB, Art. 43, III, 1996).

For education to achieve its objectives we need prepared teachers, structures focused on education, knowledge, methods, curricula and the indispensable presence of the student, who in turn needs to correspond with the teaching/learning process with his presence and interest. The student must be ready to receive knowledge, willing to participate in the process of education and know that knowledge is continued, it is a permanent search for knowledge.

> To arouse the permanent desire for cultural and professional improvement and to enable the corresponding concretization, integrating the knowledge that is being acquired in an intellectual structure that systematizes the knowledge of each generation. (LDB, Art. 43, V, 1996).

The human being is an inconclusive being, he will always have something new to learn, since the world constantly undergoes transformation. Technologies evolve every day, and the human being, regardless of the area in which he works needs to update. Even in homes, where children attend school, college or university, or someone ends up having contact with new technologies or knowledge, or in their own coexistence, individuals face new situations, discoveries and challenges that they need to face, according to Freire (1996, p. 58):

> It is in the incompletion of being, which is known as such, that education is founded as a permanent process. Women and men became educable to the extent that they recognized themselves as unfinished. It was not education that made women and men educable, but the awareness of their incompletion is what generated educability.

We can affirm that knowledge and education are one as an endless, unfinished path, a permanent process. Also change the technologies and people change their customs, way of acting and thinking. Therefore, each and every professional needs to deepen and update. In education, especially at the higher level, the same thing happens, perhaps more intensely than at other levels, because they are adults and many have already entered the labor market.

6 THE AUTONOMY OF THE STUDENT OF HIGHER EDUCATION

Until the nineteenth and early twentieth centuries we had an Education that is classified by theorists as being "traditional", where the teacher was the one who held the knowledge and transmitted it to the student. From new lines of thought and theoretics, this has been changing and the student is seen as being the subject of his own learning. This new school period may have been wrong to let

education focus only on the interest of the student and the immediate needs of the student and the group to determine the axis or direction of education.

Meanwhile, the socio-historical conception, whose main theorist is L. S. Vygotsky, which suggests that man is an active, social and historical being, that the current society is a historical production of men, we are today the result of what has accumulated to the present day, and so through us tomorrow there will be another reality. Therefore, qualified professionals in teaching / learning can give space to opinions, desires and desires, however, do not lose sight of the objectives, goals, skills, knowledge and other qualifications that the courses and training seek.

There are many factors that contribute to teaching/learning, some have been cited by education experts, but it is also important to highlight especially the commitment of teachers and students to education and the good relationship between them, which Vygotsky calls affectivity, which can contribute to the teaching/learning process, according to Libâneo (1990, p. 24):

> In dialogue, as a basic method, the relationship is horizontal; where educator and students position themselves as subjects of the act of knowledge. The criterion of good relationship is the total identification with the people, without which the pedagogical relationship loses consistency.

In Higher Education it is expected that students are more mature than in Elementary and High School, because many are already professionals who work in various professions of society, already have life experience and their personality and identity formed. Even so, the human being is a social being, not a purely rational one. Their integral formation also involves well-being, being well-liked, being loved and respected.

Everyone knows, according to Belloni (2008), the importance of the integral formation of the human being and gradually the social demands also require more and more professionals with multiple capacities, who know how to work in teams and have good interpersonal relationships, who incessantly seek for updating and improvement, who are able to learn new concepts and techniques, capable of facing different and even adverse situations, be responsible, flexible, cooperative and control over yourself.

> Contemporary societies and those of the near future, in which the generations that now enter schools will act, require a new type of individual and worker in all economic sectors: the emphasis will be on the need for multiple competencies of the individual, on teamwork, on the ability to learn and to adapt to new situations. To survive in society and integrate into the labor market of the twenty-first century, the individual needs to develop a series of new skills: self-management (ability to organize his own work), problem solving, adaptability and flexibility in the face of new tasks, take responsibility and learn for himself and constantly work in a group in a cooperative and little hierarchical way. (BELLONI, 2008, p. 5)

According to HUEW, autonomy is attributed to those who are able to dominate or determine, through their reason, their behavior, act, think and take responsibility. It is unlike the one who

accomplishes all this from others, without having his own personality and behavior, without having the commitment, purpose and motivation to go in pursuit of his goals.

> Autonomy derives from the Greek *autos* (by itself) and *nomos* (law), comprises the power to determine oneself the law itself. It is contrary to *heterotomy,* a law that proceeds from another, *hetero* (other) and *nomos* (law). To be autonomous is to be able to think, to act, to transform, to make use of one's own reason, to decide for oneself about one's acts and choices, to take responsibility for one's judgments and actions, to assume oneself as a social subject, with the freedom to choose one's path and to walk it with one's own legs.
> (HUEW, Elisa Lioe Teh. The Importance of Autonomy in Foreign Language Learning for Free Course Students. Available at: http://www.veramenezes.com/elisa.htm. Accessed 2013-01-22)

The autonomous student or learner, in addition to being responsible, motivated and interested, is able to manage his time, life, purposes, learning, have clear goals, know what is important, is productive, knows how to evaluate, knows his tastes and qualities and does not need to wait for the initiative of others to direct his life.

> Most authors agree with the definition of autonomous learner as that student who has the ability to control their own learning, and to take responsibility for all decisions regarding all aspects of their learning, such as determining the objectives to be achieved, defining the content, evaluating how they are doing, among others. The autonomous student knows what his preferences are, his ability and ability, and is aware of his limits. For Dickinson (1995), autonomous students become more motivated, and with this, autonomy contributes to a more efficient work. He further cites Knowles (1975), who says that there is compelling evidence that people who take the initiative to learn – the so-called proactive students – learn more things and better than people who sit in front of the teacher, passively waiting to be taught (reactive students). (HUEW, Elisa Lioe Teh. The Importance of Autonomy in Foreign Language Learning for Free Course Students. Available at: http://www.veramenezes.com/elisa.htm. accessed on: 22/01/2013)

Student autonomy is not only the control of the student over the planning, execution and evolution of his work. He needs to learn to reflect, analyze, be critical, capable, responsible and active, escaping from the commodity and influence of others. You also need to test, experiment, and substantiate your knowledge. Go in search of new proposals, discoveries and consider those already existing, in a reflective and critical spirit, both in the field of knowledge, science, theorists and social reality where he lives, according to Oliveira and Nunes (2011):

> Current technological and multimedia advances corroborate the idea that the act of educating cannot be understood as a simple transmission of knowledge. The instrumental-technicist model does not account for education in its formative totality. It is insufficient to form the learner into a man and a citizen. The schools that follow this model do not manage to form individuals capable of reflecting, of issuing their own and autonomous judgments, they do not seek to develop in the student a way of thinking correctly. All thought and action are imposed and determined by others or by circumstances external to them, thus transforming them into passive subjects and incapable of reaction and transformation of themselves or the environment that surrounds them. To educate is more than transmitting knowledge, it is to guide and guide the subject so that he becomes capable of exercising his freedom and is able to determine himself, whether in the scope of theory or action. Exercising their capacity for reflection and the realization of their particular projects, understanding themselves as subjects and citizens of the world.

Due to the social demands regarding the training and need for professionals to be very high and the conventional Higher Education, with face-to-face classes, do not give account, the courses by distance education are reaching such a large field of action in Brazil, although in other countries there is more fear. However, many students are not prepared and able for this type of training, because they lack determination and autonomy. Perhaps many opt for this modality for the sake of time and cost, but when faced with the demands end up abandoning their training by distance learning. They are mistaken to think that in face-to-face courses they will not be challenged in so many activities and it will be indispensable for their good professional and integral training, a good dose of personal autonomy, according to Oliveira and Nunes (2011):

> The point is that many of those who propose to study at a distance do not seem to be prepared to deal with this teaching model, they do not have the necessary autonomy to face the necessary challenges that a distance course requires. There are many students who drop out of courses at the beginning. The dropout rate has far exceeded that of face-to-face courses. The central and worrying factor is that the challenges that arise for the student of this modality should not be restricted to it, they should not be only a requirement for distance education courses, but for any teaching modality. The autonomous attitude should be required in any educational process, whether in family education, at school or in face-to-face or distance courses.

According to BELLONI apud TRINDADE, Higher Education Institutions by distance education do their best to adapt and adapt the teaching/learning process to students or users, through the fractionation of the services provided and producing smaller modules, which would make the process and the knowledge itself accessible.

> In the same way that in the company the management models lead to changes in the work and management processes, in the educational field, and in distance education in particular, the model of the large specialized provider, producing standardized education for a mass market, would tend to transform. The adaptation of the services to the individual profile of the user can be achieved through the fractionation of education and training services into smaller modules, which would facilitate the choice and composition of a personalized "menu" (TRINDADE, 1998). This perspective, however, will require from the student user self-study and self-management skills that perhaps many of the young adults who seek distance education have not developed. (BELLONI, 2003, p. 19)

In order for the student of Methodology of Higher Education Education to conquer this specialty and the proposed competences, it is necessary to have their involvement, incessant search, discipline, adaptation and perseverance in the stages of this formation, according to Gadotti (1997, p. 12):

> [...]" Autonomy is a preparation for the life of the citizen, all the better, the more it replaces in it the concrete exercise and experience of civic life to the theoretical and verbal lesson" [...].

For GADOTTI (1997), both education and autonomy, which is the result of education, should lead the individual to act in the environment in which he lives, putting into practice everything he has learned, so that knowledge does not remain only in theory or in the field of ideas. So that your

contribution can bring positive results to humanity, its history and culture. Having practical results from your contribution you can also find motivation not to give up, seek more knowledge and better understand the world in which you live, always seeking improvements.

7 FINAL CONSIDERATIONS

With all the aspects addressed in this research we can observe that autonomy is not only necessary in distance education, but in any form of education or education system, as well as in other areas of knowledge or in professional or individual life, so that each and every individual can be effective in what they do. However, in a UOL research, according to IZUMI (2013), citing Guibert's response, in distance education the autonomy of the student is much more important and necessary.

> [...] "Distance learning proposed by competent educational institutions may require much more work than in a face-to-face classroom. For you to assimilate knowledge, you have to program yourself, have discipline, make the commitment to study with autonomy, managing your schedules. For those who enter a qualified course, know that they will have to work hard to obtain the diploma" [...]

Even the autonomous student still needs to expose himself and put into practice his learning. Experiment and test your knowledge, and be able to reassess whether you are indeed headed in the right direction. Have a researcher's spirit, so that you notice what various authors say about the subjects and new or platform, the forums and the extra works. Also a course plan and the approval of the MEC (Ministry of Education), which guarantee the quality of teaching / learning. In addition, there are the student service centers and tutor teachers, who constantly help, support and guide the students.

In distance learning, there are sufficient conditions for the student to develop skills, abilities and knowledge. It is also an opportunity to have some training in cities or municipalities where there are no face-to-face Higher Education units. Higher Education Institutions have in EAD a noble opportunity to bring training, knowledge and research to many regions and people.

This research, therefore, does not want to defend and adhere to the thinking of the New School, a current that defends that the student is the holder of the central and primordial role of education, which considers the teacher only as a facilitator of the teaching/learning process, having a secondary role of education. The objective is to show how important it is to the students their participation, interest, effort, dedication, motivation and also be an active subject of their training.

When the authors talk about autonomy, they talk about the importance of the student being active and co-author of their training and that it is also important that the autonomous student can be tested, experienced and evaluated. Therefore, even in distance education the student undergoes assessments, monitoring and guidance from professionals more qualified than him, so that he can progress and not be stagnant in his doubts and limited to his point of view.

Thus, it is perceived that the teaching/learning process is a continuous and permanent process. That it is always important to review, reassess, confront, analyze and observe the new challenges that each epoch and experiences bring.

For GADOTTI (1997, p. 10), "there is no absolute autonomy, it will always be relative and conditioned to circumstances". Thus, we realize the relevance of the proposed theme, such as teachers and students of distance education, in the discipline of Methodology of Higher Education Education and others, so that we investigate more about the autonomy of the student, problems that hinder, possible solutions, factors that motivate and that can promote social and individual well-being.

The autonomy of the individual will always remain a goal of educators and goal of learners, as provided for in the laws. The goal of education is not only the transmission of knowledge, but also the ethical, citizen, professional and integral formation of the human being.

Students can build knowledge and skills to contribute to society, improve their lives, not only in the financial aspect, but also bring benefits to the community. Thus, we can form critical, responsible, helpful, ethical and autonomous citizens.

The Autonomy of the Higher Education Student in distance education becomes indispensable for the student to achieve his goals. In the same way it is necessary for the Educational Institution to also perform its task well, since it does not depend solely on materials, teachers, methods, poles, tutors, but also to form good citizens who are willing to face the challenges and stages that this discipline requires. In this sense, it is also necessary for life, to face challenges, contribute to society and realize dreams.

The affectivity, involvement and interest of teachers can and do help in the formation of students, in addition to collaborating in training can help in motivation and self-esteem, giving them more inspiration, involvement and guidance.

The job market and the modern world demand more and more skills, knowledge and skills. There are several factors that hinder, but there are also numerous reasons to encourage, assist, envision possibilities and set goals for individuals, thus being more autonomous and effective. Thus, this research aimed to raise some important points on the subject, so that we could identify some factors that impair autonomy and possible alternatives to achieve it, knowing that we have much to research and reflect on this theme.

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SEVEN
publicações acadêmicas

Critical Mathematics Education and its contribution to the formation of the historical subject and its emancipation

Crossref doi
https://doi.org/10.56238/ptoketheeducati-016

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ABSTRACT
This article is the result of bibliographical research and literature review directed to Mathematics Education and Citizenship, from critical theory, but without losing the influences of analysis of other currents of thoughts that give possibilities for a dialogue between epistemologos. Thus, it is a brief theoretical reflection, from the thought of Theodor W. Adorno and together with other theoretical references such as: Paulo Freire, Bauman, Morin, and the Danish professor Ole Skovsmose. It is also noteworthy that these authors consider that, from pedagogical practices that stimulate criticality and dialogue, the subject's education will be active, reflective, critical, favoring the strengthening of citizenship. It is in this context that the present work aims to focus and bring the theoretical foundation to the debate of education that aims to provide the creation of a critical and democratic environment inside and outside the classroom. Finally, it is concluded that it is of paramount importance to look at mathematics, which should highlight and add practices of reflection and dialogue, in order to provide the creation of a critical and liberating environment.

Keywords: Education, Critical Mathematics Education, Subject, Citizenship.

1 INTRODUCTION

Starting from this assumption of evolution in the educational sphere, we can turn to some theorists of education to understand the object of study in relation to Mathematics Education and citizenship, from the perspective of an education that seeks and promotes liberation from society, through the bias of critical mathematics.

After studies, readings and research in the disciplines of the Master's Degree in Education, by the Federal University of Mato Grosso, in the Research Line: Education in Sciences and Mathematics Education and in the search to understand the line of thought that underlies critical theory, before the construction of an education that leads us to the formation of the historical subject within his community, we find several motivating theorists: in the Critical Theory of the Frankfurt School, Theodor W. Adorno, who read and reviewed the book Education and Emancipation published by the publisher Paz e Terra, for the first time in 1995, which has a preface by the translator of the work Wolfgang Leo Maar and offers an overview of the relationship between Adorno's thought and his vision of education.

These possibilities, according to the translator of the same work, are only possible through an awareness of the subjects reflected in history. The object of the debate between Adorno and the German jurist Hellmut Becker is education about the sphere of constant concern about the non-repetition of the atrocities committed in the Auschwitz concentration camp[1]. Therefore, in this article we will focus on the relevance with regard to education, from the Critical Theory focused by Adorno and other theorists who walk the path of emancipation, which is listed by Paulo Freire and other theorists, with regard to the relationship with Mathematics Education in the critical approach between education, the object of research, the Quality of Mathematics Education and Citizenship.

Moreover, the basis of the theory developed by Ole Skovsmose, Critical Mathematical Education, allows a certain interaction with Critical Education, based on the Critical Theory of the Frankfurt School, created by the Frankfurt philosophers, Theodor W. Adorno Max Horkheimer and Jürgen Habermas. This school was founded on June 22, 1924 in the auditorium of the University of Frankfurt at a time of great social and political conflicts spread throughout Germany, was a research institute and organ of dissemination of the productions of its associates. In this way, they are known as Critical Theory, which is opposed to Traditional Theory. The difference is that, while the traditional one is "neutral" in its use, the critique seeks to analyze the socio-political and economic conditions of its application, aiming at the transformation of reality.

Finally, Paulo Freire focuses precisely on his thinking for an awareness education that, in addition to knowing reality, seeks to transform it, that is, both the educator and the learner deepen their knowledge around the object to be able to intervene on it.

2 MATHEMATICS EDUCATION AND CITIZENSHIP

Mathematics Education and Citizenship have in their lines of approach that mathematics cannot be considered as an accumulation of information without objectives pertinent to daily life and detached from other areas of knowledge, but rather as a factor that integrates knowledge and according to the thought of Morin (2000, p. 93), "Educating to understand mathematics or a particular discipline is one thing; Educating for human understanding is another." Therefore, it is necessary, for contemporaneity, that education goes beyond the formation of contents, goes beyond simplicity, reaches the field of complexity, breaks down barriers and makes it capable of being worthy and important in the construction of union and social well-being, as well as sustaining structures that aim at the maintenance of culture and society.

In addition, Skovsmose (2008) raises the mathematical literacy called by him materacia[2], referring to the literacy of Paulo Freire, who considered literacy not only as an ability to read and write,

[1] A network of concentration camps, used by Nazi Germany for the extermination of countless Jews during World War II.

but also as a competence to read and interpret a social situation, subject to change. In fact, mathematics "does not refer only to mathematical skills, but also to the competence to interpret and act in a social and political situation structured by mathematics" (SKOVSMOSE, 2008, p.16). This thinking supports critical citizenship.

It is worth mentioning that the Brazilian educational society has experienced tense moments in recent years. In this bias, there is a distance between the logic that the actors of the school context defend for the objectives and purpose of school education and the logic of neoliberal models of public policies aimed at education, especially that aimed at the management of results and curricular standardization. Therefore, it is essential to break the barriers of the traditional teaching of mathematics education and go beyond the contents.

Although the proposals of these public policies are explicit and intentional, on the part of the developers, the way the decisions and documents reach the school leaves managers, teachers and students in despair, without understanding why so many changes and discontinuity of actions and programs that are interrupted without there being debates and reflections in the school space.

Moreover, access to social rights, such as education, has occurred in the context of "profound" changes in the social structure and in sociability itself. Critical theoretical perspectives have highlighted the profoundly contradictory role of rights arising from the relationship of individuals with consumer markets. In this sense, the notion of citizenship would be intrinsically related to the condition of consumer of products and services, finding support, including, in specific laws that regulate the relations between market and civil society. According to Bauman:

> Today, for many people, the actions of citizenship are limited to the acquisition and sale of goods (including for candidates for public life itself), rather than increasing the scope of their freedom and rights in order to amplify the acts of a true democracy. The consumer is an enemy of the citizen... In every 'developed' and rich region of the planet there are numerous examples of people turning their backs on politics, in political apathy and in a loss of interest in the ever-increasing political processes. (BAUMAN apud PORCHEDDU, 2009, p. 681).

From Bauman, we note that these changes are ways of reframing the space of struggles for citizenship rights that, in times past, was supported by politics, within the framework of a broader social participation. However, the devaluation of participation in the public sphere, as a support for the construction of collective identities, weakens social bonds and individualizes demands for rights. Thus, the construction of citizenship in the school environment goes through the search for a critical

[2]SKOVSMOSE, 2008 - "materacia does not refer only to mathematical skills, but also to the competence to interpret and act in a social and political situation structured by mathematics", that is, mathematics goes beyond the application of mathematical formulas; it encompasses a reflection on this application. It is not only concerned with operations and numbers, but also with how we can use and understand these numbers in the face of an economic, political or social situation.

formation in which the contents coming from the scientific, philosophical and artistic fields do not overlap, in an artificial way, in relation to the challenging daily life of people.

For Machado (2000, p. 40) "[...] in current times, no characterization of the functions of Education seems more adequate than the association of it with the formation of the citizen, with the construction of citizenship". Therefore, the education-citizenship relationship is also a theme intrinsically linked to critical education. In this perspective, citizenship is characterized by the construction of legitimate instruments of articulation between individual projects and collective projects, which stimulate individual actions, articulating them with greater intensity in society.

This articulation presupposes ordinary actions and an active participation in the community or society, assuming responsibilities in tune with the interests and destiny of the whole collectivity. According to Machado (1997, p. 47), educating for citizenship means "[...] to provide individuals with instruments for the full realization of this motivated and competent participation, of this symbiosis between personal and social interests", that is, an integration in an active way and with a mutual goal.

From this assumption, it is essential a reflection and the resumption of Mathematics Education in the approach of critical mathematics as a channel to understand and propose suggestions for the guidelines, which help in the pedagogical proposal for the formation of the historical subject, who interacts in his own environment, from the mathematical concepts and the dialogue with the world of uncertainties, of the contradictions and disorders of the system itself. For Morin (2011), "[...] to expect the unexpected and to work for the improbable", it is necessary, then, to work with significant themes that stimulate the subject to understand his planetarium and, at the same time, interfere in the actions that will produce a human conduct in the very space and time of the community.

In addition, Adorno (2020 p. 185), warns of the difficulties to be faced by those who intend to act in the transformation, through education. Thus, becoming aware of one's own impotence or of one's impotence is an aspect of the practice of critical self-reflection emphasized by Adorno and with a primary relevance in the process of teacher education.

Finally, it is inferred that education for emancipation provides a broad concept of formal and scientific knowledge, which understands thinking about reality in a dialectical process. Therefore, education must prepare the human being for the confrontation with real experience and not for experience alienated from the world.

3 THE THEORETICAL PATH AND MATHEMATICS EDUCATION FROM A CRITICAL APPROACH

For the foundation of this article and the walk in an epistemological perspective, we seek an approach that is closer to the demands of contemporary society, indicated for those who desire a more humanized world. From the theoretical references that point to Education in the context of liberating

practice, we will have as a basis for Critical Mathematics Education the theory developed by the Danish professor Ole Skovsmose, which is based on the Critical Theory of the Frankfurt School that, despite some contrary notes in relation to Critical Theory does not point out assumptions for the Education of Critical Mathematics, Skovmose defends the relevance of the theory to his thinking. Therefore, they are: Theodor W. Adorno, Max Horkheimer and Herbert Marcuse, Walter Benjamin and Jürgen Habermas, both from the Frankfurt School and who propose to form critical and reflective citizens in the face of society and its technologies.

It is essential to highlight that, for a democratic space within the school that defines in its projects the liberating practice, Skovsmose (2008) brings to the debate the term democracy, because for a critical education is of paramount importance a democratic space. In his theories, the author brings as main focus the issue of democracy and states that "democracy does not characterize only institutional structures of society with respect to the distributions of rights and duties. It also has to do with the existence of a competence in society." Therefore, if mathematics continues to be taught without the democratic aspect, it will be just another domesticating instrument in a society dominated by technology.

In his work "Critical Mathematics Education: the question of democracy", the author makes clear statements about the sources of inspiration in critical education and reports that:

> The basic axiom of Critical Education is that education should not serve as a passive reproduction of existing social relations and power relations [...]. Education must play an active role in identifying and combating social disparities. Of course, education does not have an important role in social and technological changes – such changes are not consequences of educational endeavors, but education must struggle to have an active role parallel to that of other critical social forces (SKOVSMOSE, 2013, p. 32).

Based on this thought, the author states that mathematics education, allied to critical education, can provide questions and possible foundations for the subsequent participation of children, young people and adults in a democratic life, as critical citizens.

In addition, we emphasize the emphasis on the thought of Paulo Freire, in relation to education with the focus on the emancipation of the subject through education that liberates, that questions, criticizes and that fights for the non-domination of being.

> [...] Critical education considers men as beings in transformation, as unfinished, incomplete beings, in a reality, and with an equally unfinished reality. Unlike other animals, which are also unfinished but not historical, men know that they are unfinished. They are aware of their incompleteness, and in this incompleteness, as well as in the consciousness they have of it, lie the very roots of education as a purely human phenomenon. [...]" (Freire, 2016, p. 133-134).

Therefore, before the author's gaze, we must direct the practices of education to an action that leads the subject to awareness education and should be understood as a process of dialogue. In this

perspective, Critical Mathematics Education must go through the thought of change and liberation and point out ways for a critical education, from mathematical knowledge.

Based on the analysis of the Critical Theory of the Frankfurt School, the German Habermas points out that the theory does not give an answer to the critical education of mathematics. However, from the approach that underlies Critical Theory itself, which emphasizes that the Education of post-war Germany should be guided by practices of emancipation, Skovsmose (2013) reports:

> In the philosophy of Jürgen Habermas, his interest in knowledge in the natural sciences is technical, and quite different from the emancipatory interest of the natural sciences. Obviously, an emancipatory enterprise such as the one worked in Critical Education, can ignore technology, even Mathematics. [...] in this way, one of the main challenges for Critical Education is to develop a more appropriate philosophy of technology, so that it can manage and interpret technical education, and so that Critical Education and Mathematics Education can be integrated, making mathematics education a Critical Education (SKOVSMOSE, 2013, p. 35-36)

Faced with the influences of Habermas in relation to the approach and the idea that the critical theory seen by him was Technique and not mathematics, Skovsmose begins to indicate structures by a broad dialogue, an important fact so that there is no exclusion of the student's opinion. Thus, he will not only be the receiver of the educational process and the teacher ceases to be a simple relay of contents and starts to mediate learning. In this perspective, Freire (2011) criticizes the relationship between teacher and student when they behave only as an announcer and listener and comments that:

> The more we analyze the educator-educating relations, in school, at any of its levels, it seems that the more we can convince ourselves that these relations present a special and striking character – that of being fundamentally narrating, dissertation relations. Narration of contents that, for this very reason, tend to petrify themselves or to do something almost dead [...] to speak of reality as something still, static, compartmentalized and well-behaved, when not to speak or lecture about something completely alien to the existential experience of the students, has been, really, the supreme inquisition of this education [...] in it, the educator "fills" the students with the contents of his narration (FREIRE, 2011, p. 79).

Therefore, for Critical Mathematics Education, education cannot only represent an adaptation to political and economic priorities, that is, educational practice presupposes engagement in the political process, including a concern for democracy.

It is relevant that Critical Mathematics Education has a critical and reflective position about the curriculum, taking into account issues such as the applicability, interests and limitations of the subject. For Skovsmose (2013),

> [...] it is important for Critical Education to interact with subjects of the technological sciences and, among them, Mathematics Education, so that critical education is not dominated by technological development and becomes an unimportant and uncritical educational theory. (SKOVSMOSE, 2013, p. 18).

In this thinking, mathematics observes the technological issue so that it is not only the instrument to leverage technology, but also a reflective discussion about its technological risks and benefits.

Moreover, for Adorno, in one of his radio interviews, we must think of a cultural formation that leads the subject to a level where he can deliberate and organize his thoughts, according to his own conscience and know himself to defend himself against the orders of the current situation of his country. Moreover, for the author "[...], the lack of decision and courage to use the understanding without guidance of others, so it is necessary a historical subject. (ADORNO, 2020, p. 185).

The idea of Critical Education spread to all levels of the educational system and also influenced Mathematics Education, giving rise to critical mathematics and the strengthening of the emancipated subject, who can dialogue and expose his ideas with critical positioning of the reality in which he is inserted.

Mathematics must be, therefore, thought in its philosophical and sociological aspects, in addition to being understood in its social responsibility to "lead the student from a state of mathematical ignorance to an appropriate state of knowledge that are useful to him to better intervene in the society in which he lives" (SILVA, 2002, p.65).

Given the above, it is essential to think about Mathematics Education, from the approach of Critical Mathematics, considering not only the critical basis, which it presents to the educational system and pedagogical practices, which reproduce the system of capitalist domination, but also in the property with which it reinforces the importance of the role and strength of education, beyond the reproduction of the historical forms of domination and alienation of individuals. For the theorists cited in this article, education alone cannot change society, but education must change society. Therefore, society will not change without education.

4 FINAL CONSIDERATIONS

The development of this article allowed us to study some of the characteristics of Critical Mathematics Education, which lead to a trend of research in mathematics education. Moreover, this study made it possible to list some points so that we could direct a different look at the teaching of mathematics, evidencing the importance of adding practices of reflection and dialogue in an education that aims to enable the creation of a critical and liberating environment.

Thus, it is up to the teaching of mathematics to provide an environment that provides opportunities for reflections and self-reflections through its contents, so that there is an awareness of our social commitments as human beings.

Thus, when we add responsibility to our teaching and learning, we contribute so that mathematics does not work exclusively with a single look in favor of current structures, which do not

always aim at the social and intellectual formation of the student. In addition, we enable the student to be a human being endowed with knowledge, possessing the ability to evolve culturally, becoming a citizen able and prepared to deal with the changes of society.

Finally, we believe that, based on the assumptions of the referenced theorists, dialogicity, problematization, criticality and reflection on practice are essential, articulated to the concepts of Critical Mathematics Education, which can offer a theoretical-methodological orientation to the Mathematics teacher, in a political-pedagogical perspective, in order to consider the specificities of each locality and enable critical learning situations.

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The vision of teachers from Ceará on racism in public schools

https://doi.org/10.56238/ptoketheeducati-017

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ABSTRACT
Racism is a problem present in Brazilian schools that is perpetuated by invisible and surreptitious mechanisms that seek to maintain prejudiced ideas even in a modern society where it should not exist. This suggests that racism is still a reality in Brazilian society, including in schools, and measures need to be taken to combat it and promote a culture of respect for diversity and equality. The research specifically addresses how these mechanisms can be combated. A qualitative approach was adopted for this research, connected with a quantitative approach, both inserted in an exploratory character. The general objective of the research is to analyze teacher perceptions related to racism in public state schools in Ceará. The research presents assumptions and perspectives regarding racism in public state schools in Ceará. One of the main results of the research is to highlight the urgency of addressing racism through pedagogical and effective actions that can reject and combat discriminatory practices against black students in the school environment. This implies that it is necessary to implement concrete measures to promote inclusion and equality of opportunities in schools, such as diversity policies and awareness and training programs for teachers and students. Additionally, it is important to adopt a critical stance towards discriminatory practices and combat the naturalization of racism in society in general.

Keywords: Racism, Teacher perceptions, Discriminatory practices, Pedagogical actions.

1 INTRODUCTION

This article presents the final results of a research conducted involving the instrumental collection of opinions of teachers of state public schools in the State of Ceará regarding racism in the school environment. The study takes into account the importance of Laws No. 10,639/2003 and No. 11,645/2008, as official instruments that act in the fight against racial discrimination, including within the school space. It is believed that the school mediated by the aforementioned Laws will contribute, above all, in the formation of citizens who will know how to face racism in their social routine. In doing so, the school values the cultural matrices that have made Brazil an example of a plural, multiple and exceptionally rich country.

For the elaboration of this research we used a qualitative approach associated with a quantitative approach, both inserted in an exploratory character. The general objective of this research

is to analyze the perceptions of teachers related to racism in state public schools in Ceará. These are the specific objectives outlined for this research: to discuss racism, focusing on its dimensioning, its threats and the ways of coping; recognize definitions and establish approaches necessary to confront racism in school environments.

This research was structured into five topics. In the first, the introduction was presented, highlighting the objectives of the research. In the second, a theoretical foundation was elaborated in which a discussion was promoted, enriched by a mutual exchange of opinions between these researchers and authors who deal with the same theme. In the third, the methodology used for the elaboration of this research was explained. In the fourth, a commented analysis of the data collected in the quantitative research was carried out. In the fifth and final topic, the final considerations of this study were presented.

2 THEORETICAL BACKGROUND

This rationale has been ordered into two subtopics. In the first, we talked about racism, dimensioning, threats and confrontation. In the second, we discussed the necessary definitions and approaches.

2.1 RACISM, DIMENSIONING, THREATS AND CONFRONTATION

Racism is one of the main threats to the democratic functioning of Western societies. To the extent that one group does not enjoy the freedom and equal rights of others, there is a dysfunction in institutions and a dangerous contradiction between the principles of democracy and socio-political reality. The complexity of the racist phenomenon is evident in the successive distinctions and adjectives that have been given to the term racism in the socio-scientific literature: biological or culturalist racism, old and new racism, internal and external (xenophobia), institutional or social, manifest and covert racism, visible and invisible, etc. (OLIVEIRA; BRANCHES; PENA, 2023) The Curricular Document Referential of Ceará warns that:

> As a result of historical processes that fostered, above all, the slavery of African peoples, articulated with discourses that aimed to justify violence, cruelty and injustice against them, several nations were constituted with racism as a structural element. Brazilian society also (re)produces racism and, even in the face of many struggles of black peoples, we realize that it is present in the school space. (CEARA, 2021, p. 56)

This plurality is based on the different variables and factors involved: psychological, sociological, cultural, economic, political, historical, religious, etc. This same plurality shows how widespread racism can be spread trusting that it will not be condemned. In any case, diversity in distinctions or conceptions stems from two fundamental elements: First, their location in the field of

ideologies (such as discourse, mentality, belief or myth), or in the field of social practices (such as behaviors and policies of discrimination and segregation) or in both interrelated dimensions.

It is also possible to measure racism through the analysis of personal and group characteristics or attributes, this time the differences are related to racist ideas or actions: biological (sex, disability, phenotype, sexual orientation), cultural (ethnic, linguistic, religious, nationality) or both related sets. Today the world is undergoing a change of profound dimensions that does not occur only because of the health and economic crises triggered by COVID-19. Obviously, a new society is emerging. Digital expansion is a reality from which we can no longer escape and virtual platforms are totally transforming our daily lives and the social and economic organization of today's societies. Changes are taking place in the world of work and in the new forms of organization of institutions and everyday life. Much of the narratives that have given coherence, meaning, and cohesion to societies are in decline. For many authors of social theory, this future is often seen from the perspective of a globalized world at risk, a world adrift and at the mercy of spurious interests (NACONECY, 2019; Dutra, 2019; LUKE; RECH, 2019) Currently the image of the future that is presented to us indicates a future that seems monopolized by the automation and digitalization of life, and it is difficult not to imagine this future without hearing these visions that anticipate new and greater global crises from which uncertainty and despair emerge. It is recognized that racism is rooted in Latin American societies:

> When discussing ethnic-racial issues in the context of Latin America and the developments that led this population to processes of (in)exclusion of the Afro-descendant population, a historical contextualization is necessary, since part of the processes experienced are the same, such as the fact that Latin American countries have suffered an important historical-social erasure with regard to the black population. (SOUZA; SCALLOP; HOEPERS, 2021, p. 02)

Unmasked the lies supported by false scientific theories related to an inadmissible white superiority, other lies insist on staying alive, are those that deny the existence of racism (who defends this misinformation denies all the situations of violence and social exclusion that the Afro-descendant population has gone through and has gone through until the present day). (ROBINSON; KOKKONEN; SOUSA, 2021)

Another lie practiced is that which claims to exist "only" prejudice – expressed within an individual perspective, not accepting the existence of a collective, institutional and structural perspective. It is perceived that racism implies a practice built from the hierarchization and racial or ethnic inferiorization. (ROBINSON; KOKKONEN; SOUSA, 2021; OLIVE TREE; BRANCHES; PENA, 2023) It is clear that the division of human beings into races is arbitrary and obsolete, but despite the social changes that have occurred in our societies, this phenomenon continues in everyday life, having even, in recent times, gained more strength even in the school space. To see this subject in depth, it is important to keep in mind that Latin American societies developed from racist ideologies that, through the glorification of white-mestizo national identity and the myth of racial democracy,

they sought to deny black and indigenous roots and their contributions to the history and culture of Latin America. This cultural and scientific negationism directly wounds one of the determinations of the National Curriculum Guidelines for the Education of Ethnic-Racial Relations and for the Teaching of Afro-Brazilian and African History and Culture (2004, p. 21):

> The teaching of Afro-Brazilian and African History and Culture, avoiding distortions, will involve articulation between past, present and future in the scope of experiences, constructions and thoughts produced in different circumstances and realities of black people. It is a privileged means for the education of ethnic-racial relations and aims to recognize and value the identity, history and culture of Afro-Brazilians, guarantee of their rights as citizens, recognition and equal appreciation of the African roots of the Brazilian nation, alongside the indigenous, European, Asian.

For a long time, racist discourse and the denial of otherness were present in our societies; in addition, in the search for models that defended a homogeneous citizenship, countries implemented different policies of invisibility and assimilation that sought to erase the cultural practices and identity of these populations. According to Melo, Santos, Loureiro and Calvente (2017, p. 04):

> Policies and cultures permeate school practices. As a social space, the school tends to reproduce prejudices and discriminations, especially of blacks, by disregarding their history beyond the condition of slaves. Through the ages, the way of being, living, thinking and living together of Afro-descendants has been disregarded, and the legacy of this invisibility is a "heritage" contaminated by racism.

In fact, one of the greatest challenges that Afro-descendants faced, and still face, was to break with the narratives of the national imaginaries that attribute to them a subordinate place in the history of the nation and make them invisible in the present, thus limiting their full access to the rights of the citizen.

2.2 DEFINITIONS AND APPROACHES NEEDED

The Inter Group (*apud* SPAIN, 2007, p.05) defines racism as a

> Social behavior, which is related to sociopolitical ideas and the institutions that sustain it, which consists of classifying people or groups based on real or imaginary differences and that are associated, in turn, with behaviors (real or imaginary). Its purpose is to justify a hierarchy between groups that allows us to accept privileges from some people over others. This mechanism has the power to place the blame for the disadvantage on the victim.

For Munanga (2003, p. 08):

> For logical and ideological reasons, racism is usually approached from the point of view of race, within the extreme variety of possible relationships between the two notions. Indeed, on the basis of the relations between "race" and "racism", racism would theoretically be an essentialist ideology that postulates the division of humanity into large groups called contrasted races that have common hereditary physical characteristics, the latter being the support of psychological, moral, intellectual and aesthetic characteristics and are situated on a scale of unequal values. Seen from this point of view, racism is a belief in the existence of

> races naturally hierarchized by the intrinsic relationship between the physical and the moral, the physical and the intellect, the physical and the cultural. The racist creates race in the sociological sense, that is, race in the imaginary of the racist is not exclusively a group defined by physical traits. The race in his head is a social group with cultural, linguistic, religious, etc. traits that he considers naturally inferior to the group to which he belongs. Otherwise, racism is this tendency that consists in considering that the intellectual and moral characteristics and a given group, are direct consequences of its physical or biological characteristics.

Racism, being one of the most serious problems of respect for human rights, is always seen in a negative way, even by those who practice clearly racist actions. Few consider themselves racist and yet racism is widespread in our society. Therefore, it is a priority to fulfill the commitments and actions assumed by the Universal Declaration of Human Rights (1948) and the National Curriculum Guidelines for the Education of Ethnic-Racial Relations and for the Teaching of Afro-Brazilian and African History and Culture (2004). (RIBEIRO, 2022)

What is advocated here is that non-racist and non-discriminatory behavior is promoted and achieved from knowledge, openness of ideas, communication and with freedom of conscience; these values and conditions must be taught and shared from formal education, through non-formal education and also at home and in the workplace. The current situation of economic and health crisis (COVID-19) that the world has been going through has generated effects in the increase of inequality and social exclusion, and in the increase of fear and the feeling of threat experienced by the population, has determined the need to intensify efforts to combat discrimination and racism in all its manifestations. The increase or visibility of corruption, racism, xenophobia, gender violence, religious intolerance and even violence that have arisen in schools are worrying indicators of possible social disruptions and vulnerability of fundamental rights. Hüning, Silva and Braga Netto (2021, p. 02) argue that: "Educational processes are intertwined with the production of social vulnerability, from the bets that are made on the curricula of the different levels of education to the policies and conditions of access and permanence of black people in these institutions."

Silva (2018) considers that vulnerability leads part of society to a threshold of indiscernibility between life and death within a segregative logic elaborated in the communities. It should be noted that what is defended here is that public educational policies both have the potential to cause changes and ruptures in situations of vulnerability and, unfortunately, can confirm them. This understanding is supported by the analysis of documents aimed at the inclusion of racial discussions. In this sense, from the normative field (directives, references and recommendations), it makes clear the need and priority that education must have in adopting the appropriate measures to end problems caused by racism and initiate strategic paths capable of avoiding this social fracture.

3 METHODOLOGY

For the elaboration of this research we used a qualitative approach associated with a quantitative approach, both inserted in an exploratory character. Souza and Kerbauy (2017, p. 14) argue that "the complementarity [between the cited approaches] must be recognized, considering the distinct and varied desiderata of research in the human sciences, whose purposes cannot be achieved by a single approach."

The qualitative approach was elaborated considering a bibliographic review and a documentary research. Through these reviews, opinions and information concerning the researched theme were collected. This stage of the research was fundamental to support the positions and opinions of these researchers. It should be noted that in the development of the quantitative approach, elaborated concomitantly with the qualitative approach, the data obtained with the answers of the form, underwent a commented analysis having as main target a scientific understanding of the social phenomenon investigated. (MUSSI *et al*, 2019)

The main authors who contributed most to the realization of this research were Souza and Oliveira (2017), Marques and Silva (2020) Barbosa, Kokkonen and Sousa (2021) Souza, Vieira and Hoepers (2021). It was considered, therefore, that the act of researching prevailing the two approaches, characterizes this research as a concrete action of formation and development of scientific knowledge, since the research provided conditions for the production, identification and determination of knowledge, in addition to offering answers to specific questions and proposing, including, resolutions of difficulties, doubts and problems related to the theme in question. (MUSSI *et al*, 2019)

The research was developed from July 1 to August 30, 2022, through an *online* questionnaire developed on the *Google Forms* platform, consisting of 10 multiple-choice questions. The invitations to participate were made available via Whats *App* (being allowed the sharing in groups of responsibility of the teachers who agreed to participate) and 100 teachers accepted to participate in the research from the answer to the first question that dealt with the Term of Free and Informed Consent (ICF). The questionnaire used in this research was based on the theoretical foundation of a data collection instrument, elaborated by Rocha (2004). The sequential structure of the questionnaire followed the following organization: Acceptance via ICF, identification in relation to gender, definition of color (following the classification used by the Brazilian Institute of Geography and Statistics - IBGE), level of education, type of school (Elementary School, High School, Elementary and Secondary Education and Youth and Adult Education - EJA, promotion of thematic activities related to the confrontation of racism in school, performance of managers and teachers in these activities, performance of teachers in community initiatives and programs, identification, on the part of teachers, of situations of racism in school and teachers' understanding of how racism should be treated. The software adopted for organization and subsequent interpretation of the data was *Microsoft Excel*. A table and nine graphs

were elaborated, based on descriptive statistics, taking into account quantitative and percentage analysis of the data. (Smith, 2016)

4 ANALYSIS OF THE RESULTS

4.1 ACCEPTANCE VIA TCLE

According to Table 1, of the 100 teachers who agreed to participate in the research, 99 (99%) felt free and enlightened to participate in the research and only 1 (1%) admitted not feeling enlightened, although they answered the other questions.

Table 1 – Acceptance via TCL

Datum	Items	No.	%
Acceptance via ICF	Yes	99	99
	No	1	1
TOTAL		100	100

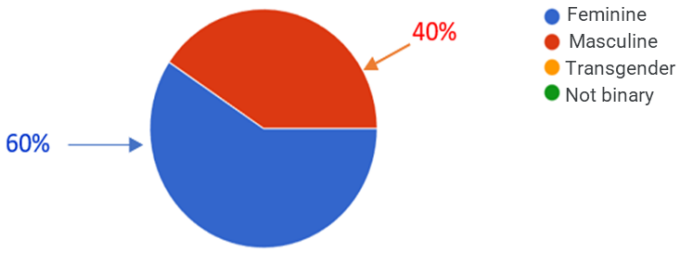
Source: Research data

It is observed that the vast majority of participants trusted the statement of the research and participated, assertively, pointing out the options that were consistent with their specific positions related to racism at school. It is worth thanking everyone who participated in this research for the social and voluntary goodwill in adding value to this research.

4.2 GENERAL DATA OF THE PARTICIPANTS

Graph 1 presents the results for the identification of the teachers who participated in the research in relation to gender, where it is possible to verify that 60 (60%) are female and 40 (40%) are male.

Graph 1 - How do you identify with regard to gender

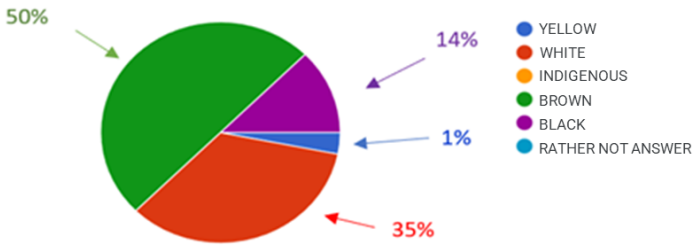


Source: Research data

This result follows the natural trend observed by the 2020 School Census, whose results indicate that 76% of teachers in Ceará are female and 24% are male. (NORTHEAST DAILY, 2021).

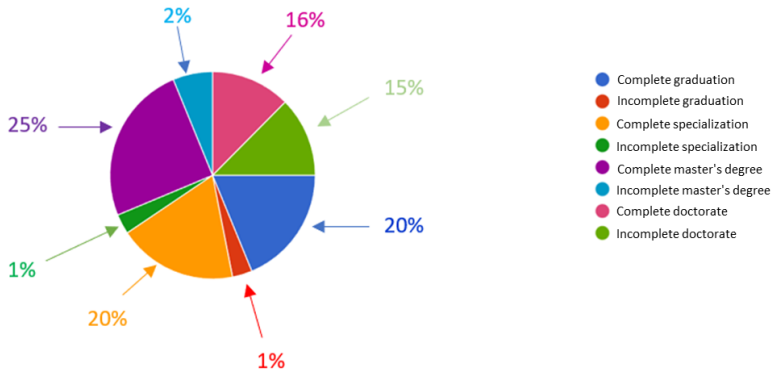
Graph 2 shows the teachers' answers when asked about their color identity following the standards adopted by the IBGE.

Graph 2 - Considering the classification used by IBGE, how do you define your color?



Source: Research data

Graph 3: What is your level of education?



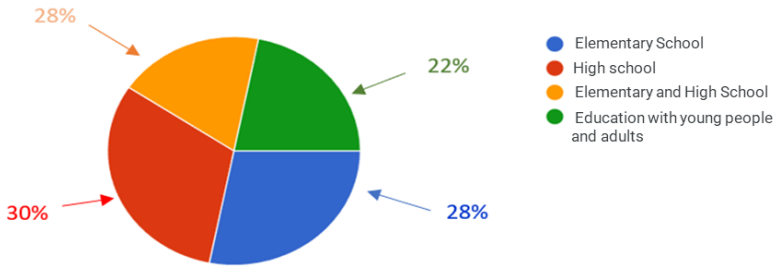
Source: Research data

This result confirms the IBGE data for the Northeast Region (in which Ceará is inserted), which indicate a larger population within the brown color in the Northeast Region. When the data referring to the brown color are added to the data related to the color black, a total of 64% of teachers of African descent is reached. It should be noted that, in this research, we used the same color categories used by the IBGE. Graph 3 indicates the classification of the data collected related to the schooling condition, according to the responses of the participating teachers. Among the interviewees, the categories Incomplete Graduation and Incomplete Specialization each presented 1 professor (1% for each) and the Incomplete Master's category presented 2 professors (2%).

The Complete Doctorate category was flagged by 16 professors (16%), while the Incomplete Doctorate category was chosen by 15 professors (15%). In sequence, two tied categories stand out, the complete Graduation and the Complete Specialization, both with 20 professors (20%). Finally, the Complete Master's category is presented, which was the most marked category with a total of 25

teachers (25%). The analysis of the collected data evidences a significant quality in the training of the teachers who participated in the research. The level of formation of the investigated group may favor the quality of the specific responses to racism treated in this research, since it is expected that the degree of knowledge of the interviewees may result in responses more associated with the rejection of the occurrence of racist acts within the school environment. The fifth question of the research instrument used referred to the type of school in which the interviewees work. In Graph 4 it is possible to observe that most of the interviewees (30%) work in high schools. In a decreasing percentage classification, the following results were obtained for the other types of school: 28% of the interviewees work in elementary schools, 22% work in specific schools for Youth and Adult Education (EJA) and 20% work in schools that offer, in the same school space, Elementary and High School.

Graph 3 - The school you work for is...

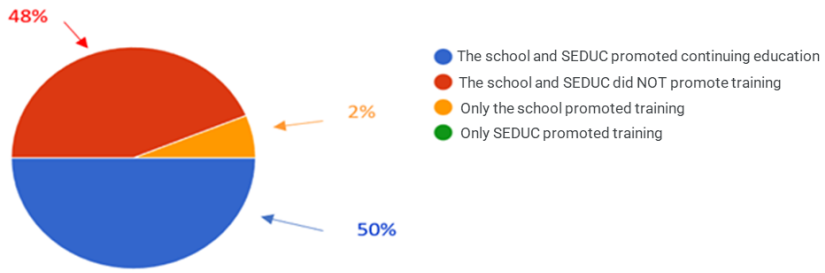


Source: Research data

Considering that the four types of schools presented their teachers participating in the research in question, it can be inferred that in all types of school, evaluated here, racism had an occurrence as will be observed in the next group of questions.

4.3 SPECIFIC QUESTIONS ABOUT SCHOOL OCCURRENCE RACISM

Graph 5: Who promoted continuing education actions on racism?



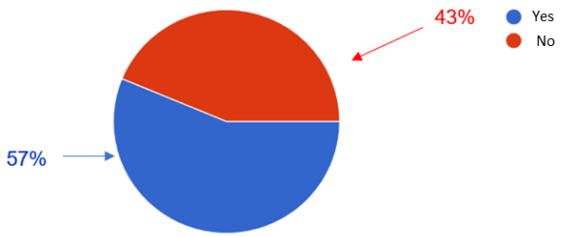
Source: Research data

The first of the specific questions about racism of school occurrence aims to know if the school (s) of the interviewees or the Secretary of Education (SEDUC) promoted or promoted, in the last five years, meetings of continuing education (or lectures, meetings, etc.) to deal with themes related to racism. The analysis of Graph 5 reveals that of all the possible answers, the option "only SEDUC promoted the trainings" was not marked by any teacher who participated in this research.

Adding the percentage of teachers who chose the option "the school and SEDUC promoted continuing education" with the percentage of teachers who marked the option "only the school promoted the trainings" reaches a total of 52%, indicating that most teachers teach in a school that had some type of continuing education related to racism.

Before considering a good result it is necessary to take into account that the percentage of schools in which there was no training (48%) is very high. It is considered, therefore, that the State should promote more training and should also encourage and provide conditions for the school itself, within its specific reality, to develop training throughout the year, seeking, in this way, to fully comply with Laws 10,639/03 and 11,645/08. It should be noted that it is not recommended that the aforementioned Laws are only "met" on commemorative dates, because what they effectively recommend is the inclusion of the theme of Afro-Brazilian History and Culture in the curricula of the Elementary and Secondary Education network in Brazil. In Graph 6 it is observed that most educators (57%) have carried out actions such as lectures, video display, implementation of projects, seminars, activities, etc. during the school year. However, as in the previous question, the number of educators who have not been performing these actions is still significant (43%).

Graph 6: Have you and your colleagues been carrying out actions to confront school racism?

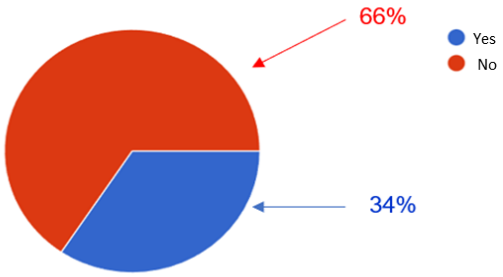


Source: Research data

It is up to the school management and the teaching staff, as a whole, the constant observance of the Laws so that racist actions are definitively overcome in the school space, although these researchers consider that such a procedure would not need a legal basis to be developed, that is, to face racism in the school environment beyond the fulfillment of the laws established in the country should be an action of ethics, of character and natural coexistence. In Graph 7 it is possible to see that most

of the educators who participated in this research do not work in community initiatives and programs related to the confrontation of racism in the school environment.

Graph 7: Do you work in community initiatives and programs related to confronting racism in the school environment?



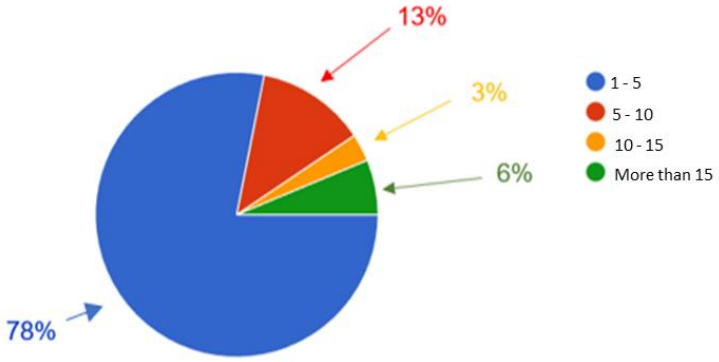
Source: Research data

The authors of this research see this situation as a great concern, because it may reveal that school planning is not attentive to the need for inclusion, implementation and development of its educators in community programs related to the confrontation of racism in the school environment, making it evident that the school and the community are distanced in what is related to school racism. It is believed that this distancing is, at the very least, incoherent because the school must plan all its actions in order to meet the desires of the community in which it is inserted, promoting, in this way, the school/community interaction that Ceará and Brazilian education both aims to achieve and, in the case of such a sensitive and necessary theme, These researchers recommend a greater concern to decrease, as soon as possible, the observed distancing.

> That is why educational spaces must promote the elimination of any form of prejudice, racism and discrimination, so that from an early age, children understand and consciously engage in actions that they know, and recognize the importance of different ethnic-racial groups, and also the appreciation of Afro-Brazilian history and culture. (MARQUES; Smith, 2020, p. 05)

In Graph 8 are the answers to the following question: How many situations of racism, in the school in which you work, have you witnessed in your teaching life?

Graph 8: Situations of racism witnessed



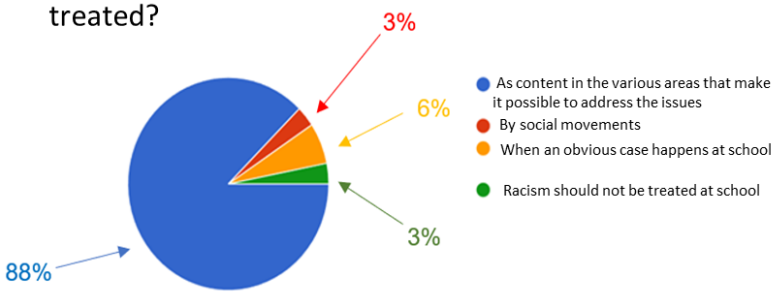
Source: Research data

The analysis of Graph 8 indicates that all teachers stated that they witnessed at least one situation of racism in the school environment. It is noteworthy that the majority (78%) indicated having witnessed from 1 to 5 of these situations, on the other hand 6% stated that they witnessed more than 15 reprehensible situations. In an environment in which no reported cases would be desirable, concern is shown and it is alerted that measures are effectively taken by the competent channels in order to reduce and even mitigate these occurrences that only happen due to the structural racism that still persists in Brazil. On this Marques and Silva (2020, p. 07) warn that:

> In addition to suffering racial discrimination, black children may still be ignored and harassed by teachers, due to their unpreparedness to deal with the situation or even by the naturalization of racial inferiorization. The cruelty, evidenced as a consequence of this, becomes even more painful when one is aware that the black child spends much of his life being nicknamed "macaca", "stinky black", "dirty", "hair of blowing", "asphalt roll", among many other pejorative nicknames, and when reporting such cases to teachers, most of the time is ignored or only listens as a response: "That's a joke, it doesn't care."

It is common sense among researchers that every time the black student is interpreted as wrong, he will tend, little by little, not to feel safe in manifesting himself and, consequently, the family, most of the time, will take time to realize that the child is suffering racial injuries. Graph 9 presents the position of the teachers who participated in the research regarding the understanding of how racism should be treated, especially in the school environment.

Graph 9: How do you believe that racism should be treated?



Source: Research data

For the analysis of these results, Law No. 11,645 (2008) with its Article 1, which modified Article 26-A of Law No. 9,394 (1996) with the following statement for its paragraphs 1 and 2:

> Art. 26-A. In public and private elementary and secondary schools, the study of Afro-Brazilian and indigenous history and culture is mandatory. § 1 the programmatic content referred to in this article will include various aspects of history and culture that characterize the formation of the Brazilian population, from these two ethnic groups, such as the study of the history of Africa and Africans, the struggle of blacks and indigenous peoples in Brazil, the black and indigenous Brazilian culture and the black and the Indian in the formation of the national society, rescuing their contributions in the social, economic and political areas, pertinent to the history of Brazil.

It is also considered very important to take into account the Curricular Document of Ceará – DCRC (2021, p.56)

> Thus, the state of Ceara defends that the effectiveness of citizenship also involves the recognition of the cultural and knowledge matrices that constitute the diversities of Brazil, and the school is one of the first institutions that has the function of forming citizens in the perspective of respect, appreciation of racial, ethnic and gender difference. In this way, black cultures and knowledge enable black women and non-black women to create a new history and new identities, strengthening and valuing positivity, beauty, radicality and the African presence in our cultural formation. Thus, students need to have access to the knowledge produced by black peoples (Africans, Brazilians and Ceará) so that they have real conditions to understand their history to face racism.

Considering the statements of the two documents mentioned above, it is defended here that the school is one of the main environments for the confrontation of racism and each educator needs to be prepared to perceive and, automatically, reject any absurd attempt to occur school racism. When it comes to the answers pointed out in Graph 9, it is possible to highlight that 88% of the teachers who participated in this research consider that racism should be treated as content in the various areas that make it possible to treat the subject, thus attending to everything that is recommended in the statements of the two documents on screen. Six teachers understand that racism should only be fought when some case actually happens at school and three think that racism should be faced by social movements. On these positions Marques and Silva (2020, p. 05) have the following opinion:

> Hence the importance of emphasizing that education for ethnic-racial relations should be implemented in all public and private schools, even if they do not have black children in the classroom, because this point, in our view has been misinterpreted, in the sense that it is only pertinent to talk about racism if there is a black child victimized.

Those responsible for this research consider that the ideal is to address racism within what was established in the documents mentioned and that in addition to social movements the school is a relevant social space for the non-dissemination of racism. On the other hand, three teachers do not accept or do not understand what the official documents defend and pointed out, in a surprising and, in our view, incoherent way, that racism should not be treated in school.

In his research Carapello (2020, p. 177) warns that, "[...] Because of the difficulties of teachers in dealing with the racial issues that cross the relations in the school, there is a tendency to configure and treat visibly racist situations in an inappropriate and sometimes omitted way." Therefore, in addition to the omission, or even for situations in which the teacher confuses racism with *bullying*, it is necessary for the teacher to understand that racism is not a unilateral action, that is, those who do racist actions are also affected and, in this case, will also need attention, so the school and the entire school community should not be omitted.

5 FINAL CONSIDERATIONS

In view of the results commented, it is evident the urgent need that any educational environment should promote the banning of any type of prejudice, racism and discrimination, so that the entire school community, especially students, can understand and engage consciously in projects, actions and activities in which it is possible to recognize the importance of respect for different ethnic-racial groups, and, concomitantly, the valorization of Afro-Brazilian History and Culture. It is important to emphasize that in the school environment the absence of this understanding can cause, among white children, a feeling of superiority, in itself destructive and, therefore, unacceptable. The commented analysis of the opinions of the educators revealed that there is among them, even if not so deep, some knowledge about what is determined in the laws commented on in this article. On the other hand, it cannot be denied that some of them still have difficulty in working pedagogical practices aimed at confronting racism in the school environment.

It is warned that such a situation may reinforce the inadmissible use of pedagogical practices with homogenizing and ethnocentric characteristics, because these practices can, in a sneaky and silent way, try to impose the colonizing culture, ethnocentric values and ideals that, although they currently have a reduced influence, still insist on staying alive. It is considered that even in the full validity of Laws No. 10,639/2003 and No. 11,645/2008, the ineptitude, disinterest and omission on the part of some teachers (fortunately the minority) evidence the need to increase teacher training aimed at the

disconnection of teachers from the prejudices and taboos common to society. What can be affirmed, in view of what was investigated here, is that most of the schools of Ceará, acting individually, jointly or with some support from the Department of Education (SEDUC), are treading a path of compliance with the laws and other official documents, promoting actions, projects, debates, training and activities that, gradually, are minimizing racism in the school environment, contributing, in this way, to the formation of the social identity of the students, offering conditions so that they can perceive and understand their group of belonging in a freer way from certain visions that prove to be prejudiced and discriminatory.

At the end of this research it is recognized that the legislation favors educational actions that develop throughout the educational society a posture of coping with discriminatory situations minimizing their effects. However, it is not possible to fail to emphasize that the Law guides the actions, but the education professional has the greatest responsibility in the formation of the "final product" that are the students free of prejudice and discrimination. Therefore, these researchers consider that only when an integral awareness is achieved by educators about the types of prejudice and racial discrimination, it will be possible to minimize, and in the long term, eliminate all racist practices in the school environment.

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Creative writing in organization teaching of the construction site

https://doi.org/10.56238/ptoketheeducati-018

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ABSTRACT
This article presents the creative writing strategies used by students of the discipline of Construction Technology of the Civil Engineering course of a university in the Brazilian Northeast to present the learning outcome in this discipline. The summaries were written in verse form by the students from the reflection of reading documents in the content area of the discipline and the understanding of the videos watched by them on the same topic. The results showed a good performance of the class in addition to the technical knowledge for the activation of the sensitive. The students considered that creative writing brought more lightness to the teaching and learning process in the organization of the construction site.

Keywords: Poetry, Construction technology, Engineering education.

1 INTRODUCTION

In engineering education, traditional curricula predominate, weak interdisciplinarity and late integration, when present, between the different curricular components, between theory and practice and between the school world and the professional world. Roughly speaking, these curricula are still organized sequentially, in which the disciplines of the basic sciences are followed by the applied sciences and, finally, by the practices, for example the internships. There are commonly a large number of subjects placed in the curriculum, in a linear and compartmentalized way. (Ribeiro, 2007).

Oliveira et al. (2013) state that several engineering schools use the traditional teaching method, composed only of a methodology based on the transmission of content in expository classes.

For Lázaro (2018) school education, even that of Higher Education, somehow presents remnants of the traditional teaching model such as: the arrangement of chairs in rows, silence, predominance of the use of the board and chalk or brush for frame, and especially the reproduction of the contents in classroom and expository classes. Taking the relationship of the teacher with the student to happen in a verticalized way, in which the teacher is the one who holds all the knowledge and the student is that passive subject, who memorizes the knowledge passed on and only repeats them. This leads to an organizational structure of teaching to incompatibility with the current demands of the classroom, and the search for new methodologies for teaching-learning.

However, today, the professional environment requires the engineer to possess both technical knowledge and transversal skills, which must be developed in the undergraduate period, so that students enter the profession with such skills, such as teamwork and oral and written communication.

Sousa (2014) considers that when the student has competencies and skills guarantee the globality of the behavior in the face of challenges, and can, therefore, mobilize what was learned in real situations. This is an important factor when it comes to construction sites, because it is the built area planned to allocate and distribute materials, labor and equipment, being necessary to its organization, and the responsible professional, in this case, the engineer, needs to be able to fulfill this mission.

In a technical way, two Regulatory Standards directly conceptualize the construction site. NR 18 - Conditions and environment of work in the construction industry, defines it as: fixed and temporary work area where support operations and execution of a work are developed. ABNT NBR 12284:1991 explains that they are: areas intended for the execution and support of the works of the construction industry, divided into operational areas and living areas.

According to Saurin and Formoso (2006) the planning of the construction site should be seen as a managerial process like any other. Since the product of civil construction is produced within the construction site, its management must occur without errors and avoiding as much waste as possible, fulfilling each stage of construction without lack of materials and inputs that are necessary for its execution. Thus, it is necessary a more qualified knowledge for this, making the student reflect on the subject.

The educational environment has also undergone constant changes in recent decades, promoting the emergence of several initiatives that aim to support and foster actions to improve the quality of education, as a way to modify the educational scenario, both in teaching practices and in student performance.

Innovative, contextualized strategies that use resources that broaden the perspectives of learning can become effective options in improving the teaching-learning process.

For the significant learning of the contents taught, changes in the posture of students and teachers are necessary. Students should be open to obtaining new knowledge, while teachers need to update their teaching methodologies, opting for didactic alternatives that favor the construction of learning in a significant way, in which the student uses previous knowledge to build new knowledge.

This article presents the creative writing strategies used by students of the discipline of Management and Production of Constructions in the civil engineering course of a Northeastern University to present the result of learning in that discipline. Syntheses were written in the form of sentences and verses by the students from the reading of documents in the area of the content of the discipline and the understanding of the videos watched by them.

2 CONCEPTUAL APPROACH

Active teaching methodologies are not new, but they have been gaining more space with the advancement of studies in the area of learning psychology. Classical thinkers of education, such as Freire, Dewey, Piaget and Rogers, already defended the thesis that the traditional model of teaching did not seem to be the most effective.

There are several methodologies considered active, but all have in common the belief that the student is the protagonist of the learning process and that he will only learn something if he experiences it in practice.

The promotion of learning through active methodologies makes use of several strategies, such as: *PeerInstruction (PI),* Team-Based Learming (TBL), *WritingAcrossthe Curriculum* (WAC), *Project Based Learning* (PBL*), among others (SCHMITZ, 2016).*

In an integrative review on active teaching-learning methodologies carried out by PAIVA et al. (2016), several types of them were synthesized, as shown in table 1.

Table 1 - Types of active teaching-learning methodologies

Types	**References**
Problem-based learning	Gomes et al. (2010) and Marin et al. (2010)
Pedagogy of problematization	Marin et al. (2010) and Paranhos and Mendes (2010)
Problematization: Arco de Marguerez	Marin et al. (2010), Pedrosa et al. (2011), Gomes et al. (2010) e Prado et al. (2012)
Case Studies	Gomes et al. (2010), Pedrosa et al. (2011) and Limberger (2013)
Reflective groups and interdisciplinary groups Mentoring groups and facilitation groups	Gomes et al. (2010) and Carraro et al. (2011)
Group exercises	Pedrosa et al. (2011)
Seminars	Gomes et al. (2010) and Pedrosa et al. (2011)
Critical report of experience	Gomes et al. (2010)
Round tables	Gomes et al. (2010)
Socialization	Carraro et al. (2011)
Plenary	Pedrosa et al. (2011)
Dialogued exhibitions	Pedrosa et al. (2011)
Thematic discussions	Pedrosa et al. (2011)
Annotated reading	Pedrosa et al. (2011)
Bureaux	Pedrosa et al. (2011)
Presentation of films	Pedrosa et al. (2011)
Musical interpretations	Pedrosa et al. (2011)
Dramatizations	Pedrosa et al. (2011)
Playful-pedagogical dynamics	Maia et al. (2012)
Portfolio	Gomes et al. (2010) and Paranhos and Mendes (2010)
Oral evaluation (self-assessment, group, teachers and cycle)	Marin et al. (2010)

Source; Paiva et al. (2016).

Other strategies of active teaching methodologies presented in the literature are project-based learning, peer instruction, culture circle; inverted classroom and classroom-laboratory.

In table 2, below, are synthesized educational practices of active learning carried out by FONTENELLE (2019) a, FONTENELLE et al. (2019) b, FONTENELLE (2020) a and

FONTENELLE et al. (2020) b in Civil Engineering course in northeastern Brazil based on Waldorf pedagogy, which is a pedagogy that uses art to assist in the teaching and learning process.

Table 2 - Educational practices of active learning in civil engineering course

Discipline	Educational practices of active learning
Building technology	▪ Watercolor painting about visits to the works ▪ Cordel's production on the evaluation of three construction sites ▪ Video production on safety at the construction site ▪ Production of poetry on construction technologies ▪ Practical class of assembly of the recycled plastic bathroom
Budget, planning and control of works;	▪ Production of a cordel on time planning at the construction site ▪ Production of video about construction budget
Management and Production of Constructions	▪ Painting watercolors on content synthesis ▪ Production of parodies about smart buildings ▪ Parody production on BIM (Building Information Modeling) ▪ Production poetry on *Lean philosophy* ▪ Video production on construction management

Fonte: FONTENELLE (2019) a, FONTENELLE et al. (2019) b, FONTENELLE (2020) a e FONTENELLE et al. (2020) b.

There are several teaching-learning methods that can be used to promote improvement in the teaching and learning process. In a way, the forms of active and/or collaborative learning, centered on the process and/or students, and the constructivist teaching methods serve this purpose (ESCRIVÃO FILHO; RIBEIRO, 2009).

3 METHODOLOGY

Building Technology is a compulsory subject of the Civil Engineering course. In the programmatic content is addressed the constructive processes of a work from the project to the painting.

The main teaching strategies used are: Lectures with discussion of concepts and case studies; Reading and interpretation of texts; Seminars of the students for presentation of scientific article and case studies and / or practical work carried out by them and technical visits.

During the pandemic, *webinars* and videos on the topics were introduced, and the students were asked to summarize the understanding of these documents, in verse form.

4 RESULTS AND DISCUSSIONS

Each pair of students selected and watched a video about building technology. The synthesis was presented in verse form, as shown in tables 3 and 4 below.

Table 3 – Creative writing of the Duo 1

ORGANIZED and PREFABRICATED WORK

Attention noble colleagues
In what we are going to present
For it is an important step
An organized work

Work is not a mess
If it's worth the cue, take the tips
For in a work facilitates
Leave everything in place

The first step is easy
Leave the workspace free
Always delimiting with tracks
The corridors, including

The second step is to separate
The places to store
In a put what you are using
And in the other what will still use

The third is more work
Because you're going to have to design
A more harmonious way
Of the shortening paths

The fourth is that just stack
And save correctly
Machines, switches and tools
Keeping them clean at all times

The fifth is you get rid of it
Of what can the path get in the way
But it's important to ask
If someone else won't use it

The sixth is planning
To leave around what is most used
And always store in the lowest places
Whichever is heavier

Another tip I'll give you
Which is using instruments
Or gutters with closures
Pro rubble discard

That's very important
And let's not forget
To use PPE's
For accidents not to happen

These tips are valuable
And they will make your day-to-day life easier
Just organize everything
To work with mastery

There's something else
That you need to be alert
Deflate tires and drums
For water not to accumulate

What if an oil spills
Or any other liquid
Clean immediately
For the fall is a risk

And to finish
Keep everything in the right place
Clean up all dirt
And don't miss any objects

Organization and cleanliness
They are not procedures
It should be a rule
To follow at all times

If you think it's over
Another thing we will teach
Which is the "5s" rule
To implement in the work

Every S is a sense
And it has its importance
Helps you save time and money
And still give you more security

The first is that of use
Which is to identify
What you're not using
to remove from the construction site

The other sense is ordination
That will help you find
All items of the work
In its proper place

The sense of cleanliness
Brings quality and safety
Eliminating disease risk
Bringing more confidence to the work

The sense of health
Talk about individual hygiene
Ensuring the right conditions
Pro worker do not get sick

The last is that of self-discipline
What is knowing how to work in a group
Hitting goals and seeking quality
For a good work to deliver
It takes willingness
to apply these principles
Increasing productivity
And avoiding waste

I'll end here
With my thanks
To Aridenise, our gratitude
For his teachings

Source: Double 1, (2021).

Table 4 – Creative writing of the Duo 2

Hygiene and health at the construction site

Hygiene is essential
Be anywhere
Especially on the construction site
For health to preserve

To start hygiene
Cleanliness and organization we must practice
If we don't keep that in mind
It won't do any good

Without hygiene, incidents will happen
Work will come to a standstill
Waste of materials will occur
Clutter and damage is what you will see

When using the bathrooms
Use neatly and correctly
Have respect for your companions
For they will use later

If the shower, by chance, breaks
It's risky for you to try to fix it
So, to prevent you from getting hurt
An electrician is advisable to call

When it's time to eat
The clean cafeteria must be preserved
For it is one of the main places
Where dirt should not be found

In addition to these precautions that we have just read
Some rules in the accommodations is also important to know
You need to respect your space and the room in order to keep
So that personal conflicts do not happen

Smoking in the accommodation is also not recommended
Aside from the fire risk, it's not very healthy
Consuming food is another point to avoid
Otherwise, bad smell and insects in the environment will set in

We must also not forget about personal hygiene
Bathing, for example, should be something habitual
It prevents skin diseases
And the sweat that stinks

Combing your hair, washing your hands and brushing your teeth
There are other habits to keep in mind
Because it avoids unpleasant situations
And terrible embarrassments

Source: Double 2, (2021).

The creative writing about the studies carried out in the area of Technology of the buildings of the civil engineering course of UFERSA-Mossoró synthesized in this text evidenced how much the students identified with the teaching of engineering through the arts.

5 FINAL CONSIDERATIONS

As an observer of the artistic activity carried out by the students, the professor agrees with Steiner when he affirms that this type of practice provides meaning to understand also with the intellect and to permeate also as the sense of duty what the individual has learned to see in art as the beautiful and the purely free human.

It is considered that the practice of creative writing should be more common in academia in order to unite abstraction with human sensibility where there is great unimaginable potential that can still be developed.

The technical and artistic productions of the students of the discipline of Building Technology of the Civil Engineering course of UFERSA show that sensitivity can be activated.

ACKNOWLEDGMENT

To the students for the poetry made available.

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SEVEN
publicações acadêmicas

Scout Educational Method and Transdisciplinarity: Contributions to Environmental Education in the light of the activities of Tribo da Terra - Insignia Reduce, Recycle and Reuse plastic bottle caps

Crossref doi
https://doi.org/10.56238/ptoketheeducati-019

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ABSTRACT
Founded by Baden-Powell, Scouting, as a non-formal education, allows its members to value the environment, preparing them for preservation and sustainable development. The practice of scouting and its socio-environmental and educational benefits for adolescents from the Bernardo Sayão Scout Group were analyzed, through the activity Insignia Reduce, Recycle and Reuse (3R's). Bibliographical and field research was carried out, with a qualitative approach. The theoretical framework was based on the concepts of Scouting, Environmental Education, Non-formal Education, Transdisciplinary Education. Weekly technical visits were made to the Scout Group, from October to November/2022. For four months, the scouts gathered PET bottle caps and participated in workshops and, with the guidance of a Scoutmaster, made with the caps: tic-tac-toe, pencil holder, "fidget spinner", cup holder and plastic plate. The scouts evaluated the discarded material on the environment and realized the importance of responsible consumption and reuse of bottle caps. This research demonstrated that the Scout method is a transdisciplinary education that is concerned and carries out activities related to environmental and sustainability issues, such as the 3R's Insignia, promoting sustainable habits for an ecological and healthy lifestyle.

Keywords: Earth Tribe activity, Environmental education, Sustainable development, Transdisciplinary education, Scout educational method.

1 INTRODUCTION

Scouting began in 1907 with the British Robert Stephenson Smyth Baden-Powell, an interested lieutenant general in testing whether their training methods were interesting for the development of young men and could be used by some youth organizations of the time. At the time, the young people were taught knowledge and techniques important for that historical context, such as first aid, cooking, discipline, morals, charity, patriotism, safety tips for urban and forest environments, as well as the observation of the space occupied. The test was conducted with 20 male adolescents, aged between 12 and 16 years old, in a camp on Brownsea Island, England, and, after passing the test, each received a badge that read "be prepared", be prepared, or as it was adapted for the Portuguese in Brazil, "always alert". The camp was a success and Baden-Powell published the book *Scouting for Boys* (1975). The

publication of this book resulted in the voluntary and independent organization of several youth groups that adopted the name Boy Scouts (NAGY, 1987).

From then on, the work was translated into several languages and spread to several countries. Initially, the program focused on boys, but in 1910, Baden-Powell and his sister Lady Agnes created a program for girls, Bandeirantismo, and for children, Ramo Lobo in 1916 (WOSM, 2016). In 1910, the First Center of Boy Scouts of Brazil was founded and already in 1917 the Decree of the Legislative Power No. 3297 was sanctioned, which in Article 1 established that "Brazilian associations of scouts based in the country are considered of public utility for all purposes." Decades later, in 1946, Decree-Law No. 8,828 recognized the Scout Movement as an extracurricular institution (BRASIL, 1946).

Worldwide, the Scout Movement (ME) is managed by the World Organization of the Scout Movement (OMME), which is nonpartisan, non-governmental and composed of 161 National Scout Organizations, located in 223 countries and territories with more than 40 million volunteer members, 80,000 of whom are Brazilians. In addition, OMME is one of 130 global non-governmental organizations with general consultative status in the Economic and Social Council (Ecosoc) and develops projects in partnership with the International Labor Organization (ILO); the United Nations Environment Programme; the United Nations Educational, Scientific and Cultural Organization (UNESCO); and the United Nations Children's Fund (UNICEF) (WOSM, 2016).

The ME offers several activities worldwide for children, adolescents and young people from 5 to 21 years old and, in Brazil, from 6.5 to 21 years old. The Scout performs most of the activities weekly in a place near his residence, whenever possible, and also excursions in more distant places that can last a few days (UEB, 2010).

The MoU is considered attractive to participants because of the various activities it provides, but should not be confused with recreational activities, but recognized as an educational movement (UEB, 2021). Therefore, it is important to evaluate through research how the experiences practiced in Scouting contribute to the learning of its members, in their relationship with the environment and, more specifically, to environmental education.

Scouting is a joyful outdoor game where the jovial-minded adult and young venture together as brothers, old and young, in search of health, happiness, dexterity and detachment (BADEN-POWELL, 1982). Its mission is to contribute to the education of young people to help build a better world, in which people feel fully fulfilled and can play a constructive role in society (UEB, 2001).

Thus, the Scout Movement is characterized as a worldwide movement, educational, voluntary, nonpartisan, and nonprofit. It has as its proposal the development of the young, through a system of values that prioritized honor, and that is based on the Promise and the Scout Laws and through the practice of teamwork and outdoor life, makes the young person assume his own growth, becoming an example of fraternity, altruism, responsibility, loyalty, respect and discipline (UEB, 2001).

The practice of scouting performed by outdoor activities with nature, contributes to the sustainability of the environment and also brings psychological and social benefits to the children and adolescents involved, through environmental perception (ZANINI; SAINTS, 2021).

Scouting has become a tool of fundamental importance for these young people with regard to the acquisition of positive values related to the family, educational and environmental context. Nature is the principle of all things, that is, *a priori*, it is from it that everything starts. The act of educating is a movement of improvement and personal transcendence. Scouting, because it is a non-formal education, is a way to educate the young people who are part of it through constant learning with nature (MENDES, 2012).

It is through the Scout method, the "Learning by Doing", preaches learning by practice, by action, valuing training for autonomy based on self-confidence and initiative, developing the habits of observation and deduction (UEB, 2021).

The Scout Method is a system of progression, the intention is to encourage each young person to develop their capabilities and interests. It does this by posing challenges to be overcome through adventures, encouraging to explore, to discover, to experiment, to invent and to create the capacity to find solutions; but always respecting them individually, their barriers (UEB, 2021).

In this sense, this research has as object of study, the children and adolescents of the Bernardo Sayão Scout Group, located in the Antônio Marmo Canedo Environmental Park - Matinha Park - in the municipality of Anápolis / GO - Brazil.

This work is justified by the need to demonstrate the importance of Scout educational methods, through transdisciplinary education, in favor of environmental issues that have affected planet Earth. This year, several nations have gathered at the United Nations Conference on Climate Change to create an effective agenda for reducing pollution on the planet and mitigating the food and energy crises. The 2030 agenda, in turn, also presents objectives for sustainable development (SDGs), and it is necessary to verify the projects and actions that have resulted or result in environmentally friendly impacts. And, within this perspective, the following questions are asked: *i*) How can the Scout method, being a non-formal education, contribute to the environmental education of children and adolescents? *ii*) How can the practice of Scouting form reflective, autonomous and investigative citizens, who learn to think in a multidimensional way, expanding, transcending and reconnecting knowledge, as provided for in transdisciplinary education?

Seeking to answer the questions, this article synthesizes, initially, the Scout educational method, as a non-formal and transdisciplinary education; soon after, it presents the methodological aspects of the research; then, it exposes and discusses the results obtained, weaving in its last part, the final considerations about the work carried out.

2 SCOUT EDUCATIONAL METHOD AND TRANSDISCIPLINARITY

The MoU spread throughout the country, being adopted, even, as a governmental educational proposal. In Brazil, in 1924 the Union of Scouts of Brazil - UEB was founded, as a result of the merger of several Scout associations existing at the time and affiliated to the World Organization of the Scout Movement - OMME. The UEB adopts a vertical organization, defining parameters of action for the local units (scout groups and autonomous sections) associated, through a single program, aiming at greater cohesion among the members. Educational programs for young people are developed through volunteers (UEB, 2012).

Scouting is a worldwide movement, educational, volunteering, which aims at the development of children, adolescents and young people through a value system that privileges honor, practice of teamwork and outdoor life, making them protagonists of their own growth (UEB, 2001).

As established by UEB in 2021, the Educational Project "We are a non-formal education movement, which cooperates with other educational agents such as the family and the school, seeking the integral development and permanent education of children, adolescents and young people" (UEB, 2021, p. 05).

"Education as I understand it does not consist in introducing into the child's brain a certain amount of knowledge, but in awakening to him the desire to know and to indicate to him the method of study" (BADEN-POWELL, 1930, p. 12).

Within a Scout Group, children and youth are distributed into branches, with their own educational programs and age-specific activities. Chart 1 presents the organization of the branches within the MoU, in which they are presented how they are divided, their form of organization, as well as the description of each of the branches. Adult ME members, called Scouts or Scouts, do not organize themselves into branches, but comprise members over the age of 21.

Table 1 - Organization of the Branches within the Scout Movement.

Branch	Form of organization	Description
Wolf Branch	Pack	The Pack is the branch for children from 6.5 to 10 years of age of both sexes. The educational program and the stages of the little wolf aim at the first teachings for life in the field, team life and leadership development. The Alcateia program is inspired by Rudyard Kipling's "Book of the Jangal," summed up in "Mowgli the Wolf Boy." The organization of Alcatéia can be only of little wolves, little wolves or mixed. The Pack is divided into teams called packs, each assigned with 4 to 6 children.
Scout Branch	Scout Troop	The Scout Branch is aimed at children and adolescents from 11 to 14 years of age, of both sexes. The educational program aims to increase knowledge and your self-confidence. In the Scout Troop the members learn to live as a team, to respect nature. The troop is divided into patrols, consisting of 5 to 8 people.
Senior Branch	Senior Troop	The Senior Troop/Guide is aimed at adolescents from 15 to 17 years of age of both sexes. The educational program aims

		to offer greater challenges and make members acquire new skills to overcome life's obstacles. The Senior Troop (male), Guide Troop (female) or Mixed Senior Troop is divided into patrols of 4 to 6 people.
Pioneer Branch	Pioneer Clan	The Pioneer Clan is aimed at young people from 18 to 21 incomplete years, of both sexes. The educational program of this age group aims to increase the integration of young people into the world, turning to service to the community and the exercise of citizenship based on the values of the Promise and the Scout Law. The pioneer's motto is SERVE. In the Pioneer Clan young people have already effectively become adults in society and are completing the formation of their values and principles.

Source: Ferreira, 2016 (adapted by the authors).

The Scout Educational Project presents some elements of the Scout method (UEB, 2021):

a) Acceptance of the Law and the Scout Promise - All those who want to be part of the MoU must accept the Law and the Scout Promise, and do so voluntarily, as no one is required to be a Scout.

b) Learning by Doing - Since the educational conception of the BD, knowledge is not transmitted, but is built through a process of inquiry, exploration, practical experimentation and reflection. It is an active relationship where the child, adolescent and young person are protagonists of their learning process.

In learning by action "the classroom is the world", and for this reason it is necessary to establish strong links between children, adolescents and young people and the environments where they are inserted, since young people learn in direct contact with different situations, with the changes and with the challenges of the social and natural reality.

c) Team System - Scouting uses small teams for its members to participate in collaborative learning and decision-making.

d) Symbolic Framework - Scouting uses a unifying structure of themes and symbols to facilitate the learning and development of a unique Scout and Scout identity.

e) Nature - Involves the approach of sustainability, which provides a better ethical perception, respect and connection with nature, encouraging sustainable behaviors.

f) Community Involvement - Enhances the value of the community itself as an educational environment, allowing members to connect with different people and realities, increase intercultural and intergenerational understanding, recognizing themselves as active, critical and responsible citizens in the improvement of the local and global community.

Also, Scouting as non-formal education:

> "It takes place outside the school sphere and is broadcast by museums, media and other institutions that organize events of various orders, such as free courses, fairs and meetings, with the purpose of teaching ... Non-formal learning thus develops, according to the wishes of the individual, in a climate specially designed to become pleasant. Finally, informal education occurs spontaneously in day-to-day life through conversations and experiences with family, friends, colleagues and occasional interlocutors (Chagas, 1993, p. 79)"

Following this reflection, we perceive the importance of the non-formal educational process in the procedural dynamics experienced in Scouting in its different contexts. Education is everywhere, and as Brandão (2008, p. 9) says "(...) there is neither a single form of education nor a single model of education; school isn't the only place where it happens and maybe it's not the best (...)".

According to Marques (2009, p. 23):

> "Non-formal education can be understood as any organized, systematic educational activity, conducted outside the limits established by the formal system alongside the educational establishments, develops other educational processes in programs and projects that are directed by training agencies, aiming mainly at the professional improvement and cultural development of the population."

It can be observed that teaching linked to Scouting can be practiced in different ways, with constant learning and through different routes and agents.

Paolillo & Imbernon (2009) identified in the MoU an environment in which formal and non-formal education find a common language and recognize in scientific knowledge strategies of social development and citizenship, which characterize the BD as the largest organized movement of non-formal education.

Non-formal education empowers individuals to become citizens of the world, in the world. It opens windows for understanding people and their social relations that their community involves (GOHN, 2006).

The Scout educational method is also characterized by a transdisciplinary education. First, it is necessary to clarify the difference between multidisciplinarity, interdisciplinarity and transdisciplinarity.

Multidisciplinarity is understood as a set of disciplines to be worked simultaneously without making appear the relations that may exist between them. Interdisciplinarity questions the segmentation between the different fields of knowledge taking into account the interrelationship and influence that exists between them as an objective of reciprocity and exchange. Transdisciplinarity in turn has systems of levels and multiple objects aiming at the global understanding of the world (ROQUETE, 2012).

By breaking the boundaries between one discipline and another, transdisciplinarity seeks to understand phenomena and acquire knowledge in a holistic and contextualized way. Knowledge acquires a transversal characteristic, for it crosses all disciplines in some way.

According to Sommerman, Mello and Barros (2002, p. 09) transdisciplinarity is:

> " [...] A theory of knowledge, is an understanding of processes, is a dialogue between the different areas of knowledge and an adventure of the spirit. [...] It is a new one among the different areas of knowledge and an adventure of the spirit. [...] It is a new articulation of the multireferentiality and multidimensionality of the human being and the world. [...] It also implies learning to decode the information coming from the different levels that make up the human being and how they resonate with each other. Transdisciplinarity transforms our view of the individual, the cultural and the social, referring to respectful and open reflection on the cultures of the present and the past, of the West and the East, seeking to contribute to the sustainability of the human being and society. [...]"

The Scout Educational Method supports young people to be protagonists of their educational process. To this end, it resorts to learning through action, valuing curiosity, questions, experience and autonomy as sources of knowledge of its local, national and international reality, present in transdisciplinary education.

Transdisciplinarity, as the prefix "trans" indicates, refers to that which is at the same time between disciplines, across different disciplines and beyond any discipline. Its objective is the understanding of the present world, for which one of the imperatives is the unity of knowledge (NICOLESCU, 2000).

In the next item, the research carried out on the Scout educational method and transdisciplinary education through the activities of the Earth Tribe will be described.

3 METHODOLOGY

A bibliographic and field research was developed, with a qualitative approach of materials collected in the databases, among which: SciELO, Google Scholar, Scouts of Brazil. The following keywords were used: scouting, Scout educational methods, environmental education, non-formal education, transdisciplinarity, sustainable development.

All photographic records were taken from the Facebook and Instagram pages of the Bernardo Sayão Scout Group. Also, we used as bibliographic sources chapters of books, dissertations and theses that dealt with the subject and deepened the analysis of the theme.

Weekly technical visits were made to the Bernardo Sayão Scout Group (GEBS), from October 15 to November 25, 2022, located in the Antônio Marmo Canedo Environmental Park – Parque da Matinha – in the municipality of Anápolis/GO – Brazil.

The research focused only on the wolves and scouts, who were in the period of this study, performing the Scout activity with the Insignia: Reduce, Recycle and Reuse – which was proposed by the Board of the Scout Group, reusing the plastic caps of PET bottles to make: old woman's game, pencil holder, "fidget spinner", support for cup and plastic plate.

4 RESULTS AND DISCUSSION

Environmental education and environmental sustainability are concerns of the MoU as noted in documents and programs developed throughout history.

The World Scout Program for the Environment was created in 2008 to introduce environmental education to young people. In 2016, the World Scout Committee created the Messengers of Peace program, the World Scout Program for the Environment and the Boy Scouts of the World recognition under the Better World platform, to encourage young people to raise awareness of the environment.

In 2018, the Scouts for Sustainable Development Goals (SDGs) initiative was created with an emphasis on the 17 SDGs of the United Nations (UN) 2030 Agenda and Education for Sustainable Development (SDS), including the eight key competences for sustainability and the Essential Characteristics of Scouting as a framework for non-formal education (UEB, 2022).

The document - Educational Project of the Scout Movement - (UNION OF SCOUTS OF BRAZIL, 2021), in one of its foundations, discusses the importance of outdoor life, interactive with the environment.

According to article 6 of the Scout Law "The Scout is good for animals and plants", in this way, the ME offers young people knowledge so that they value nature, teaching them to preserve the environment and giving them the opportunity to experience nature, making them recognize its importance for humanity.

The World Organization of the Scout Movement (OMME) concerned with the development of its young people, organized several activities related to environmental education, community actions, according to its educational project, with the aim of transforming them into good citizens for society. The Boy Scouts do various outdoor activities. And in 2022 the Earth Tribe Handbook was published – Environmental education for a global community that protects the planet. It contains three insignia: Champions of Nature Insignia; Reduce, Recycle and Reuse Insignia and Scouts for Solar Energy Insignia.

As provided for in the UEB:

> "The Earth Tribe initiative and its challenges specifically seek to address environmental and sustainability issues such as climate change, promotion of sustainable habits for an ecological, healthy lifestyle, and connection to nature through initiatives that seek to protect it.
> It fosters the development of competencies in children, adolescents and young people, encouraging them to reach their full physical, intellectual, affective, social and spiritual potential as responsible and active individuals and citizens in their local, national and international communities (UEB, 2022, p. 4)"

Figure 1 shows the images of these Insignia:

Figure 1- Earth Tribe Insignia



Source: UEB, 2022.

1-Champions for Nature Badge: This insignia was instituted for planning projects related to nature protection, biodiversity and sustainable lifestyles.

2-Scout Insignia for Solar Energy - Scouts GO Solar: Insignia developed to teach ME members to put into practice the uses and applications of renewable energies, such as solar cooker, solar side, etc., avoiding socio-environmental problems.

3-Reduce, Recycle, Reuse - Plasctic Tide Turners: Applied in projects together with the community, in order to reduce the environmental impact related to solid waste, such as plastics.

The members of the Bernardo Sayão Scout Group carried out two activities related to this Insignia of the 3R's, whose theme of the project was "Clean Planet".

The objective of the project was related to responsible consumption and the process of reducing, reusing and recycling (3R's) the waste produced in everyday life. When talking about waste, one has in mind about disposable material, which no longer has use. However, materials that could still be reduced, reused and recycled are often thrown away. New uses can be found for items that are considered useless. With regard to single-use plastics, it should be remembered that their production and consumption create a huge pollution problem. Waste is harming terrestrial and marine ecosystems.

The 3 R's Insignia offered wolves and Boy Scouts innovative ways to combat plastic pollution. They became aware of the dangers of this pollution and broader notion of climate change, through the Earth Tribe activity. This awareness has been motivated by the occurrence of deforestation, floods and accumulation of plastic waste.

For the achievement of this Badge, the 17 SDGs were presented to the children of the Lobinho Branch (6.5 years to 11 years) and the Scout Branch (12 to 14 years), stimulating Environmental Education (EA) and sustainable development (Figure 2).

Figure 2 – Workshop on the Sustainable Development Goals (UN 2030 Agenda) at the Bernardo Sayão Scout Group, Anápolis, GO, Brazil.



Source: Bernardo Sayão 2GO Scout Group Facebook Page (2022)

And among the 17 SDGs, emphasis was given to SDGs 6 (Clean Water and Sanitation), 13 (Combating Climate Change), 14 (Life Underwater) and 15 (Life on Earth).

On the explanation of the sustainable goals, for goal 6 was presented by the Chief Scout solutions for the improvement of water quality such as the reduction of pollution with elimination of dumping, minimization of the release of chemicals and hazardous materials and also the correct reuse of water. Other sustainable objectives presented were objectives 13 and 14, where items on improving environmental education were discussed; increased awareness; adaptation of their actions; reduction of environmental impact; reduction and prevention of marine pollution. And finally, goal 15 that is put into practice in Scout activities such as planting trees in order to combat deforestation.

To develop the project, GEBS carried out three planning stages for the wolves and scouts, namely: To know about aquatic and terrestrial ecosystems and prevent pollution, reduce, reuse and recycle our waste; Identify the problems of your local community; Carry out practical actions for the resolution of problems related to the environment together with GEBS, community and/or other members of society.

For four months prior to the visit, the wolves and scouts gathered plastic caps (from PET bottles) and then participated in several workshops and with the guidance of a Scout Chief (adult volunteer), made with the collected caps: old woman's game, pencil holder, "fidget spinner", cup support and plastic plate (Figures 3, 4 and 5).

Figure 3 – Pencil Holder and Cup Support Workshop at the Bernardo Sayão Scout Group Anápolis, GO, Brazil.



Source: Bernardo Sayão 2nd GO Scout Group Facebook Page (2022)

Figure 4 – Workshop for making a game of the old and "fidget spinner" in the Scout Group Bernardo Sayão, Anápolis, GO, Brazil.



Source: Bernardo Sayão 2GO Scout Group Instagram Page (2022)

Figure 5 – Workshop for making plastic dish Anápolis, GO, Brazil.



Source: Bernardo Sayão 2GO Scout Group Facebook Page (2022)

After the activities, the wolves and scouts talked to the Scouts and reflected on their role in reducing environmental impacts. They left the activity aware that their daily lives affect life all over the planet and proposed to change their attitudes so that they are environmentally friendly, reducing the use of plastic bags, plastic straws and disposable cups; reusing PET bottle caps and recycling PET caps and bottles.

Thus, it can be observed that for the understanding of the environmental problem, it is necessary to exercise the particular understanding of each subject, because each one has an individual interpretation of the space that surrounds us, reflected from its historical-cultural context.

Transdisciplinary education is an urgency of the twenty-first century, because traditional education, by dividing knowledge into several disciplines, makes it difficult to understand the whole. Transdisciplinary education aims to transform the learning method that does not take into account the circumstances that are around it and that hinders the understanding of the subjects in general.

In the words of Moraes (2020, p.23):

> "Thinking in a complex, ecological or ecosystemic way is the way to not reduce or fragment reality, to no longer divide what is complex and relational. It is to be able to think about the object and its relations; to understand the recursive processes, the interactions present in the different processes. It is to perceive the non-linear dynamics present in the processes of knowledge construction and human learning and to recognize the complexity influencing our logic by making certainty negotiate with uncertainty and what is antagonistic with what is complementary to it. It reminds us that it is necessary to reconnect what was previously separated and fragmented, contextualize the object of knowledge and problematize whenever necessary. Complexity would then be this common fabric, the background that governs the events, actions, interactions and feedbacks occurring in phenomena."

Still on transdisciplinarity:

> "In the transdisciplinary view, teaching processes are built that enable learning that can contribute to the understanding and transformation of the reality of the planet, developing awareness of the perception of the meaning of life in the individual. Since everything and everyone is connected, this migration of knowledge between all the elements present is characterized as an open network of connections with a non-linear flow that is being built and reconstructed, thus allowing constant adaptation and improvement (DUARTE, PINHO, 2020, p. 165)."

Reche (2020) compares transdisciplinarity with the human being, saying that to form the human is through the very humanity of being, living and thinking. Just like being transdisciplinary, it is to have freedom beyond the border, not to be tied to a few sources to find the true human essence.

The Scout educational method adopts a humanistic vision of education, which "contributes to the achievement of a model of sustainable development, in which respect for the environment, concern for peace, health, inclusion and social justice guide the growth of our communities" (UEB, 2021, p.7).

5 FINAL CONSIDERATIONS

The Scout educational method presents itself as an alternative of non-formal and transdisciplinary education, which offers outdoor activities, in contact with nature, for the formation of the character of its associates and thus, educating for sustainability, preserving and conserving the environment for future generations. In this research, it was demonstrated that the Bernardo Sayão 2GO Scout Group is concerned and carries out activities on environmental and sustainability issues, such as the Tribe of the Earth Activity - Reduce, Recycle and Reuse Insignia, where they collected several plastic caps for making the old game, pencil holder, "fidget spinner", support for cup and plastic plate.

Through transdisciplinary education, with the execution of outdoor activities, Scouting intends to offer other learning spaces, in addition to the home and school, in contact with nature, since, during these activities, one learns about the development of life, experiences new forms of interaction with others and with the environment, helping children and adolescents to transform experiences into learning and developing the sense of the ecological citizen.

The Scout Movement complements the school and family by responding to needs they cannot meet on their own. It encourages young people's self-knowledge, desire to discover and desire to know beyond the walls of the school, learning from others and teaching them what they know. Scouting plays a complementary role for the personal development of the individual, being an agent of non-formal education, contributing to formal and informal education.

ACKNOWLEDGMENT

To the Judicial School of Goiás – EJUG and to the Court of Justice of Goiás, for the full scholarship of the Doctorate course for the first author.

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Research in the field of psychopedagogy

https://doi.org/10.56238/ptoketheeducati-020

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ABSTRACT
The article discusses the specificity of the type of research appropriate to the field of Psychopedagogy, through the interlocution between the two authors who sign the chapter. Being both structuralists, they are based on this philosophical school when discussing reasons to recognize qualitative research as being the most appropriate when it comes to clinical Psychopedagogy, both because of the conditions of the work setting – a praxis – as well as about the client.

Keywords: Psychopedagogy, Fundamentals of Research in Psychopedagogy, Qualitative Research.

1 INTRODUCTION

In November 2016, I was invited to make an interlocution with my dear friend and always admired epistemologist Sara Pain, from a text of hers with the title *The scope and specificity of research in the field of Psychopedagogy*. With great joy and passion for the theme, we did a duet, she in Paris, me in Rio de Janeiro, at TEKOA-Center for Learning Studies. And almost nothing else happened, but the two intertwined lines[1], stored in the computer, precious yes, but nothing more.

Today, looking for something else, I discovered them in a poorly classified collection. And I started to think about the still freshness of this theme, 7 years later. This article is, therefore, the outcrop in writing of what was the duet presented. The voices, mine and hers, are mixed in a dialogue between people who like to research and accept the challenge of doing so, knowing that grace is in, with each investigation, new questions arise, in a spiral that ends...

She and I agree that research in the field of psychopedagogy is imperative, but it requires great caution on the part of those who do it, since we are not talking about a theoretical ground, which seems

[1]The writing of Sara Pain The *scope and specificity of research in the field of Psychopedagogy* that motivated my dialogue with the author was translated in 2016 by Maria Luiza Leão, Director of Tekoa, PhD in Educational Sciences. Paris V. Sorbonne.

to us firmer, even if hypothetical. The field of psychopedagogy has specific characteristics to which research papers do not always respond clearly.

The first to take into account is that psychopedagogy is not a science properly speaking, but, still considered, a praxis, a therapeutic practice that intervenes on a multifactorial practice, that of learning. But this praxis does not come out of nowhere. It is based on some theoretical pillars that are articulated within a common philosophical framework, under which structures are built that must harmonize with each other, so as not to lose the systemic balance of their parts, needing to meet, also, the movement of continuous balancing, which is life. No day is the same as the other and, for each day, the psychopedagogue needs to think both about the service he will do, and, at the same time, be prepared to receive a "same *new* client", the one who emerged from the last session, restructured with the material of what happened in the interlude of days. This is the client who will present himself in the next session. Like the sands of a beach that stand on changing elevations driven by the wind and, in this way, always surprising the walkers, so is the setting of the psychopedagogical session.

Of course, psychopedagogy has, of course, scientific references that serve as its foundation, but it justifies the veracity of these foundations more than these foundations justify it. Like all practice, the main justification for its relevance is its efficiency. The effects of psychopedagogical action are, for field research, more relevant than the causes that produce them. It's not just about the effects considered on the success/failure axis. It is, first, to consider the facts that the subject produces in a learning situation: experiences, gestures, behaviors, expressions, etc.

Being an eminently practical discipline, the specific objective of research in psychopedagogy does not aim at foundations and principles that it draws from other disciplines, such as sociology, psychology, biology and even philosophy. Thus, a theme such as the differences in intellectual performances according to socio-economic classes is properly sociological, it will not tell us anything about the functions of learning; A theme about the genesis of a specific notion, proper to epistemic psychology, will not inform us about our central interest, which is the various strategies that the different individualities mobilize within the same structural level.

Lack of attention may be a topic of pharmaco-medical research, but the location in the brain of an attentional zone adds nothing to the knowledge of attention fluctuations in relation to circumstantial variables: interest, duration, routine, etc. Psychoanalysis can unravel the traumatic moment linked to a lost epistemic function, but the interpretation is hardly likely to account for a more extensive cognitive behavior. Thus, in a child who omits the letter "h" in the word man, an (unsuspecting) psychoanalyst can easily identify a conflict of identification. However, the subjects who comment on this error and repeat it for all words that have a mute letter, the description of this symptom can guide the professional to consider the symbolic relationship of the subject with the law that governs what is not pronounced by voice.

So shouldn't we worry about these studies from other sciences? Of course. Because, in the microcosm of each learner is the mark of the biological, socio-relational, affective instances, of their ancestry and of their history.

If we add to the uniqueness of the client, that initial aspect that we brought - psychopedagogy as a praxis - we ratify the certainty that the proper use is the qualitative model, because, in general, the empirical sciences conclude their research by *descriptive* findings, when it comes to realizing what happens, or does not happen, in each case in which the subject acquires, or does not acquire, a precise knowledge or competence*; explanatory,* which relate the effects to their causes; *interpretive*, relating each behavior to the moment of its symbolic institution.

In the specific case of interpretation within the psychopedagogical setting, "it means communicating to the client, in the form of signaling or confrontation, what he understands of the meaning of his behavior and conflicts, translating, if applicable, the psychic mechanisms that led to the formation of the symptom."[2]In fact, in relation to interpretation, when performed in the psychopedagogical space, when appropriate to the client, it will be inserted in the associative chains of its psychic system, acting in a structuring way. It is important to point this out.

Returning to the central theme of this writing, given the type of phenomenon that characterizes our practice, the objective of the research is to arrive at a description of the individual psychopedagogical fact as unique and unpublished; it cannot serve a generalization, however, it can, by its richness, become exemplary. He is not just one in a sample; he is one in his uniqueness, yet he brings with him evidence of all the elements. And, we must not forget that "the only cases are full of laws". [3] If the sample results do not always explain the singular, also the singular does not necessarily have to "fit" in the parametric statistical modal curve. Lewin's ideas illuminate the contemporary debate about individual cases, as well as legality and theory in psychology; Why not extend them to psychopedagogy? We will be well accompanied.

It is then *the personal adventure in a situation that* interests us, as well as everything that in the act of learning is updated, that is, the cognitive potentialities, but also the habits, the skills, the prejudices, the inhibitions, since we will find the integral individual in each creative learning. Creative, not in the social sense, but in the reflective sense: while the subject reproduces the shared knowledge in an original way, for himself.

In fact, the process of creation cannot be linked only to the field of Arts, Design, Crafts. We have to broaden the concept, because to create is to find a new (at least for you) way to structure the elements

[2] Mamede-Neves, Antonio (1983) *Metapsicologia da Interpretação*, Rio de Janeiro: Autografia, 2022.
[3] Lewin, K. (1931). The conflict between Aristotelian and Galileian modes of thought in contemporary psychology. *Journal of General Psychology, 5,* 141–177 (tradução livre)
Tateo, L. (2013). Generalization as creative and reflective act: Revisiting Lewin's conflict between Aristotelian and Galileian modes of thought in psychology :*Theory & Psychology* 23(4):518-536

of a whole. And for this, the subject of knowledge uses two of the possibilities of thought: the *reproductive and the productive*. Thanks to the first, it keeps in itself a cast of memories that lead it to recognize internal excitations or elements of the external world; second, it uses them for the development of productive thinking, that is, it constructs the hypothetical-deductive reasoning that occurs through the creative imagination (be it artistic, useful or speculative), or by reasoning. It used to be said that by artistic creativity, the beautiful would be produced; by the practical way, the useful; and, finally, by speculative, one would try to find the truth... There is no consensus.

In any case, we know that thinking presupposes the support of an organization – the psychic organization – which constitutes a system of representations of internal impulses, objects and bonds perceived in the real world, of the experiential moments and actions of the individual himself, all of this received as information by the psyche, recorded in it and signified by it. In fact, the psychic system performs a double job: it transforms perceptions, external and internal, into images and mental operations, always integrating them into the set of already structured records, while modifying its own structures of operation, depending on the entry of new information into the system itself.

Through this possibility, that is, after receiving the information, registering it and signifying it and, above all, storing it, it is possible, to the thought, to work with mental representations of the external reality, organized in structures of operation capable of allowing the thought to put into action *Anticipation mechanisms*, perhaps the most important feature of its functioning. It is from this structured thought that the possibility of becoming organized and disciplined or refractory to life situations emerges; or to anticipate and see solutions, to weave singular plots, original for the historical moment in which it is conceived, that is, to create a new one.

And why don't we lose the focus of reality? Because thought is "kept on track" by the control of selective perception linked to reality.

When we affirm that thought does not make a linear reading of the world, we are certainly not relying on the theoretical bases of the analytical, the logical-theorists, defenders of the presuppositions of the *natural sciences,* in contrast to *sciences of the spirit*. We are relying on the proposals of the *Continental*, the historical-literary ones that defend the difference of the sciences of the spirit and the structural functioning of the mental space.[4]

Having the reach and the established approach, it remains for the researcher, the methodological referral. He must be appropriate to the epistemic theory that underlies the pedagogical experience he describes. For us, this referral is constructivist. This imposes two obligations: first, the construction of a learning situation whose theoretical description is as complete as possible; The notion to be acquired and the notions implied will be defined exhaustively, considering the intellectual level of its genesis, as well as its historical and symbolic scope. This constitutes a basis for addressing the

[4] D'Agostini, Franco Analytic and continental, Madri: Catedra Ediciones, 2010.

symbolic aspect of the notions, since we inherit the concepts with the conflicts he faced at the time of his appearance. The richer in potency the proposition, the richer will be our observation of its uptake by the subject; We can indicate what he takes, what he rejects, what leaves him indifferent. The second obligation is logical: it is not enough to establish a relationship, for example, between an acquisition and a condition; it is also necessary to confirm that this obligation is false (that there are situations where the relationship is not verified) and that there is reciprocity between the terms (that the presence of one ensures the presence of the other), because the description must allow us to make deductions, not to arrive at universal generalizations, but to identify some constants of behavior as comprehensive as possible; including all or almost all elements or aspects of the subject in question.

When it comes to human action, such as learning, exceptions to logical rules broaden the field of research, opening up to unprecedented, even contradictory possibilities that make the wonder of subjective variability. However, to better ponder a conflict, to make the impossible appear, one must be able to frame the possible. With this, the mute zone emerges, the intertext, essential to the psychopedagogical process in action.

Finally, we cannot forget the therapeutic character of psychopedagogy. The descriptive analysis of the behaviors raised by the situation will allow us to evaluate the psychopedagogical potentiality of the proposition - the variability of responses it elicits; the necessary adjustments to its application - of the demands, of the material, of the quality of the requirement; the placement of this situation in a continuous program or in a more potent research. And thus, the conducts of care are known, a subject that is still very little written in the books that deal with psychopedagogy.

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SEVEN
publicações acadêmicas

Trajectory and challenges of accounting professionals in higher education teaching

Crossref doi
https://doi.org/10.56238/ptoketheeducati-021

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ABSTRACT
This study aimed to analyze the trajectory of accounting professionals, since the conclusion of their graduations as bachelors, the practical performance in offices, the search for didactic improvement and the transition to the career of teacher. In addition, the study sought to identify and understand the challenges faced by these professionals along this path. The deductive method was used, which starts from general phenomena and comprehensive theories to contextualize a specific reality, adopting a qualitative approach with bibliographic and field procedures. Data collection was performed through interviews and semi-structured questionnaires, allowing the analysis of the trajectories and challenges faced by accounting professors. The relevant results of this research highlight the following aspects: the challenges faced by accountants when entering teaching, such as the difficulty in obtaining respect in the classroom, the importance of continuous training in didactic issues and in specific content of the discipline, in addition to the need for recognition and professional and financial appreciation by institutions towards teachers. It was also concluded that, to become a professor in the accounting area, it is necessary to have specific skills and characteristics of teaching, as well as to seek a graduate program that provides the development of didactics in higher education. In addition, it is necessary to deal with the uncertainties related to the ways of transmitting knowledge and adapting to students with different personalities.

Keywords: Professional trajectory, Professor of accounting, Accountant, Challenges in teaching.

1 INTRODUCTION

The profession of accounting teacher is considered a branch of activity within accounting, although it is distinct from the profession of accountant. According to Laffin (2002), the bachelor's degree in Accounting Sciences does not have the necessary scope to train teachers. The accountant becomes a professor of accounting by experiencing everyday situations that lead him to enter teaching, either through the interpersonal relationships developed throughout his career, or as a career choice in search of greater stability or prestige.

Gradually, the accountant moves away from his professional identity and enters a new area, often realizing that he did not receive the appropriate training in the institution for this new profession (SILVA, 1997). Miranda (2010) points out that there is no specific academic preparation for the accountant, when entering teaching, to be qualified as a teacher.

This research aims to describe which paths the accounting professional should follow to

become a teacher. It was based on research conducted throughout Brazil that bring the professions sought by the future accountant. First, it presents how the teaching of accounting in Brazil is developed, according to the laws of national curricular guidelines, later which areas stand out the most in the performance of an accounting professional and, finally, shows how some authors described the arrival of the bachelor's degree in Accounting Sciences in the area of teaching.

To be a qualified professional accountant it is necessary, according to the Federal Accounting Council Resolution (CFC) no 1.486/2015, in addition to the bachelor's degree in Accounting, the approval in the sufficiency exam and the registration in the Regional Accounting Council (CRC).

According to Resolution CNE/CES 10, of December 16, 2004, of the National Council of Education, Chamber of Higher Education, educational institutions must provide students of the undergraduate course in Accounting Sciences with the training to understand scientific, technical, social, economic and financial issues in different models of organization, both nationally and internationally. In addition, it is necessary that the accountant has full command of functional responsibilities, such as calculations, audits, expertise, arbitrations, actuarial activities and quantification of financial, patrimonial and governmental information, making use of technological innovations.

In addition to these skills that are worked in the classroom by higher education institutions, Lousada and Martins (2005) suggest that there are also skills that must be achieved in their own experience, the involvement in the market is what will help in their full training. For Fleury (2013) it is the set of knowledge, skills and attitudes that justify a high performance, to the extent that there is also an assumption that the best performances are based on the intelligence and personality of people.

At the professional level, the task of the accountant is to manage and produce information that is useful to the users responsible for making decisions. Accounting provides several options of areas where you can act, among them the main ones: Financial accounting, management accounting, cost accounting, independent auditor, expert, analyst, accounting professor among others (IUDÍCIBUS; MARION; FARIA, 2018).

Tardif (2012) presents that to enter teaching the individual needs to embrace the knowledge, capacities, aptitudes and attitudes that teachers have and stimulate by nature in their daily work. The knowledge of each teacher is related to the personal core and identity of each one, with the life experience he brings with him, with his professional history and with his interpersonal relationships that he has with the students and with his colleagues of profession.

The hon. Gentleman *et al*. (2014) emphasize that those who do not like the profession are not motivated to work and do not feel happy to be in the classroom exchanging experiences with students, influencing both technical and human training of educators and students. Enjoying teaching and living with students is undoubtedly important for the exercise of teaching; However, just liking it is not

enough. It is necessary to work so that the classes are profitable and so that one can grow together, preferring that the taste for teaching and study be translated into actions that benefit the production of knowledge.

Presented the contexts of the accounting professional who does not receive training in the undergraduate course to act as a teacher and the accounting professor who learns to teach throughout his career, it is asked: What are the paths and challenges faced by the accounting professional until becoming a real teacher?

The overall objective of this research was to describe the trajectory as well as the challenges faced by accounting professionals until they became career teachers. To achieve this general objective, specific objectives were established, which consist of presenting the panorama of the accountant profession, contextualizing the role of the professional in the teaching of accounting and identifying the trajectory of the accountants who became teachers.

Methodologically, this is a deductive research with a qualitative approach, using interviews with career teachers as the main survey technique.

As for the results, it was possible to perceive the challenges faced by accountants when entering teaching, as well as the high rate of teachers who felt unprepared when starting their teaching careers, especially in relation to teaching practices.

To become a teacher in the accounting area, it is necessary to possess specific skills and characteristics of teaching. It is important to seek a graduate program that allows contact with the didactics of higher education, improving teaching skills and learning strategies to engage students. In addition, these teachers will still face challenges and uncertainties as to the best ways to impart knowledge and deal with students of different personalities. It is essential to be open to adaptations and to be up to date with changes in the accounting area to provide a quality teaching experience to students.

2 THEORETICAL BACKGROUND

In this chapter, the topics related to the teaching of accounting in Brazil, the areas of activity of the accountant, as well as an overview of the profession of the accounting teacher will be covered. These studies will be used as a basis for the elaboration of this research.

2.1 ACCOUNTING EDUCATION IN BRAZIL

Accounting in Brazil is taught since the late nineteenth century, the School of Trade Practice of São Paulo was born in 1902 with the union of two friends: Professor Horácio Berlinck and Dr. João Pedro de Veiga Filho. Both sought public support to start this school, but to no avail. They then turned to the private sector, receiving financial support from industries and bankers. The first class of the

school had 216 students, who in 1905 had their diplomas of Accounting Technician recognized by the federal government by decree 1.399/1905. Later this institution came to be called Escola de Comércio Álvares Penteado (IUDÍCIBUS, 2006).

Martins (2006), in turn, points out that the precursor institution in the certification of technical accountants was the Polytechnic School of São Paulo, which had its regulation conceived in August 1893, with the name of School of Mathematics and Sciences Applied to the Arts and Industry. In its preliminary vocational course, lasting one year, the school already conferred the title of accountant according to a municipal decree. Its curriculum consisted of the following subjects:

> I) Elementary mathematics (revision and complements); II) Rectilinear and spherical trigonometry and higher algebra; III) Rudiments of analytical geometry and descriptive geometry; IV) Commercial bookkeeping; V) Freehand drawing and elementary geometry (MARTINS, 2006).

According to Da Cunha (2008), higher education in accounting in Brazil only came to be established years later, after Decree-Law No. 7.988/1945, which conceived the Accounting and Actuarial Sciences at a higher level. It was only in 1946 that the first institution of higher education in accounting was created: the Faculty of Economic and Administrative Sciences (FCEA). Initially, it maintained the courses of Economic Sciences and Accounting and Actuarial Sciences, but in a structural reform that occurred in 1964, where the FCEA was renamed the University of São Paulo (USP), it chose to delink these courses into seven academic departments: Economics, Administration, Accounting and Actuary, Mathematics, Statistics, Law and Cultural Sciences.

One year after Decree-Law No. 7.988/1945, which made the course of Accounting Sciences, a higher course, was created the CFC, by law 9.295/1946, with the objective of supervising the exercise of the accounting profession, the professionals qualified as accountants and accounting technicians, regular about the accounting principles, the sufficiency examination, the register of technical qualification etc (CFC, 1946).

According to CFC Resolution No. 1,486/2015, future accountants must meet the basic requirements established by the Board before practicing the profession. These requirements include completing a bachelor's degree in Accounting recognized by the MEC, passing a sufficiency exam, and registering with the corresponding Regional Accounting Council (CFC, 2015).

In order for an individual to be able to obtain the bachelor's degree in Accounting, it is necessary to meet a number of requirements established by the MEC in the National Chamber of Education. According to the National Council of Education, universities that intend to form these bachelors must follow the National Curriculum Guidelines for the undergraduate course in Accounting, according to Resolution CNE / CES 10, of December 16, 2004. These guidelines make clear the need for institutions to develop a pedagogical project that aims to consolidate the following aspects:

> I) Professional profile expected for the trainee, in terms of competencies and skills; II) Integral curricular components; III) Student and course evaluation systems; IV) Supervised curricular internship; V) Complementary activities; VI) Monograph, scientific initiation project or activity project – such as Course Conclusion Work (TCC) – as an optional component of the institution; VII) Academic offer regime; VIII) Other aspects that make this Project consistent (CNE/CES 10, 2004).

According to the deliberation of the National Council of Education, the undergraduate course in Accounting Sciences must provide the appropriate conditions for the future professional to be able to understand the scientific, technical, social, economic and financial issues, nationally and internationally and in the different models of organization; present full domain of functional responsibilities involving investigations, audits, expertise, arbitrations, notions of actuarial activities and quantification of financial, patrimonial and governmental information, with the full use of technological innovations; reveal critical-analytical capacity of evaluation, regarding the organizational implications with the advent of information technology (CNE/CES 10, 2004).

Upon completion of this academic training, with all these qualities acquired, according to the CFC (2015) in regulation 1786, those who wish to pursue a career as accountants must submit to the sufficiency examination. This exam is a test designed to prove the mastery of intermediate knowledge related to the relevant contents of the bachelor's degree in Accounting, with the aim of allowing registration in the accountant class.

This exam will be in a single test for candidates for class registration, who must prove the following areas of knowledge:

> (i) general accounting; II) Cost Accounting; III) Accounting Applied to the Public Sector; IV) Management Accounting; V) Controllership; VI) Accounting Theory; VII) Legislation and Professional Ethics; VIII) Accounting Principles and Brazilian Accounting Standards; IX) Accounting Audit; X) Accounting Expertise; XI) Notions of Law; XII) Financial Mathematics and Statistics; XIII) Portuguese Language (CFC Resolution No. 1,486/2015).

Carneiro *et al.* (2017) also mention that the MEC requires from higher education institutions a number of masters and doctors that must be attended, but that the reality reflects the lack of teachers with master's and doctoral degrees in the area of accounting, which has been discussed in the class bodies and also by academic entities, such as the Coordination for the Improvement of Higher Education Personnel (CAPES), Association of Graduate Programs in Accounting Sciences (ANPCONT) and the MEC itself. Although the growth in master's and doctoral programs in the country is remarkable, this proportion is far from establishing an appropriate relationship between the number of Accounting courses and the number of professors with degrees in the area.

2.2 AREAS OF EXPERTISE OF THE ACCOUNTANT

Lousada and Martins (2005) suggest that, in addition to the competencies worked in the classroom by higher education institutions to train the future professional in the accounting area, there are also competencies that must be acquired through experience. Involvement in the market is what will contribute to its full formation. For Fleury (2013), it is the set of knowledge, skills and attitudes that justify a high performance, to the extent that there is also an assumption that the best performances are based on the intelligence and personality of people.

The Accounting Sciences course is one of the most popular in the area of social sciences, due to the wide scope of action it offers, as pointed out by Lopes and Vendruscolo (2017). Students tend to opt for this course due to the good opportunities in the job market. As mentioned by Nascimento (2020), the most desired areas for action are those of auditing, expertise and analysis. Being that most of the graduates of the course wish to follow these areas through public positions, being the decisive factors the stability and the remuneration so that the candidates aspire to these careers.

In addition, due to the curricular components related to disciplines such as law, administration and economics, and the set of information he supervises, the accounting professional plays a strategic role in the management process of organizations. Therefore, it is considered a key piece in any area in which it operates (SANTOS *et al.* 2011).

The survey Profile of the Accounting Professional, conducted by the CFC in 2013, presents the following areas of activity for the accountant: I) Elaborator; II) Analyst and manager; III) Auditor and fiscal; IV) Others (business, educational or scientific environment). In addition, it is highlighted that there are three main sectors of activity: public, autonomous and private sector. This generates a multitude of possibilities for the future accountant to choose from among the various professions within these areas (CFC, 2013).

According to Iudícibus; Marion and Faria (2018), the accounting profession is to manage or produce information that is useful to the managers of the institutions. Among the areas of expertise for an accountant, we highlight management accounting, financial accounting, cost accounting, independent auditing, expertise, analysis, teaching in accounting, among others.

Management accounting aims to evaluate the economic performance of a company, using financial accounting, which is responsible for producing accurate and reliable statements. Based on these analyses, it is possible to identify areas of inefficiency and waste, develop action plans and allow strategic decision-making (PADOVEZE, 2010).

Cost accounting, according to Leone (2009) aims to understand the information related to the production and sale of products or services of a company or industry. With this approach, it is possible to identify both variable and fixed costs, in addition to analyzing the cost-benefit of different production and operation strategies, enabling more assertive decision-making, as well as identifying

possible opportunities for cost reduction.

Among the highlighted professions, the role of the accounting teacher is fundamental, because it provides the necessary training for future professionals to qualify and act in each of the areas highlighted by the CFC.

These teachers share their knowledge with other individuals through cognitive processes that involve specific information, knowledge, understandings, and concepts. In this way, they play a crucial role in the education of future accountants. (TARDIF and LESSARD, 2011).

However, the profession of accounting teacher is neglected during the bachelor's degree course and even in professional master's programs. Accountants interested in pursuing this area should take specific preparatory or graduate courses to obtain the necessary academic preparation. As evidenced by Miranda (2010) of the eighteen master's programs and three doctoral programs existing in Brazil at the time, only two master's programs required to attend didactic-pedagogical disciplines.

2.3 THE PROFESSOR OF HIGHER EDUCATION AND THE PROFESSOR OF ACCOUNTING

Education, in general terms, can be understood as one of the social areas whose activities underlie the performance in modern societies, having, to a large extent, predominance over other areas and activities. It is constituted as a social sphere that allows man to reflexively turn to himself to assume himself as an object of activities, projects of action and, finally, of transformations (TARDIF, LESSARD, 2011).

Mizukami (2006) evidenced the lack of a coherent and comprehensive theoretical reference that could be used as a basis to clearly understand the learning and professional development processes of higher education teachers in various areas of education.

Teaching in higher education is a territory that presents timid initiatives, there are no training programs for teachers of higher education and only a part of the teaching staff involved with teacher training courses has some kind of pedagogical preparation (MIZUKAMI, 2006).

In their research, Bouzada, Kilimnik and Oliveira (2012) questioned teachers from various areas of training, such as Psychology, Tourism, Administration, Physical Education, Law, Computer Science and Communication. In this study, the difficulties faced by these teachers at the beginning of their teaching activities were pointed out, such as the inexistence or precariousness of their training as teachers, the lack of monitoring of universities in relation to their didactic-pedagogical performance, the lack of stability in private colleges, the accidental way in which they entered higher education and, finally, the energies required to improve and master the content taught, as well as the relationship between students, colleagues and institutions.

In addition to the areas already mentioned, Costa (2010) conducted studies with medical professors, one of the most renowned and respected work careers in Brazil. In her research, she pointed

out that behind the scenes in healthcare, the career of a medical professor is not always considered a de facto profession by many doctors. In addition, she cites that if a medical professional wishes to act as a teacher, he is usually evaluated primarily on the basis of his efficiency and performance in his technical area when being hired as a preceptor in the courses, and not his ability to teach or teach practice.

However, teachers have begun to realize that teaching, like the research and practice of any profession, requires specific skills and training. In addition to the competencies necessary to exercise the profession, there are also competencies related specifically to university teaching (COSTA, 2010).

Colle (2019) points out that neglect in teacher education is not a problem unique to undergraduate accounting, but also occurs in graduate programs. The author mentions that this failure reflects the interest of the State and its representatives in satisfying their own ambitions, leaving the teaching profession abandoned and, consequently, devalued. In addition, it is pointed out the lack of a significant standardization of the performance as a teacher in the National Curricular Guidelines (DCN) and in the International Federation of Accountants (IFAC).

Although teaching is mentioned as one of the areas of activity of the accountant, for Silva (1997) and Laffin (2002), the activity of teacher is a different career, which requires specific characteristics. They claim that the teaching activity is inspired through the academic or professional history of the accountant, which gradually replaces the identity of "being an accountant" with a new professional responsibility.

However, there is often a lack of specific academic preparation for this activity, since the objective of the bachelor's degree in Accounting Sciences is to train accountants and not teachers. Thus, many accountants become teachers through interpersonal relationships, provisionally accepting some subject as a favor to some acquaintance in the department and, over time, developing interest in the teaching profession (SILVA, 1997; LAFFIN, 2002)

Miranda (2010) points out that the Accounting Sciences course does not have systemic preparation for the exercise of teaching. He also states that the first years of teaching are notably relevant, because educators seek to achieve the transition from student life to that of teacher and, at this moment, questions and tensions arise, requiring teachers to acquire science and professional competence.

As pointed out by Soares and Cunha (2010), there is no tradition of teacher training for the exercise of teaching at the university level. The criterion adopted for entry into the teaching career of higher education has been the professional experience and qualification of teachers in *stricto sensu* graduate programs, especially the doctorate.

Ferreira (2015) points out that having professional experience with accounting is relevant to the exercise of teaching. Career teachers value and attribute the importance of this experience to

teaching the practical aspects of accounting. These professionals emphasize that the teaching in accounting should privilege contents related to the professional practices of accounting, in order to enable the approximation of the student with the labor market.

Tardif (2014) argues that to follow in the career of teacher the accountant needs to embrace the knowledge, skills, aptitudes and attitudes that teachers have by nature in their daily work. The knowledge of teachers is related to the person and identity of each one, with their life experience, with their professional history, their relationships with students in the classroom and with their professional colleagues.

Having zeal for teaching and living with students is undoubtedly important for the exercise of teaching. However, it is necessary to work so that the classes are profitable and so that one can grow together, preferring that the taste for teaching and study be translated into actions that benefit the production of knowledge (CAVALHEIRO *et al.* 2014).

From the ethical point of view, teachers must observe aspects such as respect, justice, responsibility, commitment, understanding, acceptance and honesty. As for the behavioral aspects, the teacher must like to relate to people, be motivated and motivating, humble, updated, communicative, creative, questioning, leader and dynamic (FERREIRA, 2015).

Silva (2020) emphasizes that, being a professional only graduated, no longer meets the expectations of the entities. The accounting professional must specialize, understand the regulations, understand the functioning of the market and the variables of the economy directly influencing the development of quality content even within the classroom. It is observed that the accounting professional must always seek to improve himself as an accountant and as a teacher, to have a dynamic and comprehensive profile of his technical skills.

To improve teaching practices, Carvalho (2011) studies and recommends professional self-assessment. Through this practice, it is possible to identify positive and negative points in the teacher's performance, allowing a continuous improvement in his teaching practice. Some of the most common forms of self-assessment include watching one's own videos, getting *feedback* from students, evaluating assessment results, and creating journals to record and critically analyze one's own performance. It is essential to emphasize that self-assessment should be a constant and systematic process, always aiming to improve the quality of education offered to students.

In addition to the previously mentioned challenges that teachers face when entering the classroom, the COVID-19 pandemic has brought the need for a new adaptation: the use of digital tools. However, it was evident during this period the lack of adequate instruction and training of teachers to deal with these tools, especially when it was necessary to teach classes in a non-face-to-face manner. This lack of preparation not only hinders the use of these tools, but also affects the elaboration and pedagogical planning for distance learning. Unfortunately, teacher training often does not address this

demand, which can negatively impact the quality of teaching, the application of the usual methods of evaluation and the motivation of students (PALUDO, 2020).

In a study conducted with teachers during the pandemic period, Santos *et al.* (2022) showed that 55% of teachers reported impasses in interactions with students, while only 12% of them claimed to have a satisfactory interaction with their students during remote teaching. The research also identified that 74% of the faculty analyzed faced complications in the transition to emergency remote teaching, which were mainly related to the process of migration to the virtual environment, the use of new technologies and, mainly, psychological difficulties.

In the work carried out within the course of Accounting Sciences at the Faculdade da Amazônia – FAAM, only 35.7% of the interviewed professionals, graduated in Accounting, felt prepared to work within the classroom as teachers. The course of Accounting Sciences aims to prepare the academic to act in the labor market and not to act in the classroom as a teacher. The possibility that teachers are fully prepared to act at the beginning of their journey is real, however, it is necessary to realign their capabilities at the beginning of their careers as teachers because to act as a teacher involves research, patience, dedication and requires vocation (SILVA, 2020).

3 METHODOLOGY

Regarding the method, it was a deductive research, which, according to Benedicto *et al*. (2012), starts from general phenomena and comprehensive theories to contextualize a particular and specific reality. This research addressed the traditional path of an accounting professional in Brazil to become a teacher, and applied this general rule to a cadre of professors from specific universities.

Regarding the objectives, the research was descriptive, of an applied nature, with a qualitative approach. According to Silva and Menezes (2001), qualitative research aims at the specific understanding of a group, with the interpretation of phenomena and the attribution of meanings, being fundamental in the interpretative process.

As for the procedures, the research was bibliographic and field, interviewing professors of the faculties of Accounting Sciences located in the municipality of Cacoal-RO, highlighted in Figure 01.

Figure 01 – Interviewed teaching population

Institution	JOIN	UNESC/SER	FANORTE
Teaching population	11	2	2
Interviewed	10	2	1

Source: survey data, 2023

Thus, the research population was composed of accounting professors from the aforementioned faculties, totaling 15 professors. The sample was formed by the professionals who agreed to participate

in the research, thus adding 13 participants, thus characterizing a convenience sampling.

The data collection technique adopted in the research was the semi-structured interview and the application of a structured questionnaire. The questionnaire addressed the following variables: professional training, motivation to become a teacher and the challenges faced throughout the teaching career. The interviews took place from February 13, 2023 to March 25, 2023.

Six interviews were conducted in person, conducting a survey of semi-structured questions. Seven teachers refused to participate in person due to lack of time in their schedules or because they felt more comfortable answering the questionnaire, thus choosing to answer the form sent via *Google Forms*.

For data analysis, content analysis and discourse analysis techniques were used, with the creation of tables and graphs to synthesize the information. The focus of the analysis was centered on the message and it was possible to create categories for the answers obtained in a more general way, following the guidelines of (BARDIN, 2011).

4 RESULTS

In this chapter, the results obtained in this research on the performance of the accounting professional in Brazil, the contextualization of the accounting professor and the trajectory of these accountants until they become career teachers will be presented.

4.1 THE ACCOUNTING PROFESSION

The course of Accounting Sciences is one of the most sought after in the area of social sciences, has a large sphere of professional opportunities, essential for the financial management of companies and organizations around the world. Most academics usually follow this course due to the good opportunities in the job market. According to Nascimento (2020), the most desired areas to act are that of auditor, expert and analyst.

Iudícibus, Marion and Faria (2018) point out that the task of the accountant is to manage or produce information that is useful to users for decision making. This information may include financial reports, cost and profit assessments, future investment planning, and tax issues, among others.

Your knowledge of tax laws and financial regulations, as well as your ability to manage complex data, are essential skills to ensure that users understand accounting information and can use it effectively to make informed decisions.

In addition, it is critical that the accountant possesses communication and collaboration skills, allowing him to work as a team and communicate clearly and effectively with other professionals and users of accounting information. These skills are vital to ensure that accounting information is transmitted accurately and effectively, providing insights of great value to the management of the

entity.

Figure 02 shows the possible areas of action of the accountant brought by Silva *et al.* (2019), in which it evidenced that the professional preference of future accountants in the state of Rio Grande do Sul are focused on the areas of general, public and internal auditing. In their results, only one student opted for the profession of teacher.

Figure 02 – Description of the possible areas of action of the accountant

AUTONOMOUS	BUSINESS	PUBLIC SECTOR	TEACHING
Independent Auditor	Internal Counter	Public Accountant	Teacher
Consultant	Internal Auditor	Tax Inspector	Researcher
Accounting Office Owner	Tax Accountant	Collection Controller	Writer
Accounting Expert		Court of Auditors	Speaker

Source: adapted from Silva et. al. 2019

Among the areas of activity highlighted, Lopes and Vendruscolo (2017) identified in their research that no academic of the eighth period of the Accounting Sciences course mentioned that their intended profession was that of teacher.

This profession suffers neglect during the bachelor's degree course and even in professional master's programs. Miranda (2010) in his work carried out in 2008 evidenced that of the eighteen Master's and three PhD programs existing in Brazil until then, in only two (Master's degree) brought the obligation to attend didactic-pedagogical disciplines.

4.2 PROFESSIONAL PROFILE INTERVIEWED

The profile of the interviewed professionals was identified based on information such as gender, time since graduation in accounting and time working as a teacher. This profile is represented in the figure below.

Figure 03 – Profile of the interviewees

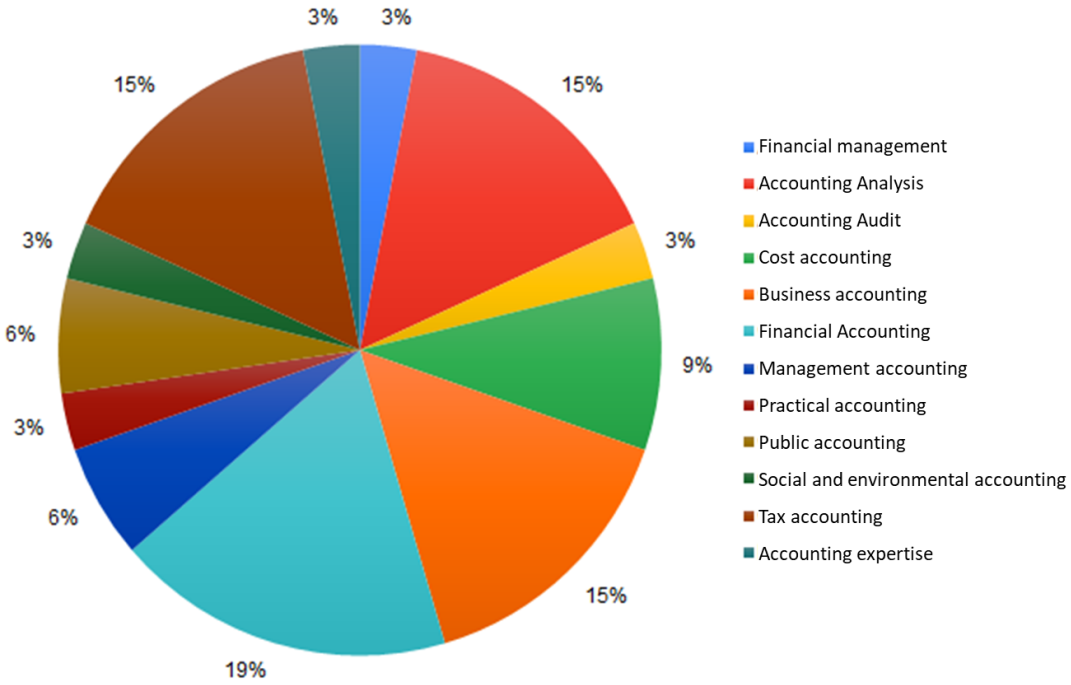
SEX		Accountant Training		Teaching	
Male	53,80%	01 - 09 Years	23,08%	01 - 09 Years	46,15%
Female	46,20%	10 - 19 years	46,15%	10 - 19 years	23,08%
		20 - 30 Years	30,77%	20 - 30 Years	30,77%

Source: survey data, 2023.

Regarding the degree of the interviewees, 69% have the title of doctor, while 23% have the title

of specialist. As for the area of expertise, 19% have a specialization in financial accounting, while business accounting, tax accounting and accounting analysis tie with 15% each.

Figure 04 - Area of specialties of the teachers



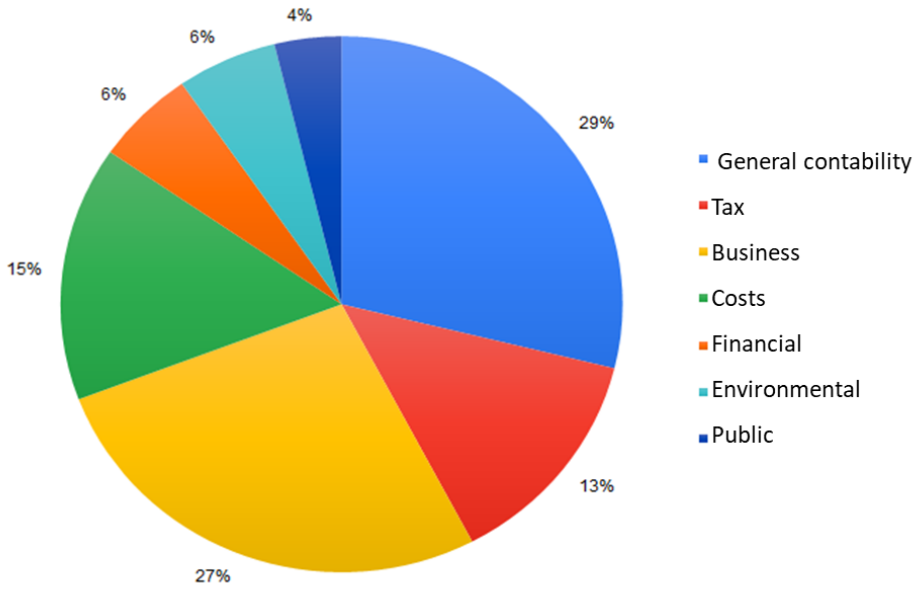
Source: Survey data, 2023.

In relation to academic courses, 53.8% of the interviewees have a specific postgraduate degree in teaching in higher education, while 46.2% of the professors had access to qualification in preparatory courses or in subjects of the master's and doctoral program.

Silva (2020) points out that being a professional only graduated, no longer meets the expectations of the entities. The accounting professional must specialize, understand the norms, understand the functioning of the market and the variables of the economy, which directly influences the development of quality content in the accounting profession and even within the classroom.

Regarding the subjects taught by accounting professors, 53 subjects taught during the semester were mentioned. These subjects were grouped into seven disciplinary areas, with the most cited being general accounting (29%), followed by business accounting (27%) and cost accounting (15%), as shown in Figure 05.

Figure 05- Main disciplines taught.



Source: Survey data, 2023.

When asked about their preferences in relation to the main disciplines taught, 92.3% of the interviewees stated that they were working with the subjects in which they have the greatest affinity. However, one of the interviewees pointed out that it is not always possible to teach exactly in the desired disciplines and that, when they have the opportunity to teach a discipline in which they have specialization, the result of the classes tends to be significantly better.

4.3 TRAJECTORY OF THE ACCOUNTANT-TEACHER

Regarding their professional experience as accountants before becoming teachers, 84.6% of the interviewees had practical experience in the profession, such as office owners, accountants, service providers, managers who dealt with general accounting aspects or liberal professionals. The majority of these respondents (39%) worked in accounting for a period of 4 to 6 years. Only 7% still work in accounting offices, even as teachers.

All interviewees have positive opinions about their practical experience in accounting before joining teaching, including those who did not have this experience. This is because this practice is considered effective for the actual teaching of accounting. According to them, only the experience in accounting practice allows relevant contents to be brought to academic teaching, since during graduation teaching remains in the abstract field.

It is through the experience in the professional environment, in the day to day of the accounting office, that one understands the demand necessary to adequately prepare the student. This perspective is in accordance with the argument of Ferreira (2015) that professional practices in the field of accounting enable an approximation of the student with the labor market.

As for the reasons that led them to choose the teaching activity, it is possible to notice the most varied answers, from statements that they have always dreamed of being teachers, to unusual invitations to be substitute teachers.

The survey results revealed that 53% of respondents were motivated to enter the teaching career due to the connections and influences of other people who already worked as teachers. These influences included family figures, such as mothers or husbands who worked in the field, as well as college classmates who had already chosen teaching as a profession. In addition, some interviewees were inspired by their own professors and colleagues during the undergraduate course in Accounting, identifying an affinity with teaching practice.

Only 15% reported that it was a dream to practice the profession of accountant teacher. Other reasons cited for entering the teaching career were to carry out their own scientific research (7%) or to encourage young minds to enter the profession (7%) and even a way to get an extra income (7%).

Laffin (2002) points out that the accountant can become a teacher through interpersonal relationships. Silva (1997) observes that the teaching activity requires specific characteristics, which are often awakened during the coexistence with study or work colleagues.

Another point verified with the respondents was in relation to the challenges faced by accounting professors at the beginning of their careers. During the questionnaire, one of the obstacles pointed out was the transition from a practical profession to an intellectual and abstract profession. Some teachers, who started their careers soon after finishing their studies, reported the difficulty in obtaining the respect of older students. In addition, some teachers reported having suffered moral and sexual harassment by some students.

Figure 06- Keywords: challenges of the teaching career.



Source: survey data, 2023

The need to keep up to date with changes in accounting legislation, the need to deal with different personalities within the classroom and the difficulty in arousing students' interest also proved to be complex challenges.

The teachers also mentioned some difficulties faced during their careers, such as: adapting to the technologies used in remote learning during the pandemic, the need to deal with the new generation of Generation Z students, in addition to expressing concern about the weakening of traditional education and the devaluation of the accounting profession, leading some teachers to seek other professional careers. Among the interviewees, 23% chose to perform other activities due to the lack of recognition and support from the institutions in relation to teaching.

The course of Accounting Sciences does not have any type of systemic preparation for the exercise of teaching. The initial years of teaching are the most complex, because educators seek to achieve the transition of student life to form a teacher identity (MIRANDA, 2010).

During the interviews, it was found that 93% of the teachers stated that they did not feel fully prepared when they started their careers in higher education. Although these teachers felt confident about mastering the content, many reported that their practice in didactics was only improved with classroom experience or through courses over time.

Regarding continuing education, the teachers interviewed highlighted the importance of seeking this professional improvement. In addition to reading magazines and periodicals with specific subjects, they also mentioned the use of short videos, courses in related areas and even conversations with accountants who are still working in offices to improve their didactics. Periodic self-assessment was also mentioned as a strategy to identify points of improvement in teaching practice.

During the interviews, asked about the search for qualification as a teacher, all respondents stated that they sought specific readings on didactics in higher education. Of these, 62% said they sought 1 to 3 copies on the subject during the year. Teachers with newly started careers sought more of this content, citing between 7 and 10 books or other types of readings. Teachers with more than 4 years of experience show a lower demand, and only 1 interviewee with more than 5 years of career stated that he seeks more than 10 books per year.

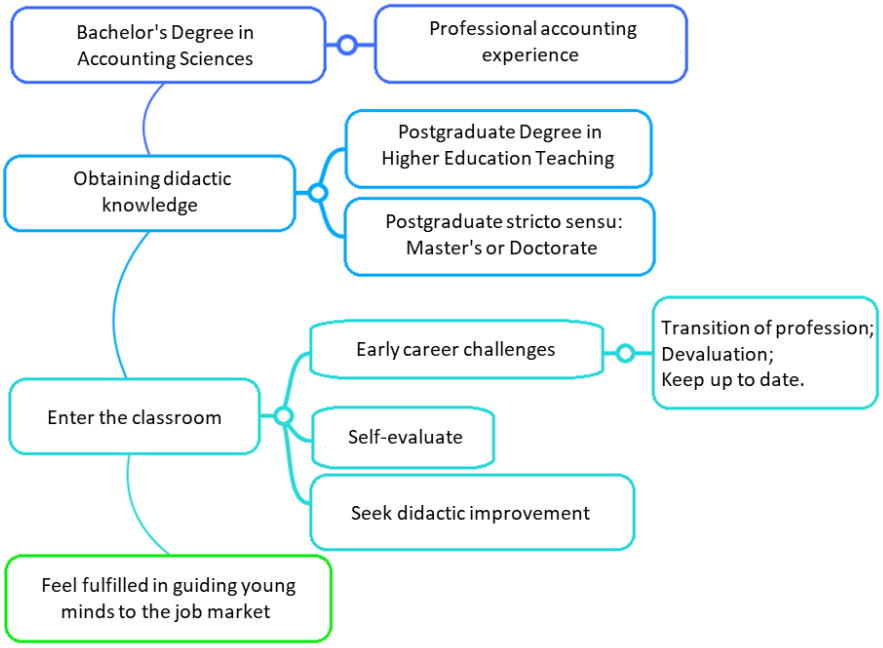
Teaching in higher education faces significant challenges, with initiatives still timid and the absence of specific training programs for teachers in this area. It is then up to the teacher to seek their professional evolution, using self-assessment as a tool to develop self-criticism. Unfortunately, neglect in teacher education has contributed to devaluing the identity and role of teachers (MIZUKAMI, 2006; OAK, 2011; COLLE, 2019).

Even in the face of all these challenges, both professionals with early careers and those with long experience stated that they would choose teaching again. In addition to the dream of becoming a teacher, they also feel fulfilled by awakening in the students the same passion for the profession that

they have until today. Discussing different opinions about politics, technique, teaching and learning with colleagues and students is an activity that favors development. It is pleasing to see the students evolving and to know that it was the teacher's contribution that helped in this progress.

From the information presented, the trajectory followed by the interviewed teachers was traced, which can be observed in the figure below.

Figure 07 - Trajectory of the Accountant-Teacher



Source: survey data, 2023

This trajectory highlights the steps necessary for the development of a career as an accountant until his consolidation in teaching. After the completion of the bachelor's degree in accounting, it is essential that the professional seeks to start his teaching practice through postgraduate courses, both *lato sensu* and *stricto sensu*. Upon entering the classroom, he will face the initial challenges common to the beginning of the teaching career. However, if you persist and accept this new professional challenge, you can reap rewarding results.

5 FINAL CONSIDERATIONS

The figure of the teacher is essential for the academic and professional formation of students, and the teaching career is an admirable choice for those who wish to contribute to the education and training of future generations. However, for those making the transition from a technical career to a teaching career in higher education, the complications tend to be significant. This is the case with accounting teachers, who often feel that they are not properly prepared for the task of teaching.

Thus were presented the traditional paths to be followed by accountants who decided to become teachers. After completing the bachelor's degree in accounting, these professionals sought knowledge

in teaching practices through postgraduate courses, both *lato* sensu, focusing on education and didactics, and in *the stricto sensu* modality. Upon entering the classroom, they faced challenges, such as adapting to the teaching environment and developing teaching skills to deal with different student profiles. It was fundamental for these professionals to seek continuous training and participate in courses related to pedagogy and teaching methodologies, aiming to improve their educational practices.

In this way, the overall objective of describing the trajectory as well as the challenges faced by accounting professionals until they become career teachers was achieved. It is noteworthy that, to become a teacher in the accounting area, it is necessary to have specific skills and characteristics of teaching. After entering the teaching career, the accountant will still deal with fear and uncertainty about the ways to transmit his knowledge, as well as possible disrespect when dealing with students of different personalities. It should always seek adequacy regarding content and new practices and face the imminent devaluation to which the teaching class has been subjected.

The bachelor in accounting, upon completing the course, may be faced with the question: "What to do now that I am graduated?". At the beginning of graduation some aspire to be a tax auditor, others aspire to be experts or even office owners. However, throughout the course, it is rare for the academic who wishes to become a teacher, in fact, as noted, teachers do not even present this professional perspective during graduation. Thus, how can a student be inspired to pursue this career if it is not addressed in the very course that should prepare him? This behavior can result in the devaluation of the profession of higher education teacher.

It was also observed that the population of teachers is decreasing. During the interviews, it can be observed that, of the four institutions scheduled to be interviewed, one of them abandoned the face-to-face course and opted for distance learning. It is more economical to offer recorded video lessons instead of hiring a local teacher. In addition, when analyzing the teaching staff of another institution, it was found that only two professors from the Department of Accounting Sciences had a degree in accounting. These data highlight the shortage of qualified teachers in the area and the trend of replacing face-to-face teaching by distance learning, raising questions about the quality and training of future accounting professionals.

Finally, we highlight the effort and dedication of each accountant who chose to be an accounting teacher to contribute to the development of young people with promising careers, who will start a new journey thanks to the commitment of these teachers. It is through this conscious decision and the commitment of accounting professionals that the field of accounting will continue to train future talents and contribute to the progress of society.

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SEVEN
publicações acadêmicas

Representations of non-teaching workers in daily school life

Crossref doi
https://doi.org/10.56238/ptoketheeducati-022

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ABSTRACT
This text articulates the results of investigations on the representations of non-teaching workers in the relationships established with other agents in the school environment. The object and subjects of this study are workers who do not work directly in the pedagogical field at school, but who support it. This is research of ethnographic inspiration, added to the qualitative instrument of the interview that helps in the reading of the social figurations of the school community (N. Elias) in the light of the theory of Social Representations (S. Moscovici) and the concepts of Working Class and Relational Work, as found in Ricardo Antunes and Tardif and Lessard respectively. It is considered here the dynamics of the relations and the perceptions about the conditions for the execution of the work, the structure of organization of the school space as a workplace and legal documentation that names, regulates and prescribes the actions in this space.

Keywords: Workers not teachers, Social representations, Basic education, School culture, Sociology of Education.

1 INTRODUCTION

This work represents an effort to understand the division and organization of work in the school environment from the performance of employees who perform the work of technical and operational support and who contribute directly and / or indirectly to the realization of educational work. We highlight as our subjects and object of research, the School Agents (servants, general helpers, janitors/cleaners), School Cooks (lunch girls), Secretary Assistants (management assistants, assistants and school secretaries), School Activities Assistants (student inspectors), among others", since they have functions to support the pedagogical work and contribute to give solidity and structure to the school routine, They also constitute a significant part of the institutional dynamics, that is, of the environment of human relations that is part of the socialization process that students live in school. In this sense, we will approach the theme from the representations that these employees have of the work they perform, paying attention to the educational dimensions of the same, describing the relationships they maintain among themselves and with the other participants of the daily school life.

To understand the situation of non-teaching staff in the school context, we turn to Tardif and Lessard (2008, p.55) for whom the school is an organized, spatial and socially separate place from other spaces of social and daily life, it is an environment produced by social and historical conventions that translate into relatively stable organizational routines over time. They also describe it, as a socio-

organizational space that functions from the performance of several individuals linked to each other by different types of more or less formalized relations, the school is a place that houses tensions, negotiations, collaborations, conflicts and circumstantial or deep readjustments of their relations, socialization, exchange of experiences, and work that is characterized by a formatting and structure – closed spaces of standardized measures with specific furniture such as chairs, tables arranged in rows and columns facing a blackboard - and by particular technologies that are its own, such as programs, disciplines, subjects, speeches, ideas, objectives, etc. It uses different instruments (books, notebooks, manuals, paintings, etc.) that have in common the fact that they are artifacts that transmit written culture and written, codified, objectified knowledge (Tardif and Lessard, 2008, p.58).

Therefore, the school rests first of all on a certain number of devices that are at the same time institutional, spatial and temporal that delimit and structure an autonomous social space, closed and separate from the community environment and that since its emergence has been dedicated to achieving quite ambitious purposes such as the dissemination of the *Lights* through literacy, to promote a new social ethic, to form enlightened citizens and balanced people, as well as to improve the fate of the working classes (Tardif and Lessard, pp.57, 77).

It is also a space that supposes special criteria of organization that must be established from the very nature of the work that is developed in it. However, for the actions carried out in this environment to be organized with a view to fully meeting the demands and goals, a process of interdependence of its agents is necessary, and so we conceive here the school, each day in its routine, alluding to Elias, as a "figuration". Was this the concept that the author used – especially from 1970, after publishing Was ist Soziologie? – to think about human societies, for Elias the concept of figuration helps us to look at social formations in a more realistic way and not in a reified way, because we have to consider from this concept, the individual in his multiple social relations while not losing sight of the social formations where he is inserted.

When we look at the school, it is clear the presence of networks of interdependence on the part of its agents, through their needs and inclinations, and these relationships can be voluntary or not (Elias, 1994, p.77). In fact, Chartier quoting Elijah also helps us in this understanding:

> A figuration is a social formation whose size can be very variable (the players of a card game, the tertulia of a café, a class of students of a school, a village, a city, a nation) in which individuals are linked to each other by a specific mode of reciprocal dependencies and whose reproduction supposes a mobile balance of tensions. (CHARTIER, 1990, p.100)

When Elijah makes use of the word figuration, he is evidencing that there is no individual independent of society, but that both are constitutive of each other. "The concept of figuration serves as a simple conceptual instrument, which will help to soften the social pressure to speak and think as if individual and society were different and antagonistic figures" (Elias, 2004, p.141). In this

perspective, the individual is no longer seen as an autonomous driver of his life and society is deprived of the conception of who submits and determines the life of the same.

Therefore, both inside and outside the school there is an individual and collective work with human beings that leads first of all to relations with people and therefore to all the subtleties that characterize human relations such as negotiation, control, persuasion, seduction and promise, which evokes activities that are configured as means in view of ends such as instructing, supervise, serve, help, entertain, heal, care, amuse, control, among others and that demand components such as empathy, understanding, open-mindedness, undeniable assets of interactive work to achieve some success (Tardif, 2007, p.33).

2 SOCIAL REPRESENTATIONS AND THE DYNAMICS OF RELATIONSHIPS IN THE WORKPLACE

Each of us has a vision and understanding of what we see, feel and hear, perceptions arising from the relationships we maintain in society, which organize and guide social conduct and communications and manifest themselves both collectively and individually, that is, they function as a system of interpretations to which we give the name of representation. We can say that the collective representations are those disseminated historically in society and that have great weight and value in it, while the individual representations, are the interpretations of each particular subject, not generalized, are interpretations of personal value.

Thus, when proposing the study of the representations of the non-teaching workers of the school, it is known that there is the coexistence of individual and collective aspects, in the work environment, there is the employee and the person simultaneously. There are several groups of professionals, but they all integrate into a single group: "employees". In this sense, it is that the theory of social representations will be used, because it allows us to weave a link between such groups that with their particularities allied to the individuality of each component establishes an effective interaction so that there is a feeling of common belonging between the "individual" and the "collective".

The concept of representation emerged from the studies of Émile Durkheim in the early twentieth century, understood as forms of social integration built by men in order to maintain group cohesion. Representations expressed in various forms, institutions, images, discourses, norms, etc. and construct a reality parallel to the existence of individuals so that it does not annul such reality and is not annulled by it.

The French sociologist made a great contribution to the studies and understanding of representations, but he raised some limitations. In an attempt to make sociology an autonomous science, he advocated a radical separation between individual and collective representations and

suggested that these should constitute the field of sociology while those constituted the terrain of psychology (Moscovici, 2012, p.13).

Durkheim placed social psychology in a crisis that lasts to this day, because from the rupture he instituted between the terms mentioned, he came to consider that social psychology had no more direct connection with sociology and that therefore social phenomena are different from psychological phenomena and even formulated ideas explicitly in his aphorism that "whenever a social phenomenon is directly explained by a phenomenon We can be sure that the explanation is false" (Durkheim, 1895/1982, p.129, apud Moscovici, 2012, p.12).

Moscovici adopted the sociopsychological perspective, however, the distinction between the terms "individual" and "collective" was not successful since the issue became problematic due to the recognition of individualism as a powerful collective representation in modern society (Farr, 1998, apud Moscovici, 2012, p.14). Durkheim conceives of collective representations as a concept, while Moscovici conceives them as socially constructed phenomena based on common sense. For him, to understand them as a phenomenon is to give priority to their condition as an object that must be understood in the dimension of the complexity of their structure and in the dimension of the scope of their influence, as content to be unveiled, as a dynamic process.

> [...] If, in the classical sense, collective representations constitute an explanatory instrument and refer to a general class of ideas and beliefs (science, myth, religion, etc.), for us, they are phenomena that need to be described and explained. They are specific phenomena that are related to a particular way of understanding and communicating—a way that creates both reality and common sense. It is to emphasize this distinction that I use the term 'social' instead of 'collective'. (Moscovici in JODELET, 2001, p.59)

> Social representations emerge, not only as a way of understanding a particular object, but also as a form in which the subject (individual or group) acquires a capacity for definition, a function of identity, which is one of the ways in which representations express a symbolic value. (MOSCOVICI, 2012, pp.20,21)

Thus, I affirm that every form of interaction between individuals in the school environment constitutes what Moscovici (2012, p.49) calls "phenomena that need to be described and explained. They are specific phenomena that are related to a particular way of understanding and communicating - a way that creates both reality and common sense", since through interaction individuals transmit a little of themselves and constitute themselves with a little of others, so that we cannot say that this process is collective but social, because social relations are formed and enriched more and more in relation to communication with others and not in relation to reality, which is what happens in the collective representations disseminated by Durkheim and Levy-Brühl that end up shaping the mental life of individuals by coercion (idem, p.209). This is due to the fact that the representations have a double nature, being able to agree how to prescribe behaviors, interpretations, objects or even people and situations causing them to become familiar and to that extent act transposing an "object" of context

(geographical, temporal, social, etc.) to a reality so that this object begins to inhabit this reality and be accepted in it as if it already belonged to it.

> [...] They conventionalize the objects, people, or events they encounter. They give them a definitive form, locate them in a certain category and gradually place them as a model of a certain type, distinct and shared by a group of people. All the new elements join this model and are synthesized in it. (MOSCOVICI, 2012, p.34)

Concomitant with the act of agreeing the representations exerts its prescriptive character above all through the culture of populations, groups, societies, reaffirming a whole set of beliefs, values and principles. To be quite clear, I would say that the way a baby after birth comes to be and be in the world, how it learns to speak, to act, to think as it grows, perfectly summarizes the implications arising from the two characters of the representations, and I believe that to a greater extent the prescriptive character acts because the child receives commands, prescriptions, rules, slogans of what and how to do, of what can or cannot be, of what and how to speak, because all people are influenced by the culture in which they are born.

> Representations are *prescriptive*, that is, they impose themselves on us with an irresistible force. This force is a combination of a structure that is present before we even begin to think and a tradition that decrees what should be thought. (MOSCOVICI, 2012, p.36)

By bringing the routines and work dynamics of cleaners, cooks, access controllers, student inspectors and school secretaries to the discussion about the representations they have and give to have of themselves, their crafts and the crafts of others, as well as the due routines and dynamics, we intend to establish a link between these categories and make them explicit in their interactions in the educational work environment that is common to all. Such relationships are "formed through reciprocal influences, through implicit negotiations in the course of conversations, where people orient themselves towards symbolic models, images and specific shared values", (Moscovici, 2012, p.208) what we know to be a range of distinct representations that, however, coexist in the same space, that is,

> The distance between the first and third person plural - in the use of the pronouns "we" and "they" - (emphasis added) expresses the distance that separates the social place, where we feel included, from a given, indeterminate or, in any case, impersonal place. This lack of identity, which is at the root of modern man's psychic anguish, is a symptom of this need to see ourselves in terms of "us" and "them"; to oppose "us" and "them"; and therefore of our powerlessness to connect with each other. (MOSCOVICI, 2012, p.50)

Thinking about the motivation of Moscovici (2012) for the elaboration of the theory of social representations is of paramount importance in view of what we perceive in the quote above, because for the author, what was intended was "the attempt to build a bridge between the strange and the

familiar; and this to the extent that the stranger presupposes a lack of communication within the group towards the world." (p.207). For him

> all things, topics or people banished or remote, all who have been exiled from the concrete frontiers of our universe always possess imaginary characteristics; and pre-occupy and annoy exactly because they are here, without being here; they are perceived, without being perceived; His unreality becomes apparent when we are in his presence; [...]. (p.56)

This is one of the reasons that leads us here to speak of representation, because it equates every image to an idea and every idea to an image, so that one thing is reality and another is the representation of it (Moscovici, 2012, p.46). In fact, the comprehension of what is and what is not but what becomes can be better apprehended by mechanisms related to memory and that Moscovici calls anchoring and objectification, mechanisms that are directly related to the ways of conception and apprehension of life in the world, both individually and collectively, because according to the author, anchoring transforms something strange and disturbing into something familiar by approximation and/or association, that is, when we deal with anchoring, we are classifying and naming something using comparison as a criterion, and thus we interrupt any estrangement and consequent threat, regardless of whether we relate such object/situation/body to something positive or negative.

The mechanism of objectification supposes transforming something abstract so that it becomes something "tangible" and in a certain way even controllable. This is, in fact, a much more active mechanism than the previous one. "To aim is to discover the iconic quality of an idea, [...] to reproduce a concept in an image, [...] to transform the word that replaces the thing, into the thing that replaces the word." (ditto, 2012, p.71).

Representation is a phenomenon that can reveal a lot to us upon close observation, since according to Durkheim, this phenomenon has specific characteristics that distinguish it from other natural phenomena (idem, p. 93). Therefore, we seek with this work to analyze how non-teaching professionals understand the social world in the context of which they are part, particularly their functions in school, and how this understanding guides/conditions their actions in daily life.

When talking about work, there are several conceptions and definitions about the term, so that many of these conceptions are directly linked to specific contexts and situations, from the first discussions, whose greatest theoretical representative is Marx, to the present day, however, in this particular study, we take the term in contemporaneity with the representation of Ricardo Antunes and in the specific area of work in school with the contributions of Tardif and Lessard, which places it beyond contemporaneity by treating and studying the working conditions of educators in today's societies, which they call Modern Advanced Societies.

Tardif and Lessard (2007, pp. 17-19) point out in their work four findings that they obtained when seeking to understand the current transformations of work societies. The authors indicate that in

all advanced modern societies the category of workers producing material goods is in free fall while workers in the service sector grow nonstop; "in the service society, professional groups, scientists and technicians are progressively occupying important and even dominant positions in relation to the producers of material goods"; the new labor activities are historically related to the professions and professionals that typically represent new groups of specialists managing economic and social problems with the help of knowledge from the natural and social sciences; Finally, in this context, the trades and professions that have human beings as "object of work" enjoy an increasing status (emphasis added).

As Antunes, he explains to us who are those who for him are not part of the class that lives from work.

> The working class today excludes, of course, the managers of capital, its high officials, who have a controlling role in the labor process, the valorization and reproduction of capital within companies and who receive high incomes, or even those who, in possession of an accumulated capital, live on speculation and interest. It also excludes, in our understanding, the small entrepreneurs, the urban and rural petty bourgeoisie (ANTUNES, 2003, p. 104).

Another striking characteristic of this "new working class" (my emphasis), according to Antunes (2002, p.53) is the female presence in the world of work, so the class that lives from work is a mixed class, both male and female, and therefore more diverse, heterogeneous and complexified.

This fact adds to this work great relevance since the research was carried out in a school whose "staff" is massively female with the presence of few male workers, all immersed in the same cultural universe during their work period, but with different attributions, distinct social roles and that build their identities from the relationships established in the work environment with all the people in it, in a simultaneous process of inclusion and exclusion according to behaviors, characteristics and other factors that, from the same point of view, equate and differentiate individuals, therefore,

> Understanding contemporaneously the class-that-lives-from-work in this expanded way, as a synonym of the working class, allows us to recognize that the world of work has been undergoing important mutations (ANTUNES, 2003, p. 104).
> In the universe of the world of work in contemporary capitalism, a multiple processuality is observed: on the one hand, there was a deproletarianization of industrial, factory work in the countries of advanced capitalism, with greater or lesser repercussions in industrialized areas of the Third World. In other words, there has been a diminution of the traditional industrial working class. But, at the same time, there was a significant expansion of wage labor, from the enormous expansion of wages in the service sector; there was a significant heterogeneization of work, also expressed through the growing incorporation of the female contingent in the working world; There is also an intensified sub-proletarianization, present in the expansion of partial, temporary, precarious, subcontracted, "outsourced" work, which marks the dual society in advanced capitalism [...] (ANTUNES, 2002, p.46)

3 OBJECT SELECTION AND INSTRUMENTAL CONSTRUCTION

Having situated the main concepts and aspects of interest for the study proposed here, a bibliographic survey was carried out that recovered few titles that could offer me support for the

development of the research, namely: "Employees and non-teaching employees of public schools: in favor of the inclusion of new educators and educators". (01/12/2000-CAPES), Master's thesis from the Fluminense Federal University of Carlos Augusto Alves Duarte – this is the work of a boy who worked for some years as a Vigilante in schools in Rio de Janeiro and who, by working in the school, begins to see possibilities of contribution beyond "watching" and opening and closing the gates of the school, the author stands in defense of the valuation, visibility and recognition of himself as a person and as a professional, speaking through his dissertation also in the name of the category "Non-Teaching Staff" (emphasis mine).

The title "Public School Employees: Professional Educators or Disposable Servants?" (2003) by João A. C. de Monlevade, is a book that resulted from a long work that the author as a trade unionist, active in campaigns and union struggles, published portraying the working conditions of education professionals who did not exercise teaching, but performed technical functions to support the teaching work such as educational advisors, school secretaries, among others. Both titles assume a tone of denunciation about the work situation of non-teachers, as well as discrimination, accompanied by the social invisibility of which they are victims. Another study found was the dissertation entitled: "The work of servants and lunch girls in public schools in the city of Rio de Janeiro" whose focus was to follow the work and performance of servants and lunch girls seeking to bring them visibility and professional appreciation by the very people who made up the daily life of the school where the work was carried out.

The official documents that deal with the issues of valuing the person and the professional and the recognition of the work performed are scarce, however, we find the work *"For a policy of valorization of workers in Education: On the scene, the school employees"* (2004), a document proposed by the government of the State of São Paulo advised by Monlevade that also has a markedly political and prescriptive character.

The differential of this research lies in its intention to identify and analyze both the educational nature of the work of non-teachers and the relationships and social interactions established with the school and its agents and users.

The choice of the school unit and the informants for the interviews was made for convenience, knowing that we needed a school, where there were non-teaching workers. For Guimarães (2008, p.18), convenience sampling, also known as non-probabilistic sampling, is formed by elements that the researcher gathered for specific interests.

Our research is of inspiration and not exactly ethnographic, since ethnography supposes a very considerable rigor, especially in relation to the time of observation, because it allows the dense description of the object studied. With ethnography, we verify what is apparent and what is latent in a culture, that is, what cannot be perceived at first glance, at a superficial glance. The dense description

is the practice carried out by the ethnographer with the aim of perceiving the "multiplicity of complex conceptual structures, many of them superimposed or tied to each other, which are simultaneously strange, irregular and inexplicit, and which he has to somehow first apprehend and then present." (Geertz, 1989, p.20).

According to Geertz (1989, p.38), the goal of ethnography is to draw great conclusions from small but densely interwoven facts; support broad assertions about the role of culture in the construction of collective life by engaging them exactly in complex specifications.

In fact, when one seeks to understand social relations, interactions in a configuration as we are proposing in this work and as Elias and Scotson did in Winston Parva – the village studied by the authors – it is necessary,

> [...] learn to systematically observe and conceptualize how individuals aggregate, how and why the configurations thus formed change and, in some cases, develop. [...] It is only possible to overcome the limitations of sociological research centered on statistical methods when researchers trained to discern and manipulate isolated factors or variables ally themselves (or have this qualification themselves) with researchers trained to discern and, at least conceptually, manipulate configurations as such. (ELIAS and SCOTSON, 2000, p.57).

If we do not pay intense attention to the situation researched we run the risk of losing many details that would certainly enrich the work. For Durkheim (1895/1982) in Moscovici (2012, p.93), "since the observation reveals the existence of a type of phenomenon known as representation, with specific characteristics that distinguish it from other natural phenomena, it is useless to behave as if the phenomenon did not exist."

> The main concern in ethnography is with the meanings that actions and events have for the people or groups studied. Some of these meanings are directly expressed by language, others are transmitted indirectly through actions. Either way, he says, in every society people use complex systems of meaning to organize their behavior, to understand their own person and others, and to make sense of the world in which they live. (SPRADLEY, 1979, apud, ANDRÉ, 1995, p19)

Each day of observation, I made notes in a logbook, some concomitant with observation, others when leaving the field of research, seeking to recover and preserve what I observed with the greatest possible richness of detail, later I organized the notes into better detailed and structured texts, which I called in this work "Extended Accounts" (R.A), so that it contains the marking of the time of beginning and ending of the observations, as well as the order number and the days of the week in which they were made. According to the degree of structuring placed by the observer, I can say that semi-structured observation was used, in which specific moments were defined to be recorded, such as the performance of the inspector of students at the exact moment of attending to the children, the work, attitudes and behaviors of the cooks at the time of serving the meals, the performance of the janitors/cleaners when performing their work and especially when all these categories of workers

interact with the students and each other, but also in which much information stood out outside these already established standards.

In this work the observation in question was an open observation, that is, the observer is visible to the subjects/objects that knew of my condition as a researcher and that they and their functions, my research objects.

Vianna (2003) highlights, in a summarized way, based on several authors such as Creswell (1998), Flick (1999), Bailey (1994), the different phases of the observation process:

- Selection of a "scenario", that is, establishing the place where and when the people involved in the process can be observed;
- Definition of what will be documented in the observation and in what cases, that is, identify who or what to observe, when and for how long;
- Descriptive and reflective observations that offer a general presentation of the observed field; planning and methodology for recording field notes;
- Highlighting of observations that contain aspects relevant to the research inquiries; record aspects such as the description of the informants, physical context, particular events and activities, and the observer's own reactions;
- Selective observations that intentionally intend to understand central aspects;
- During the observation, if you are an external observer, introduce yourself, establish friendly relations, start with restricted objectives in the first observation sessions; [...]
- After the observation, inform the interested parties about the use of the data and the availability of the study. (VIANNA, 2003, pp. 28-9).

In the interim, I made the selection of some informants with whom I conducted interviews following a script between 15 and 20 questions previously established in a semi-structured way, which were carried out with 7 workers who agreed to collaborate with this study.

The interviews were conducted individually on the premises of the school unit, since the interviewees were in working hours, but did not have their activities compromised with the dedication of time to the interviewer. All of them (the interviews) were recorded in audio and transcribed literally. Anyway, with regard to observation and interview, I justify its use at work because:

> The observation [...] participant [...] assumes that the researcher always has a degree of interaction with the situation studied, affecting it and being affected by it. The purpose of the interviews is to deepen the questions and clarify the problems observed. The documents are used in order to contextualize the phenomenon, explain its deeper links and complement the information collected through other sources. (ANDRÉ, 1995, p. 28)

4 PERCEPTIONS ABOUT SCHOOL WORK

4.1 EVERYDAY DOING: PRESCRIBED WORK VS. PERFORMED WORK

Given the functions/positions presented above, we inquire about who determines the work to be performed, performed in the school unit? What are the legal functions/attributions prescribed for each of the positions that make up the staff of the school? In order to seek answers to such questions, I sought to retrieve specific data about each of the positions, their requirements and specificities.

We were able to better visualize and understand the composition of the positions and nature of the functions from the attributions that the employees have prescribed for them, based on the description present in the notice of the public tender of 2010; of the work routines collected in the field days before we started the observation period at school, and finally from what we were able to observe during our visits to the school., and from what the interviewed informants tell us about their work routine.

Thus, we propose the analysis of the working conditions, of the non-teachers, above all, from the angle of the real demands of daily work before the dichotomy that pervades the worker in the exercise of his functions that move fluidly between the intellectual and the manual. We understand with regard to the teacher the non-equivalence of the modalities of work due to the nature of each one, especially because it is concomitantly objective and subjective work, our effort is to approximate what reflects in the workload of both groups when immersed in the same environment, in the same institution, in the same workplace, Of course, without disregarding all the variables that we know exist between the act of teaching and that of serving snacks, washing, cleaning, sweeping.

The considerations we propose also emerge because there are workers in the school environment who interact directly with students, and the nature of their work is close to the teaching work, for example, the work of school monitors, student inspectors and school activity assistants, functions that have a degree of prescription and specific and pedagogical knowledge requirements such as those that teachers must master, For just like the teachers, the work of these subjects is carried out together with a "living object" of work and not inert matter, – such as the paper, the computer, the pots, the squeegee, the broom and the physical environment that are completely submitted to the control and action of the worker – therefore, it is a work on the man himself so that both the teachers and these workers daily "confront with the irreducibility of the individual in relation to the general rules, to global schemes, to collective routines. It is a work whose product or object always escapes, in various aspects, the action of the worker." (Tardif and Lessard, 2007, p.43).

It is important to consider that the school is an educational institution also outside the classroom, to the extent that all the experiences of students and teachers there constitute the curriculum. Thus, according to Tardif and Lessard (2007, p.49), such people act "in a certain context in function of a goal, acting on any material to transform it through utensils and techniques".

Having as premise that the context we are talking about is the school, can we say that the work performed by them is an educational work? Certainly, provided that we take – according to Tardif and Levasseur (2011, p.12) – by "educational work" (emphasis added) the set of tasks and functions performed by all the subjects who work in the school contributing, according to the various modalities and purposes, to the realization of the schooling process, in close interaction with the students through both direct and indirect interventions.

> Today, with the progressive expansion of schooling, it is perceived that, more than being instructed by teachers, the population needs to be educated by educators, understanding that all those who have a permanent presence in the school environment, in contact with students, are educators, regardless of the function they perform.
> In this scenario, lunch girls also need to take care of food education, librarians, help in the construction of the habit of reading and literary education, secretaries should collaborate with the evaluation process of teaching and learning, configuring the institution of new functional identities. (BRAZIL, 2004, p.16)

4.2 WORKING AND WORKING CONDITIONS

> The term *working conditions* involves physical facilities, materials and available inputs, equipment and means of carrying out the activities, but also concerns labor and employment relations. The forms of hiring, remuneration, career and stability also have effects on the well-being of workers [...]. (CNTE, 2012, p.302)

We can analyze the working conditions according to three axes:

4.2.1 a) Physical Conditions

We consider here as physical conditions of work, the facilities, the physical structure of the workplace and in the workplace, therefore, the school building with all its dependencies. From all that we have seen in our field of study, we note that there is a considerable territorial extension, access ramps and stairs, a cafeteria of size and accommodations disproportionate to the number of students who use them daily, a large number of railings and gates, the absence of adequate spaces and furniture for pedagogical meetings in the teachers' room, large classrooms, non-slip bases on the floors etc. One hypothesis is that these physical working conditions are naturalized by the subjects, who do not consider ways in which their action can be favored by the organization of the physical space.

4.2.2 b) Means of carrying out the work

The second axis concerns the way of doing, the instruments that one has for the accomplishment, execution of any tasks. It is possible to better understand these conditions from the questioning made about those involved in the research having had some specific training or preparation for the exercise of the function.

By declaring that they do not have any kind of preparation or training to perform their work and, even so, do so without the need for those, the interviewees lead us to understand that they have familiarized the work performed through the processes of anchoring and objectification because, according to Moscovici (2012, p.20), in these processes "the unfamiliar begins to occupy a place within our familiar world", which justifies the fact that they say that they perform the work at school from the experiences they obtained doing something similar or the same work elsewhere, that is, when the interviewees identify that what they do at home or did in the office can be used in their task at school, they were able to anchor their actions, And to the extent that they place this association in favor of the practice and perform the activity, they are objectifying the action, therefore making it tangible, palpable, that is, reproducing a concept in an image." (Ditto, p.71)

The different situations observed in the configuration of this research show that workers reinvent themselves daily, in an attempt to create operative modes to fulfill the daily prescriptions of the school organization. For the school worker,

> the characteristics and requirements of the task it needs to perform and the function it must perform depend in part on the set of elements of the context, some of which are not very stable, since it faces pressures and manages resources that are its own, from the biological and psychological point of view, as well as also depend on subjective mobilization, which conditions its functional state at a given moment, can modulate the situation considerably. (TEIGER, 1998, p8, apud, CHAVES, 2004, p. 22)

Thus, we can say that these findings corroborate what Tardif and Lessard (2007) affirm as determinants of workload and help us understand some of the aspects that directly influence the working conditions, described in the table of answers to the interview questions and in the observations.

- Material and environmental factors, such as the nature of workplaces and the material resources available. For example, the insufficiency of adequate material, [...] the dependence on transport schedules (in distant regions), the insufficiency of financial resources [...].
- Social factors, such as the location of the school (in a rural or urban environment, in a rich or poor block, etc.), the socioeconomic situation of the students and their family, the violence prevailing in the block, the sale of drugs among children, etc.
- Factors linked to the "object of work", such as the size of the classes, the diversity of the clientele, the presence of students with special needs and difficulties of adaptation and learning [...]
- Phenomena resulting from the organization of work: working time, - [...] the amount of tasks to be fulfilled - the employment relationship (regular, precarious, by contract, etc.). [...]).

- Formal or bureaucratic requirements to be met. [...]
- Finally, there are also the ways in which workers deal with these phenomena and the strategies they devise to assume or avoid them. Here we have to take into account the age and time of profession of the workers, their experience, how they see their role and their mission. Their sex, because women, who are the majority of the body of work, often have to face a double task, at work and at home etc. (TARDIF & LESSARD, 2007, p.113, our emphasis).

4.2.3 c) Labour and employment relations

According to the data obtained in the interviews, the hiring regime of the workers who make up this study and other employees of the City Hall of Suzano, was initially through the Consolidation of Labor Laws (CLT) lasting until the year 2010, when all municipal employees began to be governed by Complementary Law No. 190/10 that provides for the Statute of Public Servants of the Municipality of Suzano, i.e. statutory regime.

According to article 231 of that document, we have the identification of education professionals:

> § 1. For the purposes of this Law, Education Professionals are all employees of the Staff of the Municipal Department of Education under the terms of its own legislation.
> [...]
> Art. 232. The career positions of Education Professionals are accessible to all Brazilians who meet the requirements established in Law. (PMS, 2010, p.35)

4.3 SOCIAL RELATIONS IN THE SCHOOL ENVIRONMENT

When talking about working conditions we must take into account much more than wages, the workload, the status of the function that is exercised, there are other variables that include in the understanding of working conditions a set of dimensions also personal and social that converge in the work environments and cause diverse effects, sometimes positive, sometimes negative, sometimes explicit, sometimes implicit in performance, among these variables, there are social and/or interpersonal relationships, therefore, we understand here the school as

> A social organization derived from secular collective practices, whose modes of organization and functioning weigh heavily on the personal and social destiny of millions of individuals. Like other contemporary social organizations, it is linked to a system (formal or informal) of functions and tasks performed by agents depending on various trades and professions. [...] The school is effectively no different from other large public service organizations. It is anchored in a collective work simultaneously shared and divided among innumerable categories of agents that intervene in various places and moments of the work process: shared, because all these agents contribute, in principle, to a common work, which is the instruction and socialization of students, through the school continuum, which necessarily requires the activities of coordination among themselves, as well as the mechanisms and controls that govern them; divided, because these agents are responsible for different tasks and, finally, because they occupy specific spaces and working times and different institutional positions

> and, ultimately, because they have different formations, competences, knowledge, functions and statutes in their relations with students. (TARDIF AND LEVASSEUR, 2011, p.19,20)

Given the field observations and answers obtained from the interviews, we can say that there is little room for interaction with the students, partly because of the school's own organization as an institution, partly because of the specific demands of the work of each segment.

Regarding the interactions between the workers themselves, we found that there is also little interaction when it comes to the interaction between different categories of work, because among those who perform the same task, there is a greater degree of interaction, of conversation, even because it is necessary that there is communication so that everyone does and knows what to do.

5 CONCLUSION

Our work detected the almost inexistence of systematic studies on workers who work in the school environment and who do not perform functions directly linked to teaching or school management, and the few works found during the bibliographic research for the composition of this work were focused on specific categories of workers. We began this investigation by questioning the treatment of non-teaching workers as educators.

Now, in order to be educators, it is necessary that the non-teaching workers of the schools perform, perform, do work that is educational. We hypothesized that the work carried out by these employees could present an indirect educational content that was not even perceived by the subjects themselves and other members of the school community. So we seek to define what is the educational work relying on Tardif and Levasseur (2011, p.12), which proposes to be "the set of tasks and functions performed by all the agents of education [...].", and that, therefore, takes place in a specific space, that is, the school, described by Tardif and Lessard (2007, p55) as an organized, spatial and socially separate place from the other spaces of social and daily life, as an environment produced by social and historical conventions that translate into relatively stable organizational routines through time and space that functions from the performance of several individuals linked to each other by different types of more or less formalized relations.

From the comprehension of the aforementioned definitions, the question we proposed became even more potent: *If non-teaching workers are equally educators, how does the execution of their tasks position them before the function of the school institution?* Thus, the hypothesis that there is some educational effect on the work of these subjects attracted new questions: *What makes the actions of these workers have such an effect*? *How are these actions characterized? Are the educational effects perceived? How and by whom?*

The answers to these questions came through observations and interviews, through which we were able to reach our objectives, that is, to map the representations of non-teaching school employees

about their work, as well as the social relations and interaction in the school environment, discussing the dynamics of action and working conditions.

It would not be possible to talk about the work and non-teaching workers without taking into account the nature and specificity of the work they perform, therefore, we seek in the analysis of the public tender notices and in the Statute of Public Servants of the Municipality of Suzano to capture such aspects and we found that in the tender notices themselves the workers are appointed as educators, because in the attributions placed to them there is the prerogative to have as a principle the educational character of their functions, as well as for various positions it is established that the employee must eventually collaborate in the direct care with the student, therefore, the PMS through its SME is the one who says first that the non-teaching worker is an educator through the description of the job attributions.

We found that, even unconsciously, the workers perform the educational work, however, some do it intentionally as was the case of the cook, when calling attention to the health benefits of food. And the and of the school agent, when passing in the classrooms talking to the students about the conservation and maintenance of the cleanliness of the rooms. In the same way, there is also the work that, regardless of the perception or not of the worker, has an educational content, as occurs with the work of the School Support Agents (inspectors of students), because it is a work of human interactions, and that consists of advising, guiding, accompanying the children during all the time in which they are not under the care of the teachers, Being that the main moment of performance is the interval / recess.

A hypothesis that we had at the beginning of this work and that was a very strong representation in the view of this researcher, is that the non-teaching workers of the schools are stigmatized or suffer prejudice because of the work they do, the schooling they have and, when arriving with this vision in the school studied, the researcher was confronted with an environment where, Despite little interaction, workers do not exclude or are excluded. It was possible to witness a complicity between them during the fraternization party that took place at the school and the researcher was able to participate and see that the various population groups of that figuration talked among themselves. However, in view of the interviews, it was clear that the degree of interaction between employees is somewhat restricted because of the work dynamics that they have, that certain groups maintain contact only at specific times, as occurs with teachers who interact more with these workers to the extent that they depend more directly on their work.

The relationship with the students is more restricted to the moments in which they are conditioned to observe them, that is, time of entry, exit and interval. Although there is interaction between the different categories of workers, it was possible to notice that the work in the school environment considered by Tardif and Lessard as collective work is not in fact collective. It is noticed, throughout the analysis of the interviews and in the face of the observations, that the collectivity of the

work only appears among the components of the same work group and that when this occurs between the different groups, it occurs by request or order of the school management**.** We then have a typical scene of schools that in part confirms the initial hypothesis of the researcher: despite the feeling of collectivity and friendship that exists between people who perform different tasks in the school environment, each one will do only his part without caring about the work of the other, no matter how much the other has some form of damage to his work. This situation is apparent when the school agents claim that they help in the break, that they look at children, but that they have no return of help from the other employees when it comes to the work of cleaning. They also point out that not even the school management realizes that they "help everyone" and by "no one" are helped.

We found that the physical conditions and the means for carrying out the non-teaching work are still seconded by the school management and the SME itself, which is clear when the cooks declare that they receive last-minute food and that they often take seasonings from home or buy to increase the food, when the cleaners (School Agents) say that the material sent by the city is sometimes insufficient and that they need to ration what they have, when the assistant secretary says that the information arrives with little of the last minute, that teachers are missing and / or late without notice, that sometimes they run out of material to support the teaching work. Finally, working conditions, in general, are fickle.

The universe analyzed by us confirmed that the devaluation of the work of technical, support and operational staff, in which non-teaching workers participate, is the result of a perverse logic of work, because according to Chaves (2004), many of these jobs, especially the work of cooks and cleaners/janitors are considered "natural" and the domain of any woman, Thus, it is not taken into account that cooking for many people and cleaning various environments in short and predetermined periods of time constitute works with a specific logic and knowledge, which would distance, in ideal conditions, from the logic of domestic work by the simple fact that they are performed on a large scale. Thus, the precariousness to which they are subjected ends up constituting forms of devaluation of work and the worker in several aspects.

In fact, our research showed that the work activities of non-teaching employees of schools contribute to the educational process that is characterized by the socialization of habits, values and attitudes, and its effect will occur when it makes sense to the student, when he realizes that everyone in the school values the clean environment, the organized room, when everyone treats another employee at school with respect, when they help each other, etc. However, it is necessary to draw attention explicitly to these issues and, in this sense, the main responsible is the teacher, both for the speech and for the example.

This work reveals the need for the non-teaching worker to be perceived and also to perceive himself to a greater extent as an educator Finally, we conclude that, although the policies of

valorization of the non-teaching worker have the intention of projecting to all the members of the school their functional identity and pointing them out as educators, evidencing the educational dimension of their work, It is necessary that the worker can be seen, valued and recognized in order to understand the educational dimension of what he does.

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Laboratory practice complemented with chemical ludo – The design of a multistrategic teaching unit for regular high school chemistry students

https://doi.org/10.56238/ptoketheeducati-023

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ABSTRACT
The research refers to the process of presenting and teaching Chemistry to regular high school students who attend the first year. consequently, the project aims to apply the concept of Multistrategic Didactic Units (MDU), which aims to link a variety of didactic sequences in harmony with previously established and delimited learning objectives, recognizing and stereotyping the fundamental concepts necessary to introduce, achieve and practice, in a playful and empirical way, the Teaching of Chemistry to students of the first year of regular high school; execute the appropriate sequences to understand the issues involved; improve school development by relating the contents taught with their social and technological importance, with emphasis on the study of acid bases and indicators, at first; highlight the importance of teacher and student performance in the teaching-learning process, providing recommendations for pedagogical practices to improve Chemistry Teaching. To support the research, we rely on the theoretical contribution of David Ausubel, Amadeo Bego, Cleidson Carneiro Guimarães and modern authors who approach the themes. The methodology for carrying out the research included bibliographic research on the content, practical classes held in the science laboratory on inorganic functions - acids, bases and indicators and the complementation of the methodology with playful activity, the latter being carried out in the media room of the school. This playful activity includes a game, where all the theory taught is explored through objective and essay questions in order to provide an environment suitable for the full development of students' skills and competences.

Keywords: UDM, Playfulness, Laboratory Practice.

1 INTRODUCTION

In this pandemic scenario in which we are living, education, like many other areas of human activity, has been severely affected. The obstacles were diverse during the development of this research, but even in the face of all the drawbacks, the professionals who work in education, especially teachers are proving to be more and more dedicated to improving the quality of teaching. With regard to the Teaching of Chemistry, we verified the great amount of research and fervent debates in favor of this improvement. The various events such as congresses, debates, conversation circles, symposia,

meeting of experts, lectures, among others, always aim to improve and share the didactics and ideas used in the day to day in the classroom. These exchanges of information and experiences among research teachers will always contribute to the search for novelty in teaching, often through alternative methodologies, differentiated didactic instruments, among other things. The different methodological practices such as playful, experiments, group dynamics, non-formal spaces, seminars and lectures of common interest are some that the teacher perform with his students and that aim to deviate from the traditional pattern of classes that are common today and whose principle is based on the figure of the student as a transmitter of knowledge and with a main and active role, To the extent that, the student is a passive individual and simple receiver of information.

> The teaching considered as traditional seeks to pass on the knowledge, that is, the contents to be taught by this paradigm would be previously summarized, organized and incorporated into the cultural collection of humanity. In this way, it is the teacher who dominates the contents logically systematized and structured to be transmitted to the students. The highlight of traditional teaching, therefore, is in the transmission of knowledge. Saviani (1991)

This study arose from my experience in more than 24 years as a teacher of Chemistry in Elementary School (EF) and high school, and, in the same way, by the observations found by me regarding the lack of enthusiasm, both of teachers and students of the public school system.

As a teacher of Elementary and Secondary Education of the public and private network I have observed the great difficulty that students have to understand concepts and applications in the area of Chemistry. There are really numerous obstacles found in the craft of educating, problems that go through the structural precariousness in public institutions of elementary and secondary education, complete lack of interest and predisposition of the student to want to take possession of what is offered, knowledge, lack of professional qualification among many others. Added to this is an absurd number of students per class and approximately 45 minutes, which constantly prevents an effective and different approach from the traditional one, this undoubtedly contributes to making Chemistry a fundamentally theoretical discipline and without any real relationship with the student's daily life. Much of this difficulty in the learning process is in the act of teaching. As a result of these difficulties, a good part of the teachers of this area are feared, because they make the act of teaching Chemistry a task of difficult understanding.

The research aims to develop a proposed approach involving Multistrategic Didactic Units (UDM) using experimental practice and complemented with a playful activity in the teaching of Chemistry. The proposal is to use simple experiments, referring to the content of acid bases and indicators for students of the first year of regular high school that can be performed with simple materials, easy access and low cost. To measure the content, a question-and-answer game will be addressed in the classroom or in the school's media room.

Most students show difficulties in learning Chemistry, because they did not understand the purpose of having to study the discipline, due to a teaching disconnected from reality and difficult to understand, generating failures in the learning process (CHASSOT, 1995). The way the contents are disseminated results considerably in the discouragement of the student, because too many topics taught in an abstract and superficial way contributes to the apathy in the study of the contents Chemistry (CARDOSO and COLINVAUX, 2000).

In this perspective, the UDM are presented as a convenient proposal, given that it directs an approach to the concepts of Chemistry from a prism that advocates teaching through plurality, since students have different levels in the learning process. Thus, the teacher has a way to make his work with teaching more accessible, uniting theory and practice, based on a purpose that will be achieved in defined stages that comprise the use of the laboratory through experiments that will enable students a closer proximity to the practical application of knowledge in their daily lives.

2 THEORETICAL FRAMEWORK

2.1 THE TEACHING OF NATURAL SCIENCES, IMPORTANCE OF THE USE OF DIFFERENT TECHNIQUES

Scientific knowledge is one of the fundamental knowledge indispensable for the construction of a critical and conscious individual, with regard to the phenomena that happen daily, being responsible and operative directly or indirectly. (SAINTS; OLIOSI, 2013). Scientific education goes beyond the difficulty of constructing knowledge pertinent to outlined objectives, referring to contents taught. In Brazil, science education is, nowadays, the subject of several disputes and criticisms that show the need for reorganization in its format. These changes are inclined to institute a new proposal for teaching natural sciences, which emphasizes contextualization, because only in this way can teaching promote learning, so that the real subject of the process understands and becomes involved in human activities, enjoying the progress of science in its material world. It is relevant to point out that science exceeds the idea of a curriculum, it is a human activity with all the particularities that are pertinent to it. (SANTOS; OLIOSI, 2013).

2.2 THE ROLE OF THE TEACHER IN THE TEACHING OF CHEMISTRY

The essential purpose of the teacher is to promote student learning (DELIZOICOV; ANGOTTI; PERNAMBUCO, 2007). Therefore, questions arise such as: What are the actions, the practices of the teacher in the development of teaching and learning? What obstacles does the teacher face in their daily battle in the classroom? We probably won't find ready answers to these questions. The accumulation of events that we encounter within this complicated educational system that we experience allows us to affirm that we are far from an adequate answer to such questions. However, it

is clear that these solutions can be granted if the teacher receives the precise minimum requirements for the smooth running of his beautiful work.

The student needs to build, through the help and advice of the teacher, his knowledge to gradually become competent and independent in problem solving, application of concepts, in the realization of deliberate actions and in countless others (SOLÉ; COLL, 2009, p. 22). Therefore, it is vitally important to point out that in order to achieve these goals, the student needs to know a united, shared process of the teacher's teachings.

The help of the teacher is essential for the education of the student and is subject to variation in quantity and quality (SOLÉ; COLL, 2009). This action of the advisor is also called mediation and, according to the thought of Libâneo (2010), it is significant in the face of the realities of the current world.

> The teacher makes the interposition between the active relationship of the student with what really involves him, enclosing the contents of his discipline, but always taking into account the knowledge, the experience and the knowledge that the students bring to the classroom, their cognitive potential, their competences, aptitudes and interests, their ways of thinking, their way of working (LIBÂNEO, 2010, p. 30).

2.3 THEORY AND EXPERIMENT IN CHEMISTRY CLASSES

According to Bizzo (2000), Science learning has become a simple act of memorizing concepts, words and terms that are difficult to pronounce, without clear objectives, and that do not promote the progress of students' ability to understand, which is one of the main reasons why the objectives in learning are not achieved, since it is essential to provide incentives for students to unveil the meanings present in the concepts addressed. This teaching perspective based only on the simple duplication of scientific knowledge in a decontextualized way, makes students not stimulate the willingness to learn science and often question the reason for teaching it (POZZO; CRESPO, 2009). This contests one of the primordial pretexts of science teaching, which is that of usefulness, which preserves the need for a society that understands science from an empirical point of view (MILLAR, 2003).

These strategies are beyond the theoretical field, but they need it; thus, equal attention should be given to theory and practice in the school space to provide meaningful learning (SOUZA et al, 2014). Thus, the teacher needs to make a critical analysis of his teaching practice required by the act of teaching (FREIRE, 1996). In this perspective Gouveia (1994) says that:

Together with an approach with Multistrategic Didactic Units (UDM) that relies on practical activity and didactic recreation, it seeks, in an effective way, to shorten the space that exists between the theory that is practiced in traditional classes and is also presented in the literature and the day to day of the high school student, emphasizing that the theme studied is associated with several situations. At this level of education, the concepts of Chemistry would be introduced, organizedly, in an experimental and playful way.

The activities and/or teaching strategies are determined as diverse situations, created by the educator to favor the students to live with knowledge. The professional chooses the teaching methodologies and uses them as a means of mediation for a good relationship of commitment of the students with the learning taking into account the educational objectives, verbal or written indications about the particular or collective conduct of the class, the period necessary for the accomplishment of the activities and the physical space.

Being able to tie this theoretical foundation, which is very important, together with a previously planned and organized experimental activity can lead the teacher to succeed in his task of bringing this student to the beautiful world of knowledge. From the moment that this student can associate the theory of the content approached with the experimental procedure paying attention to the existing relationship with his day to day, this process of teaching learning had a significant success in its purpose, because in a certain way it had a meaning for this student, had a real importance in this process. Ausubel (2003) recognizes two varieties of meanings that are associated with learning: the logical and the psychological meaning. Although there are distinctions between one and the other, it is possible to obtain relations between both. At the same time, Ausubel doesn't rule out the chance of there being social or shared meanings, such as an idea that is shared by every student in a classroom. What will make learning "psychologically significant" is how much logical meanings will be fixed in a non-literal and non-arbitrary way in cognition.

2.4 PRACTICE OF GAMES IN SCHOOL ENVIRONMENT

Considering the various points that encompass the teaching and learning process treated so far, it is emphasized that a new perspective is necessary under the training of the teacher and his conduct in the classroom. Just the understanding of the pedagogical potential of playful procedures is not enough for their execution and promotion of active learning. It is necessary a training that meets the playfulness and its pedagogical capacity that the teacher is able to plan and qualify the moments of the game or playful activity. It is of paramount importance that the teacher evaluates, for example, how and why deliberate material can be used, without forgetting to analyze and evaluate his own role and that of his learners in any project that uses an apparently playful resource.

It is noteworthy, nowadays, that the game is only one of the numerous pedagogical resources that point to the improvement of the teaching and learning process, always used in order to stimulate interest and promote motivation in the student for the study. When we relate the pedagogical and psychological potential of the game, we are led to believe that the game is the pedagogical resource with the ability to help solve the problems of the learning process and with the task of increasing the quality of teaching and making it "ideal". However, it is known that it is not within our reach to solve all the adversities in the educational environment, including the existing relationships between

teacher/learner and learner/content through the game. Employing it without reflecting on its various aspects, just for fad or fun, will bring harm both in terms of learning and in the relationship between those involved in the process.

3 MATERIALS AND METHODS

For the execution of the proposed study, students of the 1st year of regular high school were invited, from a public school, located in the neighborhood of Nova Cidade, north of the city of Manaus. The invited students participated spontaneously. To keep the appreciation for the ethical issues of the thesis, each student received a consent form to participate and was signed by themselves, since all were under 18 years old.

The classes were designed so that the contents of the chemistry curriculum that addresses the inorganic functions – acids, bases and indicators were taught mainly under a practical aspect, in the laboratory and in the physical space of the school classroom. After this moment, the interaction of the students and teacher was sought, seeking an effective learning, a playful procedure was performed with the participating students, a procedure that involves a game of questions and answers related to the experimental activity in order to measure the knowledge worked.

Due to the pandemic moment we're going through, classes are happening in a hybrid way. Only the interviews before and after the application of the methodology can be done with everyone because it was held in the auditorium of the school that has a physical space that quietly supports more than 100 people and gave us conditions to perform them, always complying with all the protocols required by the school.

The interpellation with the students participating in the project was carried out in a didactically sequenced way with the intention of always seeking to extract the best possible result from the student and leaving him at ease so that he was always comfortable to expose his opinions, reports and positions on the activities performed, both in the classroom and in the laboratory. The sequences of the activities performed are shown in the table below, along with the number of participating students.

Table 1 - Sequence of activities and participants.

Activities	Participants
Meeting to expose the project and clarify the didactic sequence to be applied.	44
Approach to the application of a questionnaire in order to measure the expectations of the students.	40
Lecture 1 on Inorganic Functions – acid, bases and indicators.	36
Lecture 2 on Inorganic Functions – acid, bases and indicators.	34
Experimental activity 01 – Acids and bases, using bromothymol blue as an indicator.	32
Experimental activity 02 Acids and bases, using phenolphthalein as an indicator.	36
Experimental activity 03 – Acids and bases, using as an indicator red cabbage juice.	36
Playful activity to try to measure the content exposed in the room and in the laboratory	38
Meeting with project participants to hear the positives and negatives of the UDM used.	34
Application of the Final Questionnaire	36
Interview	32

Source: prepared by the author

4 RESULTS AND DISCUSSION

The technique of Discursive Textual Analysis (DTA) designed by MORAES and GALIAZZI (2007) was used to measure the elements and clarify the events of the research. This is an adjusted method of analysis and synthesis that interprets various textual materials in an intense and investigated manner in order to report and clarify them and to arrive at a deeper understanding of the actions and statements according to which they were elaborated. Thus, the results were organized as follows:

1) characterization of the participants

2) Analysis of the sequences and discussion.

The follow-up Didactic-pedagogical analysis is arranged in a twofold way: the notions already acquired from the members on the theme of the UDM and the cognitive requirements of the contents addressed. Blanco and Pérez (1993) point out that the verification of students' previous conceptions is vital not only to recognize errors, but to value them and use them for the benefit of learning, with regard to the anticipation of possible difficulties of students and the proposition of strategies that allow them to be overcome. In the table below, the sections Didactic-pedagogical analysis are shown.

Table 2. Didactic-pedagogical analysis

Students' previous knowledge of the concepts of acids, bases and indicators.	Certain students have a notion of acidity and basicity, but still cannot understand its applicability in everyday life, that is, they have severe difficulty in understanding the difference between acids and bases in a more detailed identification.
Cognitive requirements of the contents addressed	Complication in the passage from the level of observation of phenomena to the level of interpretation of the theory; students' intuitive understandings; difficulty in understanding to differentiate substances of an acidic or basic character.

Source: prepared by the author

Initially, in order to observe the main teaching techniques used by teachers in the previous grades, the expectations about the application of the research and the knowledge already acquired about the content to be applied, a series of questions was asked to be used in the debates related to the project. When observing the table (3), it is noted the situation and the most frequent alternative(s) in the students' answers, which ranged from 26 to 34 participants during the stages performed.

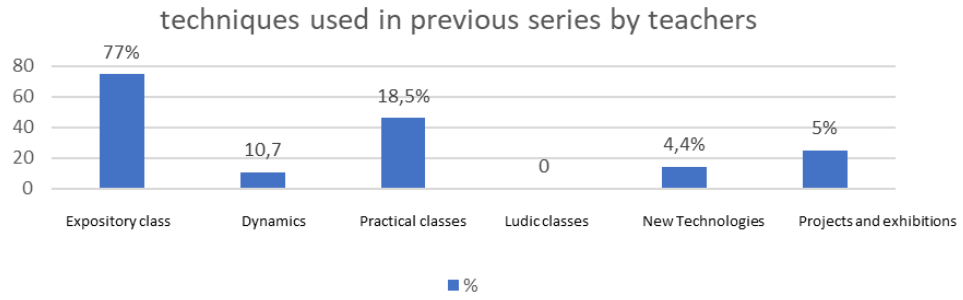
Table 3. Most frequent responses to the initial questionnaire

Question about:	**Alternatives**	**Time**	**%**
Previously used teaching techniques	**a**	2.5h	**5**
	b		**10**
	c		**10,5**
	d		**0**
	and		**4,4**
	f		**55**
Expectation about scientific research.	**1. Yes**		**100**
	2. No		**0**
Knowledge about acids, bases and indicators	• **71.5% of the interviewees have a notion about acids, bases and indicators.** • **14.4% were able to understand the importance of acids, bases and indicators and to identify substances that have an acid or basic character.** • **14.1% did not have knowledge about the content about acids, bases and indicators or could not tell where this subject can be applied on a daily basis.**		

Source: researcher

When asked about the strategies to which they have been subjected in recent years, the results are presented in the graph below. It is important to note that the student could choose more than one option.

Graph 1: Previous activities



Source: prepared by the author (2021)

4.1 ANALYSIS OF DIDACTIC SEQUENCES

4.1.2 The Experimental Activities

The experimental activities were carried out, in different classes, in the school laboratory and the students were organized into six (06) distinct groups, where each team performed its own activity and, after debate, reported its results. In order to analyze the learning on the subject, the group was subjected to questions that should be answered before the practical part and, after that, they were submitted to questions to analyze the understanding about the experimental practice they did.

In order not to have some kind of "advantage", the teams were drawn, in addition to avoiding the so-called "little groups" among friends and thus were organized:

Table 4 - Teams in experimental procedures Figure 1 - Beginning of experimental activities

Teams	Participants				
1	P3	P12	P6	P30	P19
2	P16	P5	P8	P20	P28
3	P5	P2	P15	P26	P7
4	P11	P23	P9	P17	P24
5	P8	P4	P29	P22	P27
6	P25	P29	P13	P1	P10



Source: Prepared by the author Source: Prepared by the author

EQ1 (P02). "Because that way the fish doesn't smell bad, unpleasant."

EQ2 (P17). "Because if you don't put lemon it is pitiú and no one likes it."

EQ3 (P15). "The more lemon you put in, the better it gets. I think that with this the seasoning adheres better to the fish and so it tastes better, especially when it is fried ",

EQ4 (P22). "So the fish doesn't rot soon and we think that without the lemon it doesn't get the seasoning right."

EQ5 (P20). To take away the smell of fish, the famous pitiú. You can even leave it in the refrigerator later if there is a need, so the fish can still be consumed without problem."

EQ6 (P24). To be able to better preserve take away the smell of spoiled fish that can stay when cooking or baking.

It is important to describe at this stage the complete delivery of the students to contribute to the research, because, even with some obstacles that occurred during the procedure, such as the reduction of class times on the day the activity occurred, practically 100% of the students participated in the procedure in the laboratory.

Figure 2 - Analysis of the addition of red cabbage juice.



Source: researcher

4.2 ON THE EVALUATION OF EXPERIMENTAL ACTIVITY

Most of the students found it interesting, were positive in their opinion, here are some reports:

P23 - "very interesting, helped the understanding about the concepts of acids and bases"

Q25 "I found it very interesting, it's a deferential, effective and... joyful, in my understanding, to learn chemistry"

P24 "'amazing!', this engagement between teams has allowed us a better way to learn"

P09 "It was exciting, because in the activity and the explanation in the classroom, we remembered the contents that we had already studied, such as Arrhenius' acids and bases"

P07 "The laboratory had plenty of space to carry out the activity, and we had no difficulty in carrying it out. I wish these activities could happen more often."

4.3 THE PLAYFUL PROCEDURE

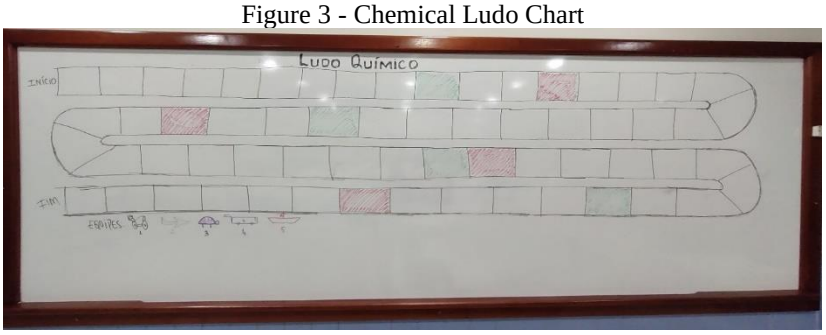
The activity took place with the presence of thirty-three (33) students divided into 5 groups in the classroom according to the row in which they were. At first, the students were agitated and at the

same time intrigued about what the procedure would be like, since they had not participated in any playful experiments throughout all their experiences in high school.

In the sequence, the board on which the game is held was made on the blackboard of the room itself with the help of suitable brushes, consisting of forty (40) compartments, with about 10% (four) of them separated for game punishments and another four for bonuses. The first of each group was responsible for communicating the answer that the team chose to intercede and, when necessary, roll the dice and tell the mediating teacher the value of the sum of them. This allowed a greater interaction between the teacher and the students. About thirty slides were made in a total of 36 questions for the progress of the game, which were displayed on slides projected on the wall in the classroom.

According to ZANON (2008), the Chemical Ludo benefits cooperation, that is, the arrangement of students in teams promotes interaction between them where one member helps the other (of the same team) to win.

Figure 3 - Chemical Ludo Chart



Source: researcher

Figure 1 - Participants during the playful procedure



Source: researcher

The research professor acted as an intermediary of the match and stressed that the act of "playing for play" has no real answers for the development of learning at all times, since certain games provide certain unwanted behaviors, such as the exaggerated competitive spirit. In the case of Ludo Química – a didactic game we are describing – cooperativity represented one of the positive factors indicated by the teacher. Thus, victory is achieved the moment one member helps the other to achieve success, both belonging to the same team.

The groups found themselves to be quite competitive from the beginning to the end of the playful procedure, always interacting among their participants and hoping that the other teams would miss the answer to the questions that were projected on the slide. Everyone was very attentive to each particularity of the game, to the questions, the dice with the values, from the disappointment of giving a low sum value, to the euphoria to see a maximum possible result when throwing two dice, the counting of the houses and the advice of the intermediary. These relationships that occurred both in the playful and practical experiment come from the autonomy that the UDM grants to the student, not letting him only help himself with textbooks available for research. There was no obstacle about the conduct of the participants during the playful process, that is, all behaved in a very organized and respectful manner, without any type of mess or delaying behavior that could hinder the smooth running of the procedure.

At the end of the process, even if there was no winning team for specific punishments on specific parts of the board and the duration of the game was only two class times, the enthusiasm and involvement of the participants with the activity was evident. It is interesting and curious to point out that the groups that no longer had a chance to win the match made clear the satisfaction when the team that was winning missed the question, received low points in the dice or was penalized during the game, which shows the competitive spirit present in the event. Phrases such as *"P.02 we need to do this more often this year, teacher" or "P.16 I do not remember the last time I interacted so much in a chemistry class"* represent well the satisfaction of the group with the playful procedure that was developed, making it evident that the students truly appreciated the end given to the content taught in the experimental activity and exposed in the classroom.

At the end of the experimental and playful activities, excitement and happiness were evident on the faces of the participants. The practice of employing the UDM using these methods directly and dependent on each other promoted an effective and effective interaction of individuals at all times of the activities.

4 CONCLUSIONS

Because they were accustomed to traditional teaching, they had only a teaching conditioned to the mechanic and the memorization of concepts. The students were welcoming about the methodology used and it is believed that a better organized Didactic Unit and the use of several strategies contributed to learning, including motivating and involving throughout the procedures.

It is considered that the experimental procedures, used in the first part of the UDM, were interactive strategies, since most of the students have greater understanding in practical classes, because the subject taught obtained better assimilation due to the strong collective interaction that promoted a beneficial exchange of information between the members and led to a higher quality in

learning. Regarding the aspects that impact on the speed of a chemical reaction, since a good part had a notion about the subject (70%), this favored the implementation of the UDM, we believe that the understanding about the meaning of concentration and the use of dynamizations were the themes that the participants had greater difficulty to understand during the procedures, and it was complicated, in his view, to make an association with his daily life; and in relation to the dynamizations it was necessary to review its concept and application.

In the second stage of the UDM used, the playful procedure, although it counts on the presence of a smaller amount of participants (32), was surrounded by a lot of anxiety and animation, since they had not yet participated in an experience where they could interact to learn, which would be used an experimental and playful sequence that would complete each other. At first, because they were not yet familiar with the simple rules of the game, there were some setbacks such as the time allotted for each group to answer the questions and penalties involved in the red houses of the board drawn on the blackboard. However, after the second round onwards they understood the dynamics and harmony became present in the laboratory. The effective integration of all participants in the procedure is perceived. It was evident the satisfaction and involvement of the subjects, always trying to collaborate so that their team won the game, evidencing the commitment of the students with the search for learning.

We believe that, as exposed in the meeting held after the experimental and playful activities, the strategy used really reinforced the understanding of the concepts presented, and that, as mentioned, the interactivity and effective participation of the subjects during the procedures allied to the will to have the implementation of the UDM used in other concepts were the essential points to base the comment.

We note that the approach presented can be used in other principles within the content of chemistry. The elaboration of a UDM in order to enable a better learning is a strategy that promotes a strong interaction between the students and between the students and the coordinating teacher who was mediating the activity as well. The use of the playful and the experiment showed that, if it is prepared and organized the phases effectively, this didactic sequence proved to be a powerful instrument in the process of knowledge construction.

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ZANON, D. A. V.; GUERREIRO, M. A. S.; OLIVEIRA, R. C. Jogo didático Ludo

Potentialities to promote environmental awareness in economics student's education

https://doi.org/10.56238/ptoketheeducati-024

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ABSTRACT
Universities are responsible for developing the educational work of committed-to-their-social-mission professionals. The need to improve the teaching and learning process to favor students´ integral formation constitutes the basis of the problem investigated. Since it requires making use of all the educational potentialities, taking advantage of the curriculum, the university environment and the extracurricular sphere to favor the insertion of the environmental dimension in such task is the essence of this work. As a result of this research, a methodological strategy for Environmental Education is presented as a contribution to the B.A. in Economics-to-be teaching-learning process. It regards the relationship between environmental knowledge, values, and attitudes as an environmental content repository, which articulates the environmental dimension in the comprehensive education process.

Keywords: Environmental education, teaching-learning process, methodological strategy, B.A. in Economics.

1 INTRODUCTION

Currently, the progressive man-made environmental damage and, along with it, the resurgence of environmental problems at a global scale, sets a challenge for humanity: protection, conservation, and improvement of the environment to maintain its survival on the planet.

Fidel Castro, in his speech at the Earth Summit, held in Rio de Janeiro in 1992, expressed: "There´s an important biological species at risk of disappearing due to the fast and progressive liquidation of its natural living conditions: man." Thus, in a few words, it expressed the threat the planet suffers from the environmental perspective to the point of endangering man`s existence on Earth.

With the irrational use of science, technology, and natural resources, mankind is the one who causes damage to the environment; hence economic, social, and environmental integration is not achieved. Therefore, it is required the development of a profoundly human new behavior toward the environment, in which solitary, critical, and participatory men, who recognize and accept responsibility for themselves and future generations, are formed.

In this sense, UNESCO (2008), quoted by (Mejías; 2010), in its international application plan, emphasizes the need to redirect education towards sustainable development so that it addresses its three spheres: society, economy, and environment; for which it is essential its expansion by emphasizing on Environmental Education contents and students´ axiological education.

Cuba regards environmental issues as one of its main priorities, therefore, it has been defined as an environmental policy showing the ways for practical, effective, and conscious application of actions favoring the environment´s protection, conservation, and improvement, closely linked to the country´s economic, social and cultural development, where the preservation of man and the elevation of the quality of life are essential elements.

Education is a process of transmission and appropriation of deposited-by-humanity-historical-cultural experiences which leads man throughout his life and plays a leading role when solving this problem. Hence, promoting environmental culture development in the population is one of its challenges.

Cuba conceives Environmental Education as sustainable development. This comes about through the introduction of the environmental dimension in the educational processes, considering the systemic nature of a set of elements with a particular environmental orientation; and through environment-development linkages, which consequently are interconnected and where the functions or behavior of some, act and can modify that of the others.

Proenza (2009) considers Environmental Education as a continuous and permanent process that constitutes a dimension of all citizens´ comprehensive education; oriented towards harmonizing the relations between men, and among them, the rest of society and the environment, in the knowledge acquisition, skills development, attitudes and values forming process, to promote the orientation of economic, social, and cultural processes.

It is not about preserving and living in harmony with nature, but about recovering what can be recovered. Therefore, it is vital to create an environmental education allowing sustainable development to start from universities, that is, from the local to the global scale.

In this sense, universities play an important role in achieving this requirement, since their purpose is to prepare the new generations, which involves their learning to live in harmony with the environment, and having the necessary tools to value and solve the problems they face.

Thereafter, the objective of this work is to develop a methodological strategy that favors Environmental Education for the education of economics students.

2 RESEARCH ELABORATIONS

The information collected in scientific publications, dissertations, and books on this subject was reviewed, aiming at verifying the main limitations existing from the methodological order in the

Degree in Economics. Its study plan “E” and Resolution 47/2022 on Organizational Regulation of the teaching process and teaching and methodological work management for university majors are also analyzed.

3 RESULTS OR FINDING

University, as an educational institution, is historically conditioned, in other words, it responds to the demands and imperatives of a given time. Given the task that it must assume in the development of all areas of humanity, it has an active role to play as a setting where knowledge is generated and from which knowledge is disseminated into society.

The Degree in Economics was created at the University of Havana in 1962, as a homegrown project and an expression of the national, regional social reality and the international economic order transforming vocation. Graduates must solve, with creativity, independence, and honesty, the problems related to the production, distribution, exchange, and consumption of social wealth that arise in the economic system, to achieve the objectives of the Cuban socialist development model. This must be achieved by applying the scientific research methodology, as a reality´s critical transformation process, based on ethical, economic, environmental protection, and country defense considerations that allow him to make decisions, with a high sense of responsibility and political and social commitment, as well as paying tribute to the consolidation of the Cuban socialist project´s theoretical reference in the different areas.

The teaching process is carried out through the development of different disciplines and subject contents making up the major´s study plan; and promotes the appropriation of the profession´s knowledge, skills, and values students need to perform in the labor market. Research is a central process where it is not possible to conceive a university without research: in it, the teaching process must be developed using research.

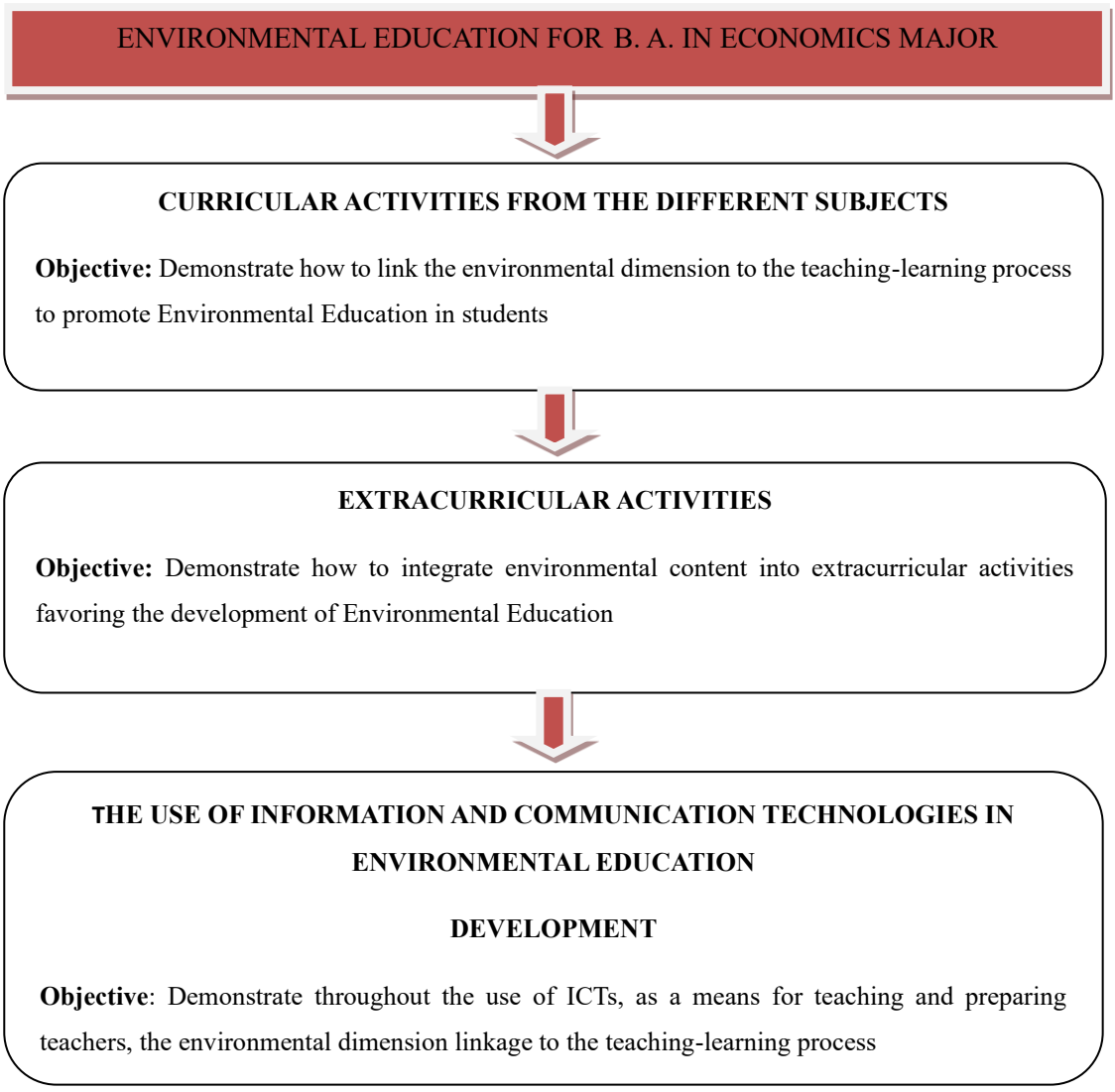
The major´s staff, in its role as professional educators, is responsible for guaranteeing knowledge and skills formation, as well as motivations, attitudes, and values in students to reach an effective solution to environmental problems. A key aspect in the integration of environmental theoretical content with the practice is the methodological work throughout curricular and extracurricular activities, in which the environmental dimension can be inserted to improve a professional's comprehensive education. The methodological variants constitute actions for the teaching-methodological work that assume its declared organizational forms- methodological meetings, methodological workshops, and methodological preparation- as teachers´ permanent improvement forms. The topics below are proposed to be developed as part of the methodological teaching work at each of the organizational levels.

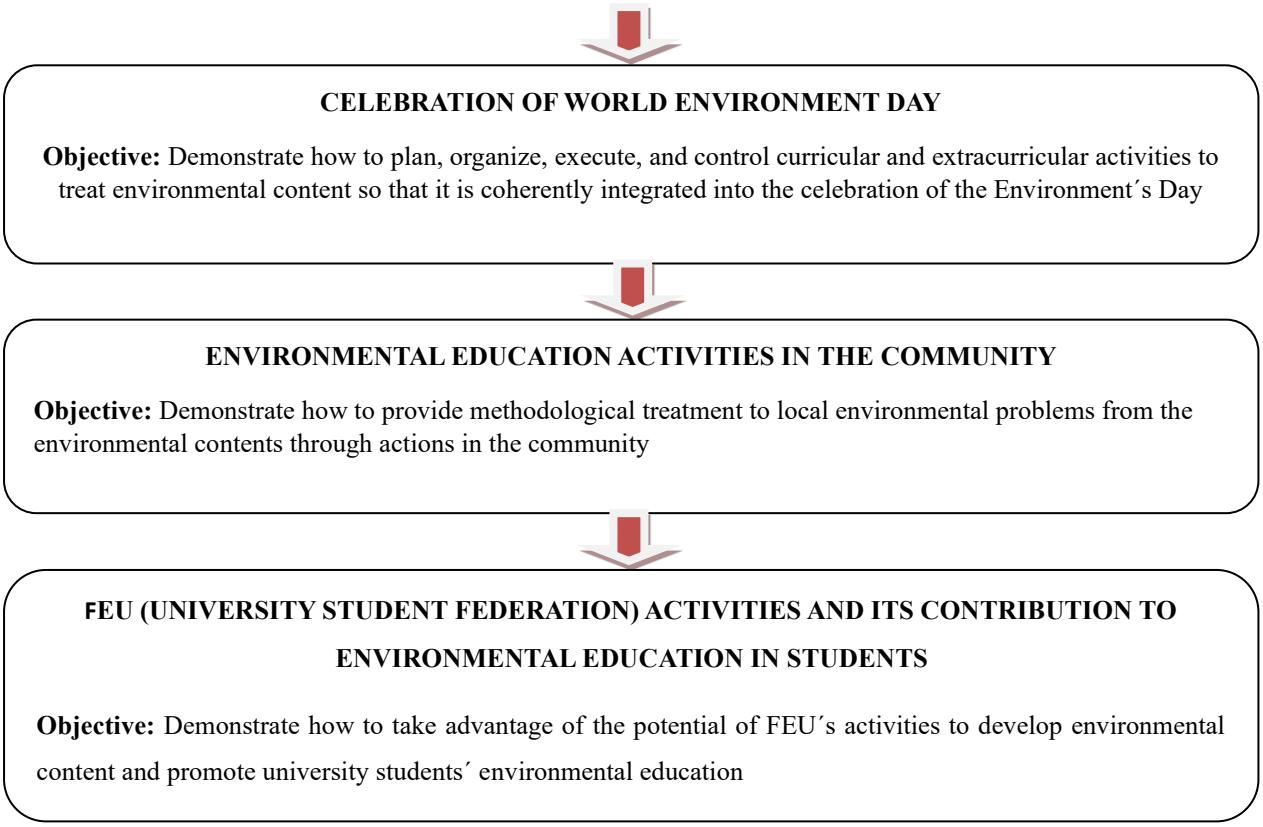
Methodological Strategy for Implementing the Pedagogical Approach for Environmental Education into Economics Students' teaching-learning process.

The authors consider a methodological strategy to implement Environmental Education that favors the theoretical and practical understanding of environmental problems in the university practice. It is structured into three stages, where it´s explained, starting from their objective the relationship with the components of the conception, actions, and orientations.

Conclusions- The University, in its professional educating role, has the responsibility to guarantee the formation of knowledge and skills, as well as motivations, attitudes, and values in students to achieve an effective solution to environmental problems. This establishes a curricular environmentalization process as a configuration of Environmental Education.

Thereof, the proposal of the methodological strategy for Environmental Education allows the articulation of the environmental dimension in the comprehensive education of future graduates in economics.





4 METHODOLOGICAL STRATEGIES FOR IMPLEMENTING THE PEDAGOGICAL APPROACH FOR ENVIRONMENTAL EDUCATION INTO ECONOMICS STUDENTS' TEACHING-LEARNING PROCESS

The authors consider a methodological strategy to implement Environmental Education that favors the theoretical and practical understanding of environmental problems in the university practice. It is structured into three stages, where it´s explained, starting from their objective the relationship with the components of the conception, actions, and orientations.

Stage 1. Environmental theoretical-methodological orientation

Objective: Prepare, on the teaching-learning´s theoretical side, the pedagogical conception of Environmental Education´s components, in the process and methodological terms, from its applicability in university practice.

Its purpose is to guarantee the implementation in university practice so that the established objective is achieved. In this stage, it is oriented toward the different theoretical elements of the environmental dimension in the teaching-learning process.

The staff must be prepared with the pedagogical principles´ premises and updating as a starting point for the process of scientific guiding. Also, they must know the environmental dimension basic concepts.

This step will allow the majors, discipline, and year staff to be holders of an environmental culture that allows them to take advantage of the environmental educational potential offered by the Economy, emphasizing a systemic relationship with economic, social processes and the environment, to foster in university students, knowledge, skills, habits, values and attitudes that allow them to relate, harmoniously, with themselves, others and the environment.

Stage 2. Concreting the env

Objective: Offer guidelines for the preparation of the environmental educational diagnosis that allows knowing the comprehensive education´s current state, from the environmental dimension of university students in the teaching-learning process.

This constitutes an element of great importance to articulate the environmental dimension in the teaching-learning process. It is a set of actions that must be carried out to specify the existing potentialities and insufficiencies to achieve it; hence, qualitative techniques allow the observation of attitudes, and university students´ behaviors at different times and activities of the process, as well as surveys, interviews, and document review must be used.

This stage is related to the second basic component of Environmental Education for sustainable development modeling in the future B. A. in Economics-to-be´s education that allows evaluating, providing feedback, and enriching the relationship between knowledge, attitudes, and environmental values. In short, achieve environmental content learning.

This process results enables to characterize of each student regarding the environmental aspect and; over this knowledge, achieve the environmental dimension linkage to the teaching-learning process.

Stage 3. Proposal´s implementation and evaluation.

Objective: Implement methodological variants in the teaching-learning process, as well as socialize curricular and extracurricular activities that can be planned for such materialization. Carrying out methodological workshops will allow for feedback and elaboration of new activities proposals that enrich the methodological alternatives.

The proposed methodological strategy plans how to link the dimension to the process; therefore, it must be selected, in a coherent, systemic, and systematic way, in the different instructional and educational processes, the environmental content, and the alternatives for knowledge, values, and environmental attitudes integration in the academic year, contributing to a more scientific teaching-learning process in such a way the university students´ comprehensive education is favored, they are provided with guidance and get prepared to participate in the solution, mitigation or prevention of environmental problems in their immediate surroundings.

The methodological alternatives must start from the students´ psycho-pedagogical characteristics, the environmental content educational potentialities, and the teacher´s creativity.

For its efficient achievement, the importance of using methods that imprint an investigative nature to the process is recognized, such as action research, problem-based learning, heuristic teaching, and, in general, active methods in the process that cover both, learning in the cognitive scenario and axiological education.

Par excellence, it is considered appropriate, as a fundamental evaluation form of this process, the assessment, argumentation, and solutions or variants proposition to mitigate environmental situations and, in general terms, qualitative evaluations that reveal the ways of feeling regarding the behaviors in certain situations, besides, the intervention itself will demonstrate the knowledge achieved in the cognitive order by the students.

4 CONCLUSIONS

The University, in its professional educating role, has the responsibility to guarantee the formation of knowledge and skills, as well as motivations, attitudes, and values in students to achieve an effective solution to environmental problems. This establishes a curricular environmentalization process as a configuration of Environmental Education.

Thereof, the proposal of the methodological strategy for Environmental Education allows the articulation of the environmental dimension in the comprehensive education of future graduates in economics.

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SEVEN
publicações acadêmicas

The body in communicative ecosystems: Developments for educommunication

Crossref doi
https://doi.org/10.56238/ptoketheeducati-025

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ABSTRACT
The communicative ecosystems designate the relationship between subject and media and are the basis for theoretical developments in different authors of Educommunication. The concept goes further by embracing the change of sensitive perception in the contact between human and technology. This transformation of the sensorium is a reference for Communication and the Human Sciences and also establishes a connection with Neuroscience, whose understanding of human cognition refutes the separation between body and mind. On the contrary, it points out that thinking and perceptual and expressive abilities are the result of an integrated action of the body, not just the brain. Therefore, the change of sensorium associated with communicative ecosystems implies also dealing with the body, which represents new possibilities of reflection and practice for Educommunication in the era of digital technologies in network.

Keywords: Educommunication, body, cognition, sensorium, technology.

1 INTRODUCTION

The idea of communicative ecosystem crosses the field of Educommunication from the concept introduced by Martín-Barbero for the first time in the year 2000. In the initial formulation, the author identifies communicative ecosystem with the relationship between subjects and the various technologies that characterize contemporary digital culture - encompassing from magnetic cards to the extensive routes of the Internet.

This is usually the starting point of different authors who reflect on Educommunication, when they cite the emblematic concept of Martín-Barbero and then update it. Prado Soares (2005) proposes an expansion by making reference, for example, to an integrative perspective of education and technology, in which there is no single model of communicative ecosystem:

> "The rescue of learning as a space that produces meanings in pedagogical processes has been, for example, one of the contributions of the Argentine Daniel Prieto to the analysis of technology/education relations. According to this author, the conceptual design to introduce technologies at the service of education is primarily communicational. On the other hand, the so-called displacement of learning centers, both of the sources of knowledge and of the actors of the educational process, seriously compromises the type of communication model that supports these formative practices. Therefore, there is not only one model of communicative ecosystem, but diverse, according to the degrees of interactivity present in the processes of symbolic exchanges." (PRADO SOARES, 2005, p. 7-8)

In the specific perspective of Educommunication, Tavares Jr.'s approach offers a more detailed definition of how communicative ecosystems operate in practice:

> "As for the concepts disseminated by the educommunicative theory, we can understand the communicative ecosystem as the set of actions that enable the promotion and expansion of communication relations between the various people and instances that make up the educational community. It includes everything from the organization of the environment to the availability of resources. It stimulates the decentralization of power, dialogue, interaction and the opening of space for different experiences and cultural experiences. It evaluates the quality of interpersonal relationships seeking harmony and balance in environments in which various actors can live with different technologies and means of expression." (TAVARES JR. 2007, p.72)

In another approach, Consani (2011) connects communicative ecosystems to the notion of community:

> "The concept of "communicative ecosystem" is identified with the notion of educational community as long as it is articulated transversally by communicative processes, which presupposes the shared management of processes, the horizontality of the organization chart (empowerment) and the stimulus to protagonism." (CONSANI, 2008, p.40)

All these developments of Martín-Barbero's initial proposition help to outline an updated understanding of communicative ecosystems and how fundamental they are in the relationship between Education and Communication.

For the discussion we are making now, it is worth noting, however, a little-remembered emphasis on the original concept of Martín-Barbero (2000): the change of the sensorium. The author explains this term by stating that it is more visibly revealed in younger people, through:

> "... their cognitive and expressive empathy with technologies, and in the new ways of perceiving space and time, the speed and slowness, the distant and the near, that they enter.
>
> It is a new cultural experience, or as W. Benjamin called it, a new sensorium, new ways of perceiving and feeling, of hearing and seeing, a new sensibility that in many ways shocks and breaks with the sensorium of adults." (MARTÍN-BARBERO, 2000, p. 37)

It is undeniable that young people demonstrate in practice a greater propensity to absorb and deal with technology, and to forge a cultural universe integrated with the digital reticular. It should be noted, however, that that initial scare and estrangement of adults with the new digital network culture, which emerged more than 20 years ago, is no longer the same, with older people also adhering, in different intensities, to social networks, smartphones, memes, apps, digital services and all kinds of connectivity.

The central point of this observation is that this change in sensoriality is a phenomenon that has spread across different spectrums of society. And this indicates new ways for people to be in the world, to interpret stimuli and situations, to express impulses and reactions, to construct thought.

Thus, the notion of transformation of the sensorium, proposed by Benjamin and rescued by Martín-Barbero, is a key element to fully understand the human dimension in communicative ecosystems. And even more, from the perspective of Communication as a whole. This is what reminds us of another emblematic author, who also drinks in the concept of Benjamin. When Marshal McLuhan asserts that "the medium is the message," he is not restricting himself to the factors of information transport and narrative production associated with the media. It is also alluding to how the sensory and cognitive qualities associated with different media become a bridge to new ways of perceiving, expressing oneself and reflecting on the world.

> "Whoever still feels inclined to doubt that the wheel, the photograph or the airplane alter our habits of sensitive perception, can no longer doubt before the electric lighting. In this domain, the medium is the message, and when the light is on, there is a sensory world that disappears when the light is off." (MCLUHAN, 1964, p. 150)

This is the dimension of the sensorium sometimes overlooked in the readings on McLuhan's concept, as well as receiving less emphasis in the readings on Martín-Barbeiro's reflection on communicative ecosystems. The motivation to make more evident the correlation between sensoriality, communication and communicative ecosystems lies, in the first place, in the possibility of strengthening perspectives already existing in Educommunication: as of the symbolic exchanges and qualities of interaction highlighted by Prado Soares (2005); or the qualities of dialogue, interaction, experiences, cultural experiences, interpersonal relationships and modes of expression highlighted by Tavares Jr. (2007); and the dynamics of community constitution, referred to by Consani (2008).

But there is a second motivation: addressing the transformation of sensoriality in the relationship between education, communication and technology has the power to overcome the limitations of a paradigm that even today reduces the power of this relationship, both from a conceptual point of view and from a practical perspective. The Cartesian bias of Western thought has for centuries synthesized people's ways of being and acting as exclusive products of the mind which, by this same bias, would be a specific result of brain activity.

Fortunately, a few decades ago this type of segmentation began to be challenged by new questions of the history of thought and discoveries of Neuroscience. This area of knowledge has been modifying notions that seemed crystallized about human cognition and today no longer works with the idea that human thought is an exclusive product of the brain. But, rather, an unfolding of the integration between different systems, layers and functions of the body, which together dialogue with internal and external stimuli, producing cognition. One of the most emblematic authors, Antonio Damasio, explains:

> "(i) The human brain and the rest of the body constitute an inseparable organism, integrated by means of regulatory biochemical and neural circuits (including endocrine, immune and autonomic neural components); (2) The organism interacts with the environment as a whole;

> the interaction is neither of the body alone nor of the brain alone; (3) The physiological operations we call the mind are derived from the structural and functional whole and not from the brain alone; Mental phenomena can be fully understood only in the context of an organism interacting in an environment. The fact that the environment is, in part, a product of the organism's own activity, only underscores the complexity of the interactions we have to take into account." (DAMASIO, 1994, p. 16-17)

Damasio's finding points not only to the complete integration between the brain and the "rest" of the body, in the context of cognition, but also stresses the continuous dialogue between body and environment for the constitution of the mind.

This perspective, which has become fundamental in the field of Neuroscience, is also present in recent reflections in the field of Human Sciences. This is what elucidates Ferreira (2013) when identifying the emergence of an "animist paradigm" in contemporary thought, which brings together a set of sociological approaches that give life (anima) to the flesh, previously summarized to the epistemological condition of discourse, material or ideal.

> "The concepts of "lived body" and "incarnation" explored in this paradigm bring to the center of the sociological discussion the assumption of indivisibility between the subject and his flesh, overcoming dualities and dualisms rooted in the history of thinking about the body." (FERREIRA, 2013 p. 521)

These recent contributions from Neuroscience and Human Sciences bring interesting developments to the understanding of communicative ecosystems. The first and most immediate of these is that the transformation of the sensorium, pointed out by Martín-Barbeiro, implies a transformation in the body. It is the integrated body, in dialogue with digital technologies and the entire social context that surrounds them, that comes into contact, interprets, feels, understands, reflects, reacts, expresses and resignifies the being and being of each subject in this new context, thus revealing a new sensorium.

This same perspective of the sensorium, rescued from Walter Benjamin by Martin-Barbeiro, in McLuhan is the basis for recognizing also a transformation of sociability that comes imbricated with the change of sensoriality. Di Felice refers to McLuhan to clarify the relationship between changing sensoriality and changing sociability: "His starting point lies in the realization that the introduction of a new medium into a culture changes the 'sensory balance' and, consequently, the forms and practices of interactions." (DI FELICE, 2009, p. 161)

For Di Felice, a distinctive feature of the sensorialities and sociabilities that emerge in the age of networked digital technologies is the constitution of a new way of inhabiting the world, of reticular and transorganic character, which he calls atopic inhabitation:

> "The result of the emergence of this new interactive and unlimited social is the construction of a sociability and a post-territorial habitation. In addition to architecture and geography, atopic inhabiting is no longer linked to topographic coordinates or to a genius locus, but to information flows and to a resident spatiality, neither external nor internal, an inhabiting

> neither sedentary nor nomadic that through wireless technology and mobile computing, makes the body the support of information, agglomerating the "biomass" with the "infomass" in a fluid interrelationship." (DI FELICE, 2009, p. 226)

This new way of inhabiting, characterized by the reticular perspective of technology, the environment, being and relationships in society, is rooted in the changes in sensoriality linked to the digital. Hence the pertinence in including the body in the notion of communicative ecosystems: one does not exist apart from the other. In this regard, it is worth recalling here a reflection carried out in a previous study:

> (...) Even what seems like a strictly organic relationship, will inevitably be appropriated by the transorganic dimension of the body, since an experience of connection with nature, moonlight, climate change, biodiversity, ecosystem services, geographies will eventually be digitized, stored in our virtual memory, shared on the network, accessed and commented on in our technological extensions.
>
> We have seen, therefore, that the sensory and perceptual changes associated with atopic inhabitation stimulate a recognition of the reticular in the world—a new perception of the connections of things and of natural and anthropogenic processes and their unfolding. At the same time, they stimulate the recognition of the reticular and fractal condition of the body itself and of making its potentialities, its perceptive, sensitive, kinetic, psycho and biophysical capacity one with the inhabiting of the world." (BARRETTO, 2013, p.66-67)

In this sense, the perspective of atopic inhabitation modifies not only our understandings about the human, but about the environment and technology itself, as Di Felice postulates:

> "The impossibility of perfect distinction of the limits that separate our bodies from the world and from those other entrepôtos between the technical instruments and our perception, induces, in our days, the need to rethink the meanings and forms of communicative relations with the environment, from the technologies used to communicate with it. The very concept of media, analyzed in this perspective, can be thought, in the path of the studies proposed by D. De Kerckhove [2009], as a psychotechnology, that is, as a technology of intelligence, which interprets and organizes information in symbiosis with our mental structure (...)" (DI FELICE, 2009, p. 63-64)

We have a double invitation there. On the one hand, there is no way to think about body and environment without also thinking about technology. On the other hand, understanding the possibilities of using technologies, media production, transforming subjects from interactions with digital devices and also the relations between Communication and Education means an invitation to recognize and explore how the body is implicated and affects all these elements.

The background to this reading is that of the perspective of complexity, as formulated by Morin:

> "What is complexity? At first glance, complexity is a fabric (complexus: what is woven together) of associated inseparable heterogeneous constituents: it presents the paradox of the one and the multiple. By looking more closely, complexity is effectively the fabric of events, actions, interactions, feedbacks, determinations, chances, that constitute our phenomenal world. This is how complexity presents itself with the unsettling lines of entanglement, inextricable, disorder, ambiguity, uncertainty (...)" (MORIN, 1994, p. 32)

The perspective of complexity also allows us to identify that there is no linear or cause-and-effect relationship in the emergence of an intimate connection between technology and sensoriality, since both elements feed each other. It is the type of dynamic that Morin (1994) calls recursion. This means that, at the same time that new technologies influence the way of perceiving and acting in the world, providing a networked perspective on different facts, these technologies themselves are also the result of a networked perspective already latent in human thought. Thus, one phenomenon feeds the other, without being able to define exactly who generated whom.

It is inevitable that this dynamic is also observed in the relationship with the body, revealing precisely the idea of change of the sensorium alluded to by Martín-Barbeiro (2000). In other words, the transformations of sensitive perception nourish and are nourished by the dynamics of digital reticular technologies; and instigate and are instigated by a new sociability, traversed by the connective flows between human beings, nature and technology.

This reticular perspective, which is often expressed in actions and thoughts in contemporary society, will reveal itself in situations as diverse as the systemic approach of Neuroscience on cognition and the body; the understanding of society and the environment as integrated and interdependent systems; the new ways of following the politics of a country, through digital media and networked activism; the disputes in electronic games with teams formed by people in different physical parts of the globe; the manipulations of public opinion through fake news that are spread by the said-me-said in the messaging applications etc.

These, among many other possible examples, could be the agenda of reflection and practice in the educative approaches, in the production of communicational content, in the realization of classes and educational debates.

But the specific focus here is to recognize the assimilation that the networks that shape communicative ecosystems also include the body in its systemic totality. Thus, what new paths and perspectives in Educommunication emerge from the body as a universe of the sensorium in the digital age?

A first relevant development is that, by adding the body among the elements that make up the communicative ecosystems, we propose an expansion of the sense of Communication that permeates this concept. We would have, in this way, something closer to the definition of Muniz Sodré, of the science of the common, "in which communication is configured as a regulatory form, essential to the cohesive bond with the socius or coexistence." (SODRÉ, 2014, p.232) This involves different types of forms of dialogue and flows oriented to the construction of the common, including those that cross the present body and the virtual states of human presence in the contemporary.

Another development is that Educommunication now has before its spheres of knowledge and practice the challenge of including the living body, not only as an object and subject of discourses, but as an experiential dimension and the complexity of the human, as Selgas helps to reflect:

> "... To emphasize the 'incarnate' character of our identity and our experience, and to focus attention on the constitution of social agents, leads us to see the two natures that inhabit our body: it is flesh and blood, but also a social entity; it is the first symbol of the self, but also of the community; it is something that we have and something that we are, that has us; it is individual and unique, but it is also common to all mankind; it is both object and subject." (SELGAS, 1994, p. 45)

The body is not, therefore, only the one that operates media; which expresses conceptions of culture, social patterns, forms of control and market dynamics; or who just thinks, speaks, and moves. The body continues to perceive the world, acting and interacting through emotions, feelings, instincts, impulses, desires, movement, sensorialities and all the singularities that are proper to this living system in constant internal and external dialogue.

And what powers can be unlocked in the subject by stimulating the entire body universe in the educative doing, without subjugating it to the role of vehicle for a thinking brain?

This is a question that demands answers forged in practice. Neuroscience and the Human Sciences already inform us that the human is more potent when the integrated and connective body universe is no longer neglected as a producer of experience and knowledge.

But some clues can be captured from another area that hybridizes with that of Education and that proposes to feed the body awareness and the psychomotor powers of the body in its multiple layers to generate transformations in perception, in the production of knowledge, in the ways of being and being of the subject.

These are somatic education approaches, which are practices that develop proprioception, the ability to recognize the subtle internal structures and dynamics of the body, and the ability of the human being to build movement and interact with space and others beyond the psychomotor patterns inherited and taught.

> "When I wake up, when I sensitize a given joint, I acquire another point of balance in my body, and this ends up acting on everything else, including things that apparently have nothing to do with muscles and joints, such as intellectual activity." (VIANNA, 2005:99)

In this simple and specific example, Klauss Vianna, developer of a unique and Brazilian method of somatic education, indicates the power that the stimulated body in all its systemic dimension can bring to the production of knowledge and self-knowledge. But perception at the collective level is also within the reach of these transformations, as another master of somatic education explains to us:

> "The modification of the imaginary must occur in the form of a collective experience, in a relationship of exchange with the group, in a classroom, for example. The student develops by

> observing the other, witnessing the action of the colleague. Through stimuli brought by the teacher and the companions, the exchanges begin to occur, triggering a network of mutual beneficial influences. The imagination, materialized in different modes of expression, is no longer content with the TV show devoid of ideas, with the poorly elaborated text, with the easy music." (BERTAZZO, 2004, p. 31)

These references propose a change of mental model in educational activities, by refuting the separation between body and mind proper to the Cartesian paradigm, as has also occurred in the Human Sciences:

> "Body and mind, body and thought, body and image constitute obstacles to the narratives of science. By prioritizing social relations as an analytical focus, the so-called humanities forget that senses, feelings, body images integrate and delimit the world of life. Credited to the Cartesian paradigm, this duality prevents a hominescence – a differential of hominization – from being put into practice in the present day." (CARVALHO, 2008, p. 27)

The ways in which this type of unlocking by the body can be transposed to the field of Educommunication are many: specific body practices to stimulate the integrated perspective of individual and collective thought; development of activities that enhance the construction of knowledge and communicative skills from the stimulation of sensoriality and body skills; realization of projects that instigate the expressive side of the body in consonance with the media production in educommunication; construction of collective knowledge and debates from previous stages of sensitization of body awareness and movement construction; experiential dive into the networked dynamics of the body to elucidate the reticular condition of the digital age and the systemic environment; among many other possibilities.

No matter the form, what is proposed here is that the field of Educommunication – which historically emerged between gaps and resistances and which has already opened up to the field of the arts, for example – has ahead another possibility of expansion of study and practice, from the assimilation of the living body as part of the communicative ecosystems that structure its focus of action. To appropriate this possibility is to advance beyond the Cartesian paradigm of segmentation between body and mind and, mainly, to deepen the sense of transformation of the subject that is the defining of reflection and practices in Educommunication.

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SEVEN
publicações acadêmicas

Geometric transformations: Actions and applications in the final grades of elementary school

https://doi.org/10.56238/ptoketheeducati-026

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ABSTRACT

The present study deals with the mathematical content of geometric transformations, bringing as a problem the fact that it is little explored, often due to the gaps in the knowledge of the teacher in relation to this theme. Given this, the main objective is to seek in historical facts the importance of this content, as well as to observe in the Brazilian curricular guidelines its prominence and its paths to be taken in the teaching of this curricular component. In addition to bibliographic research, activities with digital technologies will also be applied to work on the main isometries, such as rotation, translation and reflection, in order to contemplate the skills required by the current National Common Curricular Base (BNCC).

Keywords: Rotation, reflection, translation, transformations.

1 INTRODUCTION

Fulfilling has a very broad meaning, thus being a synonym of performing, satisfying, accomplishing, completing, among others. For a teacher within the school planning, fulfilling means much more than applying all the established contents, it is necessary that the student learns, understands, establishes relationships and knows how to apply in his daily life. Reconciling these tasks brings a conflict in the time in which each topic is covered. It is common to observe mathematics teachers from the same school who teach in different classes, but of the same grade, addressing topics at different times.

Many teachers leave this content of geometric transformations to work at the end of the school year, due to the lack of knowledge on the subject. In this scenario, the study of geometric transformations has been little explored in the classroom, as highlighted that "we found that the contents of Geometry that were not learned by teachers, were also not taught, giving rise to a vicious circle that ends up affecting generations of students who do not learn geometry" (MABUCHI, 2000, p.1).

Given this, the interest in studying the subject occurs to find its relevant importance, based on the objectives outlined by national and state curricular guidelines, such as the National Curricular

Parameters (PCNs), the National Common Curricular Base (BNCC) and also the Gaucho Curricular Reference.

The general objective of the study is to investigate the importance of the content of geometric transformations within the development of students' geometric thinking, in order to identify practices that best meet the theoretical foundations related to the subject.

As specific objectives:

- Identify the purposes presented by the national curriculum guidelines within the theme of geometric transformations;
- Use the Geogebra software in the execution of practical activities to improve the understanding of geometric transformations such as rotation, translation and reflection;
- Apply practical activities with Geogebra and manipulable didactic materials in the content of geometric transformations;

2 BRIEF HISTORY OF GEOMETRIC TRANSFORMATIONS

Many are the facts that can be highlighted when it comes to geometric transformations, because it is a millennial and global subject. Where it was studied or translated into the arts it left a meaning for humanity. It is an important connective between mathematics, art and engineering. Understanding the process of its evolution is a starting point to understand how significant this subject is within schools.

2.1 THE HISTORY OF GEOMETRIC TRANSFORMATIONS IN CIVILIZATION

The chronology of geometric transformations is very old and was revealed through several discoveries until it reaches today in schools as important school content. One of the oldest geometric demonstrations involving the symmetry of geometric transformations is a cave painting found in Bolivia. It also has the record of a piece of pottery decorated with geometric transformations that is recorded as built in the Neolithic period. In Siberia, in an excavation in a royal burial room was found the carpet of Pazynyk, dating from the fifth century BC. In Brazil, an art of indigenous tribes from the pre-colonial period, the Marajoara ceramics, was found in Pará, a work decorated by symmetries and reflections.

More recently three characters have excelled in the study and art of the geometry of transformations. Felix Klein (1849-1925), Evgraf Fedorov (1853-1919) and Maurits Cornelis Escher (1898-1972). The latter featured prominently in his works of art formed by geometric patterns such as reflection and symmetry, among other geometric operations. The Brazilian Luiz Sacilotto (1924-2003) was a painter, sculptor and draughtsman who had in his works symmetry as a striking point, also exploring optical phenomena.

2.2 THE HISTORICAL MOVEMENT OF GEOMETRIC TRANSFORMATIONS IN THE CURRICULAR GUIDELINES OF ELEMENTARY SCHOOL – FINAL GRADES

The school curriculum is structured according to debates, influenced by transformations of society. Since the 1920s there have been movements of curricular reorientation. Between the years of 1960 and 1970 the so-called Modern Mathematics influenced the teaching of mathematics, bringing school contents closer to those seen by scholars and researchers. In 1980, a document called "Agenda for Action" influenced reforms around the world. Thus, the reformulations that occurred between 1980 and 1995 had points in common, such as emphasis on problem solving, introduction of elements of statistics and probability and statistics.

In Brazil, in 1995, the National Curricular Parameters (PCNs) were initiated, a document that aimed to organize the contents. Following this process, in 1996 the Law of Guidelines and Bases of National Education (LDB) was created, a legislation that regulates the Brazilian educational system. And in 1998 the PCNs were launched, bringing an important change in the teaching of geometric transformations, geometry should not be restricted to the study of forms, but engage in the notion of position, where these forms are located and their movement within the Cartesian plane.

In 2014, a process of updating the National Curriculum Parameters began. From then on, it had several studies, debates and consultations, until in 2017 it was approved and guided the implementation of the National Common Curricular Base (BNCC). The document comes with changes in relation to the PCN, where now along with an object of knowledge, there are several skills that must be developed in students, in all the final years of elementary school.

Following the BNCC, came the creation of the Gaucho Curricular Reference, a guiding document of curricula in the State of Rio Grande do Sul. It adds new skills to the BNCC and adds regional themes such as history, culture and ethnic-racial diversity. In mathematics, the document presents the pedagogical principles, and in the part of geometric transformations, it repeats the ideas shown in the BNCC, expressing in other words the importance of this content and basing with the same intentions of the application of this content.

The main curricular guidelines of Brazil present the geometric transformations as essential, showing that it should be privileged among the contents and even when not applied, it should be treated with great concern, because it is a prerequisite in the understanding of geometric concepts. The geometric transformations are subjects present in the National Curricular Parameters, in the National Common Curricular Base and also in the Gaucho Curricular Reference, and the Homotetias are placed in the 6th year, the rotations, reflections and translations in the 7th and 8th years and in the 9th year we will have these contents as fundamental for the understanding of congruence and similarity.

3 PRACTICAL ACTIVITIES INVOLVING GEOMETRIC TRANSFORMATIONS

In the guiding documents of the curricula to be worked, the Geometric Transformations are always present. Starting from the implementation of the PCNs, in 1988, we have at least twenty years of well-defined and organized curricula, but when repairing activities related to geometric transformations, there is a scarcity compared to other mathematical contents, being another demonstration of helplessness of this content in the teaching of mathematics. Thus, in the sequence, there are some suggestions of activities and results of applications, following the skills proposed by the National Common Curricular Base

3.1 GEOMETRIC TRANSFORMATIONS IN GEOGEBRA SOFTWARE

In the National Common Curricular Base, the content of geometric transformations for the 6th year, is proposed in two skills to be developed, the first refers to "build similar flat figures, in situations of expansion and reduction, with the use of checkered meshes, Cartesian plane or digital technologies" (BRASIL, 2018, p.303) and the second does not deal directly with geometric transformations, but one can use transformations such as translation and rotation for the representation of parallel and perpendicular lines, it is addressed in "using instruments, such as rulers and squares, or software for the representation of parallel and perpendicular lines and construction of quadrilaterals, among others." (BRAZIL, 2018, p.303).

In both skills, digital technologies are approached as auxiliary instruments in the development of the proposal. Thus, through the software Geogebra was developed at the Maria Antônia Uggeri Pizetta School, in the city of Entre-Ijuís, Rio Grande do Sul, an application of the content in a class of the 6th grade of Elementary School. The activity was based on a tool of Geogebra, the homothetia. After learning about the software, students were provoked to solve tasks on their phones or computers. With each step taken, the teacher projected the result on the board and there was the conference and understanding of what was being done or what was in disagreement.

Activity: Homothety in Geogebra:

1) Select the "Point" tool and mark five points: A (2,3), B (4,3), C (3,5), D (0,3) and E (0,6).

2) Select the "polygon" tool and click on points A, B, and C.

3) To make the homothety we select the tool "homotetia", then the point D and the polygon formed, after that put the number 2 in the tab that will appear.

4) Select the point E and the polygon formed, after that put the number 0.5 in the tab that will appear.

5) Which polygon will appear?

6) What happens when the number 2 is placed on the tab that appears after the polygon and point D are selected?

7) Explain what happens when the 0.5 is placed on the tab that appears after selecting the polygon and the E point?

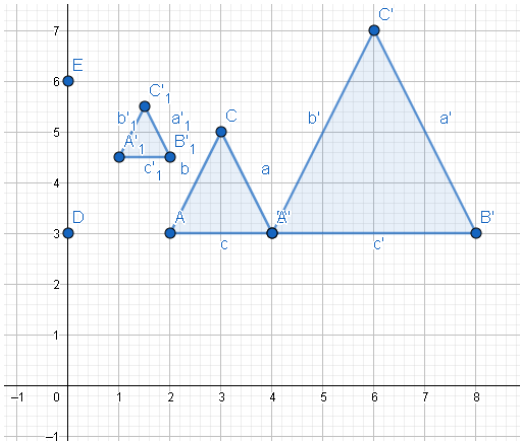
8) For which values placed in the tab will we have a polygon magnification?

9) For which values placed in the tab will we have a reduction of the polygon?

10) Which value placed on the tab will keep the same polygon, in the same place and at the same size?

At the end of the activity, students should arrive at the result of the figure below:

Figure 1- Homothetia in Geogebra



Source: Prepared by the author

The realization of the activity brought an intense movement of the students, unlike what usually happens in other mathematics classes.

As not everyone had access devices to Geogebra, the creation of groups helped them in carrying out the tasks.

They performed the activities with a lot of autonomy, and when they arrived at items 8, 9 and 10, they began to conjecture, simulating values.

Every time they simulated the values opened a tab with the word "factor", thus questioning the teacher about what this word meant.

The teacher then explained that it would be the result of dividing the corresponding sides of the polygons and that in the 9th grade they would understand it as a constant of proportionality in the similar polygons.

Figure 2- Students comparing the results on the smartphone with the projection



Source: Image of the author

In the 7th year three skills proposed by BNCC involve the content of geometric transformations, the first is about "performing transformations of polygons represented in the Cartesian plane, resulting from the multiplication of the coordinates of their vertices by an integer" (BRASIL, 2018, p.309), while the second suggests "recognizing and presenting, in the Cartesian plane, the symmetrical of figures in relation to the axes and the origin" (BRASIL, 2018, p.309), the last one discusses "recognizing and constructing figures obtained by translation, rotation and reflection symmetries, using drawing instruments or dynamic geometry software and linking this study to flat representations of artwork, architectural elements, among others" (BRASIL, 2018, p.309).

It should be noted that it is also suggested the use of software for the development of one of the skills. Thus, an activity involving Geogebra and geometric transformations was also applied in the 7th grade of the same school in the municipality of Entre-Ijuís. The practice consisted of the same dynamics applied to the 6th grade, but aiming to develop the skill that suggests the use of dynamic geometry software.

Activity: Reflection on Geogebra:

1) Select the "Point" tool and mark three points: A (1,3), B (2,1) and C (4,2)
2) Select the "Polygon" tool and click on points A, B and C
3) To make the reflection select the tool "Reflection in relation to a line", click on the polygon formed and the axis of the ordinates
4) Click on the tool "Reflection in relation to a line", click on the polygon and the axis of the abscissas
5) Select the "Point" tool and mark the D point at the source (0,0)
6) Select the tool "Reflection in relation to a point", click on the polygon formed and on the point D
7) What polygon was formed between points A, B and C?

8) The polygon generated in the reflection of the ABC polygon and the axis of the ordinates is in which quadrant?

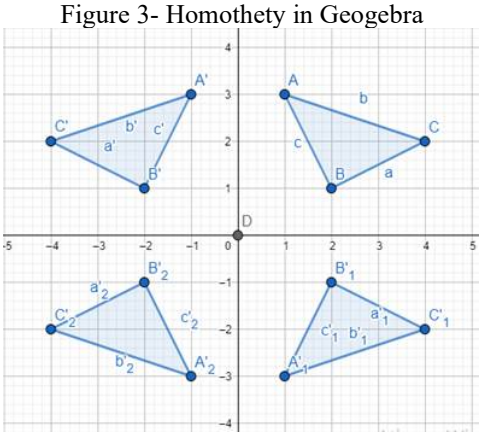
9) The polygon generated in the reflection of the ABC polygon and the axis of the abscissas is in which quadrant?

10) The polygon generated in the reflection of the ABC polygon and the point D, is in which quadrant?

11) What do you understand about reflection?

At the end of the activity students should arrive at the result below:

Figure 3- Homothety in Geogebra



Source: Prepared by the author

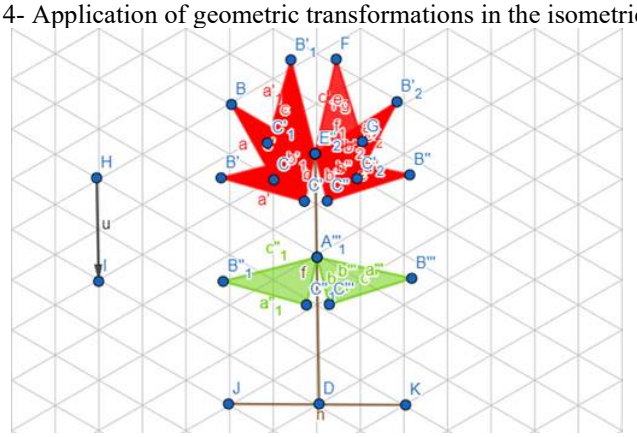
The results of the presentations were also surprising, with a lot of student involvement, since the 7th grade class is composed of several students with grade/age distortion and with two inclusion students. The proposal even brought the participation of the two students with inclusion, even though they were at the literacy level, with the help of colleagues they performed the Geogebra tasks. At first, the class had a hard time, because during the 6th grade their studies were affected, with hybrid teaching, due to the COVID 19 pandemic. Once they understood the process, everything became easier.

Similarly, to the reflection activity, the constructions of rotation and translation in Geogebra were also performed. The latter, with very fast realization. Still, it is easily observable for those who conduct daily mathematical activities, that the use of digital technologies provides a greater acceptance of teaching and consequently, a better learning of the contents. It should be noted that the contents of geometric transformations were being worked on in an unprecedented way, because the study plan of the municipality began to have well defined this part of mathematics after the launch of the BNCC.

In the eighth year also the BNCC proposes a skill on geometric transformations, and again suggests the use of software. The ability is described as "recognizing and constructing figures obtained by compositions of geometric transformations (translation, reflection and rotation), with the use of drawing instruments or dynamic geometry software" (BRASIL, 2018, p.315). At this stage a suggestion of activity, with the use of Geogebra, would be the creation of a figure or a logo, but using

the isometric mesh and not the checkerboard mesh. This would bring a new way of working with Geogebra and introduce a mesh that will be part of the content of the 9th grade, in the construction of perspective objects, to recognize orthogonal views of spatial figures.

Figure 4- Application of geometric transformations in the isometric mesh



Source: Prepared by the author

In the 9th year, the geometric transformations are not mentioned directly, but at this stage it will be necessary this content to understand the similarity and congruence of figures and also in the demonstration of metric relations of the right triangle. It would also be important to use Geogebra to understand the similarity and congruence of polygons, being able to observe the measurements of the sides and angles, their congruences, proportionality coefficient among others.

4 FINAL CONSIDERATIONS

The inclusion of geometric transformations in the study of geometric concepts has been greatly emphasized in curricular guidelines in Brazilian education. Despite the relevant importance, this content is little explored by the teacher, often due to the lack of knowledge on this subject, bringing with it a great loss in the student's learning regarding the understanding of geometric concepts, such as: Cartesian plane, angles, congruences, similarity of figures, metric relations, among others.

It is necessary to note that all mathematical content is important in its essence and that one content complements the other. This fact can be verified within the applications, suggestions and also within the order of skills treated by BNCC, where the pedagogical strategy known as spiral education, with the revisiting of the contents, is proposed.

It is widely known that the study of geometry carried out by the initial formation of the teacher, is not enough to solve the difficulties they will face when teaching the contents of geometry. Thus, it is believed that the study of geometric transformations in a continuing education of the teacher, would make him able to apply the content as proposed by the BNCC.

In order to help elementary school teachers to work the content of geometric transformations in a more dynamic way, as proposed by BNCC, activities were developed in this work with students

of the 6th and 7th grades of elementary school, addressing topics such as homothecy and isometries using the Geogebra software.

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SEVEN
publicações acadêmicas

The education of health professionals in coping with violence against elderly women

https://doi.org/10.56238/ptoketheeducati-027

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ABSTRACT
Background: Violence against the elderly is an important public health problem, and permeates the ability of health professionals to conduct the case. Objective: What is the importance of formal and non-formal education for health professionals in identifying and acting in the face of situations of violence against elderly women? Method: This is a qualitative, exploratory research whose data collection instrument is a semi-structured questionnaire. The research participants are 34 health professionals (geriatricians and gerontologists) from the state of Paraná/Brazil. Results: The lack of an educational formation (formal or non-formal), aimed at health professionals, generates discomfort and difficulty in conducting cases in which violence against elderly women is observed. Conclusion: It is emphasized the urgency in the development of public policies for the education and protection of elderly women, and training and qualification actions for health professionals, so that these moral patients have their dignity and human rights preserved.

Keywords: Social vulnerability, violence against women, bioethics, formal and non-formal education.

1 INTRODUCTION

In Brazil, the person considered elderly is 60 years or older (BRASIL, 2003), and corresponds to about 55% of the population. In this age group, women are more prevalent, with a life expectancy of 79.9 years, while men have an expectation of 72.8 years (IBGE, 2019). Population aging is already a reality in Brazil, and adjacent to this movement comes the need to promote comprehensive care for the elderly (MONTEIRO, 2017).

This assistance also presupposes ensuring dignity, the right to freedom and security (JEON ET AL, 2019), since the elderly person is more predisposed to social exclusion, especially in females where there is exacerbated moral and social vulnerability (SANCHES et al., 2018). Thus, identifying possible cases of violence is also the work of health professionals and everyone involved in the care process (FILEBORN, 2017; PARANHOS, 2019).

However, it is presumed that there is probable difficulty of the health professional in identifying and conducting cases of violence, which makes the situation worrisome, since they are also responsible for ensuring the autonomy of elderly women and valuing their dignity. Thus, it is imperative to discuss ways to preserve the Fundamental Human Rights of elderly women.

2 METHODOLOGIES

It is research of qualitative, exploratory approach, with procedures of bibliographical research and field research, with comparative analysis of the results, and was developed in three stages.

In the first stage, the conceptual theoretical foundations on formal and non-formal education, on the breadth of gender roles shaped by the historical past, violence and the struggle for women's dignity were sought. This review on the state of knowledge was carried out on the platforms Virtual Health Library, Pubmed, Google Scholar, Scielo; under the descriptors "elder abuse"; "vulnerability"; "Women", in the period of December 2021, contemplating articles from the last 28 years.

In the second stage, empirical research was carried out, whose data collection instrument was a semi-structured online questionnaire with 34 participants who are professionals of Geriatrics and Gerontology of the State in Paraná[1]. Data collection occurred in the months of December/2021 and January/2022. The questionnaire, which was sent in the online format, has 09 questions, being 04 closed questions and 05 open questions. The instrument contained questions related to professional practice, physician-patient relationship, identification of the work area, referral of cases, which type of violence and who was the aggressor, and educational training related to the theme.

In the third stage, data organization and analysis were performed, where the results of the questions related to the training of professionals and referral of identified cases were compared and discussed in an interdisciplinary perspective, based on the meaning and explanations attributed by the participants.

3 FINDINGS

The participants of this research have a formal education in the area of health (Geriatrics and Gerontology), therefore, they have a position of recognized authority, because they speak of a social place endowed with public credibility that is the doctor's office or hospital, and take care of the health of the target audience of this research (FOUCAULT, 2013). The total number of participants was 34 geriatricians and gerontologists from the State of Paraná.

Most participants (N=30) reported having identified in their work routine some case of violence against elderly women. Of these 30 professionals, 80% (N=24) indicated that they did not have any type of training or qualification to deal with this type of situation, neither in their academic training nor in their professional practice. Of these 24 professionals, even without a training process on the subject, 7 were able to refer the cases to a responsible body. Therefore, a large portion of the professionals were not able to adequately notify the case of violence.

[1] The research was approved by the Research Ethics Committee (CEP) of the Pontifical Catholic University of Paraná - CAAE: 52978321.2.0000.0020. The participants who responded anonymously were not identified.

Only 20% (N=6) reported having had some type of education in this area, 4 in non-formal education and 2 in formal education - namely, through training in the Municipal Health Department, participation in congresses, seminars, lectures of the Municipal Council of the Elderly/Social Action Fund, in the geriatric's residence and in an extension project at the university.

A more objective look at the results shows that the 4 professionals who had non-formal education maintained the conduct of referral to social assistance, psychology, the Public Prosecutor's Office and 1 of them only registered in the medical record and talked to the family, not notifying any responsible body.

This unreported case record evidences serious conduct and contributes to the continuation of violence. The 2 participants who had Formal Education were able to take the situation to the responsible body (referral to the Public Prosecutor's Office and Social Assistance).

In the research, the participants were asked how they felt about situations of violence against the elderly women. It was found that the moral discomfort faced by the health professional contemplated all those who have already faced situations of violence. Some participants mention the anguish of not knowing how to act properly, others of the fact that the victim was slow to seek help.

There are also those who were sensitized to see the vulnerability of the victim and were perplexed that no other professional colleague had taken an attitude in defense of the elderly woman previously. One of the participants records the surprise to discover that the victim himself did not wish to receive help.

Thus, it is noted that the health professional is not indifferent to the situation of violence, but needs more instruction to know how to act in this situation.

The main types of violence reported by the participants were patrimonial and psychological. In all the cases reported, the aggressors were people very close to the victims (husband, children, caregivers), who participated in the elderly women's lives and who should take care of them, but who instead generate a situation of vulnerability due to affective, financial or other dependence.

An interesting fact is that when we look in detail at the totality of the research participants, only 33% of the total made a complaint to the responsible authorities. Those who did not file a complaint, when asked how they acted in the face of the situation, reported that they only recorded in the medical record or referred them to the social worker or psychology service and also to the direction of the establishment. Thus, most professionals maintained the situation within the institution, without proceeding, contributing to the cases not becoming public, and not complying with the Statute of the Elderly.

4 DISCUSSIONS

The population aging that has occurred in recent decades (CEPELLOS, 2021) comes from many factors, such as greater access to health, evolution of the pharmaceutical industry, the reduction of the mortality and fertility rate, and many others (MONTEIRO, 2017). Brazil is the 15th country in the world with the largest number of elderly people, and in 2050 will occupy the 9th position (MONTEIRO, 2017; VERAS, 2018). Currently there are more than 30 million elderly people in this country (IBGE, 2019).

This process also contemplates the feminization of aging, which will correspond to 54% of the global population in 2050 (CEPELLOS, 2021). There are several factors that contribute to greater longevity of the female sex, such as less use of alcohol and tobacco, decreased maternal mortality, stricter health monitoring, and others (NICODEMO, 2010). All this situation brings with it the need to propose a quality care aimed at the elderly population specifically (MONTEIRO, 2017).

Thus, the importance of understanding the complexity of the situations that make the elderly person even more vulnerable throughout the aging process is emphasized (CEPELLOS, 2021; LINS, 2017). Existential vulnerability is proper to every human being, but the elderly person has the aggravation of social vulnerability, either by lack of support, senility, and many others (DONG, 2015; SANCHES, al., 2018). Society has as cultural value the valorization of work, the idealization of the young as a model of health and criterion of happiness, and this creates an impression of uselessness of the retired (JUNGES, 2006).

Elderly women have exacerbated moral and social vulnerability, making them the target of higher rates of violence (JEON, 2019; Pickering, 2016). The macho and patriarchal culture defends policies that reinforce the devaluation and exclusion of elderly women (GOLDEMBERG, 1997; NICODEMO, 2010). This fact may contribute to the victim's own having difficulty recognizing their reality, since the "normalization" of violence was imprinted within them (NICODEMO, 2010). Silence is the result of a cultural history of inferiorization and subalternization of women (SANTOS, 2007; QUIJANO, 2005). Dussel (2005) and Herrera Flores (2005) highlight this same oppression that was naturalized in everyday life and that functions as a driver of violence. This is what Anibal Quijano (2005) calls the coloniality of power, with the subalternization of women. The silencing of elderly women in the face of cases of violence shows the urgency to recognize them as subjects of rights (BOURDIEU, 2009), and the understanding that they have a historical and cultural identity that does not always allow them to verbalize or demonstrate the violence to which they are subjected. Both dignity and integrity are basic requirements to guarantee fundamental human rights (HOSSNE, 2009).

Given the urgency in confronting the issue, it is essential that public institutions of care and support for the elderly carry out political productions to confront violence.

This action contemplates providing means of education, or training that guide professionals how to act, remembering that "education should be a mobilizing practice of truths and a form of intervention in the world" (FREIRE, 2014, p. 97).

This research showed that there are few health professionals who had training on how to face the problem, and also evidenced the lack of communication between the professionals who care for the elderly and the protection agencies.

This denotes that there is little effectiveness of a protection network aimed specifically at this population that has marked vulnerability (SANCHES et. al., 2018) and needs help so that their rights of protection and freedom are respected.

Thus, the municipal governments should act more actively so that health professionals have knowledge about the Municipal Councils of the Elderly. It is necessary to give voice to those who have been silenced and break with marginalization, so that the elderly have more autonomy over their lives (SANTOS, 2007).

In Brazil, the Federal Constitution of 1988 established the foundation of equal rights, human dignity and the promotion of the well-being of all without discrimination (Art. 1 and 3) (BRASIL, 1988).

In order to protect the elderly, the Statute of the Elderly, Law No. 10,741/2003 (BRAZIL, 2003), was sanctioned in 2003, which has among its foundations the preservation of their health (Article 2), not to be neglected, not to suffer violence and also establishes the duty of all to prevent violations of rights (Article 4.) (BRAZIL, 2003, p16).

But in reality, there is a gap between what is written in law and what the ageist and sexist society has propagated (GOLDANI, 2010).

Among the public policies to confront the theme, some measures were created, such as: the Sinan (Information System of Injuries and Notification) that implemented the Surveillance System of Violence and Accidents (Viva) in 2006.

This fact culminated in the implementation of Ordinance No. 104, in 2011, which makes notifications of violence compulsory (SINAN, 2020); the Statute of the Elderly (Law No. 10,741/2003) that guides the referral of cases of violence to the police authorities, the Public Prosecutor's Office or the Municipal, State or National Council of the Elderly (BRAZIL, 2003).

There is also the creation of own protection networks aimed at the elderly in each state (Special Center for Assistance to the Elderly.

Public Defender's Office of the State of Rio de Janeiro; Secretary of Social Development, Children and Youth of the State of Pernambuco; Center for Reference and Confrontation of Violence Against the Elderly; State Fund for the Elderly of Ceará; State Council for the Rights of the Elderly.

Government of the State of Paraná). The legal effort to try to guarantee human rights is remarkable, but it should be noted that statistics, guidelines and laws apply to women in general, and exclude the age group of elderly women.

Since respecting the principle of justice and equity presupposes prioritizing the vulnerable (SCHRAMM, 2008), one must break with the silencing and invisibility in public policies of elderly women, and talking about the subject is a way of trying to guarantee access to the social rights provided for the elderly and can contribute to the confrontation of violence against women (SANTOS, 2007).

In relation to the theme of violence against elderly women, a few studies were found, such as: Manso (2020) who reviews publications from 2009 to 2019 in Latin America and the Caribbean, presents official documents that address the theme and analyzes how much older women are more susceptible to violence in the face of a patriarchal culture and the gender roles to which they are subjected.

Dias, Lopes and Lemos (2018) analyzes the aging of the female population of Portugal, highlights its social and economic vulnerability, discusses the importance of Feminist Movements and the consequences of gender asymmetry.

Sousa et all. (2021), surveys the elderly living of Pernambuco to find which factors aggravate the risk of violence and conclude that items such as multimorbidity, cognitive deficit and functional dependence corroborate the delicate situation. Thus, there is also a lack of scientific studies that prioritize elderly women.

Gender violence has multiple faces (MANSO, 2020; SOUSA, 2021), since gender roles are socially formed (DIAS, 2018).

For a long time, it was socially accepted and even internalized in the women themselves (NICODEMO, 2010), and therefore the need to understand that some women are more exposed to situations of vulnerability, such as the elderly, is highlighted.

Violence can occur in the sexual, psychological, physical, patrimonial sphere (OLIVEIRA, 2017) and when it occurs in the intimate family environment it creates even more obstacles to its intervention (MANSO, 2020; DAYS, 2018).

Because the aggressors are mostly close people, the dependence and coexistence that links the domestic environment makes it even more difficult to seek help (FILEBORN, 2017; Pickering, 2016; BERNARDES, 2016).

There are many impasses on the part of victims that generate obstacles in the search for help, such as guilt, shame, lack of information, loss of their own identity and even the erroneous idea that only physical abuse is characterized as a type of violence (FILEBORN, 2017; MCGARRY, 2017; SOARES, 2005).

It should also be noted that elderly women have a less efficient coping parameter because they may present more passive postures and renunciation of their autonomy (DONG, 2015; PARANHOS, 2019), consequences of a historical context of inequalities.

The negative impacts of violence on health are already well established: depression, anxiety, post-traumatic stress syndrome, substance abuse, increased risk of institutionalization and suicide, among others (DONG, 2015; MCGARRY, 2017; Curry, 2018).

It is known that cognitive impairment or impaired health, caregiver stress, low education and socioeconomic level, are risk factors for violence (FILEBORN, 2017), not to mention the female gender itself (PICKERING, 2016). Thus, violence against elderly women is an obstacle to public health, as it affects physical and mental health and mortality rate (PICKERING, 2016).

The notification of violence against the elderly is surprisingly low: approximately 10% of cases (CURRY, 2018), which emphasizes a significant underreporting.

Since the victim presents marked vulnerability, the health professional needs to be attentive and aware of its relevance in the fight against this situation, since notification is an instrument for the preservation of Human Rights.

Because they are on the front line, they can be the first recipients of the victims' distress call (MCGARRY et al., 2017, MACEDO, 2020), and in view of this they must know how to identify and properly conduct the situation because they have responsibility for protecting the autonomy of elderly women.

The 9th art of the National Judicial Policy highlights that the omission of violence against elderly women is considered institutional violence (CNJ, 2021).

The results of this research show that the minority of professionals underwent some type of education (formal or non-formal) while the majority did not have access to educational processes on the subject, and reported that they did not know how to proceed in cases of violence against the elderly and neither that they should fill out the report of Notification of Aggression or report it to the authorities.

This result shows the importance of education, whether formal or non-formal, so that the professional is instrumentalized and knows how to refer the identified cases of violence.

What is expected of a professional is not the mechanical repetition of the gesture, but "the understanding of the value of feelings, emotions, insecurity to be overcome by security (...)" (FREIRE, 2014, p. 45).

The social responsibility of Higher Education Institutions is highlighted, so that the professional has knowledge of how to refer cases of violence and break with silencing.

The importance of education (formal and non-formal) in the construction of citizenship is reaffirmed, respecting the dignity of elderly women, non-omission in cases of violence (GOHN, 2016, 2020).

This is an emerging theme and cannot continue to be neglected by professionals and society. In this sense, it is necessary to "build emancipation from a new relationship between respect for equality and the principle of recognition of difference" (SANTOS, 2007, p. 62).

The concept of education encompasses "the formative processes that develop in family life, in human coexistence, at work, in teaching and research institutions, in social movements and civil society organizations and in cultural manifestations" (BRASIL, 1996, art. 1º.).

Formal education is characterized by the "formal character of school processes, standardized by official higher institutions and certifiers of titles. (...) has a national legislation that regulates specific criteria and procedures" (GOHN, 2016, p.60).

Therefore, it is institutionalized, regulated, standardized and follows the legislation and official norms of education. It aims at school, technical or academic training and at the end of the process certifies the modality or degree of education.

It is structured in a system "hierarchically structured and chronologically graduated, from primary school to university, including academic studies and the varieties of specialized programs and technical and professional training institutions" (MARANDINO, 2017, p 812). It is held in formal school institutions, complying with legislation, regulations and guidelines. It is a certifying education.

Non-formal education is understood as

> A socio-political, cultural and pedagogical process of formation for citizenship (...). It designates a set of sociocultural practices of learning and production of knowledge, which involves organizations/institutions, activities, means and varied forms, as well as a multiplicity of social programs and projects (GOHN, 2020, p.13)

Non-formal education, which takes place 'outside the walls' of schools and universities, is a socio-political process of formation for citizenship and learning new knowledge (GOHN, 2020). It can be carried out in social institutions, non-governmental organizations, social movements, collegiate bodies and others.

"Non-formal education is a learning process, not a symbolic structure built and embodied in a building or an institution; it occurs through thematic dialogue" (GOHN, 2016, p. 60).

Non-formal education is built by choices, proposals and intentions. Learning is not spontaneous, but generated and shared. It is a right and an important tool of citizen formation, regardless of social class or level of education (GOHN, 2020)

Education is a condition for the person or an organization to decide to change or incorporate new elements into its practice (CECCIM, 2005). The booklets produced by public agencies, derived

from public policies, are educational instruments that can guide health professionals in coping with the violence that elderly women suffer.

They are produced by institutions endowed with public credibility and socially recognized for their speech of veracity (FOUCAULT, 2013, RENK, 2018). A *primer* is a didactic manual that describes and instrumentalizes the language (AUROUX, 1992).

For this study, some were located that are educational in the orientation of professionals to face this delicate situation, with access released to the public, namely: the Primer Coping with violence against the elderly in Health - of the State Department of Health of Rio Grande do Sul (SILVA, 2016) and the Primer of Viva (BRAZIL, 2016) that teach professionals about the flow of referral and completion of the notification report.

Also, the Booklet Facing Violence against Women, Practical Guidelines for Professionals and Volunteers, of the Special Secretariat of Policies for Women (2005) which addresses the theme, but does not have any specific chapter on elderly women (SOARES, 2005).

Considering that there are already public policies on the guarantee of the rights of the elderly, these published materials have an important social role in guiding legal procedures and in the notification of cases of violence against the elderly.

These materials aim to guide and educate the professional to change behaviors and attitudes, reverberating in attitudes that guarantee the dignity of the elderly. Non-formal education and continuing education can be ways to build ethical, respectful attitudes, in the commitment to human rights, dignity and justice.

The difficulty of action of health professionals makes it urgent to address this issue, because it affects the class of the population that is vulnerable and excluded, causing violation of the Fundamental Human Rights to security, protection and freedom.

The importance of public managers to become aware of and promote formal and non-formal education for these professionals is highlighted, as they are important disseminators of knowledge and instruments for the protection of fundamental human rights.

5 CONCLUSIONS

It is observed that population aging is occurring, but even so, the elderly person is marginalized in public policies, in scientific studies, suffers from the difficulties of intergenerational coexistence and is a victim of violence. In Brazil there is a feminization of aging, but, paradoxically, the elderly was socially invisible and excluded.

This movement of prevalence in the age group indicates the need to include the needs of elderly women in sanitary measures, create conditions for their well-being and stimulate their autonomy.

There is still an appreciation of the young person as synonymous with health, of workers as socially useful people, creating marginalization and contempt for the elderly.

Elderly women are little contemplated in public policies and the violence to which they are subjected is still a taboo subject, little discussed by society and academia.

Historically, society has accepted and normalized the exclusion of elderly women, who have marked vulnerability, which has led to the maintenance of invisibility, innumerable forms of violence and discrimination.

Many women have even internalized violence and habituated it as something naturally imposed on their gender.

Feminist Movements and supranational Conventions are important milestones in the attempt to guarantee women's human rights, but they are still insufficient to end violence against elderly women. It is necessary to promote more effective political and institutional changes in coping with this delicate situation and that the elderly (and all women) can live fully with dignity.

In this research, it was found that violence against elderly women is not yet a significant theme in public policies or in scientific articles, which shows their invisibility as a person and as a subject of rights.

Physical, emotional, psychological and patrimonial violence is carried out by close people, such as family members, caregivers, who should be positioning themselves in favor of the protection of the elderly.

Given the historical cultural conditions, it is difficult for victims to denounce these situations, and therefore, the geriatricians and gerontologists who care for these elderly women should be more attentive to their requests for help. Few professionals denounce cases of violence. Thus, within many homes, the cycle of violence against elderly women persists.

The study shows that health professionals felt powerless in the face of cases of violence. Most of the participants do not have any training or educational qualification on this topic, and thus, did not know how to act and did not submit a complaint to the responsible bodies.

The minority of the research participants took training courses on the subject and, therefore, were able to feel more secure in identifying the cases and conducting them to the authorities. In this sense, the Statute of the Elderly is clear in stating that society is responsible for the well-being and dignity of the elderly, but when there is omission, the situation persists.

Therefore, it is urgent that health professionals have educational training on the subject to know how to proceed before the identification of cases of violence.

Formal and non-formal education proved to be an effective instrument in the fight against violence against the elderly, as it equips health professionals in the identification, notification and intervention of cases of violence.

Protecting moral patients is the responsibility of all those who care, because the search for a society with more equity foresees fighting against actions that violate basic human rights in the context of freedom and dignity.

Thus, there are numerous challenges in acting in cases of violence against elderly women, and much is due to lack of knowledge of the legal procedures to be adopted.

There is a need for more public policies for the well-being of the elderly, which ensure their autonomy, their effective participation in society, and guarantee their rights and dignity.

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Chatbot interaction development and assessment that assists teachers in inserting content into ITS MAZK

https://doi.org/10.56238/ptoketheeducati-028

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ABSTRACT
This paper aims to present the use of a chatbot as an alternative for teachers using an Intelli-gent Tutoring System and also verify MAZK's chatbot acceptance among the instructors, as this functionality was developed in MAZK's system exclusively for this purpose. A ques-tionnaire was carried out with 32 teachers, most of them beginners on MAZK. These in-structors should set up a class with the chatbot's help and it was noticeable that this re-source's use in their training was well accepted due to the practicality of an online tool. Still, some of the instructors had questions if they could learn all the aspects of the system only through the chatbot's help. Teachers who had previously used MAZK considered the chat-bot's development a necessary improvement as a supporting tool.

Keywords: Teacher Training, Chatbot Development, Intelligent Tutoring System, MAZK.

1 INTRODUCTION

There is a big discussion in the educational area regarding how to use technological devices as supporting tools for the subjects taught in the classroom in an adequate and motivational way. The use of technology has made students collaborate amongst themselves regarding the studied subjects, not only knowledge replicator listeners [1]. That way, the teachers get potentially empowered, because they have gotten devices to catch the students' attention and to share rules and experiences in the context of the matter that is being taught.

Technology's use makes the instructors turn into knowledge mediators instead of being only transmitters, hence they can present the subjects in an interdisciplinary way [2]. Brazilian Federal Government has elaborated – through the Ministry of Education (MEC) – policies to help spread the usage of New Information and Communication Technologies in public education, with projects such as "Digital Education" and "Educational Tablet" and raising capacity through programs as "PROINFO" [3].

The Department of Education of the United States highlights that it is important to create various approaches and ways to capacitate the teachers to use the technological tools, searching for the best manner to prepare the instructors to project and implement their teaching strategies. As the available resources for each school are distinct, it must be considered that the technology itself can provide an enriching role through the professional's training, whether for the knowledge's conception or its dissemination [4].

An Intelligent Tutoring System (ITS) – MAZK – has been developed utilizing Artificial Intelligence techniques for the hybrid teaching of various subjects. These systems are usually filled with texts, examples, exercises, and other learning objects provided by a specialist and accessed by students, to help the latter [5].

According to NMC Horizon Report (2018), some reports predict a 43% growth for Artificial Intelligence in the educational area until 2022 and highlight the use of chatbots to record, organize and provide detailed feedback from the students, while answering their questions [6]. The potential role of chatbots is to generate curiosity and instigate interest in a product, a process, or a problem [7]. In this context, the chatbot can perform the intermediator role between the system and the professors, helping the latter with any questions and directing them on the usage of a tutoring system, while guiding the instructors' training and supporting the understanding of the system's functionalities.

From the research that was performed with the technological resources available – resources that might contribute to the teachers' training regarding the tools used in education –, this paper aimed to evaluate a chatbot's potential implementation developed to assist instructors on the intelligent tutor MAZK.

2 METHODOLOGY

To build the theoretical reference that created basement for this research, the following databases were used: Scopus, IEEExplore, ACM Library, Google Scholar, UFSC periodicals; journals such as Renote – that approach the technology and education themes, conference proceedings of important events in the educational field, physical and digital books, dissertations and theses, besides important websites in the technological area.

A data survey was performed – about using chatbots for teachers' training on intelligent tutoring systems – on the mentioned databases during the methodological procedure of this paper and no results were found for a chatbot designed with that purpose searching for the queries "'chatbot" AND "training teacher"', "chatbot for professor training" nor its variations. Hence no databases found chatbots meant to help teachers/tutors with an intelligent tutoring system, which characterizes innovation on the proposed research theme. However, it was possible to find many chatbots with educational intentions to assist students and chatbots used as support on websites with no educational purposes.

The search also found a methodology that checked the teachers' actions while using chatbots to help students, and it offered the instructors – according to the need – an experience where they could use the tutoring chatbot before applying it to the students [8]. These researches were used as basements for the construction of this paper.

3 CHATBOTS ON EDUCATION

Creating intelligent tools using Artificial Intelligence techniques has become a continuous and necessary practice in searches for improving technological procedures and there are many types of research around that topic. This paper will address conversation bots denominated chatterbots or chatbots (this second designation is more common in the development field and will be used in this work), which are computer software that simulates a conversation with people to make them believe they are talking to another person [9].

There are some possible types of chatbots [10]:

a. Only for conversation: this type of chatbot focuses on the users' conversations and does not need to deeply understand what the user says nor to register the context, this type of chatbot is just for entertainment;
b. Goal-oriented: helps the user accomplish tasks and obtain specific information;
c. Goal-oriented and for conversation: presents the first two types combined in its construction.

In the 1950s, Turing proposed the imitation game where an interrogator communicates via terminal with a software and another person, that should find out who it was [11]. That created the first generation of chatbots, which is currently in its fourth generation [12].

Elektra was one of the first chatbots created in Brazil for educational purposes. She was developed in 2002 by researchers of the Federal University of Rio Grande do Sul (UFRGS) to help high school students learn Physics to prepare for University. In 2003, it got an extension for teaching computer networks that still works and can be accessed through the website (http://penta3.ufrgs.br/~elektra/info/index.htm). It was inspired by the ALICE chatbot [9].

Another educational chatbot was developed to be a part of the languages teaching tool Duolingo – considered an intelligent learning system –, called Duolingo bot, which offered practice classes to the students via chatbot. As the students talked to the bot, it would correct their spelling and check the learning level of the student, so it could progress in the chosen language [13]. Another example is the EASElective, a chatbot developed to assist the students with information about the course, such as characteristics of the teachers, perceptions, and other relevant aspects to help their questions [14].

Various other chatbots are developed every day and many of them have the intention of answering students' questions on a specific discipline, assisting them on different matters [15].

4 MAZK CHATBOT

The intelligent tutoring system MAZK was developed by the Laboratory of Computational Technologies (LabTeC) of the Federal University of Santa Catarina (UFSC) and it applies the intelligent tutoring concept using Artificial Intelligence techniques with pedagogical theories to help students with specific contents. The MAZK system is divided into two types of main users: the teachers and the students. The teacher can register questions, explanations, and examples, elaborating material that may or may not be a part of a virtual classroom and course. The students can use this material when logging on to MAZK to use it as support for their studies.

By interacting with teachers that use the intelligent tutoring system MAZK, it was possible to notice the need to create some method that would respond to common questions in a quick, clear, and intelligent way, amongst other necessary aspects for using the system. Chatbots are intelligent solutions used by several companies to chat with the clients, which facilitates the purchase and sale of various products and can be used in other areas, like education, by helping students solve their questions about certain matters. This paper presents the development of a chatbot that "helps teachers that use MAZK to create their teaching material and enjoy the system's functionalities simply and intuitively" as its main objective. To elaborate on the knowledge acquired by the bot related to MAZK, there happened an analysis of the user support manuals and the teacher and pedagogical structural models. These manuals are available in a tool in a .pdf file, containing explanations and illustrative images.

As for the manual analysis, a database was created with potential questions and their answers. It was considered some questions that could be asked to the bot, in different ways, to each functionality of the system, creating then a range of possibilities for each specific subject. The inserted personality traits were designed from the analysis of the presential training team and from the searches for the insertion of features that resemble a human, besides analyzing MAZK’s graphic interface and its structural modules, respecting the software’s planning and taking into consideration the system’s color palette, availability, attributes, and features. For the bot to maintain a dialog, a model was created through the structure of a JSON file, to deal with the questions taking the context into account, and some chatting intentions were defined in this model. It also created a word classifier using NLTK, a Python tool block to make a natural processing machine language along the TFlearn library, a property of TensorFlow for learning processes. The classified data are transmitted to the neural network, built through TensorFlow. TensorFlow catches data and uses it to make tests, aiming to assess the precision of a newly assembled model, until it gets to a satisfactory knowledge level. It was decided to use the simple deep learning network because that network model has the characteristics to process a big number of data for the output of a smaller set. This was possible to notice because of the following: the network input document has a big number of data, synthesized by the NLP classifier from MAZK's

manual. The outputs are the "classification tags", to which the questions and answers belong. To enter the words "good morning", for example, the network verifies which tag has a heavier weight related to those words, and uses that information to return an answer.

By completing the tool programming and the network training, it was possible to verify the bot's learning. The chatbot replied, in an autonomous way, to questions that were made according to the studied basis, showing intelligence by distinguishing questions asking for examples and questions about creating virtual classrooms, for example.

4.1 DEVELOPMENT PROCEDURES

To build the chatbot, it was necessary to search for development alternatives until it was decided to use the programming language Python in its 3.6.5 version. Besides, it was also decided that Artificial Intelligence techniques would be used, such as artificial neural networks and machine processing language with libraries previously developed, like TensorFlow, TFlearn, and Natural Language Toolkit (NLTK). MAZK is developed on Hypertext Preprocessor (PHP), which means it is necessary to find alternatives to integrate its system with the chatbot. Studying MAZK and its manuals was also necessary for creating the bot's database. Table 1 shows the development methods.

Table 1. Development Procedures.

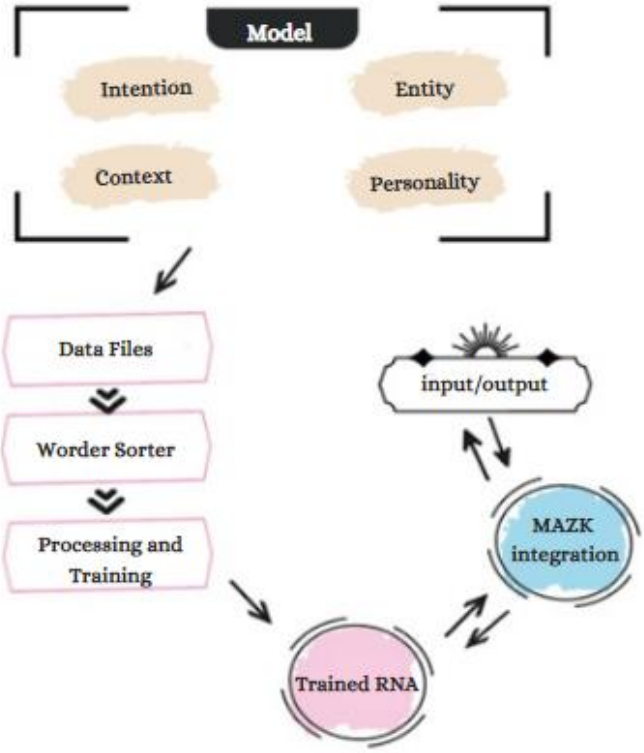
Conception	Development	Integration
Problem analysis	Learning the Python language and the TensorFlow, TFlearn, and NLTK libraries	Learning how to integrate Python and PHP
MAZK manuals analysis	Learning about the operations of neural networks and natural machine learning in practice	Chatbot insertion and tests on the MAZK system, considering its problems
Database creation with possible questions and answers	Development of JSON file with answers	Creating the bot's graphic interface
Analysis and creation of the bot's personality	Development in Python 3.6 on Sublime interface using concepts and libraries to build the bot's structure	Making it available for tests

The chatbot structure corresponds to the following aspects, from the interaction with other bots, through the gathering of characteristics present in its construction:

a. Intentions: what the bot intends to respond;
b. Entity: the necessary components for the response;
c. Context: the situation in which the response is inserted;
d. Interface: the project of the interaction with the human and the construction of its personality.

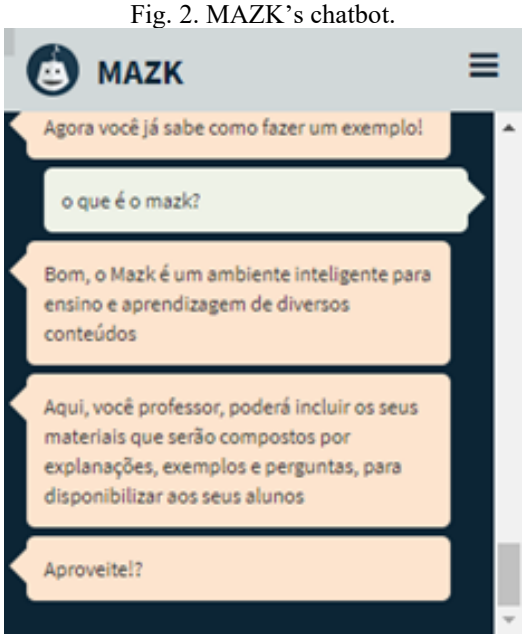
Figure 1 shows the modeling of the chatbot structure, where it was defined its intentions, entities, personality, and context. With that, it is possible to create the database through a data file that goes through the word classifier and procedures and data training on the network until it gets available for input interaction and output responses with the user.

Fig. 1. MAZK's chatbot structure.



With the integrated chatbot, it was necessary to perform utilization tests to observe aspects regarding the usability, as well as how to make improvements to present it to the users and how to change the bot's internal structure, for it to be available for the teachers users. Most of the errors and possible improvements noticed in the first tests were solved with new training and changes in the PHP script for the chat presentation for the users. From the chatbot interaction with 32 teachers, it was possible to observe and evaluate heuristics for improvements by checking the aspects related to usability, safety, ethics, visibility, and communication, suggesting some changes for the chatbot's effectiveness and posterior applications. This paper is a part of one of the author's master's degree research, with updates about the tool's evaluation regarding a human-computer interface analysis of the developed object. The chatbot developed for MAZK is only for conversation, but a new version is already being developed with updates that allow a mixed approach, as it is shown in Figure 2.

Fig. 2. MAZK's chatbot.



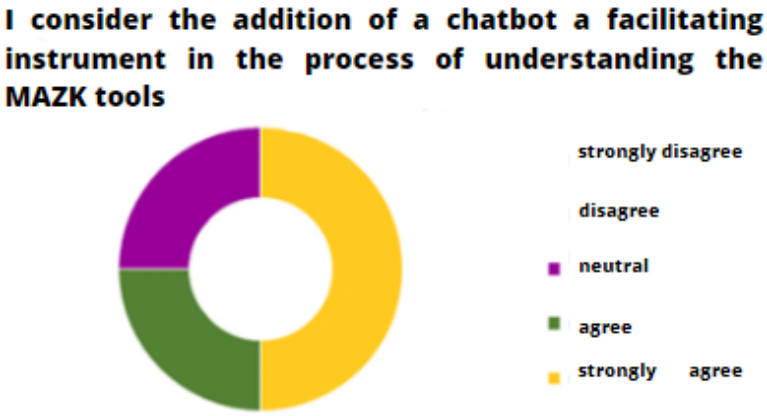
5 APPLICATION WITH TEACHERS AND RESULTS

To evaluate the acceptance of the developed chatbot and verify the potential of its implantation, a questionnaire was elaborated and made available online. This questionnaire had 15 questions of which 3 of them are presented in this paper, as they are directly connected to the chatbot's potential evaluation made by the teachers. The questionnaire was answered by 32 users that teach at public and particular schools, and other kinds of institutions in the south region of Santa Catarina. These users were supposed to build a classroom with complete material with the chatbot helping them and clarifying any possible questions about the system's usage.

To find out the users' knowledge level about the tool, they were asked if they had previously used the Intelligent Tutoring System MAZK. Also, the type of questions the teachers asked the chatbot was noted to check and see where it would be able to assist them and if it could help with the more advanced questions related to the system. Most of the respondents said that had never used the system before, and only eight users said they had used MAZK somehow before.

The respondents that answered they had already used MAZK before received the following affirmation: "I consider the addition of a chatbot a facilitating instrument in the process of understanding the MAZK tools", and then the teachers could agree or disagree about the topic.

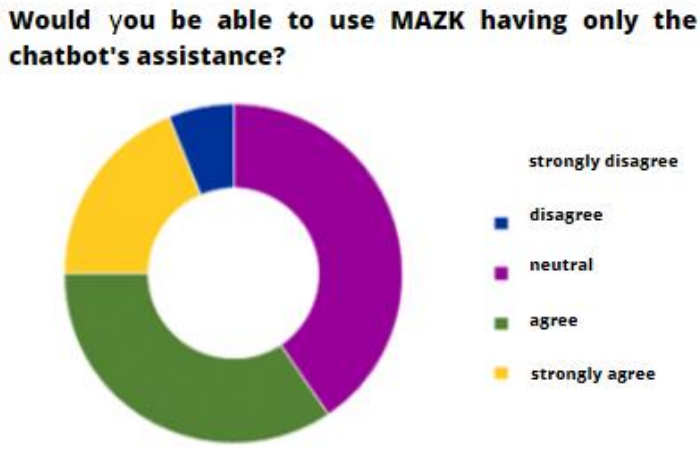
Fig. 3. Opinions on MAZK's chatbot inclusion on the system.



As shown in Figure 3, almost all teachers that had previously used MAZK considered that the inclusion of a chatbot was a facilitating instrument in the process of understanding and none of them disagrees, which makes it possible to say it was a positive aspect. One of the teachers reported that if this resource was available when he first used the system, it would have been easier for him to understand the procedures on the tool and it would have him time by not having to look it up in the manual.

For the other teachers, it was asked their opinion about the exclusive use of the chatbot to assist them while using the system, if they thought it was viable, or if they needed something else to help them, besides the chatbot. This question is related to chatbot use and is especially important for long-distance instructors, and is also related to understanding the procedure the teacher has over the tool.

Fig. 4. Chatbot's usage.



As shown in figure 4, there was a significant quantity of teachers that had doubts about using or not the chatbot as the only way to have any assistance in the system. It was possible to notice that the teachers that had more trouble with technology and basic computing details would have difficulties

using the chatbot, especially if it does not respond to questions like copy and paste, copy link, etc. It is important to understand that having a data limit to which the bot can respond is fundamental for interaction. This is one of the most important questions to analyze because it is possible to observe that with short-term questions are important in the MAZK system usage: the chatbot works fine, but technical support is essential to break barriers, especially because of the fear of dealing with new technologies. The chatbot is a technology used by many companies that answer preprogrammed questions: understanding the context is the biggest challenge in Artificial Intelligence, and that varies according to the difficulties of each teacher.

With the questionnaire's answers and through observation, it was possible to build Table 2 with the principal suggestions and changes to be made on a second version by the MAZK tool development team, after the confirmation of the bot's efficiency.

Table 2. Development Procedures.

Problems	Solutions
Answer questions correctly beyond the manual; or about basic computing for usage	Increase the database with questions and answers and include external usage functions in the manuals; train the network with the questions saved in the database (and create the answers)
Not answering questions without being sure	Search accuracy and return to the user a message that says the bot does not know such subject in case it is not up to a percentage
Improve the way the answers are available to ease comprehension; decrease the number of texts	Insert images, videos and suggest questions to interact in the best way with reading and entertainment
Decrease answering time	Improve network
Comprehension about how to use the chatbot, clarifying what it is and how it works	Insert in the MAZK tool or in the chatbot itself the right way to use a chatbot, whether through video or text

From the application, it is possible to consider that the chatbot is a tool accepted amongst the teachers and that it can contribute to the understanding process, assisting in the teachers' learning process regarding the technology itself. Bibliographical research was performed for the contextualization of this work, to find literature about the historical and conceptual evolution of the learning environments focusing on chatbots – the tool chosen to resolve the main issue in the research, considering that no results were found regarding chatbots assisting teachers on ITS, only students. It

is also possible to verify that researches related to chatbots in education are a tendency that has been explored more, especially in the last year, which marks an innovation to the proposed theme.

When the chatbot was integrated into the system, it was necessary to analyze if it was according to the teachers' needs and fit in the role it was supposed to. Hence, a questionnaire was available for 32 teachers, that had the aim to create a classroom on MAZK using the chatbot to help them. Most teachers considered the chatbot a tool that contributes to the understanding of the system, even though some of them had questions about whether they would be able to use MAZK just with the chatbot's assistance. This may have occurred because of the questions the chatbot was unable to answer since it was not present in the data file that the tool was trained with.

Using an intelligent tool to help the teachers' comprehension in a system like MAZK contributes to education, as it facilitates the process of exchange between the user and the system and it decreases the quantity of errors that might happen, however, the way of using the tools must be clear. In the chatbot's case, even though it works as a support for most teachers, it does not get 100% of satisfaction, whether it may be for issues that yet have to be solved or the teachers' misunderstanding. And because of that, it is necessary to do more research to be possible to study how to improve the tools to break barriers and make them useful for more users.

6 CONCLUSION

From the application, it is possible to consider that the chatbot is a tool accepted amongst the teachers and that it can contribute to the understanding process, assisting in the teachers' learning process regarding the technology itself. Bibliographical research was performed for the contextualization of this work, to find literature about the historical and conceptual evolution of the learning environments focusing on chatbots – the tool chosen to resolve the main issue in the research –, considering that no results were found regarding chatbots assisting teachers on ITS, only students – which is understandable, as MAZK's main characteristic is the focus on content teachers, and that is not common on most tutoring systems. It is also possible to verify that researches related to chatbots in education are a tendency that has been explored more, especially in the last year, which marks an innovation to the proposed theme.

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SEVEN
publicações acadêmicas

Strategies to fight disinformation in health: Is it possible for a brazilian podcast to reach any target audience?

https://doi.org/10.56238/ptoketheeducati-029

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ABSTRACT
Aim: Knowing the use in the education of podcasts was occurring in some countries, the present work developed one in Portuguese. The aim was to promote health and combat disinformation in Brazil. Methods: Different categories of Podcasts were created: shorter/longer; with/without guests and disease-related issues or other topics about prevention/health education. After that, the audios were edited and submitted on platforms: Results: It was analyzed through the data generated by the published episodes. It was observed that duration vs several reproductions did not correlate with (p=0.2521). Then, the presence/absence of guests (p=0.1779). However, themes related to infectious and chronic diseases obtained more significant results (p=0.0466) when compared to the other topics. Also, we noticed that our listeners are primarily men aged between 18 and 27 years old and residing in Brazil. Conclusion: Podcasts may be able to disseminate knowledge, however, themes and the type of audience must be considered to choose this kind of approach.

Keywords: Podcast, Health Promotion, Portuguese, Audience.

1 INTRODUCTION

In January 2020, the world was surprised by an outbreak caused by a new type of coronavirus, SARS-CoV-2, leading to a public health emergency of international relevance. By March 11, 2020, the virus had already taken on worldwide proportions and became a pandemic[1].

The little knowledge about this new virus created a scenario of uncertainty and insecurity in society, to demonstrate that there was in Brazil a mass dissemination of false information,[2] collected

information that was circulating in Brazil from January to April 2020 and the authors report that only 6% were reported as true, therefore 94% were fake news.

It is noteworthy that the spread of fake news and the culture of disinformation in the health field are old attitudes. According to [3], the health field is a propitious area for the spread of rumors quickly in Brazil. For the researcher, this practice occurs because part of the population does not receive correct information about the health-disease process, due to the lack of trust in health authorities, and the feeling of anxiety caused by news about diseases and epidemics [2].

In the face of this scenario, communication efforts are needed to help people obtain correct knowledge about health issues, prevent diseases, and maintain and improve health. In this context, it is necessary to create and implement strategies that can enhance the dissemination of scientific information in a simple, fast, and correct manner. One tool that can help in this process of scientific dissemination is podcasts [4].

During the days of isolation, it was observed that podcasts were used as an important tool for education and information. The podcast is a digital media with high potential due to the plasticity of interaction that it provides to users because they, can listen to these files whenever and wherever they want, in addition to the possibility of downloading the created audio. The user, because they have access to information in unconventional educational environments, can be used in the field of health promotion, prevention, and education, making it possible to transmit important content online and thus provide greater autonomy on the part of the population about learning[5]. Therefore, the objective of this work was to create a Podcast focused on health to verify its potential within several audiences, through data produced by the podcast aggregator platform.

2 METHODS

2.1 POPULATION AND RESEARCH ETHICS

This is an observational study with a quantitative approach, based on the development of podcasts published from May to December 2020, whose content was exclusively of scientific knowledge in the health area. The Portuguese language was chosen to publish the content, due to the amount of fake news and misinformation that Brazil is being submitted[6]. The data presented in this study is information generated by the Anchor application itself, obeying the terms of use that the listener authorizes when accessing the platform. Therefore, not requiring an ethics committee.

2.2 DESIGN

For the construction of the podcasts, essential principles were established for the creation of quality content, scientifically based and that would allow to bring information with the potential to promote health.

In the initial stage, research was conducted on academic platforms such as PubMed and Google Scholar to collect articles that supported the theme to be discussed. From the collection of studies, the scripts were elaborated, documents that served as recording guides, which were previously shared with all participants. Three podcast models were established: 1- Podcast Dictionary (PD); 2- Interview Podcast (PE); 3- Scientific Article Summary Podcast (PRAC). The PD aimed to create audios with the definition of terms used in the health field; The PE was elaborated from the construction of dialogue in interview format; The PRAC was produced from the translation of articles that presented unpublished research for Portuguese, a language in which podcasts were recorded and made available.

The recording of the audio occurred by the Anchor platform (https://anchor.fm), a platform that allows online recording and sharing of a link generated by the application itself after recording. The podcasts produced in mp3 format were edited in a free computer audio editing software, Audacity (https://audacity.br.uptodown.com/windows). Once finalized, they were hosted on the Anchor aggregator and made available on the platform itself [7].

2.3 DATA ANALYSIS

The Data were analyzed by Chi-Square goodness of fit test. It is a non-parametric test of GraphPad Prism 8.0 software.

3 RESULTS

3.1 DETAILS OF THE EPISODES PRODUCED AND DISSEMINATED

47 podcasts were released from May to December 2021 on digital platforms Spotify, Anchor, Google Podcast, and others. Several health issues were addressed, which can be seen in **Table 1**, and are presented according to the chronological order of publication, the first being published in a longer time. In bold we detail the episodes that have been played more than 40 times (episodes 1, 2, 3, 5, 6, 7, 13).

Table 1- Podcast episodes in order of publication (from oldest to most current) and their details regarding title, duration, number of plays, and link.

EPISODE	TITLE	DURATION	REPRODUCTIONS	LINK	WITH GUEST
1	Health without fake-presentation	1-minute e 56 seconds	66	https://anchor.fm/saudesemfake/episodes/Sade-sem-Fake--Apresentao-edgios	N
2	Coronavirus - surface cleaning	6 minutes e 29 seconds	68	https://anchor.fm/saudesemfake/episodes/Coronavrus--Limpeza-de-superfcies-edk2d5	N
3	Vaccines in the Context of Fake News	16 minutes e 14 seconds	86	https://anchor.fm/saudesemfake/episodes/Vacinas-no-Contexto-das-Fakes-News-eeebt2	Y

4	Dictionary applied to vaccines	6 minutes e 21 seconds	61	https://anchor.fm/saudesemfake/episodes/Dicionrio-Aplicado-s-Vacinas-ef6sge	N
5	Coronavirus in people with diabetes mellitus and hypertension	3 minutes e 16 seconds	65	https://anchor.fm/saudesemfake/episodes/Coronavrus-em-pessoas-portadoras-de-Diabetes-mellitus-e-Hipertenso-arterial-efth8v	N
6	Explaining autism spectrum disorder	7 minutes e 18 seconds	140	https://anchor.fm/saudesemfake/episodes/Explicando-o-Transtorno-do-Espectro-Autista-egia4	Y
7	The World of Diabetes Mellitus	20 minutes e 57 seconds	109	https://anchor.fm/saudesemfake/episodes/O-mundo-do-Diabetes-Mellitus-eh7sq6	Y
8	Dictionary about Diabetes Mellitus	5 minutes e 12 seconds	67	https://anchor.fm/saudesemfake/episodes/Dicionrio-sobre-o-Diabetes-Mellitus-ei0cro	N
9	The CRISPR-Cas9 genome editing technique	4 minutes e 07 seconds	63	https://anchor.fm/saudesemfake/episodes/A-tcnica-de-edio-de-genoma-CRISPR-Cas9-eibu6i	N
10	Off-label use of medicines in medicine	6 minutes e 24 seconds	71	https://anchor.fm/saudesemfake/episodes/O-uso-off-label-de-medicamentos-na-medicina-eilmtv	N
11	How to maintain mental health in times of pandemic.	18 minutes e 49 seconds	66	https://anchor.fm/saudesemfake/episodes/Como-manter-a-Sade-Mental-em-tempos-de-pandemia-ej14pv	Y
12	The enigmatic brain	3 minutes e 16 seconds	39	https://anchor.fm/saudesemfake/episodes/O-enigmtico-crebro-ejc8sm	N
13	Memory rescue in people with Alzheimer's, is it possible?	3 minutes e 58 seconds	67	https://anchor.fm/saudesemfake/episodes/O-resgate-da-memria-em-pessoas-com-Alzheimer---possvel-ejm88u	N
14	Understanding Alzheimer's through the perspective of an expert on the subject.	14 minutes e 46 seconds	69	https://anchor.fm/saudesemfake/episodes/Entendendo-o-Mal-de-Alzheimer-atravs-da-perspectiva-de-um-especialista-no-assunto-ek4e4d	Y
15	Knowing the bone marrow transplantation process, by directing the direction of a professional	15 minutes e 19 seconds	55	https://anchor.fm/saudesemfake/episodes/Conhecendo-o-processo-de-Transplante-de-Medula-ssea--atravs-do-direcionamento-de-um-profissional-ekh2hl	Y
16	Knowing the Respiratory System	4 minutes e 3 seconds	52	https://anchor.fm/saudesemfake/episodes/Conhecendo-o-Sistema-Respiratrio-ekruko	N
18	Artificial organs, the future of humanity?	6 minutes e 53 seconds	71	https://anchor.fm/saudesemfake/episodes/rgos-artificiais--o-futuro-da-humanidade-elbcb5	N
19	Unveiling the world of micro and parasitology.	10 minutes e 22 seconds	57	https://anchor.fm/saudesemfake/episodes/Desvendando-o-mundo-da-micro-e-parasitologia-elqe5a	N
20	The impact of human actions on the environment	8 minutes e 19 seconds	61	https://anchor.fm/saudesemfake/episodes/O-impacto-das-aes-humanas-no-meio-ambiente-e-o-surgimento-da-pandemia-COVID-19-em48sm	N

	and the emergence of the pandemic				
21	The main mental illnesses that affect humans.	10 minutes e 37 seconds	52	https://anchor.fm/saudesemfake/episodes/As-principais-doenas-mentais-que-afetam-os-seres-humanos-emhv4v	N
22	The impact of the COVID-19 pandemic on mental health.	10 minutes e 23 seconds	53	https://anchor.fm/saudesemfake/episodes/O-impacto-da-pandemia-COVID-19-na-sade-mental-emnjhl	N
23	This isn't goodbye, it's a see you soon!	3 minutes e 07 seconds	43	https://anchor.fm/saudesemfake/episodes/Isso-no--um-adeus---um-at-logo-en0d8k	N
24	Podcast Bonus: Clinical Vaccine Research.	1-hour e 35 minutes	35	https://anchor.fm/saudesemfake/episodes/Podcast-Bnus-Pesquisa-Clnica-Sobre-Vacinas-enr3i3	Y
25	Bonus Podcast 2.0: An Encounter between Health without Fake and Contains Reference.	2 hours	32	https://anchor.fm/saudesemfake/episodes/Podcast-Bnus-2-0-Um-encontro-entre-Sade-sem-Fake-e-Contm-Referncia-eocn10	Y
26	Is memory recovery in people with Alzheimer's possible?	3 minutes e 58 seconds	107	https://anchor.fm/saudesemfake/episodes/Podcast-Bnus-2-0-Um-encontro-entre-Sade-sem-Fake-e-Contm-Referncia-eocn10	N
27	Let's understand more about the Portuguese language?	22 minutes e 28 seconds	139	https://anchor.fm/saudesemfake/episodes/Vamos-entender-mais-sobre-a-Lngua-Portuguesa-ep9qqe	Y
28	High Blood Pressure / High Blood Pressure - What you need to know!?	43 minutes e 52 seconds	125	https://anchor.fm/saudesemfake/episodes/Hipertenso-Arterial--Presso-Alta---O-que-voc-precisa-saber-eq34d4	Y
29	Directly from NASA: Initiation to Scientific Thinking!!	38 minutes e 27 seconds	96	https://anchor.fm/saudesemfake/episodes/Diretamente-da-NASA-Iniciao-ao-Pensamento-Cientfico-era6n1	Y
30	Vaccines in the Fight against COVID-19	13 minutes e 50 seconds	81	https://anchor.fm/saudesemfake/episodes/Vacinas-no-combate--COVID-19-ev1rf2	N
31	The mysterious silent hypoxia: what is its relationship with COVID-19?	3 minutes e 42 seconds	65	https://anchor.fm/saudesemfake/episodes/A-misteriosa-Hipxia-silenciosa-qual-sua-relao-com-a-COVID-19-ev257e	N
32	The risks of self-medication in the face of COVID-19	7 minutes e 39 seconds	113	https://anchor.fm/saudesemfake/episodes/Os-riscos-da-automedicao-em-frente--COVID-19-evniv7	N
33	Natural Gynecology, what do you need to know?	34 minutes e 43 seconds	66	https://anchor.fm/saudesemfake/episodes/Ginecologia-Natural--o-que-voc-precisa-saber-e104n04	Y
34	Sequels of COVID-19	5 minutes e 17 seconds	111	https://anchor.fm/saudesemfake/episodes/Sequelas-da-COVID-19-e10usvf	N

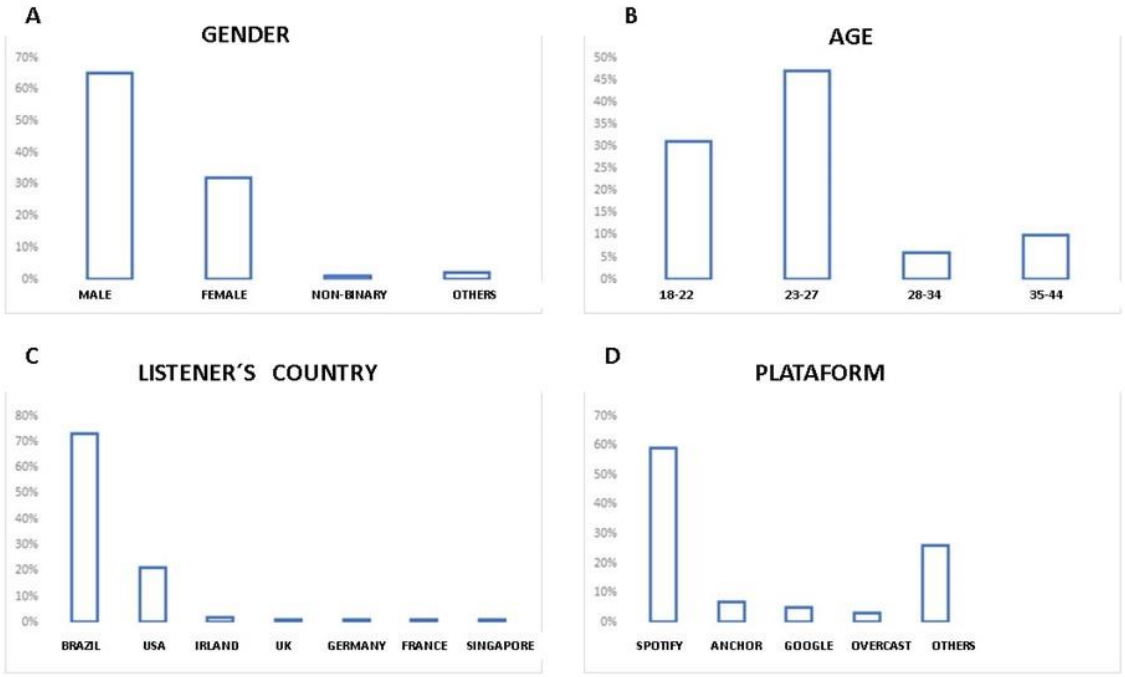
35	Toxoplasmosis / Cat disease	27 minutes e 34 seconds	102	https://anchor.fm/saudesemfake/episodes/Toxoplasmose--Doena-do-gato-e120mk2	Y
36	The SUS - Challenges and importance!	18 minutes e 29 seconds	109	https://anchor.fm/saudesemfake/episodes/O-SUS---Desafios-e-importncia-e131158	Y
37	PHYSICAL EXERCISE AND COVID-19, WHAT YOU NEED TO KNOW!??	5 minutes e 15 seconds	167	https://anchor.fm/saudesemfake/episodes/EXERCCIO-FSICO-E-COVID-19--O-QUE-VOC-PRECISA-SABER-e13pvc0	N
38	ALZHEIMER AND COVID-19 - WHAT IS THE RELATIONSHIP?	5 minutes e 51 seconds	112	https://anchor.fm/saudesemfake/episodes/ALZHEIMER-E-COVID-19---QUAL-A-RELAO-e14glq8	N
39	Academic career abroad: Precious tips with Celina Abreu	57 minutes e 18 seconds	53	https://anchor.fm/saudesemfake/episodes/Carreira-acadmica-no-exterior-dicas-preciosas-com-Celina-Abreu-e15djeo	Y
40	Vaccine and drug approval process, how does it work?	21 minutes e 45 seconds	74	https://anchor.fm/saudesemfake/episodes/Processo-de-aprovao-de-vacinas-e-medicamentos--como-funciona-e16191r	Y
41	BENEFITS OF MEDITATION FOR PHYSICAL AND MENTAL HEALTH	5 minutes e 59 seconds	144	https://anchor.fm/saudesemfake/episodes/BENEFCIOS-DA-MEDITAO-PARA-SADE-FSICA-E-MENTAL-e16r48t	N
42	Food Consumption and Anxiety During the COVID-19 Pandemic.	10 minutes e 18 seconds	104	https://anchor.fm/saudesemfake/episodes/Consumo-Alimentar-e-Ansiedade-Durante-a-Pandemia-da-COVID-19-e17dllo	Y
43	Elderly health in Brazil and Africa, what are the differences?	21 minutes e 27 seconds	70	https://anchor.fm/saudesemfake/episodes/Sade-do-idoso-no-Brasil-e-na-frica--quais-as-diferenas-e186gud	Y
44	Stress and its harmful effects on health!	7 minutes e 21 seconds	123	https://anchor.fm/saudesemfake/episodes/O-estresse-e-seus-malefcios--sade-e18r5cv	N
45	Is there an influence of psychological aspects during pregnancy and children's behavior?	5 minutes e 4 seconds	110	https://anchor.fm/saudesemfake/episodes/H-influncia-dos-aspectos-psicolgicos-durante-a-gestao-e-comportamento-dos-filhos-e19kqjt	N
46	The use of anabolic steroids in the search for the "ideal" body.	5 minutes e 2 seconds	111	https://anchor.fm/saudesemfake/episodes/O-uso-de-anabolizantes-na-busca-do-corpo-ideal-e1ac0v6	N
47	Impact of the COVID-19 pandemic on people with chronic disease.	17 minutes e 24 seconds	76	https://anchor.fm/saudesemfake/episodes/Impacto-da-pandemia-da-COVID-19-em-pessoas-com-dor-crnica-e1b5nap	Y

3.2 LISTENER ANALYSIS

Regarding the characterization of the public **Figure 1**, it was found that the largest proportion was identified as being male (62%); female (26%), and non-binary (10%) **Figure 1A**. It is emphasized that (2%) of the listeners did not specify their gender. It was noticed that the audience that most reproduced the audio files was in the age group between 23-27 years (62%); listeners between 28-34 years (19%) **Figure 1B**.

It was found that the consumers of the podcasts had different nationalities, and the countries with the most listeners were Brazil (85%); and the United States (12%) **Figure 1C**. A total of 3,972 plays were obtained over the months, most of them through the Spotify platform (71%); web browser (3%) Anchor app (2%), and Google Podcast (7%) **Figure 1D**.

Figure 1 Audience Characterization publicized on Anchor´s page. It is possible to see that most of our listeners are male (1A), Youth under 30 years old (1B), and most of them from Brazil, but not exclusively (1C).



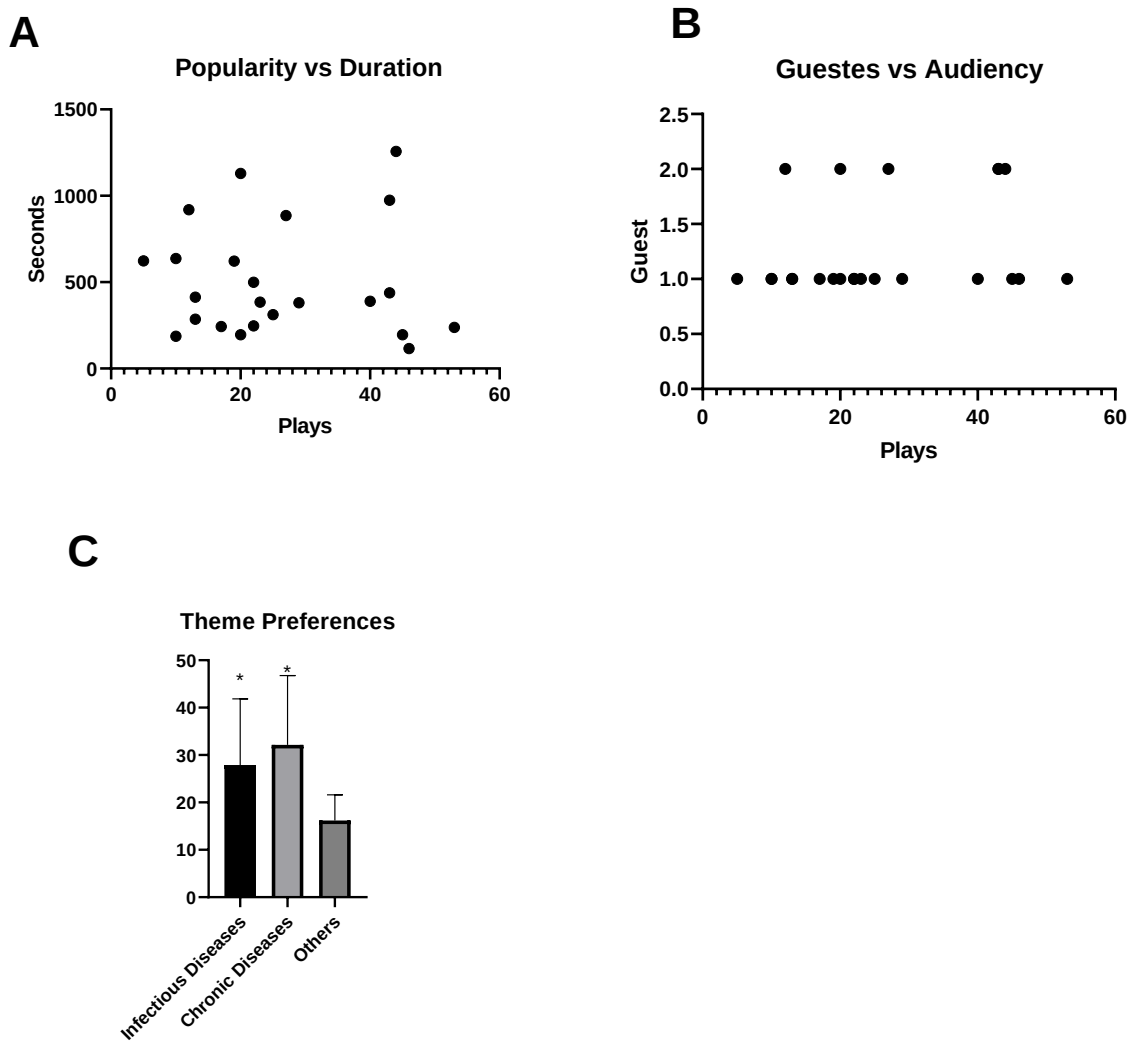
3.3 COMPARISON OF THE MOST-PLAYED AND LEAST-PLAYED EPISODES

The episodes that were most reproduced according to Table 01 served as a positive pattern for a more detailed statistical analysis. The first analysis was to correlate the duration time (in seconds) of the episodes versus the number of reproductions, according to **Figure 2A**. Spearmann's analysis shows that the variables did not present a statistically significant association (p=0.2521).

In **Figure 2B** we tested the correlation of the popularity of the episode with the presence or absence of guests to talk about a particular subject. Again, there was no association with the presence of a specialist (p=0.1779), suggesting that it is not a guest that makes some episodes more reproduced than others.

Finally, **Figure 2C** grouped each episode within a predominant theme. For this analysis, we excluded the first and last episodes, which were the episodes of the opening and ending of the program. We used the main themes of Infectious Diseases, Chronic Diseases, and other health issues not related to these themes. In this case, the main theme of the podcast presented a significant association with the number of audio reproductions (p=0.0466). Individually evaluated, when subjects such as Coronavirus, Diabetes Mellitus, and Alzheimer's disease were approached, a greater number of listeners were obtained.

Figure 2 The episodes that were most reproduced served as a positive pattern for a more detailed statistical analysis. The first analysis was Spearmann's correlation test to evaluate the duration time (in seconds) of the episodes versus the number of reproductions, p=0.2521 (Figure 2A). In Figure 2B we tested the correlation, using the same statistic method, to analyze the popularity of the episode with the presence or absence of guests to talk about a particular subject. Again, there was no association with the presence of a specialist (p=0.1779). Finally, Figure 2C grouped each episode within a predominant subject such as Coronavirus, Diabetes Mellitus, and Alzheimer's. We analyzed by chi-squared and the main theme of the podcast presented a significant association with the number of audio reproductions (p=0.0466), confirming the importance of theme and audience.



4 DISCUSSION AND CONCLUSIONS

4.1 DISCUSSION

The podcast is configured as a digital media on the rise, when in 2018 Brazil showed a 127% increase in the average rate of use, second only to the United States of America [8]. Given the exponential growth of this media as a health education tool [9], discussing the public profile becomes essential to know the reasons why those who reproduce this media, and use this knowledge to implement health promotion practices.

Because the podcast is an online media and desists from the technological extension of its aggregator platforms, such as Spotify, it can reach different places without geographical and demographic restrictions [10]. Therefore, it was observed from the results obtained from the analysis of health consumers without Fake, the presence of an international audience, such as Americans (21%), Irish (2%), and others.

Podcast consumers are not restricted to a single age group, studies show that the variety of age groups has increased since 2016, with greater progress in the age group from 25 to 54 years [11], but with frequent use of the ages between 12 and 34 years [12]. This more frequent use by young people was also demonstrated by a Reuters article, which showed in its 2019 report that podcast consumers in Sweden and the U.S., two major media users, were under 35 years old [13].

When we analyze our Brazilian data on the age of the target audience the same was confirmed by [14] conducted in 2019-2020, which found that 84.76% of regular listeners were under 35 years old [14]. The real health data show the prevalence of listeners aged between 23 and 27 years, although we have significant reproductions between the ages of 18 to 22 years and between 35 and 44 years. These data suggest that the Podcast is a tool for health promotion and education, but the data suggest that it cannot be considered comprehensive for any age group.

As for the consumption of podcasts by gender, it is known that there is a rise of this media among the male audience in the USA[15] and this scenario is reproduced in different countries such as Israel, for example, where 56% of podcast listeners are men[16]. PodPesquisa[14] demonstrated in its report that 72% of Brazilian podcast listeners belong to the male gender. Data like those found in these studies can be observed in the results of this study, where men correspond to 65% of listeners[14]. This finding may be related to the presumed greater willingness of the male public compared to women in using new technologies[17]. One of the questions for future studies would be the use of this tool for the promotion of men's health, addressing important and even stigmatized issues such as prostate cancer and sexual impotence, since they are more willing to listen to this type of media.

As for the factors that influenced the public of this article to reproduce the podcasts, it was noticed that there was no significance regarding the duration of the audio. A review showed that podcasts of educational nature generally follow a trend of duration with short intervals of a maximum

of 5 minutes[18]. Other studies show the preference of listeners for shorter audios between 6 to 10 minutes[19,20]. According to one of the creators of Nerdcast, the first Brazilian podcast to reach the milestone of 1 billion downloads, it is essential to invest in guests who have experience in the subjects to be addressed and develop an interesting debate to continue creating innovative content[21]. However, the present study demonstrated that the number of reproductions was also not affected when a podcast was adopted in the interview format.

According to[22] the opinion of the guests is the foundation of the discussions. Moreover, the presence of nationally recognized guests was considered essential for the excellent dissemination of audio programs. It was believed that the public better understood the arguments and counter-arguments of the topic addressed, expressed by people capable of supporting their statements with expertise in the area[22,23].

However, our data observed that there was a significant correlation between the increase in reproductions and the theme of the audio, even if there were no guests present. The interest of the Brazilian population in the use of audiovisual resources when compared to writing, the high increase in the consumption of podcasts in Brazil, and the greater demand for scientific subjects on the Internet represent an excellent means of propagating science to a lay public[24].

Access to intellectually challenging material is what motivates listeners to tune in, and repeatedly listen to audio to make sure they understand the main idea[25]. Also in this sense, podcasts are being used as an educational learning tool, providing an improvement of the achievements of academics, and consolidating themselves as a resource that enhances scientific communication[9,21,26–28] this fact may be related to the association found in this study, since our listeners have an average age close to university students and graduate students.

Thinking about the popularization of science, using the podcast as a possible tool for health promotion, we must also consider the role of scientists who, currently, in addition to communicating science also play a fundamental role in the social context that is to democratize access to knowledge through communication in science[29].

Despite the exponential growth of the podcast, there is still a very large gap regarding scientific research developed on this theme[4] and this is a limitation of this study, considering that there is not much data characterizing consumers of this media, especially regarding Brazil. From this perspective, this study brings an analysis of the podcast as a tool capable of promoting health, which provides a vision for other researchers, despite being restricted to a target audience and specific content, still allows an analysis of this new media process[30].

4.2 CONCLUSIONS

It can be concluded that the podcast is an Information and Communication Technology on the rise in the scientific environment because it can promote and disseminate knowledge, although our study suggests that podcast producers may find some limitations on the type of audience it reaches since we observe a specific population of young adult men. However, with the popularization of this type of tool, it may be possible to use this media in the field of health promotion and education benefiting beyond the population we observed in our study because it is possible to carry out information on various subjects with a simple language, through an accessible tool.

Although the podcast is expanding and with increasing interest to be used in the broadcast of issues related to health promotion and patient self-care, our study demonstrates that the reach of this media is limited to the profile of the people who consume it. In this way, health actions that seek to reach an older audience may present a certain difficulty if you choose this type of approach. On the other hand, actions that target young men may be more successful when using the podcast as a facilitator.

ACKNOWLEDGES

To Unilab for the Student Extension Scholarship.

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Sensory trail as pedagogical action in early childhood education

https://doi.org/10.56238/ptoketheeducati-030

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ABSTRACT
The present work began with a research project at the Municipal School of Early Childhood Education Meu Cantinho in the municipality of Rolante, Rio Grande do Sul. It is perceived that, over the years, the relationship between human beings and nature has been distancing itself. The theme of this research is related to the Environment and the learning of children of Early Childhood Education - Garden A, through a pedagogical dynamic called sensory track. It aimed to "provide students with the experience of perceiving elements of nature through the senses". With this pedagogical proposal, the students' senses were stimulated, generating a relationship of connection with nature, as well as it was possible to develop some skills, among them motricity, emotional, cognitive, observation and experience with the natural environment. It is observed that it is possible to unpair early childhood education with methodologies interconnected with nature.

Keywords: Nature Deficit, Environment, Apprenticeship.

1 INTRODUCTION

One of the reasons for conducting a trail is that, at the end of its course, participants understand the differences between the various elements of nature and the importance of preserving and caring for the environment. In this sense, Pfeifer *et alii* (2016, p.5) state that

> In natural areas, the trails perform important functions and, among these, stands out to connect visitors with the place, creating greater understanding of natural and cultural resources; They provoke changes in attitude, attracting and involving people in the tasks of conservation of the environment.

In this way, the proposal of the sensory trail also aimed to develop the sensory and motor skills of the students, in addition to providing a unique experience in contact with nature.

There are many forms of trails and usually the best known are the ecological trails, those that take us to beautiful landscapes, usually to the waterfalls, the forests near the school or the rivers. There are several environments that are possible to be carried out the trails. There are those in which sensitive trails can be performed with the elderly to stimulate the senses and stimulate a relationship of these with nature. In this case, the place can be in the countryside or you can also adapt the trail in some garden of the house, where we can also adapt trails with the purpose of accessibility for those who

need it. The urban trails, in turn, would have the purpose of knowing the social problems of the community, provoking reflections on human actions, which are disconnected from the defense of the Environment.

Authors such as Silva and Silva (2020, p.13) state that "people's awareness of environmental problems can be done in a differentiated way, through the stimulation of the senses, in order to approach and increase the bond between the human being and nature". When it comes to perceptive and interpretive tracks, Silva and Figueiredo (2020, p.17) state that "they can be considered an EE tool in the search for the awareness of the population about the problems related to the environment, being a great bet on the (re)construction of the bonds of the human being and the environment in which they are inserted".

The experience through the sensory trail broadens the students' knowledge, with regard to the perception about themselves and nature. In addition, direct contact with nature or with elements of it develops a connection of admiration and respect for the Environment.

Araújo and Farias (2010, p.1) when discussing the theme, state that the tracks "aim not only at the transmission of knowledge, but also provide activities that reveal the meanings and characteristics of the environment through the use of the original elements, by direct experience and by illustrative means". The trail is, then, a basic instrument of outdoor education programs", unpairing the classroom and exploring the surroundings of the school, as to the ecological and cultural aspects.

Connecting to nature is just as important as protecting ourselves, as it is our existence that is at risk. However, many prefer to think that this is not an issue or a problem, and therefore continue not to question the fact that we depend on the preservation of the Environment for the present and future of our children. In this sense, Krenak (2020) in his interview for the *UFRGS online* newspaper assures that the moment of the "pandemic was seen, mainly, as a 'terrible threat against the human'. Of course, the human was so comfortable in the place of dominant that a virus destabilized that tetric confidence. It broke that trust" (y/n).

In this way, we need a change in the way we perceive and act on the environment in which we live. We know that education is the best way for this to occur, from the change of mentality, to leave the comfort zone and go to actions of protection and greater connection with the natural environment.

The role of the school goes far beyond teaching to respect nature: it should make us restless, dissatisfied, so that it makes us act promptly and as another member of Mother Earth. Therefore, it is up to teachers to involve students in projects to protect the environment and raise awareness regarding preservation from the beginning of schooling, that is, in Early Childhood Education.

It is in this direction that Vasconcellos (1997, p.269) affirms, because "there is no Environmental Education without the reflection on the relations of beings among themselves, of the human being with himself and of the human being with his fellow beings is not present in all

educational practices". Therefore, we believe that the relationship with nature leads us to a search for understanding the need to preserve the Environment, to a notion of belonging, so that we can seek a better quality of life for all.

In addition, nature-related projects can extend to the school environment and can occur in spaces in the city or region throughout the school years. It is pertinent that the projects involve families and the school community, because the involvement of these agents are important to renew this connection that we have lost over time, thus creating a new connection beyond respect for nature: a connection of sensitivity and belonging.

In the perception of Chimentti and Cruz (s/d), the researchers emphasize that a sensory garden is intended to promote

> Space of pleasure and leisure for all users, merging a paradigm of dream and reality. Through the sensory gardens, one can travel back in time, experience different sensations, promote encounters and get in touch with nature in its most exuberant expression (s/p).

In this way, we realize that the contact with the external environment generates unique sensations, such as, for example, when they feel the perfume of nature, the teas that were on the trail, the temperature of the soil and the texture of the dry leaves. It is necessary that the school curriculum contemplates activities related to the Environment, so that schools create projects in which students not only have contact with nature, but are interested in knowing and learning about it.

In the document National Common Curricular Base – BNCC, when it refers to the field "explore", we find the elements of nature. That is, it is necessary to initiate contact with nature from Early Childhood Education and, in this case, it begins with

> movements, gestures, sounds textures, colors, words, emotions, transformations, relationships, stories, objects, elements of nature, in school and outside it, expanding their knowledge about culture, in its various modalities: the arts, writing, science and technology (BRASIL, 2018, p.3).

We can and should develop in students an interest in the subject, so that the will to care, protect and connect with nature can be awakened. It is believed that the school has a role of transforming agent in the life of each student, which goes beyond curricular learning, thus leading to important reflections and creating a thinking and active being in society. Rodrigues and Saheb (2015), when discussing the subject, states that

> it is necessary that in Early Childhood Education and in all other school levels, there is an optics that includes Environmental Education, because the human being, knowing the natural sciences, integrating himself in nature and humanity and recognizing himself as part of society, begins the constitution of his human condition (p. 186).

Currently it is essential that the school environment contemplates the knowledge about

Environmental Education so that students develop activities to raise awareness of the Environment. Thus, in the future, when they become adults, they will have subsidies to be responsible and committed to the care and preservation of nature.

Through contact with elements of nature in the school space, children will understand the importance of preservation and then build the feeling of belonging, learning from a young age how to care for and preserve nature.

The document National Curricular Guidelines for Environmental Education – DCNEA, of the National Council of Education, in the item "2-Merit", with regard to the objectives, stands out the one that indicates "systematize the precepts defined in Law n.9.795/1999" with a view to the "advances that have occurred in the area so that they contribute to ensure the human formation of concrete subjects who live in a given environment, historical and socio-cultural context, with its physical, emotional, cultural and intellectual conditions".

In this perspective, Rodrigues and Saheb (2018, p.580), assert that "the constitution of the human condition of the individual is linked to his relationship with the world, because he needs to perceive himself as a human being and live with the beings that surround him, learning to respect his individuality and that of others." In addition, the authors state that there is a need to learn to perceive, because "opinion can be different and that each one has their way of acting and thinking", thus favoring a mosaic of actions and ideas.

And yet, the document attached to the DCNEA, "Draft Resolution", establishes objectives of the EA to be observed by educational institutions, from basic education to teaching to graduate studies. Article 3: " Environmental Education aims at the construction of knowledge, the development of skills, attitudes and social values, the care of the community of life, justice and socio-environmental equity, and the protection of the natural and built environment." The 4th article presents the interaction between living beings. It says that "Environmental Education is built with citizen responsibility, in the reciprocity of the relations of human beings among themselves and with nature."

In understanding the above, the school environment has a transformative role in the lives of students and it is pertinent that it allows them opportunities for inquiry, research and exploration of the theme so that they develop interest in projects to preserve the Environment. In the case of school institutions, Paulo Freire (1996, p.2), states that the

> Pedagogical practice, in this transformative vision, is sustained by the action of the teacher, so that his activities make the student establish significant relationships and appropriate the socially constructed knowledge, giving them meaning in the context in which he lives, because "teaching is not transferring knowledge, but creating the possibilities for its production or its construction.

Thus, the school, by offering Environmental Education activities, promotes the establishment of these students' connection with nature, providing opportunities for projects outside the classroom or

school environment. It is up to education professionals to change the impregnated concept of the classroom. In this line of thought, Prigol and Behrens (2020, p.15) highlight that education is always in motion, shaping and modifying itself in constant construction of knowledge, in a "sense of movement leads to the understanding that all action and reaction in education do not occur linearly", since knowledge, according to Morin (1999, p.116) is in motion, "a knowledge of back-and-forth, which progresses from the parts to the whole and from the whole to the parts; which is our common ambition."

We understand that the school should establish a relationship of interest of the students for the theme Environment, with practices that make them curious about the theme, creating enthusiasm in the activities. It takes attention and dedication for us to take action. In this sense, Boff (2012, p.37) "understands that caring is more than an act; It's an attitude. Therefore, it encompasses more than a moment of attention, zeal and care. It represents an attitude of occupation, concern, accountability and affective involvement with the other".

In this sense, Luccas (2016, p.69) tells us that the school

> it is a place of experiences and experiences of children in the process of formation of human qualities, of development of their intelligence and personality, that is, of formation and development of the capacities and abilities necessary for the constitution of a new form of relationship between human being-society-nature: the appropriation of the knowledge historically produced by humanity and the formation of a mature personality, stable and supportive.

Through the knowledge acquired in the school environment, it is possible for students to develop some measures of nature preservation, capable of expanding and modifying the place where they live, transforming the local reality through small attitudes, thus causing a great difference initiated from a simple change of perspective or with important actions for the future of the place in which we live. For this, it is essential that the school broadens the student's view of the importance of the theme and allows students all the necessary input so that actions can be put into practice. On the subject, in the words of Gerhardt and Silveira (2009),

> Knowledge as a form of problematic solution, more or less complex, occurs around the ebb and flow in which the basis of idealization, thought, memorization, reflection and creation takes place, which happen with greater or lesser intensity, following chronological parameters and consciousness of the reflected and the unreflected. Knowledge is a dynamic and unfinished process, it serves as a reference for both qualitative and quantitative research of social relations, as a way of seeking knowledge proper to the exact and experimental sciences. Therefore, knowledge and knowledge are essential and existential in man, it occurs among all peoples, regardless of race, belief, because in man the desire to know is innate (p.17).

Emphasizing, therefore, that the construction of knowledge applies to the experiences lived through the opportunities of construction of development. In addition, activities involving nature should be applied, promoting social interaction, developing interaction with nature and establishing a

relationship of respect and future interest in its preservation.

Environmental Education is fundamental nowadays for students to realize the importance of preserving nature and reflecting for changes in the daily actions of society. In this sense, Souza (2014), assures us that Environmental Education "is a process in which people are encouraged to think reflexively and critically" (p.241). And so, Oliveira and Toniosso (2014, p.36) announce that "the intention to investigate the presence of nature in Early Childhood Education schools is evidenced by considering the contact with the fundamental environment, being the same in early childhood".

Thus, the relevance of the insertion of children in the external space in contact with nature for their development is considered. In this perspective, Soares and Flores (2017, p.122) assert that

> The professionals who work in Early Childhood Education need to think and organize the courtyards and squares with the understanding that the external environment is essential for the growth of children, because it provides several possibilities of learning from the games and interactions that can occur there, when this space is pleasant, and rich in alternatives that guarantee contact with nature and the opportunity for creation and imagination.

In similar research, Cavalcante and Ferreira (2021, p.6) reiterate that "in the conception of Maria Montessori, a well-prepared environment helps students, so that they can develop the activities, with intelligences in a very playful way, is essential for their development." The authors add that

> one of the ideas of Maria Montessori is that the important thing is not to teach, but to give conditions for learning to happen in a playful way. Play is a social learning, the games of the adult with the children are essential and this makes the child think and experience many aspects (CAVALCANTE; FERREIRA, 2021, p.7-8).

Thus, it is believed that the school environment needs to provide playful spaces for the development of the child. In addition, the external environments in contact with nature are fundamental so that the child can use his imagination from the creation of games related to nature.

The school environment is necessary in the development of projects through active participation and commitment of students to reverse all the damage caused to the Environment by previous generations through a construction of joint actions between school and society.

2 METHODOLOGY

The field research was done through the construction of a sensory trail with elements of nature. The trail was assembled/created as follows: made with cardboard boxes, in which each box had an element of nature. One box was filled with medium-sized and rounded stones, the other box with white sand, one with dry leaves, the other with green leaves, and one with black earth, which was still moist. The trail was developed with cardboard boxes decorated with colorful activities in previous classes by the students themselves, and the boxes were arranged in a straight line, where each student, blindfolded, walked slowly in each box, with the help of the class teacher to the end of the trail. The

other students sat at the side of the trail, waiting for their moment to follow the planned path. It was held in the schoolyard. The children walked through the boxes that were the said elements of nature. The children were blindfolded so that they had contact with the objects through touch, smell, sounds and different textures.

3 RESULTS AND DISCUSSION

Through the observations, it was noticed that the students of Jardim A do not have a schedule for physical education. They only leave the classroom when they can go to the schoolyard, on sunny days and only for a few minutes when they play in the school square. On cold or rainy days, children stay all the time inside the classroom, developing various pedagogical activities.

The activity was elaborated in the schoolyard, on a sunny morning, where five boxes were arranged in a straight line, with objects of different texture and temperature: sand, black earth, stones and dry leaves. It was possible to notice the smile on the faces of the students in each exchange of boxes.

After the completion of the journey by all students in the class, we removed the blindfolds and asked them to use the perception of touch, placing their hands on the objects, as recorded in Figure 1.

Figure 1 - Image of the trail being walked by the students



Source: The Authors (2022)

The proposal was developed with the aim of providing students with the experience of perceiving elements of nature through the senses. In addition, we sought to provide a practice related to nature with a differentiated practice, in which the students were blindfolded, where they would be concentrated on the path and textures.

The receptivity of the children was such that, after the completion of the activity, the students asked to repeat the experience and, this time, without the sales. At that time the goal was to develop visual acuity. We then asked them to touch their hands on the objects, as shown in Figure 2. So they

sat next to the boxes and touched the objects. It was very emotional to witness the reaction of the children: the sparkle in their eyes and the smile on their faces. They had a lot of fun with the novelty and sensations of kneading and tearing the dry and green leaves, immersing their hands in the sand, feeling the texture and weight of the stones.

About this period, the children of early childhood, Louv (2016) argues that it is at this stage that the child acquires empathy with nature. For the author, when there is contact with the natural environment, "they make ready use of their keen sensory abilities to notice and categorize elements of the natural world" and also develop "keen sensory skills, including sight, hearing, smell, taste and touch" (p.95).

As he walked along the trail, the student changed his countenance at each box change: the feeling of surprise at the box changes was visible at the time of the experience. In the research of Lea Tiriba (2022), today's children do not play like their parents and teachers. They don't know how to climb trees, they don't take rain showers, they don't get dirty in the sand or in puddles. They are protected so as not to get dirty.

Figure 2 - Hands on the elements of Nature



Source: The Authors (2022)

After appreciating the objects, we returned to the classroom where we sat in a circle to evaluate the experience. In a round of conversations, each child told about their sensations when passing through the trail with closed eyes and when visualizing the elements of nature. He highlighted the element that was most significant, the interest in repeating the practice, the most relevant sensations and the surprises of the activity. Summarizing, the students had similar responses about their perceptions. In addition, in their reports, it was found that it was very significant. The objects they appreciated the most were the sand and the dry leaves, due to the texture. Thus, the most relevant part of the activity was touch; the temperature of the sand, which they reported to be cold and, for some,

icy. The texture that least caught their attention was that of the stones, as they reported being very firm.

The little contact of families with nature allows the school to promote the first interactions with such objects, because the children live in urbanized and well-sanitized places. The class also hadn't tried activities blindfolded. In research by Louv (2016) this contact with nature on the part of parents is reducing considerably in relation to their time as a child. Today's children have restrictions on green areas and more conserved places. The most that some frequent are the parks and the lawn of their residences. In the practice of Cornell (1997) it is providential to have outdoor activities because it promotes the expenditure of energies so present in children.

For Louv (2016, p.57) children have "nature deficit" has increased, because there are indications that it can contribute to the increase of ADHD symptoms and hyperactivity. Exposure to nature can contribute to "improving children's cognitive abilities and resistance to stress and depression," so common in our day.

The activity exceeded our expectations, in addition to the satisfaction of the duty fulfilled, with the certainty of the relevance of the activity for the well-being of the children, for the initiation of a more satisfactory relationship with nature so that it was possible to envision a construction of a greater connection with the Environment, in addition to the skills that are important for the development of childhood in school.

4 CONCLUSIONS

The intention was to provide them with a unique experience, built with elements of nature – sand, dry leaves, green leaves, stone and soil. Thus, we work the exploration of the senses, the perception of textures, through touch, pressure, smell and vision.

We found that when they returned from this moment with the play in the external environment, they became more attentive and willing. Therefore, we understand that this external contact is very important for children and, for this reason, we insist on school practices that connect the student to the Environment. We know the difficulties that schools face, but we need to look for alternatives to make this reality possible for students of Early Childhood Education, that is, to unpair the school.

Currently, we can see that education is based on methodologies aimed at the classroom, with reduced pedagogical practices that use external spaces. Although we know the current difficulties that many educators have in most school spaces, we realize that children prefer outdoor classes, with directed or free play. We believe that this contact with nature is fundamental even in early childhood.

The idea of the development of the sensory trail being constituted only with elements of nature arose from an affliction in verifying that the children of early childhood education have few possibilities of activities in this external space, that is, the little contact with nature. Thus, through the sensory trail, in addition to the development of psychomotor skills, spatial and sensory notion, they

had the opportunity to create a connection with nature, developing a relationship of respect, admiration and care for the Environment.

Thus, we think that including this practice in the methodology of Early Childhood Education schools would be a possibility to make possible the connection of students to the environment, expanding their experiences and learning. Thus, projects aimed at the collective consciousness can be developed. The example has a transformative role: if the little ones are playing a role with attitudes of preservation and care, the family and society will become more active in this project.

Within the school environment can be developed projects that arouse the interest and daily care of the student, such as medicinal gardens, implementation of composters, separation of organic and non-organic waste through ecological dumpsters, planting of various types of vegetables and many other practices.

In early childhood education, the school can develop projects outside the school environment, in conjunction with the city's Department of the Environment. With older students, do a research study, to know what the main needs of the region and what improvements can be made, bringing benefits to the entire local population, meeting some demands of the region and society in relation to the Environment and, thus, students will be acting directly in the preservation of nature.

Small actions can make a difference in the future from projects of planting native or fruit trees that, in the future, can be planted on the slopes of rivers, or even become shadows in places scattered throughout the city.

We think that sensory trails can be an easy and viable alternative for schools, as they do not require very large spaces, nor the climate. These can even be elaborated, with some adaptations, in the classroom itself. In addition, as only elements of nature are used, which have low cost, there can be easy access to these elements and, in this way, will be contributing to the school curriculum.

In addition, we believe that the school will be acting directly on the sensitivity of the students' families and local society, regarding the care and preservation of the Environment, expanding views through examples and attitudes. It will also encourage students to be more attentive to nature care. These small actions can have a positive impact on the entire local society.

The sensory trail developed in the school generated a connection of the student with the elements of nature. The touch, the smells, the feeling of being blindfolded transformed that moment of the students. The elaboration of trails in the school generated well-being in the students, awakened sensations through the path. The school that uses the trails as a pedagogical practice, will be adding to its students unique sensations, creating links with nature and also helping its student to know how to perceive details that make a difference in their relationship with nature, in addition to their sensations and emotions.

The blindfolded trail, in silence, allowed the students a unique moment where they needed

concentration and balance. So we see surprise in the looks at each change of box with another element, with each change of texture. The purpose of the activity was to create the opportunity to establish a relationship of the student with nature, a sensory experience where the student could connect with his body, walk without looking, feel the different textures and temperatures, and to know the elements through which he passed, to thus establish a relationship of care and attention with the Environment.

The learning contributed to develop sensory perception, generated a curiosity of the students for the elements of nature, created in them the desire to repeat the route several times. Thus, we believe that schools could experience this activity with Early Childhood Education, providing a differential of low cost and with great pedagogical experience and broad sensations and emotions, promoting a brief relationship with the Environment.

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Violence against children: Nurses' role in primary health care

https://doi.org/10.56238/ptoketheeducati-031

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ABSTRACT
Violence is a phenomenon that may be present in the history of some children, configuring itself as a serious public health problem, which can compromise the formation of these developing subjects. We sought to know the role of the professional nurse in cases of violence against children. This is a research with a qualitative approach, whose data collection took place through semi-structured interviews. We used the path of thematic categorical analysis that resulted in three broad categories: "Violence against children, as nurses identify"; "Conducts adopted by nurses in cases of violence" and "Limits and challenges faced by nurses". This serious problem reported here, despite its complexity, requires health professionals to take actions to cope with it, and efforts should be made to make a greater effort to understand, identify and notify the different types of maltreatment, in order to enable a registration system with reliable information regarding situations of violence against children, thus allowing forms of prevention of this social aggravation. The expansion of this study in other realities may increase the visibility of the barriers to the necessary implementation of the notification of violence against children in health services.

Keywords: Nurses, Primary Health Care, Child abuse.

1 INTRODUCTION

Violence is a phenomenon that may be present in the history of some children, configuring itself as a serious public health problem, which can compromise the formation of these developing subjects. (LOPES; LEWGOY; MARQUES, 2020).

Studies conducted by the World Health Organization (WHO), point out that annually, about 1 billion children suffer some type of violence, generating injuries, disability and death (WHO, 2020). In Brazil, according to data published by Dial 100, in 2019, there were 86,837 complaints related to human rights violations against children and adolescents, 14% higher than in 2018 (BRASIL, 2020a).

In 2020, there was an 18% reduction in complaints received by Dial 100, a consequence of the underreporting generated by the SARS-CoV-2 pandemic (BRASIL, 2020b).

The Child and Adolescent Statute (ECA) was established to ensure full protection for children and adolescents. Thus, the ECA (Law n.8.069, of July 13, 1990) determines in article 11 that full access to child and adolescent health lines is ensured through a unified health system that supports the principle of equal access to activities and services of health promotion, protection and rehabilitation.

The health care network has the Family Health Strategy (FHS) as a model of care focused on the family, whose multidisciplinary team provides comprehensive care to the subject. It is the responsibility of the FHS to identify children vulnerable to violence, developing strategies to intervene previously and adopt appropriate measures to cope with this disease (MACHADO, 2014).

The professional nurse, in the care setting, performs the notification of the disease, prevention, identification, guidance and assistance to children victims of violence. By identifying cases of violence, it contributes to overcoming the social consequences of the phenomenon (TAPIA; ANTONIASSI; Aquino, 2014). In areas of greater vulnerability, it can prevent violence against children through health education, development of strategies and control measures (SILVA et al., 2020). Thus, the objective of this study was to know the performance of the professional nurse in cases of violence against children.

2 METHODS

This is a qualitative study of the phenomenological type that characterized the knowledge of Primary Care (PHC) nurses about violence against children.

The phenomenological methods seek to identify and describe the structure and inner meaning of the lived experience (MANEN, 1990). In this way, phenomenology can give meaning to professionals in their collaborative relationships with others. How he perceives things, how he experiences and describes his needs, desires, fears and aspirations (OMERY, 1983).

The research was conducted in the municipality of Petrolina, located in the backlands of Pernambuco, on the banks of the São Francisco River, has an estimated population of 354,317 inhabitants and a territorial area of 4,561,870 km² (IBGE, 2021). In the municipality, there are twenty-nine Basic Health Units (BHU) located in the urban area, where 66 nurses work. Five professionals from the UBS in the urban area were included in this study, because they report violence against children, these nurses work in four UBS in the urban area. The choice of Basic Health Units was made for convenience.

After the signing of the Free and Informed Consent Form, data collection began in the period of April and lasted until July 2022. A semi-structured script was used to mediate the recorded interview

with the participant's consent. Subsequently, the participants' reports were transcribed and systematized for analysis.

The treatment of the data was carried out through thematic categorical content analysis, divided into the following stages: pre-analysis, exploration of the material, treatment of the results and interpretation (BARDIN, 2009). Content analysis, according to Bardin's perspective, consists of methodological techniques that can be applied to different discourses and to all forms of communication. In this analysis, the researcher seeks to understand the characteristics, structures and patterns through the fragments of messages under consideration (GODOY, 1995).

This study was approved by the Research Ethics Committee (CEP) of the Centro Integrado de Saúde Amaury de Medeiros (CISAM) of the Universidade de Pernambuco (UPE), under protocol number 4,786,883. Participants were identified by the letter E and numbers from 1 to 5 in order to ensure total anonymity.

3 RESULTS AND DISCUSSION

The participants of this study have a bachelor's degree in Nursing, most of them were female, 80.0% (4/5), with an average time of 13 years. The average time of effectiveness in the Basic Health Unit (BHU) was seven years.

The meanings underlying the professionals' statements revealed three broad categories: *"Violence against children, as the nurses identify"; "Conducts adopted by nurses in cases of violence" and "Limits and challenges faced by nurses*".

3.1 VIOLENCE AGAINST CHILDREN, AS NURSES IDENTIFY

The nurse is one of the components of Primary Health Care (PHC), present at different levels of health care and characterized by a holistic perspective, which is important to deal with potential victims of violence, especially in primary care (MELO *et al*., 2016).

Violence may be considered as the use of physical force or power, real or threatened, against oneself, against another person, against a group or a community, which results or has any possibility of resulting in injury, death, psychological harm, developmental disability or deprivation (NUNES; Sales, 2016).

The nurses participating in the study classified violence according to their own experiences. The forms of violence enumerated were limited to physical, psychological and negligent violence, as can be seen in the following statements.

> When we talk about violence against children, we see a lot of sexual violence, but that's not all. It is verbal and psychological violence, exposure to work and is not offering the child the period of play (E 1)

> [...] we do not think only about physical and sexual violence, we focus a lot on neglect, providing the care that that child needs, such as leisure, education, good quality food (E 3)
> Sexual abuse, rape of the vulnerable, psychological violence, torture (E 4) (code 52/102)

Galindo; Alexander; Gonçalves (2017) affirm the importance of health professionals in order to raise awareness about the forms of violence, in order to promote early detection, individual support and action to prevent. When faced with a violent event, nurses need to delve into this theme, knowing its peculiarities and acting with propriety to intervene in this scenario.

A study conducted in Norway showed that exposure to violence in childhood was significantly associated with the presence of anxiety and depression in adults, and this presence was more common among those who had been exposed to neglect and psychological abuse than among those who had been sexually abused (THORESEN *et al*., 2015). In addition, children who have been abused or neglected are more likely to engage in sexual activities and delinquent behaviors earlier than children who have not been exposed to such situations (HORAN; WIDOM, 2015).

Nurses need to be vigilant to detect signs of possible violent behaviors and be able to take action when confronted with a suspicious situation. The following statements describe the signs that professionals have identified in children who have been victims of abuse.

> By anamnesis, evaluate the genitals [...] (E 2)
> [...] Sometimes the mother brings it because of a pain, a fall and the child's behavior is different. We ask the mother to leave and the child reveals in a playful way (E 4)
> [...] when I did the evaluation I realized that he had some hyperemic lesions[...] (E 5) (code 52/102)

Silva *et al*. (2020), argue that, among professionals working in primary care, nurses stand out as those who identify situations of potential violence. The importance of a nursing history, a well-conducted physical examination and a complete anamnesis are highlighted, which facilitate the recognition of the physical and psychological characteristics associated with possible violence.

Recurrently, the interviewees associate child follow-up with childcare and as a way of detecting aggression.

> We do childcare, which is the monitoring, development and evaluation of the child, from this we will act, if this child is malnourished, if this child is overweight, if this child has some marks of violence. (E 2)
> In the basic health unit we have the childcare service, on Friday afternoon and is aimed at children under one year and over one year on Wednesday afternoons. (E 5)
> [...] we meet the spontaneous demand, which may or may not come as a child, and has two shifts of childcare (E 4) (code 52/102)

Saraiva *et al.* (2012) emphasize the role of nurses in the promotion and preventive actions against child violence, early detection of suspected cases of violence. In the aggressive situations already identified by the professional, it is crucial to diagnose and monitor the cases, emphasizing the

importance of the professionals from the reception to the victim to the specific care, thus ensuring the emotional and physical integrity of the child.

3.2 CONDUCTS ADOPTED BY NURSES IN CASES OF VIOLENCE

The interviews revealed that the nurses act, in most cases, in an interdisciplinary way, with the collaboration of the medical professional and the members of the Family Health Support Center (NASF), when making the notification and in the unfolding process, such as the referral of cases to the Guardianship Council.

> Here at the UBS we activate the guardianship council and the psychologist, there are even cases that need the social worker (E 2).
> We notified in three ways, one with us to support us, another to the Guardianship Council and another to the health department. In addition, CRAS is communicated to ask for help from professionals and we notify the health department (E 3).
> There is a system of the city hall that is internal, that we have direct contact with the tutelary council and we carry out the notification, we send an e-mail and at the same time the tutelary council carries out the visit, as well as forwards cases of sexual violence to the Dom Malan hospital (E 4).
> I detected it, but I had to call the doctor and we called the police, made the notification and forwarded it to the guardianship council (E 5). (code 52/102)

It was observed that the interviewees act in accordance with the Code of Nursing Ethics, Resolution 311/2007, of the Federal Nursing Council (COFEN), section I- Art.34, which prohibits "provoking, cooperating, conniving or omitting any form of violence". According to the Child and Adolescent Statute (ECA), professionals have the duty to make the notification when they suspect and/or identify cases of child violence.

Study conducted by Albuquerque *et al*. (2019), reports the importance of interdisciplinary work, with multiprofessional care that expands knowledge and provides actions to combat violence to transform this reality beyond health problems.

According to Sommer *et al.* (2017), there is a need to develop health education interventions, seeking to implement effective actions that promote strategies to cope with this problem, in order to reduce and eradicate this problem.

For the participants in this study, child abuse is something that must be worked on under the leadership of the family.

> It is important to guide the mother in relation to the surveillance related to the father and stepfather, to hold lectures and intensify the actions of the PSE (E 2).
> We must guide our children with the companies, in the case of girls I always say that parents should guide their daughters, for example, not to be sitting on a man's lap, not to go to every man who calls, no matter how much it is an uncle, godfather, close people. This is prevention, talking, explaining that no one can touch the private parts, not exposing the child in front of every man. They are the simplest orientations that we can give and talk to family members as well, have patience, observe, accompany, because often parents are inside the house, but they are dispersed, they do not follow the growth of their children (E 5). (code 52/102)

Matoso *et al*. (2014) cite some data and show that 64.5% of aggressions against children occur in their own home and that in most cases the perpetrators are family members and, therefore, close people, constituting the main authors of violence in this group. They also state that in some Brazilian municipalities the incidence of violence against children is increasing, especially in the family environment, and becoming a serious public health problem.

3.3 LIMITS AND CHALLENGES FACED BY NURSES

Nurses do not feel qualified to deal with situations of violence and are not sufficiently trained to address the issue in more depth. It was identified, by the reports of the professionals, that there is a gap in the academic formation in relation to the issues of aggression, which, possibly, hinders its daily practice.

> We nurses are not prepared at graduation for this, but life, experience, studies, extra courses, we end up taking some elements that bring a different look (E 4). (code 52/102)

As a strategy to deal with child abuse, it is clear that professional qualifications for nurses have an impact on solving this problem. In this regard, Apostolic *et al.* (2017) describe the training and qualification of professionals to provide safe and effective care. Finally, they emphasize the need to implement public policies, in addition to training and professional qualification to deal with coping with violence in this vulnerable group.

Dias *et al*. (2013) conducted a study with nurses at the UBS in Uberlândia, MG, and found that these professionals had not attended or could not remember having taken a course on this topic during graduation. Therefore, it is clear that this subject is not part of the undergraduate curriculum.

According to the report below, there is no specific orientation, however, even if a situation of violence against children is identified, the professionals feel insecure about the interventions.

> We need to set up a flow of care to get an idea, a violated patient arrived, so we already know that we notify and refer to such a place, without this we are lost (E 5). (code 52/102)

According to Lobato, Moraes and Nascimento (2012), the teams complain of lack of structure for adequate care in cases of violence, lack of knowledge about flow and difficulties in integrated and intersectoral approaches. The focus of violence in group discussions requires more debate, as well as an integration with the functioning of intersectoral networks.

Another aspect that makes it impossible to cope with this disease is the notifier's fear of suffering reprisal from the aggressor. This difficulty is explicit in the following discourses:

> I am very afraid of having a vengeance, because the guardianship council can take away the custody of the father and mother, even though they are the authors of the aggression, they come to take satisfaction and even came to kill (E 1).

> [...] the guardianship council went to a patient's house and soon after the aunt came here to ask me if I had spoken to the council and I said no (E 2). (code 52/102)

Study conducted by Maia *et al.* (2016) emphasize that the UBS team works directly with the community, allowing the establishment of professional bonds with patients and creating a favorable environment for early detection of cases, identification of risk factors, investigation of suspected cases and preventive actions. However, the lack of laws for the protection of professionals in this situation, leave vulnerable and afraid of suffering violence.

In addition to the fear of the professionals, it was also evident the difficulty of the families and victims in denouncing the aggressors.

> One of the difficulties I have is the resistance of family members to denounce the aggressor (E 3).
> The difficulty is for the child to say that they are being attacked and we do not have this praxis (E 4).
> [...] It also lacks the courage of the family to come here to denounce, often they do not denounce [...] (E 5). (code 52/102)

Study conducted by Miranda *et al.* (2014) emphasize veiled violence, the pact of silence in intrafamily violence, such as: the difficulty of access to family privacy; fear, suffering and guilt of children and ambivalent feelings of love and trust within the family; fear and complicity of spouses who do not denounce violence; fear of spouses who are aware of the situation, But they don't want to reveal their family's privacy.

Another important issue for understanding is the complexity involved in notification, since professionals have direct contact with all family members, including the aggressor, generating underreporting.

> If we had a better support, a guarantee that nothing would happen to the professionals who perform the notification and the approach, having a counterpart that after the case the person would be punished, reeducated, I believe that the underreporting would decrease a lot (E 1). (code 52/102)

According to the Ministry of Health (BRASIL, 2015), underreporting can be attributed to several reasons, from the lack of knowledge of the notification, to the difficulty of working on this issue in welcoming. However, for each record of child victims of violence, 10 to 20 cases are not reported.

4 FINAL CONSIDERATIONS

This study contributed to answer the guiding question and understand the performance of the professional nurse in cases of violence against children and points to the need for further studies on the subject. This serious problem reported here, despite its complexity, requires health professionals

to take actions to cope with it, and efforts should be made to make a greater effort to understand, identify and notify the different types of maltreatment, in order to enable a registration system with reliable information regarding situations of violence against children, thus allowing forms of prevention of this social aggravation. It is noteworthy that violence needs to be addressed in the existing groups in the health units, in social circles, during home visits and in any scenario that allows this dialogue, so that the community reflects and recognizes the extent of the problem.

There are, therefore, several gaps that need to be filled for the prevention and management of childhood violence to be effective and decisive. This requires authorities to invest in courses and training for nurses and other health professionals working in Primary Health Care, incorporating notifications into institutional routines.

There is a weakness in the approach to thematic content in vocational training and a lack of specific knowledge and guidance in training to deal with situations of violence against children. There is, therefore, an urgent need to equip future nurses with the skills and abilities to identify situations of violence against children already in their undergraduate courses.

It is important to emphasize the issue of the availability of the participants, with regard to the interviews, constituting a limitation of the study. The expansion of this study in other realities may increase the visibility of the barriers to the necessary implementation of the notification of violence against children in health services.

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The training of experimental skills in the high school physics teacher in São Luís do Maranhão

https://doi.org/10.56238/ptoketheeducati-032

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ABSTRACT
This work is the result of the results of a master's thesis in education, referring to the reality of the teaching of Experimental Physics in the middle cycle in São Luís – MA, where the problem found was the lack of experimental skills of teachers who use the laboratories of their schools and also, how to promote experimental classes in schools that do not have laboratories. A Theoretical Practical Model that develops experimental skills in the high school teacher in the area of Physics is proposed. The model makes use of the theory of human activity in the improvement of the teaching-learning process. In the applied methodology, different research methods were used: theoretical methods (analysis-synthesis, induction and deduction; modeling and systemic-structural) and empirical methods (unstructured interview, participatory observation and questionnaires). 04 four high schools in São Luís were diagnosed, being 02 public and 02 private. The results of the diagnosis showed that even in schools that have laboratories, 85% of teachers do not have any ability to develop experimental classes of a practical nature. After the application of the proposed methodology in the schools, a partial validation of the results was promoted, applying the PNI technique (Positive, Negative and Interesting Points), where 90% of the teachers began to apply the model in their work practice.

Keywords: Teaching, Experimental, Physics, Skills.

1 INTRODUCTION

The Brazilian educational reality, formed by different social levels, is the faithful portrait of the educational system now proposed by our schools. In Maranhão, especially in São Luís, this system does not differ from the rest of the country, since the basic guidelines of education governed by the Ministry of Education and Culture (MEC) is a reflection of a teaching where it is almost always mediated according to a traditionalist approach, where the teacher develops a role of transmitter and instructor of knowledge.

The disciplines that fall among the natural sciences, among them Physics, require an adequate orientation on the part of the teacher, and the latter has to transform this reality seeking the need for the interrelationship of theory with practice (praxis). All efforts must be added to achieve transformations that raise the quality of the efficient teaching-learning process, which ensures the training of a teacher capable of incorporating into his system of knowledge the new scientific discoveries that are being produced, and always use them as a fundamental way to contribute to the accelerated development of the sciences and, therefore, of society.

The scope of the above is only possible if a creative, skilled and independent teacher is formed who can work with his students in high school, helping to form them into deeply studious, competent and prepared individuals to apply each new knowledge acquired to the concrete conditions that one lives.

The first words of Paulo Freire (1999) in the opening of his book Education as a practice of freedom were: "**There is no education outside human societies and man does not exist in a vacuum**." It is inherent to the human being to be critical of the philosophical or scientific construction of the other, or even of himself, precisely because man perceives himself inserted in a culture and, this, makes him possess inherent links to his life history and intellectual, bibliographical and formative, philosophical and scientific sources to which they had access.

These words of Paulo Freire portray his axiological, methodological, epistemological and social reflections that allow our physics teachers to appropriate them to incorporate it into their work practice.

Most of the professors in Physics in our capital are bachelors and not graduates, thus there is an imbalance in the level of knowledge of the pedagogical disciplines. Deficiencies were diagnosed from results obtained through empirical methods, such as direct observation of experimental physics classes in middle schools in the capital and other methods such as unstructured interviews that most physics teachers (85%) have not developed skills to teach experimental classes. For the development of these skills we have to think of education as a system of knowledge, habits, skills and abilities that provides the creativity of our students, influencing the development of all cognitive activity and the communication of these students in close connection with the world that surrounds them.

2 METHODOLOGY

In the development of the work, different research methods were used: theoretical methods (analysis-synthesis, induction and deduction; modeling and the systemic-structural) and empirical methods (unstructured interview, participatory observation and questionnaires). And it was structured in two chapters:

In chapter 1, it was evidenced a study of bases for the formation of experimental skills of the Physics teacher, characterizing them in the sphere of personality and valuing them through dialectical materialism, supported by the theory of knowledge and the theory of activity.

Chapter 2 presents a model for the development of experimental skills, also taking into account the theory of knowledge and the theory of activity, which was conceived through a diagnosis previously made.

3 STUDY OF BASES FOR THE FORMATION OF SKILLS IN THE PHYSICS TEACHER

3.1 HISTORICAL ANALYSIS OF THE STUDIES DEVELOPED ON SKILLS

The first intentions to explain capacity as a process of development of the human personality were carried out by Democritus, who linked it with the imitation of nature and supposed that the first creator is inherent in rational activity. Plato also set out his point of view on this question and explained capacity as a result of spiritual forces.

The followers of Democritus maintained that the creative capacity of personality is due to nature, with the explanation of Helvetius who insisted on the surrounding environment in general and the role of education.

Practical work, especially laboratory work, is given vital importance in science teaching. The English philosopher John Locke proposed the need for practical activities, helped by reflection as the fundamental way of access to knowledge.

In Latin America, particularly in Cuba, one of the main drivers of the use of practical activities in science classes was the Cuban philosopher and educator Félix Varela Morales who founded the first laboratory of Physics and Chemistry at the Seminary of San Carlos de La Habana.

At the end of the last century in England and the United States practical work was closely linked to the school curricula of science.

The physical-teacher experiment constitutes in the context of the school a reflection of what is a physical experiment for the sciences. Scientists give the experiment a role of extraordinary relevance. Thus, for example, (FEYNMAN; LEIGHTON; SANDS, 2008) assured that "*The proof of all knowledge is an experiment. Experiment is the only judge of scientific truth*." Also in this sense RAZUMOVSKY (1980) pronounced stating that "*If the theoretical consequence of an initial model is verified experimentally, then the abstract model that reflects the properties of the studied phenomenon is adapted. If the experiment does not reflect the desired results, it means that the limits of application of the theory have been discovered*."

3.2 GNOSIOLOGICAL AND PSYCHOPEDAGOGICAL CHARACTERIZATION OF SKILLS

As a historical-logical process, scientific thought develops by incorporating new theses, ideas and arguments in the solutions of the problems that are addressed, which should not be limited to the simple sum of our concepts accumulated by science, but rather, it is that the successions of ideas act as a synthesizing criterion of the needs of social development.

The emergence of the Psyche as a relatively new form of reflex in the course of phylogeny is produced in the close relationship with objective external reality. Therefore, the psychic reflex arises linked to the need to know the objective world, its properties and relations, to be able to act in it, and originates in those practical processes of interaction of the individual with the environment. On the other hand, it is indisputable that the process of creating the instruments of work is a highly stimulating result for human development.

These elements are contained in the structure of the work functions, and the characteristics of the profession that consequently requires for their successful realization. In their performance of the work each one acquires a series of knowledge, motivations and specific particularities that become the basis of his preparation to carry out the activity in the concrete conditions according to the type of profession he performs in a given sphere of society. In turn, the development and continuous progress of science and material production requires an increasing increase in the level of capacity and quality of the execution of the works.

For this intent it is necessary to consider the capacity of the personality based on the personological approach.

The personality of a psychic structure is constructed by the unity of the functions of inducing and executing character; of the internal and external planes and of the conscious and unconscious levels (voluntary and involuntary) that arise as a result of the interaction between the biological, the social and the individual.

The units that make up the personality are distinguished by their qualitative differences, such as:

a) Psychic processes that reflect directly on the reality in which man is immersed providing information about his interaction with his objective and subjective reality, since they depend on the internal conditions of the individual. They are distinguished from cognitive processes, which allow to know the objects and phenomena of reality (sensation, perception, memory, imagination ...), and the affective processes that they establish with the objects and phenomena of reality, on the basis of the satisfaction of their needs (joy, sadness, empathy, irritation, etc.).

b) Psychic properties that are qualities that acquire the psychic processes in the course of their development and individual evolution constituting characteristic traits of the person, such

as the rapidity of thought, the feeling of the fulfillment of duty, responsibility, humanity with another person, etc.

The psychic processes and properties both cognitive and affective are linked to each other and one cannot deny the existing links of the unity of the cognitive and the affective, but this unity does not reach a degree of integration and stability because it cannot be considered as integral and complete units of the personality.

c) Psychological Formations: are personality structures in which the unity of the cognitive and the affective is presented in a high degree of integration, which allows a higher level of psychic regulation of the activity of the individual having different degrees of complexity (particular and general) and are characterized by the predominance of induction and execution of the personality.

The **inducing regulatory system** comprises the mobilizing, sustaining, directional functioning of the subject, which largely determines the motivations for which man acts. It is integrated by psychological formations with a predominant inducing character, such as emotional orientation and expectation and the state of satisfaction. On the other hand**, the executing regulatory system** comprises the cognitive and instrumental functioning of the subject in the execution of his performance inherent to a context and is integrated by psychological formations with a predominant executor character, which is synthesized in **the Cognitive State that** generalizes any type of manifestation of the knowledge that the person possesses with respect to one or several concepts; the **Metacognitive** Statewhich encompasses any form of manifestation of that person about himself (self-knowledge) about his cognition about one or several contexts and about his own execution in those contexts; **the Instrumentation Executor of the Performance**, which is considered as a functional unit of executor character and that comprises the manifestations of the executions in a context. These can be conscious and unconscious, voluntary and involuntary, and we call them activities, actions and operations; skills, **abilities** and habits. It is through the executory regulation that human action is manifested.

It is important to emphasize that the presence, both in the inducing regulatory system and in the executor, of psychic processes and properties (cognitive and/or affective) and the necessary unity of the cognitive and affective have close integration in all psychic units (or psychological formation).

For the purposes of our investigation we will focus attention on the relationship with the **executing system** and especially on the relationship with the instrumental function that this subsystem has.

The operation of these executions implies a set of integrated elements that determine the performance, called ORIENTATION, which are cited below.

The **activity** is the most complete of man's forms of action. It is a form of interaction between man and his environment, whose process tries to achieve a conscious end by having an internal

condition that stimulates and drives the individual provoking a state of desire, generating a driving motive of a directed activity.

Motive, on **the other hand**, is the most important aspect that psychologically distinguishes human activities from each other. In its evolution, motives become convictions, ideal aspirations, interests, etc. And it constitutes the basis that regulates man's conduct.

Throughout all activity, man is guided by an early representation of what he hopes to achieve with this process. These anticipated representations constitute a conscious **goal** or end that man sets out to achieve.

Given the complexity of the activity, it requires man to perform many actions. And the action is that execution of the action that is faced with a conscious character, determined by the anticipated representation of the result to be achieved (objectives) and put into play the set of operations required to activate.

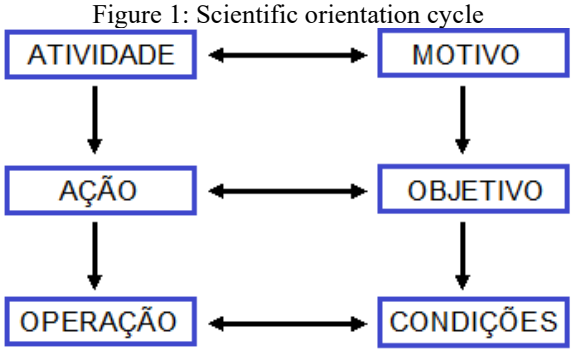
The **operation** is that execution of the action that reaches as a component of an action, without by itself, having a conscious end. It is a product of the transformation of a previous action into operation, due to the mastery achieved in it, which allows a smaller participation of consciousness, by requiring the concentration of man's attention and the attainment of a partial goal.

An action may be formed by operations, which previously constituted (by their psychological structure) actions. The dominion achieved by man in these executions is what converts them into operations. In this way, a current action could have been an activity, and this can become an action at a later time in the development of the individual. It is also necessary to highlight that the same action can be formed by different operations and the same operation can be part of different actions. The same can occur in relation to the activity, the execution of the same activity can be carried out through different actions and the same action can be part of different activities. This is due to the fact that man to obtain his goals can use an arsenal of forms of execution that he uses according to his free will and the conditions in which he develops.

We can conclude, then, that if the activity exists through the actions, these are sustained in the operations, that is, the actions arise by the subordination of the activity process, however the operations arise by the conditions in which the activity develops, those that dictate the ways in its execution.

The above can be summarized in the figure represented in the text Psychology for Educators (González Maura, 1995).

Figure 1: Scientific orientation cycle



Source: Viviana González Maura (1995)

The formation of habits and skills is one of the fundamental objectives of the teaching-educational process, and there is a great divergence in the criteria about the nature of these phenomena, the place they occupy in human activity and in relation to those conditions and fundamental requirements for their formation and development.

And this problem stands out in the theoretical contribution made by Dr. Carlos Alvarez de Zayas (1989), in which he considers that the ability is an element of the content, and expresses a didactic language a system of actions and operations to achieve a goal.

On the other hand, (Gonzalez; Repilando, 1996) consider that the ability is the mode of interaction of the subject with the object, it is the content of the actions that the subject performs, integrated by a set of operations that has an objective and that is assimilated in the process itself.

However, the term skill, regardless of the different definitions it has in the literature, given by different authors, is generally used as a synonym for **knowing how to do**.

Currently the skills are formed and developed in students through the teaching-learning process. On this point, we agree with the psychologist Sergei Rubinstein (1974) when situating the abilities in the executor regulation of the personality as a result in which the activity is carried out in correspondence with the existing conditions and with the objectives pursued by the subject.

3.3 THE FORMATION OF EXPERIMENTAL SKILLS OF PHYSICS TEACHERS.

Would it be possible to do a meaningful teaching of Physics without the use of experimental activities? Our experience in high school has shown that it doesn't. A teaching based only on the transmission of concepts provides a distance between the true objectives of science and the objectives achieved in school. In addition, it contributes to the studies having a great aversion to physics, since it becomes bookish and memoristic.

Three factors summarize the problems that permeate experimental activity:

- **Separation between laboratories and other activities developed in the classroom.**

  In most schools, the laboratory is seen as a special place where students must work in groups and only use the equipment that the teacher indicates. In this place the student

believes he is learning Physics, but when he leaves the laboratory for the classroom he no longer associates his learning.

■ **Misclassification of experimental activity as practical activity and classroom activity as theoretical activity.**

This distinction between "theoretical" and "practical" contributes to the student detaching learning in the laboratory from learning in the classroom. In this context, the typical activities of the classroom are speaking, reading, writing and those of the laboratory are measuring, smelling and, from time to time, planning, investigating, discovering.

■ **Experimental activities reduced to the laboratory class, with a variety of objectives not always compatible.**

Many teachers believe that experimental activities are only possible in well-equipped laboratories. Thus, the experimental activity is reduced to the laboratory class.

In the course evaluations made with our students it has been highlighted that the experimental activities, in their different denominations, contribute to a better understanding of the contents and make a connection between the theory and its application.

3.3.1 Systematic structure of physical abilities

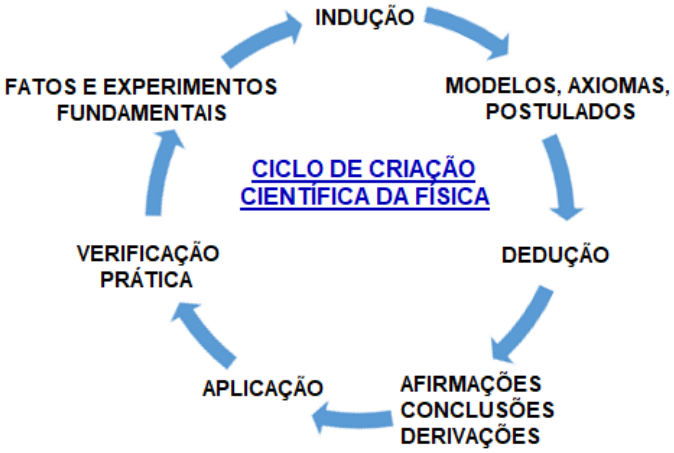
The system approach of the process of formation of physical skills guides its study in an integral way to reveal the various relations, properties, components and qualities that manifest themselves in the process of development, the states or levels through which this process passes and that materialize in the student's performance.

The systemic approach is based on the principle of systematization, but differs from it, it means that the object of study is structured with a set of invariants, constitutes the expression of the essential content and guides the process of search for the remaining knowledge that gives it precision, depth and solids.

3.3.2 The formation of individual inductive and deductive forms of students' thinking in Experimental Physics classes

Let us see how through the study of Physics this can be accomplished through **the cycle of scientific creation of Physics** (Razumovsky, 1980), which shows the continuation with the purpose of developing the logical thinking of the students:

Figure 2: Cycle of scientific creation



Source: V. G. Razumovsky (1980)

As shown from natural facts and/or fundamental experiments, through induction, the student is led to the elaboration of a model (hypothesis) in which, through deduction, it is possible to reach a conclusion that is validated through its practical application.

Inductive reasoning is that general judgment obtained from the knowledge of particular objects of a given class or type.

Deduction is that form of thought, in which new judgment is obtained directly by a law of logic, from judgments given to the premises. The same term deduction means "conclusion."

The difference between induction and deduction lies in its gnosiologic role. Induction always operates as a result of observation, of experimentation of practice. Obtained as a result of analysis and generalization, this way of thinking acts as a method of obtaining probable judgments.

Deduction is the conclusion of one judgment from others, in correspondence with the rules and laws of logic. This method of organizing the knowledge obtained, expresses the step of thought to the concept. It is used, fundamentally at the theoretical level of knowledge.

In teaching at school, as well as in scientific knowledge, induction and deduction act in unity with other methods of knowledge and teaching.

3.3.3 The potential of practical-experimental activities

As emphasized earlier, the experimental activity is not limited to the laboratory class. But, after all, what are the potentialities of practical-experimental activities?

Knowing that all these approaches fulfill different objectives and make experimental activities more motivating and less routine. Let's make some comments about each of these explorations.

3.4 DEMONSTRATION OF PHENOMENA / ILLUSTRATION OF THEORETICAL PRINCIPLES

This is the most defined practice among teachers. It is desired with this type of activity to illustrate the theory through concrete facts and/or to confirm or test certain theoretical principles. This type of activity often does not require the use of a laboratory, nor of sophisticated devices. It does require great creativity from the teacher to create real situations that illustrate the theory.

3.5 DATA COLLECTION

This type of work is very common in activities that aim to "confirm" the theory. Although it is a more mechanical activity, it has its importance as the student develops a sense of organization, a rational and clear way of recording the data.

3.6 DEVELOPMENT OF BASIC OBSERVATION AND MEASUREMENT SKILLS

With this type of activity the student develops the ability to perform measurements, from the choice of the appropriate instrument to the correct way to do the readings. Here it is important to highlight that, without a good planning of the activity, the objective may not be achieved, because often, the object of observation perceived by the student is different from that imagined by the teacher.

3.7 HYPOTHESIS TEST

This activity is sometimes confused with the confirmation of a theoretical result. But it doesn't always mean testing a hypothesis predicted by the theory.

3.8 FAMILIARIZATION WITH THE APPARATUS

Here, it is necessary to use a well-equipped laboratory, because it is intended with this activity to disinhibit the student and teach him the way to work with some basic laboratory equipment such as multimeter, caliper, distillers, etc.

3.9 ILLUSTRATION OF CLASSIC EXPERIENCES

It aims to give the student a historical view of physics by illustrating classical experiments that arouse the attention of physicists to certain phenomena. A typical example of this approach is Oersted's experiment in electromagnetism.

3.10 INITIAL MOTIVATION

In general, it is a demonstration performed by the teacher who intends to contrast a phenomenon or situation with common sense and thus motivate students to study. Therefore, it should be performed

before the development of the content and has an important role in identifying the spontaneous conceptions of students about the subject.

3.11 EXPERIMENTAL CHALLENGES

This approach is very motivating and involves a lot of students' attention. A problem situation is proposed, and the student must solve it within the conditions presented by the teacher.

3.12 INTRODUCTION OF NEW TECHNOLOGIES

At this point, it is intended to introduce new technologies in the classroom or laboratory. Typical examples: the use of computer interfaces and sensors for real-time data collection, the use of micro micro-coupled cameras for small-scale observation. This work is very motivating, because it brings to the classroom the modern technological advance.

3.13 PRACTICAL APPLICATION OF PHYSICS

The student sees in these activities a practical application of physics. Typical example are the prototypes of electric motors, bimetallic blades in fire prevention circuits, manufacture of homemade batteries, etc.

4 RESULTS AND DISCUSSIONS

4.1 MODEL FOR THE DEVELOPMENT OF EXPERIMENTAL SKILLS IN THE HIGH SCHOOL PHYSICS TEACHER

Throughout this chapter, it was demonstrated the importance of the link between theoretical and practical knowledge in the Teaching of Physics, especially in the formation of experimental skills of the high school teacher in São Luís - MA, because, observing the teacher-student relationship we find that almost no experimental activities are applied by the teacher and on the part of the student there is more and more divorce between theoretical and practical classes.

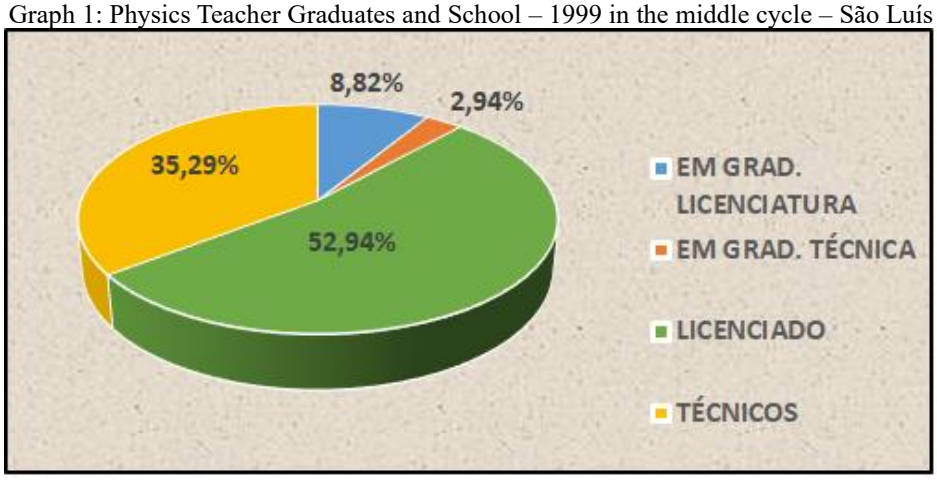
4.2 RESULT OF DIAGNOSIS PERFORMED

For the verification of the problematic reality of the teaching of Experimental Physics, through a critical reflective process, it was necessary to carry out a diagnosis through which one can verify the pedagogical practice of the teaching of this discipline, randomly taking a set of 110 existing high schools in São Luís. From this universe, we found that only 20 schools worked with Experimental Physics and we elected 04 students among them, two private schools and two public schools, in which field research was conducted with students and teachers.

In 1992 a survey was conducted by SEEDUC, where it was proven that a good part of the teachers who made up the teaching staff of the state of Maranhão, 37.4% of high school, were not qualified. And according to the Law of Guidelines and Bases of education LDB / 96 this reality would have to be changed and on an urgent basis, that is, teaching should be taught only by trained professionals.

Although today there is already a teacher training program offered by UEMA (State University of Maranhão), the number of graduates (graph 1), obtained through our investigation, indicates that only 52.94% of the teachers who work with Physics in high school in São Luís-MA are qualified.

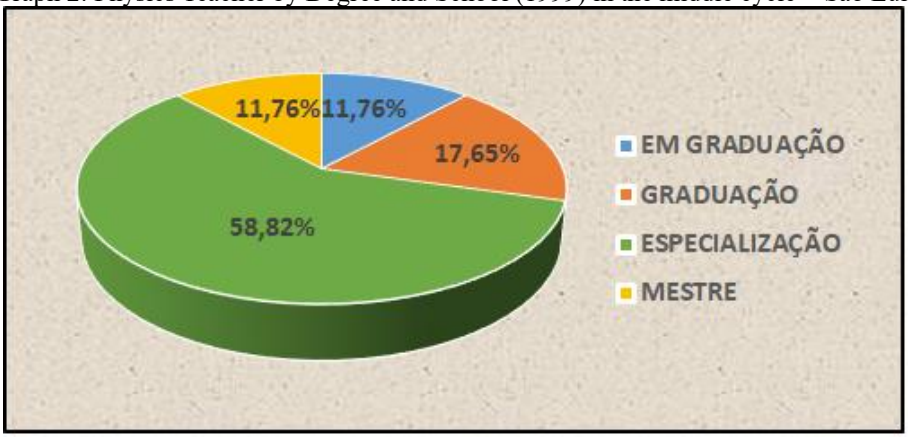
Graph 1: Physics Teacher Graduates and School – 1999 in the middle cycle – São Luís



Source: Coord. School Staff (1999)

With the realization of public examinations for the teaching career of high school, which began in the second semester of 1994, the character of hiring teachers for state education was null, while in the private network, it increased. In this research, it was found, in the teaching staff, that there was no increase in the due degree (graph 2), and, consequently, qualification for a better qualification.

Graph 2: Physics Teacher by Degree and School (1999) in the middle cycle – São Luís



Source: Coord. School Staff (1999)

In the analysis made in our study in an **unstructured interview conducted with teachers,** whose objective was to identify the teacher's conception of the act of teaching Experimental Physics, a sample of 12 teachers was conceived, 03 of them from each school.

Of the interviewees, 66.66% said that the experimental classes of Physics could be surpassed by theoretical classes, since in some schools they were not charged practical classes.

The above argument does not proceed, because the fact that the school management does not charge them, does not prevent that each subject explored theoretically does not exemplify the phenomenon through simple demonstrations.

Regarding the existence of an appropriate place for practical classes, 75% of the interviewees stated that, in order to carry out such activities, schools should have special laboratories with adequate minimum conditions for experimentation. To which we fully agree.

We understand that since Physics is a science, whose fundamental pillar is the physical experiment, it is, therefore, an inexhaustible source for students to develop not only experimental skills but also intellectual activities, providing them with a better performance in the exams in which they will participate.

In the analysis of **the unstructured interview conducted with students,** whose objective was to identify the relationship of students with Experimental Physics (their understanding and motivation for the study of physical phenomena), a sample of 700 students was conceived, 75 per school of the three years of the middle cycle in the three shifts.

In order to identify the relationship of students with experimental physics, their understanding and motivation for the study of physical phenomena, we asked students :

In relation to how the experimental physics classes were taught, 70% of the students were categorical in stating that the behavior assumed by the teacher in the classroom was basically reduced to a mechanical way of transmitting knowledge to a passive clientele and the resources used did not exceed the limit of the chalk and brush board, resolution of exercise and reproduction of the experiment, providing a monotonous climate, which could be provided by more dynamic and participatory techniques such as seminars and debates.

Regarding the duration of the classes, 60% of the students said that the time of teaching the practical classes was short, because there were questions that could not be answered.

When asked what kind of skills the teacher could provide them in an experimental class, 560 students, or 80%, were categorical in stating that the main skill developed was to simply reproduce the experiment he demonstrated, without the proper contextualization of the experiment as the physical phenomena that happen in the student's day-to-day.

The analysis of **participatory direct observation** at various moments of the diagnosis allowed us to perform comparative evaluations of the behavior of teachers in experimental physics classrooms, in such a way as to whether, if they promoted the link between theoretical and practical knowledge.

When analyzing the data of the questions, it is demonstrated, sensibly, the low level of experimental skills used by teachers in high school in São Luís.

4.3 METHODOLOGY FOR DEVELOPING THE EXPERIMENTAL SKILLS MODEL

It is a requirement for universities to train professionals with solid knowledge and a high development of professional skills, from the application of a university extension program for current and future teachers in Physics.

The planning, organization, execution and evaluation of the learning activity by the teacher, proposes to determine the operations that will be carried out for both the student and the teacher in each of these stages with the objective of achieving the effective development of the skills, habits, knowledge, capacities and values of the students.

Taking into account these characteristics, we dedicate ourselves to particularize the theoretical aspects of each of the stages in the teaching activity with the objective of developing experimental skills.

4.3.1 Orientation step

At this stage it is necessary to highlight the importance of students' motivation for the activities to be performed; the values that the student possesses before the conditions of the tasks and the objectives in function of the knowledge acquired by him.

4.3.2 Execution step

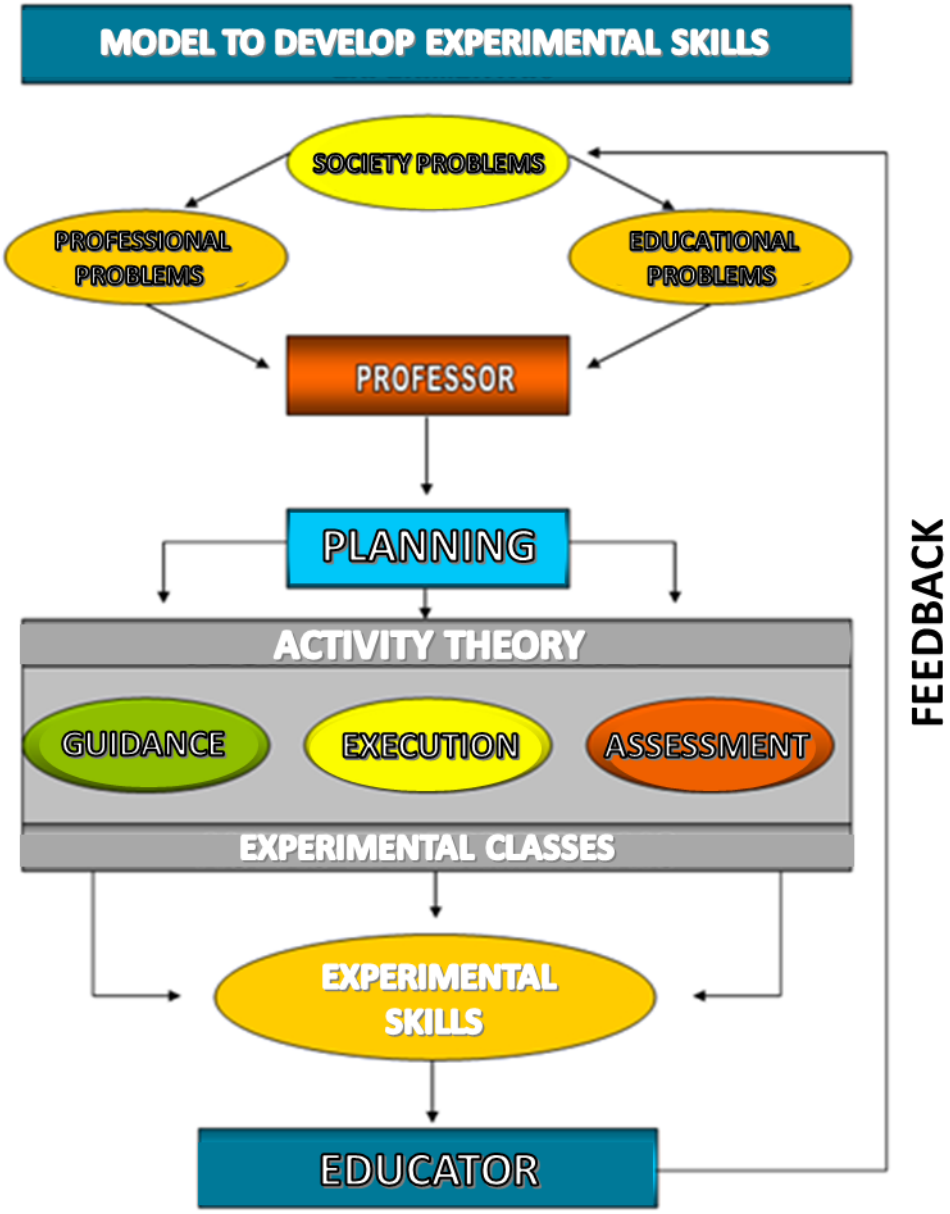
At this stage the student develops the learning strategies elaborated by him in order to solve the task or problem that is assigned to him.

4.3.3 Evaluation stage

This step is included in both orientation and execution. The teacher must take into account the effectiveness of the learning strategies to know if they have been well applied and, if not, interact with the deficiencies and improve them.

The sequence of the proposed methodology for the development of experimental skills is summarized in the following flowchart.

Flowchart 1 - Experimental Skills Model



Source: Author (2023)

4.4 EXPERIMENTAL SKILLS SYSTEM

- **The methodological requirements that contribute to the formation of mental operations by students in Experimental Physics classes.**

The sensory information of man's activity serves as the basis for rational and intellectual activity and to achieve the concentration of sensory perfection of students it is necessary to use different means and ways of teaching.

The school physical experiment, in analysis of practical examples and other means, contribute to the greater assimilation of knowledge. In this way thought interacts with language.

To stimulate the mental activity of the students, one must rationally plan tasks.

Comparison is the fundamental generalization, in which the establishment of the common and essential traits of objects and phenomena is assumed. However, it can be applied effectively by the teacher during the formation of physical concepts.

For the formation in students of the skills of substantiation of concepts it is necessary to propose questions such as: Highlight the fundamental characteristics of the given concept; Which traits of the concept are not essential; Determine the concept of a particular theme.

A fundamental factor in the development of students' thinking is the verbal stimulus that allows them to acquire and develop an exact conception of the given aspect and also the increase of interest and motivation.

A superior aspect of the methodological conditions is the orientation in the improvement of the work of the teacher for the formation of the physical thought of the students.

- **The formation of students' thinking in the process of solving physical tasks.**

The function of students' thinking directed towards a goal in physics classes requires the teacher to establish a group of special conditions. If only the expository method is used and does not make use of the technical means of teaching, then the mental activities of the students are not stimulated, converted into passive receivers of intended knowledge

For each theme of the Physics teaching program, it is necessary to select and/or elaborate a system of tasks with the fundamental objective of fixing (assimilating) a system of knowledge, the formation of skills and practical habits and the formation of activity procedures.

The task systems of different themes must relate to each other, in a way that enables systematization, achieving the assimilation of the fundamental contents of the program.

One of the complete criteria of the development of students' physical thinking is the ability to create new tasks from a work situation.

The proposed approach is directed, in the first place, so that the students become aware of the activity for the solution of tasks. The reflection of the physical task and the process of its solution, allows to form in the students the procedures of thoughts, the invariants for any concrete task of Physics, including the experimental ones.

During the teaching of Physics it is necessary that the students learn to solve the tasks, because in school the logical discipline is not taught, but the conscious application of the laws by the students will be very difficult to develop mental operations and, therefore, their cognitive capacities.

- **Demonstrative experimental skills**

Through the physical experiment the initial facts are accumulated, a representation of the physical phenomena and the physical magnitudes is obtained. Subsequently, abstract models of the phenomena are established, and, finally, the theoretical conclusions are proved.

The demonstrative experiment consists of the demonstration of physical phenomena, their regularities and their practical application intended for simultaneous preparation by students.

The objective of the demonstrations is to give students knowledge in a quick way of the qualitative aspects of the phenomena studied, such as the functioning and arrangement of different equipment and instruments using the visual and auditory perception of the students, with a view to formulating or structuring the abstract models, using demonstrative experiments, such as:

- Fundamental experiment: it is the initial source of the presentation of phenomena and concepts.
- Investigative experiment: it is used for the study of the essence of physical phenomena and the establishment of their regularities.
- Polytechnic experiment: shows the possibility of practical application of physical phenomena and their regularities.
- Auxiliary demonstrative experiment: serves to show the instruments or procedures that will be used to observe the phenomena studied or their regularities.

Importance of the demonstrative design**:**

- Contribute to the initial training on the phenomena, processes, and their practical application;
- Trigger the cognitive activity of students;
- Collaborate for polytechnic education;
- Foster awakening interest in Physics.

Experiment is the richest of forms of human experience; in addition to observation, the control of certain factors based on theoretical assumptions. The scientific experiment when it is carried out with the help of the teacher guides and affronts the result properly of the experimental method.

4.4.1 Partial Validation of the proposal

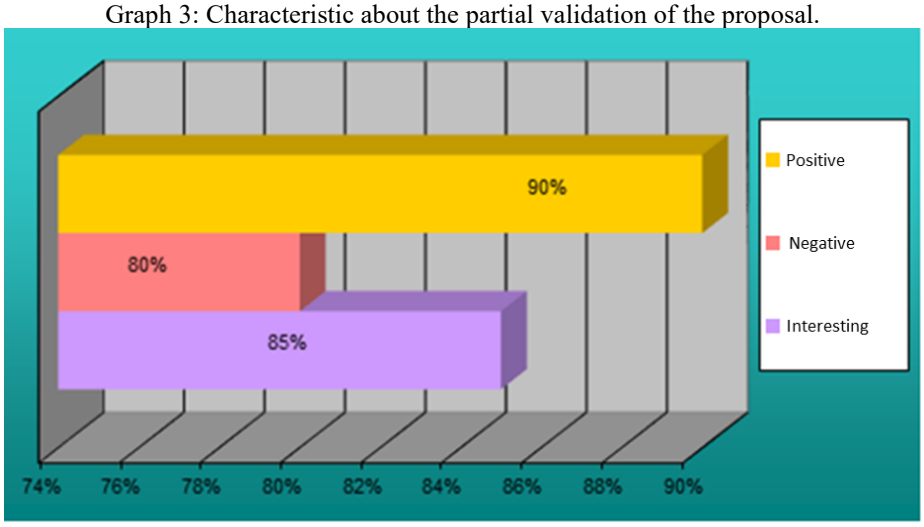
The work developed had as universe the 4th and 7th period of the Science course, qualification in Physics of UEMA, where the disciplines Physics - III and Electromagnetism were worked.

This partial validation does not constitute the conclusion of the studies that propitiate the formation of experimental skills in the Physics teacher, but a brief sample of the evaluation of the results of the proposed model.

A technique called PNI (positive, negative and interesting) was performed with 20 students from two classes, where they could reveal what was positive, negative and interesting in relation to the practical classes of Physics, worked in the way already exposed in the proposal previously. It was an anonymous testimonial so that the students felt comfortable expressing themselves. Because we considered the sample not to be significant, we did not list their answers as being representative of all.

The analyses obtained in this validation can be seen in the following graphs.

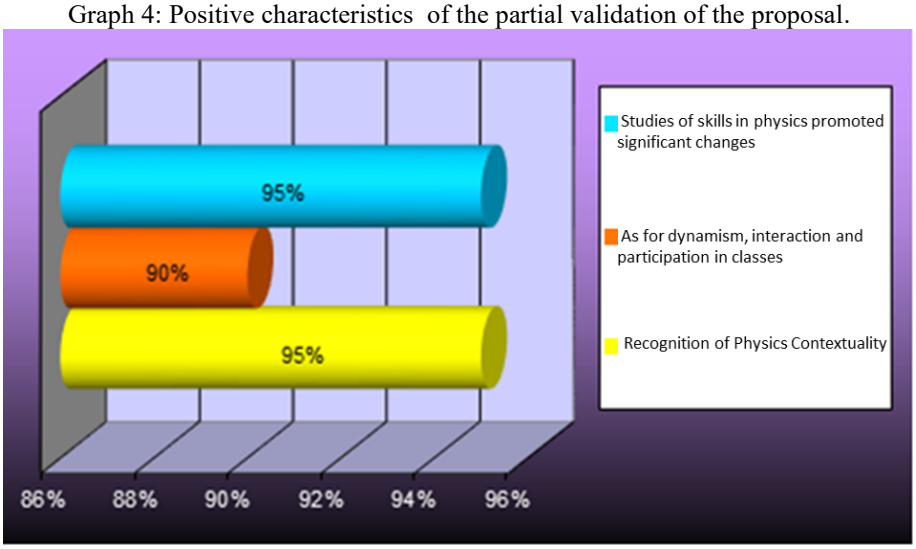
Graph 3: Characteristic about the partial validation of the proposal.



Source: Author (2023)

4.4.2 Positive Features

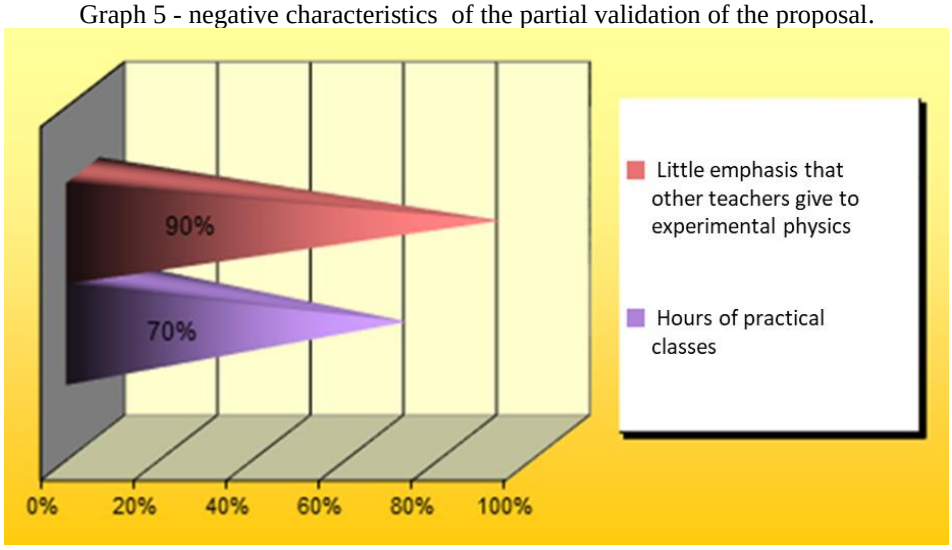
Graph 4: Positive characteristics of the partial validation of the proposal.



Source: Author (2023)

4.4.3 Negative Characteristics

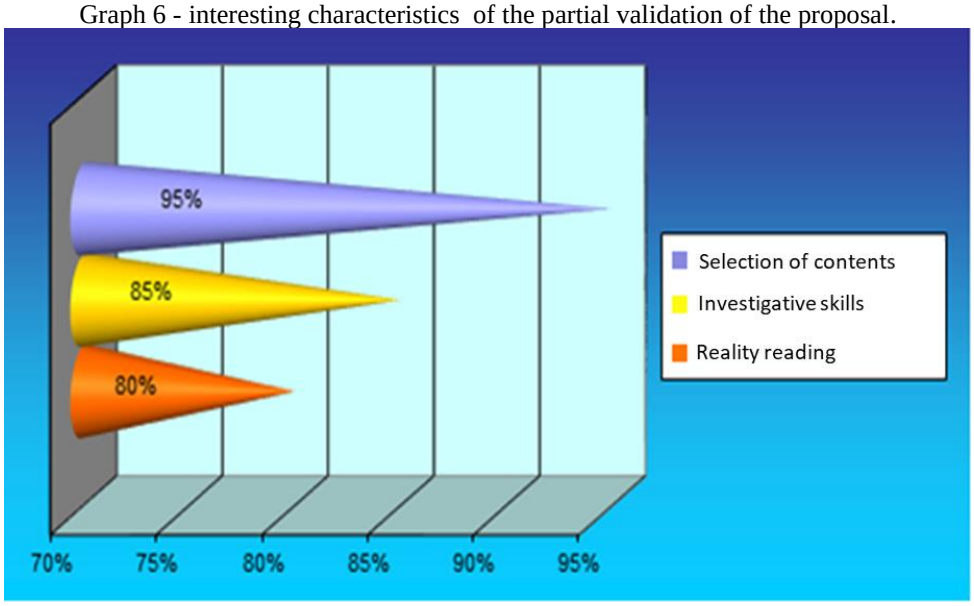
Graph 5 - negative characteristics of the partial validation of the proposal.



Source: Author (2023)

4.4.4 Interesting Features

Graph 6 - interesting characteristics of the partial validation of the proposal.



Source: Author (2023)

Thus, the formation of practical and intellectual skills, incorporated by high school teachers, should encourage students to compare scientific news, orienting themselves to the identification of the subject being treated and promoting means for the interpretation of its physical meanings.

5 CONCLUSION

In an educational process, as in almost all human activities and actions, there are types of knowledge that are acquired through theoretical and practical teachings. These teachings should be

associated, mainly, in the teaching-learning process developed in the classes of experimental Physics. In view of all that has been explained, the following is concluded:

- The knowledge through and an analysis of the bases, gnosiologic and psychopedagogical for the formation and development of experimental skills in high school physics teachers in São Luís, allows a professional performance of the teacher more solidified, conscious and effective in the teaching-learning process.
- The formation of physical thinking skills of students, analyzed through methodology and procedures allows us to achieve, through these skills a better performance of the activity.
- The experimental skills, seen through the theory of knowledge and the theory of activity, allows to prepare the students (future teachers) so that they can scientifically solve the problems that present themselves in their work.
- The decision to conceive a systemic model of experimental skills is mainly due to understanding a system as a set of elements belonging to a reality, but apprehensible in their reciprocal articulation. Where the meaning of the parts is only defined in the whole. In a vision of totality. An interdependent and related reality. Everything is related to everything and everyone depends on everyone. Therefore, the proposed system of activities that propitiates discovery, approximation to integration, with nature by physics, can not only the future students, but man recognize himself in the world, with the world and acting on it. Coming out of indifference, motivated by a teaching that privileges him as a capable being, the student sees himself as the subject of his own knowledge, appropriates it through the link he makes between the theoretical and practical knowledge offered by human culture and relates it to the action of his own existence.

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SEVEN
publicações acadêmicas

Teaching-learning of remote sensing at UNESP-FE Ilha Solteira: A proposal based on the previous knowledge of academics

Crossref doi
https://doi.org/10.56238/ptoketheeducati-033

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ABSTRACT
The present work aims to present the results of the use of the teaching-learning techniques Posters in Group (CG) and Group of Observation versus Group of Verbalization (GOxGV), compared to the expository technique, applied in the disciplines that use remote sensing in Agronomy and Biological Sciences. The techniques in which the university students learned acting (CG) and (GOxGV), were applied between 1998 and 2015 and compared to the traditional expository technique used until 1997. It was found that teaching-learning was more efficient and pleasant than in the expository technique. In addition, the teacher had immediate feedback on student learning.

Keywords: Radiant energy, Satellite images, Learning techniques.

1 INTRODUCTION

In general, teachers reproduce what they learn or learned in their training, including the methodologies used to transmit knowledge, becoming professionals limited to reproduction, do not create new knowledge and education becomes exhaustive and repetitive (SILVA and WEIDE, 2011). Therefore, education has been seeking over the years to rely on methods or theoretical-practical orientations resulting from studies, with the aim of attributing more quality to pedagogical practices (PINTO et. al 2014). Thus these methods intend to lead to a reflection, between what is studied in the theoretical field and articulated with practice, thus facilitating learning. According to Santos et. al (2014) is significant for the formation of university students that during graduation they have the opportunity to be more active in their own training because they will make them think not only about the content, but also about the appropriate methodology for this content among other reflections. The current students are part of Generation Y, which has as one of the most striking characteristics the availability of access to a wide range of information through the internet, the rapid interaction and exchange of information through social networks, and the striking manifestations of their opinions. Thus, the forms of teaching learning should also be directed by the action and action of students and teachers, which implies in opting for policies aimed at student participation (SILVA, et. al, 2014). The

teaching techniques called Group Posters (GC) and the Verbalization Group versus Observation Group technique (GV x GO) are characterized by communication and multilateral interaction between students and the teacher, in addition to facilitating learning, because students learn by acting (ANASTASIOU; ALVES, 2006). This observational work aims to present the results of the use of two teaching-learning techniques (GC and GO x GV) compared to the traditional expository technique, applied in the area of Geotechnologies, in the period from 1988 to 2015.

2 METHODOLOGY

The study was developed in the courses of Agronomy and Biological Sciences of the Faculty of Engineering of Ilha Solteira in the period from 1988 to 2015, in the disciplines focused on the teaching of Remote Sensing in two moments: period I (1988 to 1997) where the expository technique was essentially used, and period II (1998 to 2015) where the learning techniques "Posters in Group (CG)" and "Observation Group versus Verbalization Group (GO x GV)" were used, allied to expository technique. To verify the efficiency of these techniques in learning, we used the criterion recommended by Steffen et al., (1981) which determines that the interpretation of remote sensing products depends on the understanding of the following elements: sensor, trajectory, target, source and radiant energy. The application of the techniques followed the protocols proposed by Anastasiou; Alves (2006), and are described below•: Group Posters (CG): For each group the following materials were provided: cardboard and atomic brush. Method: Groups of no more than five students were formed. Then the theme was provided: Remote Sensing: "what is it", "what is it for", "how does it work"? Subsequently, they were asked to talk about the topic and express themselves in schemes. The students thus expressed their ideas, opinions and perceptions on the posters. Then, one or more members of each group were asked to explain the proposed scheme to the others. In the next moment of the technique, the teacher performed the analysis of the content of the drawings and answered the questions formulated. • Verbalization Group "versus" Observation Group (GV x GO): Material: "The interaction of electromagnetic radiation with the plant: visible and near-infrared region" (FORMAGGIO et al. 1989). Method: The text was distributed one week in advance for them to study it outside the classroom. The students were divided into two groups, by simple lottery, limiting the size of each group to a maximum of 15 3 students and arranging them in two concentric circles. The internal group, called the Verbalization Group (SG), was assigned the function of discussing the text. The external group, called the Observation Group (GO), was assigned the function of only observing, listening and writing down the discussion of the Verbalization Group. The observers were instructed to observe, listen and write down: whether the concepts of the text discussed were all used and whether the verbalizers provided elements that made learning the topic meaningful. The verbalization session was 15 minutes. The observers then read aloud what they wrote down, without allowing themselves debates, clarification

questions, or other interventions. Verbalization resumed, with the groups reversing their functions. The professor closed the discussions and made a synthesis of the theme.

3 RESULTS AND DISCUSSION

With the application of the CG technique, the students demonstrated that they already understood the importance of the concepts: the sensor installed in an orbital platform; that there was no direct contact between the sensor and the targets; of the application of remote sensing products in target monitoring. With the use of this technique (GC), it was observed that the students understood several elements (STEFFEN et al. 1981), however they did not demonstrate knowledge about the importance of the radiation source and radiant energy. Thus, the teacher detected the levels of previous knowledge and the difficulties that the students would have in understanding these elements and selected the different techniques that facilitate learning. In the expository technique, the identification of the students' difficulties are usually detected only after the application of the evaluation, which occurs in the middle of the semester. In addition, it was observed that, through this GC technique, the members of the groups were able to express ideas, opinions and perceptions about remote sensing and demonstrated greater motivation during learning with the technique, as was also reported by (BORDENAVE; PEREIRA, 1978). At the end of the technique, the teacher compared the posters that expressed the students' knowledge on the subject with the paths taken by the radiant energy starting from the radiation source (Sun), interacting with the targets, reaching the sensor until the elaboration of a map (MOREIRA, 2011). Ass im the students realized, at the beginning of the semester, the steps to be understood for the correct use of remote sensing. By the GV x GO technique, the teacher had a feedback, of the level of knowledge that the students acquired with the reading of the text that addresses experiments with the basic concepts about the spectral behavior of agricultural targets, as well as its main difficulties 4 in the interpretation of these experiments, such as the effect of spectral reflectance, caused by the infiltration of water in the intercellular spaces of bean leaves (KNIPLING, 1970), which had not happened in the exhibition technique previously applied.

4 CONCLUSIONS

The use of the teaching-learning technique CG in the teaching of s e n s o r i a m e n t o remote, allowed immediate feedback enabling the teacher to facilitate student learning. The GOXGV technique developed the capacities of observation and criticism of group performance and of studying a little known subject, in a team, in a systematic way and assisted by the teacher who acts as coordinator and facilitator of learning. Thus, in the learning process, the use of participatory techniques is essential for the assimilation of contents and values for future professional performance.

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SEVEN
publicações acadêmicas

The audiovisual culture gap in basic education in Mexico

https://doi.org/10.56238/ptoketheeducati-034

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ABSTRACT
Currently, in Mexico there are 44,861.2 inhabitants in moderate poverty and 10,793.0 in extreme poverty, belonging to these marginalized groups limits access to basic services and generates a gap in access to technologies and audiovisual media that have become, along with the internet, in new ways of entering and interacting in social contexts, as well as joining the workplace. In this context, audiovisual education is presented as a growing need that would reduce the economic fissure of marginalized populations, incorporating them into labor competitiveness. At the same time it becomes an obligation given the rapid evolution of media in analog, digital and virtual environments. With the general objective of analyzing and exposing the relationship between the lack of audiovisual education and poverty in Mexico, this exploratory article makes visible the paradoxes of access to tools that would allow an adequate incorporation of audiovisual education as a way to improve the quality of life and achieve the welfare state.

Keywords: Audiovisual culture, Audiovisual education, Poverty, Inequality, Marginalization.

1 INTRODUCTION

Until 1895, knowledge and learning of the world had evolved around orality, literature and writing. However, from that conjunctural moment the moving image was incorporated into the collective imagination as a new way to know and recognize man himself. Traditions near and far came through the cinematograph, allowing the society of the late nineteenth and early twentieth centuries to access new landscapes, customs and ways of life. Hugo Münsterberg (1916) points out the primal capacity of the moving image as a way of interaction, generator of empathy and detonator of emotions in audiences.

The scope of the invention of the Lumières and other brilliant minds to consolidate the movement into projections has evolved to the point where its naturalization transformed it into an ordinary part of the lives of millions of people around the world. Throughout its evolution, cinema has been used as a source of entertainment, generator of capital or creator of status; But his communicative capacity also transformed him into a means of propaganda, a means of expression, communication and even protest. With the arrival of sound cinema, in 1927, the possibilities of cinema expanded by allowing the public to experience not only emotions and visual perceptions; but, also, auditory.

In this way, the interaction of societies with their environment began to change. Beyond this, with the expansion of radio (Medina, 2013), the arrival of television and its popularization, each new

generation was formed under the stimuli of audio visuality to the point of ceasing to perceive it as that novel phenomenon that even, as legends say, made the public flee from the projection of Arrival of the *train at the station* (Lumière, 1895), to avoid being overwhelmed by it. Subsequently, the internet, digital platforms and socio-digital networks were incorporated, where it is possible to consume millions of audiovisual content daily, without fixed schedules or the need to move away from home.

At present, in Mexico, all those anecdotes, such as the presentation of the arrival of the train at the station, are transformed into comic legends or little known for young people accustomed to special effects in IMAX projection rooms, MACRO XE rooms, movies on demand on *streaming* platforms, radio without fixed schedules, podcast and access to all that content through mobile devices. However, a crossroads arises: who teaches us to access and discriminate the content we consume? How can we use access to such content as a way to expand knowledge and not be detrimental to it?

Moreover, in a country like Mexico where there is an economic gap that prevents thousands of people from accessing basic drainage or electricity services, how would it be possible for audiovisual education, so necessary in current contexts, to become a priority within basic education programs?

That is why the main objective of this article, exploratory, is to review the possibilities of teaching audiovisual culture as a way to improve and encourage learning in a country where there are wide economic differences among its inhabitants. To this end, an analysis of hard data from the main pages of demographic information in Mexico and basic education programs was carried out to later contrast them with the postulates and indicators of international organizations.

Audiovisual education has become an international necessity. There have been many authors who since the nineties began to talk about it as a primary issue, alluding to the television spectrum and its potential. In 1997, Deó said with regard to the immersion of the television spectrum in education:

> In the last decade, the media and especially video (see box) have been integrated into education as a source of documentation of the different areas, as a resource for teachers in education with the image. Now we see the importance of developing the pedagogy of the image, of educating in the image. The data confirm the need to develop this aspect of Audiovisual Education. Television is not only part of the formation of children and youth, but is also the main source of information for most primary and secondary students (Deó 1997, 171).

In the case of cinema, for example, given its characteristics, it allows a subtle and intrinsic approach to the viewer at the same time. As Alonso and Pereira indicate:

> The cinema is an open circuit where the vital reality is exposed with all its feelings, desires, events, perceptions ... It is an essential medium in our learning because it constitutes a cultural product that facilitates the development of the spectators' own personality (Alonso and Pereira 2000, 129)

These precepts can be applied today to all types of audiovisual content offered on open or paid platforms, to which we have practically unlimited access, despite our very little experience of

discernment around them, since their learning has not been instilled; rather, it has developed empirically.

There is also another portion of the population that, despite living in the same immersive context of visual and auditory content, does not have the possibility of immersion of those who have already naturalized technologies and can access them on a daily basis. That is, there are two levels of literacy necessary: for those who have accessibility and for those who do not, and at some point both must be paired to achieve equity in the scope of equal opportunities.

2 EDUCATION, INEQUALITY AND TECHNOLOGICAL EVOLUTION

As early as 1958, Henri Laugier, in the prologue to the book *Essay on the principles of a philosophy of cinema* (Cohen-Séat 1958) pointed to the need to incorporate the moving image into the classroom as the main instrument to approach a student body accustomed to glimpsing the world through screens:

> The average Frenchman, some fifty years ago, had seen their days pass with no more information about the world than that which was provided to them slowly, peacefully, by the printing press and the book. [...] Today every fifteen-year-old has seen the tragic life of the workers, that of the railroad and mine men, that of the docks and shoals; ports and capitals; He has seen the corrupt life of the scum of the pleasure districts, within the human agglomerations. Filmed novels have become familiar to children, the eternal nothingness that stirs the human soul, the painful mysteries of life, love and death. [...] While in countries in general, teachers in all schools absentmindedly teach within an atmosphere of boredom the principles of morality, individual and collective, the youth of each country are enveloped in a torrential flow of shocking, moving images that form their spirit, their character, their aspirations, their behavior in life. This disordered, anarchic flow takes hold of young spirits and fresh hearts, at a time when both are receptive. At night, all youth dream of the impressions received during the day on the screen (Laugier in Cohen-Séat 1958, 5-6).

However, there were jobs in Spain such as *A proposal to read the picture at school* (García Matilla, 1980), it was until 1989, after a decade of technological evolution that forced the world to readapt, that it was published in *Ontario la Media Literacy Resources* (*Audiovisual Literacy Resource Guide*) that, according to Masterman (1995) broke the paradigms around the incorporation of the study of the media as indispensable materials in basic education, in addition to providing teachers with a complete method to adapt teaching in these areas:

> What was taking place, I think, was a mass movement of abandonment of one paradigm and adoption of another, and some of the most radical implications of this change were taking place. Because it soon became clear that we were talking about more than just a change of content of a subject. What was being proposed was a radical change in the didactic objectives, of the methodologies of the classroom, and, certainly, of epistemology, of the understanding by teachers and students of what constituted knowledge (Masterman 1995, 6).

Since then, more than three decades have passed and it is reflected that the capacity to update educational programs is quickly exceeded by technological innovations. However, despite not being

able to correct the curricula every time a new way of interaction through technology emerges, it would be possible to lay the general foundations of audiovisual education. so that they function as a means of knowledge and application despite the contextual evolutionary conditions unleashed by constant technological advances.

It is still believed that audiovisual education consists only of talking about the language of the media, understanding their skills and learning to transmit messages, but, in the words of Deó in 1997, this type of education:

> It must go beyond the knowledge of technique, audiovisual language and expressive resources, it must approach the critical study of the media and reflection on the configuration of the communicative ecosystem. At the same time, it has to promote the active and direct participation of students in communication in the classroom (Deó 1997, 172).

More than Five decades of these conclusions it is clear that even such approaches are far from the current relevance of audiovisual education, which today, more than ever, involves interpretation, social responsibility, and legal postulates both in general terms: copyright, human rights, free expression, to name a few; as in particular terms, referring to respect for the privacy of the other, the disclosure of information that affects third parties and the possibilities of complaint that users have when their integrity is violated through these means.

Audiovisual education, understood in this article as all those elements that in addition to "developing or perfecting the intellectual and moral faculties of the child or young person [or adult][1] by means of precepts, exercises, examples, etc." (RAE 2023), help you use audiovisual tools, in any of its formats, to actively integrate into society and achieve the state of personal well-being that allows you to evolve in favor of yourself and the context in which you live, is essential to achieve the responsible use of audiovisual tools in favor of growth, knowledge and social welfare; Since in this contextual moment we are not only talking about radio, television or cinema, but also about the possibilities that extend in socio-digital networks through the use of the Internet.

> Various audiovisual genres from other communicative environments are evolving to adapt to the media logic of the Internet and open new perspectives for the creation of new narrative genres exclusive to the network and that can in turn influence other cultural areas (Sevilla 2013, 154).

Although the cultural transformation driven by the use of the internet and the social networks that emerge from it was already evident, with the pandemic caused by COVID-19 The transformation of spaces into virtual zones of interaction was even more evident. The possibilities offered were expanded, allowing access to virtual classes or cultural activities, in addition to also promoting socialization in these ways:

[1] Word incorporated by the authors for the purposes of this article.

> Most Mexican netizens connect to the internet on a daily basis. The increase in online activities in the last decade has encouraged the digitization of other daily habits that used to be done only in person, such as socializing. Since the massification of digital platforms such as Facebook, Twitter and WhatsApp, social networks have become an indispensable means of communicating and interacting. In Mexico, the number of social media users remains on the rise, and is predicted to exceed 100 million by 2023 (STATISTA 2023).

At the same time, the economic gap between the sectors of the population with access to the media became more visible, of those who were unable by their social conditions to lead a dignified life as a result of the conjunctural moment unleashed by the pandemic.

In 1995, the United Nations World Organization defined poverty as "the condition characterized by severe deprivation of basic human needs, including food, drinking water, sanitation, health, housing, education, and information. Poverty depends not only on monetary income but also on access to services" (UN 2017). In recent years it has been reported that:

> Almost half of the world's population – including one billion children – currently lives in poverty, defined as an income of less than US$2 a day. Among those living in poverty, 800 million people live in extreme poverty and survive on less than US$1.25 a day. They do not have access to adequate nutrition, clean drinking water, and appropriate health services (United Nations 2023).

In such circumstances a paradox arises that widens the economic gap, if according to Fernando Thompson (2017) the inability to have apprehended audiovisual tools will prevent access to decent sources of work in the next decade; And if currently poverty, that inaccessibility to mere basic resources, prevents children from adequate training to access sustainable employment in the future, then those who currently do not have a path to comprehensive audiovisual training will continue to live in poverty and marginality.

A new paradox germinates, then, the only way to prevent the economic gap from increasing in the future and improve the situation of those who are in it is to give access to those who at this time do not have it., due to their economic situation, to the education they will require to have the possibility of a job that favors their condition. Fortunately, it is this situation that can still be corrected to stop being a paradox and become an opportunity for collective progress.

3 FROM ANALOGUE TO DIGITAL: AUDIOVISUAL EDUCATION

According to the National Survey on Availability and Use of Information Technologies in Households (ENDUTIH) 2021, conducted by the National Institute of Statistics and Geography (INEGI) in cooperation with the Federal Institute of Telecommunications (IFT), in 2021 the number of internet users increased by 4.1%, it was also ratified that 75.6% of the population aged six and over has access to this medium (ENDUTIH, 2022). On the other hand, 78.3% of that same population is a cell phone user, 37.4% makes use of computer equipment and 91.2% of Mexican households have a

television at home. "74.8% of all women aged six years or older and 76.5% of men of the same age range use the internet" (ENDUTIH, 2022).

Although the sample analyzed people from the age of six and found that the second group that has more access to the internet is the one that goes from 12 to 17 years old, there is no subject in Mexico within the primary level study programs that is responsible for the audiovisual education of students who comprise that age range. There is at the secondary level a subject called Technology that focuses on learning inputs for the creation of messages within graphic design (in first grade); its relationship with other areas of study (in second grade) and the environmental impact of technological processes (in third grade). However, most of the content focuses generally on graphic design.

It is up to the baccalaureate level that the subject Information and Communication Technologies is incorporated that as part of its graduation profile proposes that at the end the student "Use *Information and Communication Technologies* in an ethical and responsible way to investigate, solve problems, produce materials and express ideas. Take advantage of these technologies to develop ideas and innovations" (Rasso, 2018).

Table 1. Curriculum of basic education levels in Mexico

Level	**Primary**	**High school**	**High school**
Degree/ period	**Annual**	**Annual**	**Semiannual**
	Matters		
1st	•Spanish •Mathematics •Exploring Nature and Society •Civics and Ethics •Art Education	•Spanish •Mathematics •Science I (emphasis on Biology) •Geography of Mexico and the World •Physical education • Technology • Mentoring •State subject •Dance. •Music. •Theatre	•English I. •ICT I •Language and Communication I •Mathematics I. •Physics I •Social Sciences I •Introduction to •Philosophy •Artistic Appreciation I •Physical and Sports Activities I •Orientation I
2nd	•Spanish •Mathematics •Exploring Nature and Society •Civics and Ethics •Art Education	•Spanish •Mathematics •Science II (emphasis in Physics) •History •Civic and Ethical Education •Physical Education •Technology •Tutoring •State subject •Dance. •Music •Theatre	•English II. •ICT II •Language and Communication II •Mathematics II. •Physics II •Chemistry I •Social Sciences II •Ethics. •Artistic Appreciation II •Physical and Sports Activities II
3rd	•Spanish •Mathematics •Natural Sciences •The Entity where I live •Civic and Ethical Education •Art Education	•Spanish •Mathematics •Science III (emphasis on Chemistry). •History •Civic and Ethical Education •Physical Education • Technology •Mentoring •State subject	•English III. •ICT III •Language and Literature I •Mathematics III •Physics III. •Chemistry II •Geography I •History of Mexico I
4th	•Spanish •Mathematics •Natural Sciences •Geography •History		•English IV •ICT IV •Language and Literature II •Mathematics IV •Chemistry III

	•Civics and Ethics •Art Education		•Geography II •Biology I •History of Mexico II •Orientation II
5th	•Spanish •Mathematics •Natural Sciences •Geography •History •Civics and Ethics •Art Education		•English V •Workshop of analysis and production of texts I •Mathematics V. •Biology II •ESEM I •Logic and argumentation
6th	•Spanish •Mathematics •Natural Sciences •Geography •History •Civics and Ethics •Art Education		•English VI •Workshop on analysis and production of texts II •Mathematics VI •Ecology. •ESEM II •Philosophical problems
Extra materials from the common trunk	•Physical education •English	•English	*The program contained here for the baccalaureate level does not include the areas of specialization

Source: own elaboration based on the current curricula contained in the pages of the Ministry of Public Education (SEP) and the Ministry of the Interior of Mexico (SEGOB)[2]

If we take into account that the expected age at which the Mexican population begins to be cell phone users is six years, and the tentative age of entry to high school is between At 14 or 15 years, then a wide fissure of at least 8 or 9 years of training arises. Children who become internet users and have access to audiovisual content through cell phones, television or any other type of screens, do not have a previous audiovisual education that allows them to discern between the contents they consume.

Audiovisual education, at this time, is still an empirical situation that is guided by the context and the family, parents, grandparents and uncles who, for the most part, are not native users of socio-digital networks and mass audiovisual content, i.e. people who also lack audiovisual education.

If we take into account that, as indicated by Marino, Torres and Valdivia:

> Education, like any social fact, is achieved with an audience (students) that selects and interacts with the contents that are most attractive to them. On the other hand, there is a dynamic relationship with local communities (the educational center) and global communities (the human groups that access said production), developing processes of intratextuality (reiteration of themes and contents of the product itself within itself) and intertextuality (dialogue and strengthening of themes, coming from other products) (Marino, Torres and Valdivia 2020, 3).

The understanding of audiovisual education and its integration as part of the basic curricula would make it possible not only to help users of the Internet or audiovisual media to discriminate and understand information, but to give them tools of expression in these areas, to teach them the use of the language of the media and the ethics that it should contain; but also to implement a necessary evolution within the structural bases that will allow young people to join the labor field in the future.

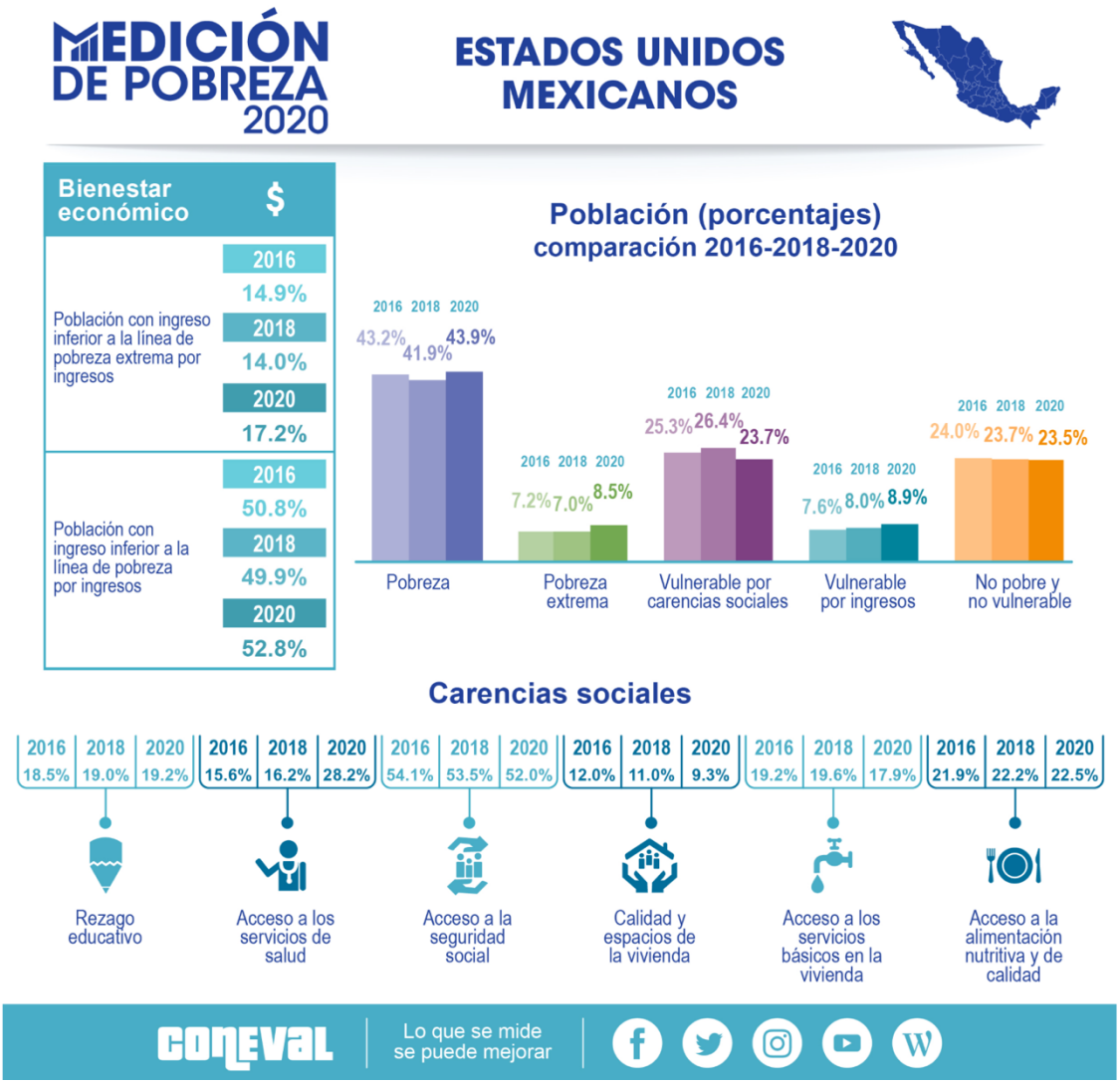
[2] For more information see: Primary. Basic education: https://www.gob.mx/sep/acciones-y-programas/primaria-educacion-basica ; High school. Current https://www.gob.mx/sep/acciones-y-programas/secundaria-programas-de-estudio study programmes and study programmes https://www.gob.mx/bachilleres/articulos/programas-de-estudio-vigentes

In the words of Fernando Thompson (2017, s/p) "50% of the jobs that currently exist will disappear in the next decade, which puts at risk the population without access to digital technologies, since it will significantly decrease their skills to access better jobs". Technology continues to advance by leaps and bounds; while curricula lag behind. To this is added that the teachers themselves do not have the necessary training and didactic tools to guide students towards the appropriation, use and disposition of audio visuality, not only as a means of entertainment; but also as a means of expression, communication and work tool, with all the advantages and risks that derive from it.

Audiovisual education, in conjunction with the experience of using devices that bring us closer to the audiovisual culture itself, must then be included as a daily practice within school environments, because outside of them it is a reality:

> Contrary to what is observed as proposed by some authors regarding audiovisual training, it is striking that it is reduced to a workshop or a learning experience when in reality we live in a world of moving images (screens in vans; our daily actions filmed for fractions of seconds by our eye ...). We are facing moving images and sounds, we generate moving images and sound. Regarding the latter, that is, actions, gestures, which are stored in our mind (Peña 2010, 59).

In Mexico, a country that in 2020 had 44,861.2 inhabitants in moderate poverty and 10,793.0 in extreme poverty (INEGI, 2023), access to ways and tools to create an adequate audiovisual education becomes a privilege. Although from 2016 to 2020 the population with lack of access to basic services and housing was reduced by almost two percentage points (CONEVAL, 2023), this does not prevent the country from having at least five states where mobile coverage in 3G technology is equal to or less than 33% (IFT, 2023) or where basic services are not remedied.



Source: National Council for the Evaluation of Social Development Policy (CONEVAL) https://www.coneval.org.mx

From this perspective, a circle of educational backwardness is generated for populations such as Oaxaca, Tamaulipas, Durango, Nayarit, Chiapas, and all those rural areas without access to electricity, let alone the internet. To this lag are added the conurbated spaces with populations affected by extreme poverty, whose basic basket does not include telephone or internet services. As a result of the study called *Inequality and its impact on access to information technologies* (2023) it was evidenced as one of the main findings that:

> When comparing the indicators of access and economic inequality, it was found that the entities with the highest degrees of access are those with the highest percentages of income inequality. The entity with the lowest access to ICTs and the greatest economic inequality is Chiapas, in contrast, Mexico City is the entity with the highest degrees of access to ICTs and the least economic inequality (IFT 2023, 215).

The access and use of technologies is becoming one of the indicators of inequality and a focus of attention for the growth and training of today's children. The era in which audiovisual education corresponded to the areas of Communication or Design has been left behind, giving way to a new

environment where the use of technologies is not a mere means of entertainment, but the difference between being able to count on a decent job in the future or being isolated from the labor fields.

Although there are basic priorities in traditional education, it is necessary to begin to address the lags around audiovisual education. As a matter of principle, curricula should be context-driven and seek overall benefit.

Following the ENDUTIH:

> The group that concentrated the highest percentage of Internet users was that of 18 to 24 years, with a participation of 93.4 percent. It was followed by the groups of 12 to 17 and 25 to 34 years, both with 90.0 percent. In third place was the group of users aged 35 to 44, who registered 82.7 percent. The lowest internet use was recorded among people aged 55 and over, with a share of 42.4 percent. Between 2017 and 2021, the trend remained upward in all age groups and highlighted the 6 to 11 years. It increased its share by 20.3 percentage points from 2017 to 2021.

It should be noted, then, that frequent Internet users are getting younger, but it is not the entire population of that age who registers as part of these groups on the rise; but only those who have overcome an economic streak that gives them the possibility of being part of such a community.

Improving curricula implies in itself that access to audiovisual media will become mandatory, at least within the educational spectrum, thereby beginning to fill a serious national backwardness. In addition, it is not enough to incorporate subjects, it is necessary to have literacy and updating ofl teachers, classrooms and teaching materials, as well as the incorporation of thematic axes that go beyond the simple incursion into the language of the media. Audiovisual education is required to address:

- The fundamental elements of the construction of meaning.
- The history and application of the moving image, evolution, development and future possibilities.
- The different languages of audiovisual media.
- Ethics in audiovisual media.
- Copyright and audiovisual media.
- Human rights and audiovisual media.
- Instances that regulate the audiovisual media, how they work and where to go in case of being violated.
- Technical functions and technology development.
- Types of tools for the development of audiovisual media.

It is not enough to put a computer within the reach of the population, it must be oriented, explain its uses, functions, but without neglecting the humanistic part where the consequences that are carried

in the use of audio visuality in any of its formats as a means or way of interaction with the context are centered.

4 FINAL CONSIDERATIONS

Talking about audiovisual education in Mexico does not refer in a unique way to ensuring that the bulk or all of the Mexican population has a computer equipment, a tablet or a mobile phone. Audiovisual education implies the digital literacy of the population, the awareness of how the audiovisual content that we see or share through any format that allows the visualization and listening of a product, opinion or life extract impacts our development as people. It is also to take into account how the media that allow such content are not mere entertainment or avenues of procrastination; but the new formats of interaction in an increasingly less analogue world.

Audiovisual education involves the appropriation of the media, the acceptance of responsibility for the contents uploaded, consumed or shared, the discernment and discrimination of information, knowledge of the uses and processes that go beyond the mere publication of a video or the creation of a *Reel*; but, above all, the awareness of non-dependence on such content and tools as the only route of expression or communication. This implies that not only must audiovisual subjects and instruments be incorporated into the classrooms, but each subject must suggest in its programs a means of use for audio visuality in any medium that it is used, in order to create a transversal educational axis.

In this sense, private and governmental efforts are required to achieve the number one goal of the sustainable development goals proposed by the United Nations, while The educational field is strengthened with ways to ensure that marginalized populations, who still lack basic services today, manage, through effective and quality education, to incorporate themselves productively into society, while obtaining their own benefits.

The elimination of poverty cannot be addressed without access to basic education that promotes the development of the population and its incursion into quality jobs. Likewise, the technological gap between classes will be diminished if comprehensive education that includes the current elements that are increasingly audiovisual begins to be guaranteed. This will also imply a substantial reduction with developed countries and the incorporation of a much more competitive interaction in international arenas.

Innovation in education is today a priority that remains neglected. While the world evolves voraciously, making analog formats increasingly obsolete, basic education in Mexico remains stuck in archaic formats that do not even attend to the audiovisual and digital literacy of an inexperienced teaching staff, which faces the current changes and paradigms even with tools of another historical moment.

It is necessary, rather than reflecting and evidencing with figures and hard data the educational deficiencies, to propose study programs that really form solid foundations for current conditions. Audiovisual education remains, despite its popularity, a vague concept that, far from being applied, is far from the needs of a population mired in poverty, accustomed to the empirical use of technological innovations, without awareness of the development possibilities they entail and the legal and personal consequences that may arise around them.

Today more than ever, authorities, academics and private entities need an investment of knowledge and resources to prevent the current economic gap from continuing to grow to the detriment of development and the welfare state; Especially at a junctural moment where the alternation of government allows us to rethink how access to education for the entire population should be built from now on.

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SEVEN
publicações acadêmicas

Periphery of education and the sociometabolism of capital in Angola: The failure of the political emancipation of the working class from 1975 to the present

Crossref doi
https://doi.org/10.56238/ptoketheeducati-035

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ABSTRACT
This article is a space in which the issues related to Education in the Angolan capitalist periphery are debated, as an ideological instrument by which the sociometabolism of capital becomes real, always with the imperatives of making the political emancipation of the working class fail, knowing that dialectically, the worker is not only a reason for exploitation of the capitalist class, It's also his biggest problem.

Keywords: Education in the Angolan periphery, Political emancipation, Capitalism-work.

1 INTRODUCTION

This article is a space in which the issues related to Education in the Angolan capitalist periphery are debated, as an ideological instrument by which the sociometabolism of capital becomes real, always with the imperatives of making the political emancipation of the working class fail, knowing that dialectically, the worker is not only a reason for exploitation of the capitalist class, It's also his biggest problem.

For the explanation or debate, recourse was made to historical-dialectical materialism from the vulgar relationship that many authors make between capital and labor in capitalist society, and that the material space of analysis is Angolan society – a periphery lacking rigorous studies – to extract its particularity, making a connection between its singularity and the universality of the capitalist system.

The debate takes place with the aim of deepening or understanding the fundamentals of the failure of the educational system (which will mean not detailing the failures of Education itself in Angola), only to go in search of what makes Education what it is today and, consequently, its relationship with the political emancipation of Angolans.

The Angolan worker is here termed as such, but from those who were part of the liberation movement of Angola, intellectuals (many of them former slaves and colonized by the Portuguese), all who make up the subalternized class with immense difficulties of access to public policies, workers in the sense of an expanded notion, which Ricardo Antunes presents.

> An expanded notion of the working class, then, includes all those who sell their labor power in exchange for wages, incorporating, in addition to the industrial proletariat, the wage earners in the service sector, also the rural proletariat, which sells its labor power to capital. This notion incorporates the precarious proletariat, the modern, *part-time* subproletariat, the new McDonald's proletariat, the hyphenated workers of which Beynon spoke, the outsourced and precarious workers of the freeze-dried companies of which Juan José Castillo spoke, the wage workers of the so-called "informal economy", who are often indirectly subordinated to capital, in addition to the unemployed workers, expelled from the productive process and the labor market by the restructuring of capital and who hypertrophy the industrial reserve army, in the phase of expansion of structural unemployment (ANTUNES, 2009, pp. 103-104).

Because it is a periphery, Angola, is mediated through public policies, whose ideology aims to reproduce the current order, always with the aim of making the working class, a passive social subject in history. Knowing that Education is integral and integrating this totality, in the face of barbarism, have Angolan workers always been passive since the liberation movement of Angola? Have there been remarkable achievements in the processes of political emancipation since 1975? Were the strategies to confront capitalist barbarism misguided? What is at the basis of the educational system and, by its character in the Angolan periphery, makes real the failure of the political emancipation of the working class? It is these issues that drive the debate.

2 IDEOLOGICAL DECADENCE AND AFFIRMATION OF CAPITALIST BARBARISM IN ANGOLA

Angola is a country socioeconomically governed by the capitalist mode of production – a dependent capitalism – since the process of colonization that faces a certain working class (that of the revolutionaries against the settlers), whose conquest of political emancipation was expressed in the independence of the country, in 1975, through capitalist accumulation, which took over this periphery, and gave way to an ideological decadence, Exemplarily repeated by the decadence of the bourgeoisie after the French Revolution. This decadence entails the totality of the philosophical, educational, cultural, aesthetic, scientific ideological conditions of existence, as well as a whole worldview subservient to the order of contemporary capital, which update the Angolan reality in the twenty-first century.

Bourgeois philosophical thought (which has manifested much since the Enlightenment movement) has undergone fundamental metamorphoses, taking into account the determinations that have compelled it to be what it was and is today.

> According to Lukács, the evolution of bourgeois philosophical thought takes place in three stages. In the first, which runs until 1848, the classical bourgeois philosophy develops: "it is this epoch that gives rise to the highest expression of the conception of the world of the bourgeoisie..."This is how its character of universality and its role as leaven of the sciences are manifested, which allows it to discover so many new perspectives". In this period, with the bourgeoisie embodying the ideals of progress of the whole of society, its thinkers uphold the full knowability of the world and maintain a great independence from the ideological demands of their own social class, to the extent that their intellectual exercise is based on the admission of the immense historical task to be fulfilled by the bourgeoisie; this enables them to critique

> from within the most deleterious characteristics of the bourgeois world, and, moreover, makes their theoretical mistakes stem from the very necessity of the "heroic illusions" awakened in the run-up to the French Revolution. (...) From 1848, with the autonomous entry of the proletariat into the political scene, the bourgeoisie went on the defensive: no longer assuming the universal values of society, but only expressing its petty particular interests, it saw its cycle of progressive action come to an end and was compelled to compromise with the remaining reaction to confront the working class. Then begins the second evolutionary period of his philosophical thought which, extending to the emergence of imperialism (around 1880/1890), operated under the aegis of decadence. The changes that the original bourgeois philosophical project undergoes are remarkable: the belief in the power of reason transformare into agnosticism (manifested in both positivism and neo-Kantism) and reflection abandons the great socio-historical themes to become a "gatekeeper" of the sciences: its role is limited to vigilance "so that no one dares to draw conclusions from the economic and social sciences that could discredit the system" (NETTO, 1978, p. 17-18).

In the mid-twentieth century, many of those who made up the working class of the African continent, especially those who were part of the Portuguese colonies, thought and felt the need for an independent continent. This was for the

> (...) The ideas of the early theorists that influenced the awakening of anti-colonial revolutionary consciousness in Africa, as is well known, came from two African nationalist currents: Blackness and Pan-Africanism. Both appeared with the aim of rehabilitating the black-African identity, for the recovery of a personality considered destroyed, inferiorized and discredited (SON, 2017, p.19).

It is in the range of these that are located fundamental Angolan party movements, such as the Popular Movement for the Liberation of Angola (MPLA), National Union for the Total Independence of Angola (UNITA) and National Front for the Liberation of Angola (FNLA), all were and are part of the working class. Since the regime of colonial exploitation, due to external and internal pressures, would not remain, taking into account the factors that conditioned the independence force, which envisioned a future Angolan state, according to Feijó (2017:221), on November 11, 1975 (the official date of Angola's independence), the Constitutional Law (LC) of Angola came into force, approved by the Central Committee of the MPLA (Government party). The same author explains that,

> "The theoretical and political foundations of the LC rested on the postulates of Marxist-Leninist conceptions of the State and Law. In essence, the Marxist-Leninist theories on the State and the Law were accepted as an instrument in the hands of the working classes, especially the working classes, destined to impose a democratic-revolutionary dictatorship and the political unity of state power, since it is the latter that has the possibility of embracing, with its influence, all the relations existing in society, which would attribute to it a universal character. (FEIJÓ, 2017:221).

This author makes us realize the conquest of power and with it the political societal project, which rejects the capitalist socioeconomic formation, the formation that oppressed the working class through Portuguese colonialism, and the previous state was Portuguese, which Angola integrated as an overseas province. The MPLA, on the other hand, being a single party, which represents the workers,

is called "Labor Party" (VIEIRA, 2007, p. 94), because it aims to realize the needs of the workers, in a deceptively socialist social formation.

The revolutionary practice, the ideology evident in this project, was very far from what the Marxist-Leninist theories advocated, mainly, that is, that Marxian theorization was never applied to the conduct of the destiny of Angolans. The intention was for the means of production to be under the regime of state ownership, controlled by the working class, fighting private property, the heart of capitalism.

> Marx thus shows the existence of two types of revolution, different in everything: the political revolution and the social revolution. The distinction that first emerges from view is that the first, however significant it may be, is characterized by a well-determined partiality: it alters the form of the state, the form of class domination, without extinguishing the domination itself, leaving untouched the material foundations of it. The second destroys these foundations and replaces them with others, thus eliminating their political complements (COTRIM, 2007, p. 65).

Everything indicated that the State would face the social question with the official assumption of socialism, with all the possible misconceptions that the word socialism carried and remains to the present day in the country. It needs to be pointed out that, despite the misconceptions that the word socialism carries, still the working class, which won national independence ideologically, represented the workers, to the extent that it tried to manage – only tried – the social wealth at the disposal of all, with the State being the sole owner of the means of production, which the working class controlled. It is a model of government whose main objective is to reduce social inequalities as much as possible. But this government, by what is the nature of a government subservient to the production and reproduction of the state, a modern state, directly or indirectly oriented by capitalist complexes, is composed of groups of social individuals who are personifications of capital.

> However, in relation to the Marxism Leninism adopted by the MPLA, there is a historical justification for this. It is noteworthy that the modern Angolan nationalism that erupted in the 50s (century. XX), having its peak in the 60s, came at a time when Europe was still living under the ghosts of the end of World War II, where the fascist and racist regimes of Europe had been defeated. It was a time when communist regimes presented themselves as credible alternatives and above all had a clear policy on colonialism, that is, they were in favor of the independence of the peoples still under colonial rule. This set of elements was favorable to Angolan intellectuals, many of whom became faithful interpreters of Marxist-Leninist ideology and partly because these countries supported with arms and money the struggle of many African countries such as Angola. (VIEIRA, 2007, p. 95).

By imperatives of the failure of the socialist bloc in the world, which supported under the most diverse forms, such as material, war, financial, and ideologically the intellectuals and workers of the MPLA-Single Party, who won the independence of Angola, witnessed socioeconomic and political crises, flagging the truth according to which, a mode of production is not installed or is not assumed with Decree, Law or with an official corporate project. In this case, one would have the hypothesis (to

be explored in the near future) according to which, the Angolans who won national independence, and formed the government that persists to this day, in the first Republic applied the ideology that had to do with socialism, but who were trapped in a dictatorship of the Single Party, a sign that they learned well what the supporters with ideology called Marxist-Leninist understood/misinterpreted the Marxian theory, whose category "revolution" became the center of the misconception. Before long, there was an economic crisis.

What would be the main way out of the economic crisis? Turn to international financial institutions. How? In a one-party climate? The MPLA/Government was forced to radically change the theoretical and political foundations of the Constitutional Law towards a democratic state based on the rule of law for two reasons. According to Feijó,

> "The MPLA/Government could not fail to confront two situations: i) the economic reforms and the way out of the economic-financial crisis passed through an agreement with the international financial institutions, max the International Monetary Fund (IMF) and the World Bank (WB), and these would require, in return, not only an economic liberalization, but also the political liberalization and democratization of society; ii) political negotiations with UNITA would necessarily end with the recognition of UNITA as a political party in a two-party or multi-party framework." (FEIJÓ, 2017:252)

The democratic system was installed in the country, when from January 14 to 25, 1992, the 1st Multiparty Meeting was held, with the presence of 26 political-party formations, but that the same party of the MPLA continued to lead the destinies of the country, winning the first elections of 1992, and continued with those of 2008, 2012, 2017 and, the most recent of 2022, (a party that has ruled the country for 47 years).

It is precisely by the escape, in a pseudo-history, that the workers who were once slaves and indigenous during the Portuguese colonization, in an Independent State, became local bourgeois, who represent the international bourgeoisie, for the production and reproduction of capitalist barbarism in the periphery that is called Angola.

> Over the last 3 decades, at a much slower pace than the legal-political regime, our socioeconomic formation is changing, but within the same order; In certain aspects, with economic growth, the advance of industrialization, conservative modernization (promoted from "top" to "bottom"), our socioeconomic formation has already changed a lot and has even assumed qualitatively new characteristics, although contradictorily coexist in the same country modes of production with more remote characteristics. What, however, is going on with the capitalist mode in Angola? Do you show signs that you are about to undergo some qualitative change? Is it about to be modified as a whole? In vain, the impatient revolutionaries who in the hustle and bustle of the proclamation of independence, incited by petty-bourgeois haste thought they envisioned a "great crisis" of the capitalist mode of production in Angola. In reality it was only the crisis of the capital of colonialism; and everything indicates that this mode of continuous production is quite strong (MONTEIRO, 2020, p.280)

It is possible to perceive Lukács' thought on ideological decadence in bourgeois society, to the extent that that category, according to the same author cited by Monteiro (2020, p. 281), designates the spiritual state of the bourgeoisie after 1848, understood as being the,

> [...] liquidation of all the attempts previously made by the most notable bourgeois ideologues to understand the true driving forces of society, without fear of the contradictions that could be clarified; This escape in a pseudo-history constructed at will, interpreted superficially, deformed in a subjectivist and simple sense, is the general tendency of ideological decadence (LUKÁCS apud MONTEIRO, 2020, p. 281).

According to the ideological decadence of the bourgeoisie since 1848, by the pressure that the working class carries out when it gains political consciousness of the social question and becomes a class for itself and therefore, "it is only possible to know something if we insert it in the history of its formation, that is, in the process by which it became what it is, so is also consciousness, it does not 'be', it 'becomes' (IASI, 1999, p. 14)", in this space it is assumed the hypothesis[1] that, in Angola, decadence is a process fundamentally led by the MPLA (its main leaders), a group of former workers who idealized representing all Angolan workers, those who became local bourgeois (with greater expression, since 1992, when the ruling party made alliance with the International Monetary Fund and the World Bank) to confront the discontents and demands of the subalternized workers, and repeating, further, that in a differentiated way the exploitation of labor power that colonial capitalism had carried out.

The Government of João Lourenço (2019), in a speech records that "to bring its program to a successful conclusion, the Angolan Government knows that it is not alone. We count on the technical assistance of the International Monetary Fund and the World Bank, from whom we also benefit from financing", it represents no other nature than one of the personifications of capital, and that is, of financial capital, making real the "uncontrollable system of socio-metabolic control" that capital has become (MESZÁROS, 2002).

The collapse of public policies in Angola (economic policies, education policies, health, social protection, housing, wage policies, employment policies) means the expansion of the expressions of the social question in the first, second and third republics, which have carried out capitalist barbarism since its origin, is a crisis in itself, and only what they can do and episodically reduce them.

The political dimension of the social question, when captured by the working class to confront the bourgeoisie, is the same (working) class that tends, in more generalized cases, to confront any act of fascism created by the bourgeoisie, being that "when the capitalist economy collapses and the working class marches to power, then the capitalists turn to fascism as the way out" (HUBERMAN, 1936, p. 322).

[1]This hypothesis will be developed in future studies, as it is a very serious commitment to apprehend the historical processes of the metamorphosis of class consciousness in the MPLA Government (during the 47 years in power).

It is under such barbarism that Education, even more in the peripheral or dependent context of capitalism as the case of Angola, becomes one of the expressions of channeling of bourgeois ideology, since it is also through this channel that the globalization of bourgeois values is made possible, so that the capitalist system is produced and reproduced as a universalized socio-metabolism. The failure of the working class only occurs when the only horizon that directs such a stratum occurs when the ultimate goal becomes political emancipation and not human emancipation, since political emancipation does not present ontological conditions capable of putting an end to the capitalist mode of production.

3 EDUCATION THAT MANAGES THE WORKFORCE, POLITICIZES AND DEPOLITICIZES WORKERS IN ANGOLA

The socio-metabolism of capital that Meszáros (2002) deals with, in his masterful work "Beyond Capital", makes us realize that Education is the most effective instrument in and for the management of the workforce, as well as for the expansion and reproduction of the dominant ideology and, therefore, the same Education is an expression of politics, which aims to mediate the social relations of production between the capitalist and working classes for the production and reproduction of the exploitation of labour power.

> The capitalist system has developed in such a way that by having politics as one of the instruments of its action, it develops a certain freedom that limits the freedom of the workers, by the relations of property (...). Politics must be conceived as an activity whose ultimate purpose is its own annulment, through the fulfillment of its determined function as a necessary phase in the complex process of positive transcendence (MESZÁROS, 2012, p. 147).

In the work of the same author "Education beyond capital", the fundamental vocation of Education in bourgeois sociability is explained.

> Institutionalized education, especially in the last 150 years, has served – as a whole – the purpose of not only providing the knowledge and personnel necessary for the expanding productive machine of the capital system, but also generating and transmitting a framework of values that legitimizes the dominant interests, as if there could be no alternative to the management of society, either in the "internalized" form (i.e., by properly "educated" and accepted individuals) or through a structural domination and hierarchical and relentlessly imposed subordination (MÉSZÁROS, 2008, p. 35).

As an ideological instrument for the management of the workforce in contemporary Angola, Education should only be perceived, apprehending the socio-historical determinations of the workforce in Angola, as a commodity. Of course, these historical determinations relate properly to the rise of the capitalist mode of production. With the emergence of the capitalist mode of production between the thirteenth-sixteenth centuries (MARX, 2013; Huberman, 1936; DOBB, 1983), while free labor

emerges in Europe through the revolutions, which build modernity, free labor in Angola is only made official in the 1960s, of the twentieth century.

> Nothing more logical, considering that the revolutions that have taken place since the sixteenth century, by consolidating liberal democracy as the dominant political regime, have brought with them freedom as an indispensable element of a struggle for the replacement of monarchical absolutism by a society based on "free competition", where free labor is only its greatest exponent (MONTEIRO, 2020, p. 153).

If the end of slave labor marks the legitimation of a certain freedom of Angolans in the colonial era, what is the greatest exponent of this freedom and when does it occur in Angola? It is about free labor, which is based on the buying and selling of labor power. When does it happen? Monteiro (2016), explains that,

> "The implementation and acceleration of wage labor in the 1960s and early 1970s, which boosted the growth rate of the economy, are accompanied by the industrialization of production and the creation of routes for the flow of products (railways), a process that for the colonial capitalist will mean economic growth and for the indigenous Angolan meant intensification of the exploitation of labor by wage earners with negative consequences for him Monteiro (2014:93)."

Based on the analysis of the universality of bourgeois society, it is possible to observe the delay in the bases of freedom that appears as synonymous with political emancipation in Angola and, that Education – which is bourgeois from the colonial era to the present – appears in this context as a weapon, which when configuring the subjective dimension of the working class, In the sense of having access to the conditions of citizenship, as a category that makes it possible to raise labor rights and, therefore, empower workers in the field of political emancipation, it also depoliticizes the same workers to the extent that it becomes a selective policy – let us try to analyze how is the access to academic and professional training in public policies, which are of a universal character, but that by the discourse of the "scarce resources" disseminated by the economism of public action, only those considered fit for this are selected.

Not all workers have access to the same policies, because they must compete among themselves and only the best (the best workers or children of the workers are those who have assimilated values and principles of bourgeois reproduction) enter the education system. Therefore, Education, as a policy, is an ideological instrument of the bourgeoisie for the formation of the consciousness of citizenship, as if it were the final alternative of humanity and the highest that the human-generic can experience.

> Full citizenship=limited freedom=capitalism. That is, full citizenship is a category that can only exist in capitalism. This is because, even when it refers to social rights, it does not fail to do so from the point of view of the political dimension. To be clear: the right to work can only exist within capitalism. In socialism, as Marx says, work will not be a right, but the expression, which need not be guaranteed by law, of the first and fundamental human need, that of self-activity. (TONET, 2001, p.8.)

Depoliticization takes place in various ways, which contribute to prevent workers from organizing through their class consciousness, and in the separation or conversion of workers already organized into isolated social individuals, considering that citizen consciousness is sufficient for them (that is why everyone is a citizen as if what unites them is not the condition of workers, but rather, the values of citizenship that are bourgeois).

Also looking at Education as an instrument of workforce management in Angola, a condition that politicizes and depoliticizes the working class, leads, for example, to the dimension of professional training, which is a type of formal education, when it constitutes one of the policies that channel the ideology of employability, to the extent that, each time the Ministry of Public Administration, Labor and Social Security includes a part of young people in the wage system, another part (especially the largest) is excluded from it. It should be noted that in the current Angolan capitalist mode of production,

> To train to be a professional is to shape the workforce. Therefore, by giving a certain form to the work required by the labor market, professional training (...) is based on the processes of the productive restructuring of capital by the imperatives of rationalization (which is manifested by its superior model – Toyotism), whose object of molding is expressed by the fragmentation, precariousness and relentless flexibilization of the subjectivity of labor, engendering a working class with precarious possibilities of political emancipation. (MATEUS and MONTEIRO, 2021, p 63).

Thus, the weakening of the subjective dimension of the worker becomes the element to be produced and reproduced, when he must be forced to consume knowledge and technologies, which make him have access to the labor market.

> The domination of the working class in the formative process is so inexorable that by Toyotism, that is, by the evaluation of the total quality in the process of productive restructuring, the workers as candidates for professional training, can only choose required courses, those already guided, planned to produce surplus value (MATEUS and MONTEIRO, 2021, p. 67).

The choice of courses in Angola is guided by the State, through the National Program for the Training of Cadres, as a strategy to give direction to the capitalist productive system. For example, the National Development Plan (2018-2022), stressed that one of its goals was that, by 2020, 100% of students would have vocational vocational guidance through the Offices of Insertion in Active Life, to achieve the following objective of the plan:

> Ensure a greater exchange between students and companies, promoting the insertion in the labor market, through the dynamization of the Offices of Insertion in Active Life (GIVA) of the Technical Medium Institutes and increasing the participation of students in curricular internships.(MEP, 2018, p. 82)

As for vocational training, the report reports that of all the estimated young people, 5.9% of men and 3.4% of women, have already done some vocational training, respectively. It is verified how

the State and the private sector have become spaces of competition for professional training:(INE, 2020, p. 41)

> Taking into account the results obtained, we can consider that 58.9% of the population presents the private sector as a place of vocational training, while 14.1% present the public sector as a place of training. There is also a group of individuals who had as a place of professional training the churches, the workshops, others, NGOs and the population that did some professional training respectively (INE, 2020, p. 42).

It is not enough to graduate from any course! What kind of vocational training do young people choose, believing that it can make it easier for them to compete in the labour market?

> With regard to the percentage data of the young population of 15-34 years of age, according to the type of professional training, the area of information technology stands out in the different age groups where the age groups 20-24 years of age and 15-19 years present the highest percentages with about 40% and 38% respectively.
> Cooking/decoration/pastry and electricity are the following professional trainings, and for cooking/decoration and pastry the predominant age group is 20-24 years old with 19%, followed by 15-19 years old with 15%. With regard to electricity, the data show a greater predominance in the 25-29 year old group with 17% and followed by the 15-19 year old and 20-24 year old group with 10%.
> The less popular formations are the locksmithing/foundry and others consisting of a group of professions such as welding, plate beating/painting, carpentry/crafts, as can be seen in graph 3.8. Among young people, in general, computer science and cooking are the most sought after professional training, with more than 30% and 10% respectively (INE, 2020, p. 43).

What subjective conditions of the worker are captured in the twenty-first century?

Table 1: New Job Skills

New practical and theoretical knowledge	Capacity for abstraction, decision and communication	Qualities related to responsibility, attention and interest in the work
COGNITIVE SKILLS BEHAVIORAL SKILLS		

Source: Alves (2007)

In fact, these are values accredited by the capitalist productive system through the model of rationalization of Toyotist labor, to better control the labor force.

> The fundamental concern of Toyotism is with the control of the subjective element in the process of capitalist production, that is, with the "capture" of the subjectivity of labor by the production of capital and with the "manipulation" of the consent of labor through a broad set of organizational, institutional and relational innovations in the commodity production complex, characterized by the principles of "automation" and "self-activation", or even, *by just-in-time/kan-ban*, the polyvalence of the worker, teamwork, lean production, CCQ's, Total Quality programs, worker involvement initiatives, the engaged insertion of workers in the production process. (CORIAT apud ALVES, 2007, p. 247)

Note the State's concern to guarantee education and vocational training policies so that the workforce is shaped for career qualification, which can satisfy the social needs of workers, also through employment policies, whose counterpart is to exclude the workforce that is considered unnecessary:

TABLE 1: Analysis of key employment indicators by age groups, 2021

Indicators	IV Quarter 2019	III Quarter 2020	IV Quarter 2020	Quarterly change (%)
Population aged 15 and over				
Economically active population	14.551.833	15.321.544	15.497.110	1,1
Employed population	9.924.675	10.112.899	10.749.488	6.3
Unemployed population	**4.627.158**	**5.208.645**	**4.747.622**	**-8,9**
Inactive population	1.901.356	1.622.052	1.617.482	-0,3
Activity rate	88,4	90,4	90,5	0,1
Employment rate	60,3	59,7	62,8	5,2
Unemployment rate	31,8	34,0	30,6	-9,9
Inactivity rate	11,6	9,6	9,5	-1,3
Population aged 15-24 years				
Economically active population	4.813.148	5.157.180	5.223.304	1,3
Employed population	2.095.957	2.248.041	2.335.065	3,9
Unemployed population	**2.717.191**	**2.909.139**	**2.888.238**	**-0,7**
Inactive population	1.090.945	940.861	943.127	0,2
Activity rate	81,5	84,6	84,7	0,2
Employment rate	35,5	36,9	37,9	2,7
Unemployment rate	56,5	56,4	55,3	-2,0
Inactivity rate	18,5	15,4	15,3	-0,9
Population aged 18 and over				
Economically active population	13.160.142	13.805.453	13.927.512	0,9
Employed population	9.405.475	9.501.361	10.137.043	6,7
Unemployed population	**3.754.667**	**4.304.092**	**3.790.469**	-11,9
Inactive population	1.172.478	868.129	941.762	8,5
Activity rate	91,8	94,1	93,7	-0,4
Employment rate	65,6	64,8	68,2	5,3
Unemployment rate	28,5	31,2	27,2	-12,7
Inactivity rate	8,2	5,9	6,3	7,1

Source: INE, 2021

4 EDUCATION IN THE ANGOLAN PERIPHERY: THE FAILURE OF THE POLITICAL EMANCIPATION OF WORKERS AS A BOURGEOIS PROJECT

The periphery linked to Education, in this space, raises a complex, a material condition, a concrete expression of the universalized capitalist mode of production, whose Angolan singularity apprehends its particularity of dependent and, therefore, peripheral capitalism, as a mediation of channeling political, economic and social domination/exploitation (of the centers over the countries of the Third World) (HINKELAMMENTERT, 1970; FERNANDES, 1975).

The periphery, as a geographical-material category, which expresses less developed capitalist productive forces and relations of production (if one has as reference the centers of capitalist production), is one of the historical dimensions that characterizes Angola, when considering this country as a constitutive part of the international market, whose commodity, par excellence, in the process of exploitation is the labor force that in the colonial era were treated as indigenous or assimilated, but that today, even though they are citizens in the civilizing sense of the term, they are exploited in the same way, and what differentiates the current exploitation from the old one is free labor.

It is considered that peripheral capitalism is one of the material conditions of the universalized capitalist system, and therefore, the periphery is a product of this system, whose ontological centrality is concretized by the superexploitation of labor power (MARINI, 1973). The periphery is one of the most blatant material conditions of the capitalist system that explains the overexploitation of labor power in societies classified as Third World by the character of their economy dependent on the economy of the center.

What mediations enable the functionality of the Angolan periphery to the contemporary mode of production? This occurs through the functionality of the personifications of capital by its political and economic dimensions. In addition to the old forms of coexistence, the crises arising from the Second World War boosted new lines of political and economic coexistence involving some institutions: – in politics*, the United Nations / UN*; in the economic sphere - with the Bretton Woods agreements, *the World Bank / WB and International Monetary Fund / IMF - (*NETTO and BRAZ, 2006*)*, engender the so-called "National Development Plan" that has as its critical foundation, the management of the cycles of crisis of capitalism – since there is no capitalism without crisis – of which the Angolan State is part.

Without neglecting to consider the good intentions and some achievements made by the educational policies in the first republic (1975-1991), the failure of the political emancipation of the working class (and here it refers both to those workers/intellectuals who won independence in Angola, and to the workers who currently face the social question tinged by the periphery) begins with the assumption of a socialist societal project (a mistaken prognosis about capitalism) that it does not account for its infeasibility, both theoretically and because of the objective conditions imposed by the globalization of the capitalist system.

After realizing the unviability of socialism, in 1990-1991, the crystallization of the failure of the political emancipation of the workers is marked, when the government in power assumes to defend imperialism, maintaining contact with the International Monetary Fund and the World Bank.

> The party that fought to expel the colonial capitalist state, and proclaimed independence under the banner of socialism, this time seeks to remain in power no longer facing the imperialism of capitalism that it previously criticized; on the contrary, it relies on it to help you minimize and not solve social problems (MONTEIRO, 2020, p. 292).

Is Education, as a policy and ideology, which aims to configure or give a certain form of consciousness to the workers, processualized by these mediations to reproduce bourgeois society in the Angolan periphery? Monteiro (2020) points out that the mediations of social policies, as is the case of Education policy, appear through mediations of ideopolitical discourses, governance programs, projects designed to face the expressions of the social issue through:

- The 2030 Agenda for Sustainable Development;

- The Africa 2063 Agenda – The Africa we want. Common Strategic Framework for Inclusive Growth and Sustainable Development for the First Decade (2014-2023);
- The Millennium Development Goals;
- The 2015 Millennium Development and Development Report;
- The National Development Plan 2013-2017 and 2018-2022;
- The Partnership Framework between the Government of Angola and the United Nations System 2015-2019;
- The MPLA's 2017-2022 Government Program
- The speeches given by the President of the Republic (MONTEIRO, 2020, p. 23)

It is from this web of national and international documents that engender social policies, depending on the development model that a given State adopts. The National Development Plan (2018-2022 of Angola) result of the objectives of the Long-Term Strategy Angola 2025 (which includes the great national consensus – Agenda 2030 of the United Nations), and the commitments legitimized by the elections of 2017 (Government Program 2017-2022), as well as the current National Development Plan (2023-2027) denote a development model, which by its peculiarity of submitting to Western ideology, produces and reproduces social policies that express the crystallization of the periphery, since it is by making itself peripheral that the policies of domination and subordination will identify the ideology of globalization as if the states of the first world were on par with the states of the third world, as in the case of Angola.

And, this universe of objectives and goals appears in the projects of past governments, since 2012,

> If we compare the speeches of Moreira and Salazar, in colonial times, with the anecdotal electoral promise of the MPLA to "Produce More and Distribute Better", which served as the motto of the MPLA Government program for the period 2012-2017, suffraged in 2012, we perceive similarities in the understanding of the expressions of the social question, understood then only as a problem that is explained in the scarcity of production of goods and services (MONTEIRO, 2020, p.280).

The scarcity of goods and services in education policies is the expression of the deprivation of social wealth produced by the working class in Angola. And, this wealth, in a materially peripheral space is always taken as the property of the local bourgeoisie (Angolan capitalists) and, of the international bourgeoisie, to exploit the labor force.

Therefore, the crisis of capital never ends and is compensated by the increase of production by the sacrifice of the workers.

> The crisis of capital is understood as a scarcity that must be overcome by increasing production. The expressions of the social question are above all explained as in colonial times and in the proposal of the Social Doctrine of the Church as a moral question linked to distribution, which is badly done, but which is overcome with its correctness. The question

> that arises is: how can there be fair distribution in a system that survives by appropriating the value of labor? (MONTEIRO, 2020, p.280).

The poor quality of the educational system carries a bourgeois rationalization, which ends up weakening the working class, so that it has little chance of achieving political emancipation.

If political emancipation, which is a dimension peculiar to modern sociability by liberalism, is not realized, the workers of the periphery cannot easily access the dimensions of struggles against the bourgeois class, and it is a sign that the educational system that is oriented, since the formation of the UN, has the vocation of making the working class dependent on the international division of labor.

The right to education has always been part of the agenda of the Angolan government (and is currently enshrined in the Constitution of the Republic), although carrying functional ills to the socio-metabolism of capital. For example, point 4 of the current Basic Law of the Education System stresses that "the payment of registration, attendance to classes, school supplies and other charges, in Secondary Education, are the responsibility of parents, Guardians or students themselves, in case of majority" (ANGOLA, 2020, p. 1). It means that the state has divested itself of some responsibilities for managing education policies for the working class – it is an expression of neoliberalism. According to Paxe (2014) the multiple determinations that have made the educational system today are related to:

> - end of the war, understanding that it demanded high budgets, destroyed public structures between schools and forced the mass adhesion of young people to the army to the detriment of other areas such as the exercise of teaching. It also produced thousands of internally displaced people among the population;
> - The expansion of the number of rooms as a result of the construction of new schools and the rehabilitation of those destroyed by war or lack of maintenance;
> - The action of international organizations that demand the reform of Education have contributed to at least respond to the challenges related to access to Education;
> - Efforts to improve the progression of students within the education system, which contributes to a decrease in failure and dropout rates;
> - growth and diversification of the population with special learning needs.
>
> In opposition, other factors continue to present themselves as challenges to the realization of the right to education, namely:
>
> - The Portuguese language as the only language of instruction, which continues to condition the learning of many students in the system. This challenge imposes as a demand the teaching of local languages and in local languages and the promotion of bilingual education, given that the official status of the Portuguese language is considered as the official language of the country.
> - The existence of many schools in precarious conditions and the overcrowding of classes.
> - The qualification of teachers, both in initial and continuing training.
> - The logistics of didactic materials.
> - The indices of the population still have to attend to the prevention of school dropout.
> - The inequality within the educational system between the regions of the country, boys and girls, due to the financial income of citizens.
> - The rates of illiteracy.
> - Poverty indices among the population
>
> (PAXI, 2014, pp.192-193).

It is exactly this educational system that shapes the face of Education in the Angolan capitalist periphery, a system that despite the theoretical limitations that Paxi (2014) presents in his study, makes

it evident that the social question, or the socio-metabolism of capital makes real the system of Education, as being an ideological instrument by which the political emancipation of the working class is projected to fail and the workers must accompany this to continue fighting.

5 FINAL CONSIDERATIONS

In Angola, the current order is questioned as a new commitment and, therefore, it becomes premature to make final considerations about the debate that took place during the discussion of the theme "PERIPHERY OF EDUCATION AND THE SOCIOMETABOLISM OF CAPITAL IN ANGOLA: the failure of the political emancipation of the working class".

The regression to the legacy of labor rights is manifested, fundamentally, by what Marini (1973) calls the overexploitation of the labor force in Third World countries, such as Angola.

It is precisely through a precarious education, being from the periphery, that the political dimension of the workers is allowed to immerse itself in the validity of dependent capitalism, both for what Fernandes (1975) emphasizes to be realized by the forms of external domination and to occur what Hinkelammentert (1970) calls political, economic and social forms of exploitation.

It is from the totality of the forms of domination and exploitation that Education will imprint its ontology – marked by the precariousness of the political dimension of the workers, who cease to claim their rights: it is a constitutive part of the way in which the socio-metabolism of capital becomes a fetish for the workers.

Faced with the socio-metabolism of capital, from the end of the twentieth century to the present, many strategies have been carried out by the national liberation movement, as by the government (MPLA), which has risen since 1975, whose project of society has not favored the working class, to the extent that it does not have objective and subjective conditions to make an effective break with the capitalist mode of production.

Daily life has shown that carrying out processes of political emancipation in a space that only favors the ruling class – the capitalist periphery – is a struggle that must continue, but that produces and reproduces failures and barbarism, when in the same periphery, the leaders who were workers, today, are bourgeois who represent the international bourgeoisie and carrying the ideology that only reproduces forms of consciousness that the workers are subjected to assume in order to survive.

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Countryside education and professional education: Territorialities under construction for a human formation

https://doi.org/10.56238/ptoketheeducati-036

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ABSTRACT
The present work brings the approach of the perspective of the construction of professional education from the Education of the Field, based on an educational thinking that is based on a formation of the subjects through human emancipation; reflecting the historicity of the Education of the Field thought by (their) Social Movements. The theoretical framework is based on the efforts of authors such as Bernardo Mançano Fernandes, Saskia Sassen, Doreen Massey, Mônica Molina and Pistrak. The methodology used was through semi-structured interviews with representatives of social movements that are in the locus of the research. Our reflection is based on the projects developed in the spaces of experiences of students, which are based on the Movement for a Rural Education, since it is contrary to the logic and dynamics of capitalist reproduction, which understands the field as a space of possibilities, valuing the cultural history of the subjects belonging to the territories of the field, of waters and forests. In this sense, Rural Education is an alternative to Rural Professional Education, especially with regard to the construction of territorialities that promote the integration of the subjects of the field, the waters and the forests.

Keywords: Rural Education. Professional Education of the Field. Territoriality. Human emancipation.

1 INTRODUCTION

Faced with the new realities of the Brazilian agrarian world, it is understood as necessary the construction of a new education project, which is focused on the socio-historical and cultural reality of the subjects of the field, favoring a broad professional formation, that is, for life, and not only for the labor market.

Thus, we think that for a change in the current educational model in vocational training schools, it is essential to dialogue with Rural Education, so that an integration and interaction between the subjects is perceived, with inclusion and participation of the collective subjects of the field. An education that is inclusive and participatory needs to be democratic, hopefully libertarian.

In this sense, the model of education that we defend here is not about education with the neoliberal bias, where the subjects of the working class are simply reduced to another piece of the productive system. Therefore, we defend an education project that considers the history of the territory of its students, which is consistent with the historical and sociocultural reality of the collective subjects of the field.

In this perspective, we argue that "there is only sense in discussing a specific educational proposal for the needs of rural workers if there is a new development project for the countryside, which is part of a national project." (ARROYO, et al, 2004, p. 13).

Discussing the project of society Silva (2014) points out that, "the project can be conservative or transformative and, therefore, also contradictory between training for the labor market or for an omnilateral perspective. (SILVA, 2014, p. 24). We are aware that the educational process as well as can favor and promote the liberation of the human being, from the bonds of ignorance and the shadows of darkness, can also, on the other hand, promote his imprisonment, deepening the process of estrangement/alienation in which he is subjected and lives.

Therefore, the education that we defend brings in its meaning and bulge, principles that are directly linked to respect for life; It is, therefore, an education project where and in which the construction of another chapter of the history of the collective subjects of the field is promoted, where they themselves are the protagonists of this history of struggles and dreams, tears and confrontations, but also of fulfillment and materiality.

The model of education that has as its subject the State, results in the control of the educational system by the logic of the thought of the bourgeois class, that is, the hegemonic ideology of the dominant class, that is, its worldview, and consequently, its cultural ideology, ends up being accepted, reproduced, therefore, shared by the subjects of the less favored classes. After all, as is well known, "bourgeois education was built as an instrument of domination and subjugation of the subordinate classes and expropriated from the means of production" (FERNANDES; ANDRADE, 2016, p. 285-286).

> The education offered by the State is a project of domination that separates the educational act from the social context of its individuals. This nullifies or reduces the critical sense of its subjects, because education does not dialogue with the concrete reality and materiality of life, which makes it an idealistic abstraction. (FERNANDES; ANDRADE, 2016, p. 287).

Certainly, the education of the capitalist mode of production and, consequently, its vision of society, has always been deeply marked by the establishment of a given pattern of thinking and imagining space, understood as unique and universalized, where all relations were/are possible, product of the form of socio-spatial organization, from the interests of capital.

According to Harvey (2005)

> [...] Capitalism strives to create a social and physical landscape of its own image, and requirement for its own needs at a specific instant of time, only to undermine, tear apart, and even destroy that landscape at a later instant of time. The internal contradictions of capitalism are expressed through the incessant formation and reformation of geographical landscapes. This is the music by which the historical geography of capitalism must dance [...]. (HARVEY, 2005, p. 148).

It is noticed, therefore, that the capitalist mode of production has not only a logic of promoting the organization of space, but a history of thinking and reorganizing socio-spatially and territorially. And this, also serves for the model of education, organized and promoted in a way distant from its main actors and subjects, the students and educators. In this way, the subjects have always been – and will inevitably be – affected materially and immaterially, by their policies, which do not attend to and do not understand the material reproduction of the subjects' lives, nor even their dreams and symbols, in short, their memory/existence.

Therefore, it is necessary to promote the construction of an education that contributes and favors a logic of social relations, in which it is not dissociated from the material and immaterial territory of the collective subjects, so that an inclusion of the excluded is affected and the integral development of people, of their lives, of their cultures is materialized. So yes, this is the education that Rural Education defends and believes it is possible to build.

Thus, the problem question raised in this work presented here, reflects on: What is the importance and contribution of Rural Education in the process of training of students of Professional Education?

The questioning presented here starts from the premise that Rural Education can enable, within its conditions and realities, in dialogue and, therefore, the construction of a human and professional formation, from the action reflection of the principles of the peasant social movements; where the field can be understood as a space of possibilities, of construction/production of a new territory, fruit of the social relations engendered by the socio-territorial movements, making its subjects feel and see themselves as historical agents, builders of their own reality.

However, we are aware that these reflections depend on and are subject to the constant changes that the field and its subjects live daily, given their inherent dynamism requiring permanent critical rethinking.

2 METHODOLOGICAL PROCEDURES

Among the methodological procedures adopted, we can highlight from semi-structured interviews to participant observation; Such procedures seek to understand not only the way, but the life history of the subjects of the field, perceiving the realities/contradictions and the needs of the same in their respective places of residence, that is, in their living spaces.

With regard to the technical-operational procedures of the research, we highlight the accomplishment of the bibliographic review about the central themes, as well as the collection of data from the documentary and field research, and in the last plan, but not less important the transcription and analysis of the interviews carried out.

We emphasize that Rural Education perceives in its theoretical-methodological presuppositions the orientation and the search for the transformation of the rural reality, understanding as a goal and principle the construction of another political project of society, where the project of professional education is the product of the educational actions and reflections produced and in production by the subjects of the field themselves, understood, therefore, as historical protagonists.

In the reflection of Silva (2014) "a political project of such magnitude can certainly lead us to the structural changes so necessary in the current historical moment". In this sense, much more than respecting and recognizing the right to have rights of the diversity of the collective subjects of the field, it is fundamental and indispensable to value the knowledge and knowledge of the peoples of the countryside, of the waters and forests that form and comprise the Amazon of Pará and the other Brazilian territories; For "the moral and intellectual elevation of our people will give us content and encouragement to realize a better existence for each and every one." (SILVA, 2014, p. 26).

It is important to point out that the present work comes from another work previously carried out by us within the scope of the IFPA Castanhal Campus, having as research subjects the students of the class of the National Education Program in Agrarian Reform / PRONERA; after starting the work with PRONERA that, since then we have sought, to contribute to the construction of another history of education for young workers of the professional technical education of the field, since, to consider the referred program, there is the proposal of change of the present technological matrix, and at the same time, there is an enormous possibility in the "reelaboration and construction of a new way of relating to nature in agricultural production". (MOLINA, 2003, p. 136).

For, as Molina (2003) confirms, PRONERA

> [...] It is a concrete demonstration of the possibilities of expanding the opportunities for inclusion and social justice, so it can be taken as a reference to think about public education policies because it is born in conjunction with the effort to fight for the sustainability of the rural peoples, their space, their landscape, their imaginary, the unity of the Earth that unites us for common goals. (MOLINA, 2003, p. 133).

It is important, therefore, to understand that,

> [...] In the capitalist system in which inequality is part of its nature, it is necessary to have strategies of resistance and defense of their territories and territorialization. It is for this reason that peasants and capitalists dispute territories and models of development. (FERNANDES, 2016, p.4).

Faced with this reality, which includes the expansion of agribusiness practices, it is essential for the peasantry to formulate new ways of thinking and elaborate strategies of active resistance, which are vital to inhibit a greater advance of capitalist practices in the Pará and, above all, Brazilian countryside.

Thus, the simple purpose of our research is to contribute to works and projects that share and seek to gather forces and interests from the most diverse sectors of academic society, so that as Fernandes (2016) maintains, together with the peasant Social Movements they can add to the objectives of promoting the construction of a professional, inclusive education project, that it serves the "maintenance of the existence of the peasantry with quality of life and respect for their identities and cultures." (FERNANDES, 2016, p.2).

3 JUSTIFICATIONS

Education in rural areas of Brazil is presented as a deficient reality not only from the point of view of schooling, but, above all, of the professional training of rural subjects. This formation, in our view, should and should be focused on the socio-historical reality of its subjects, so that it is possible to build an educational project, which integrates in fact and in law the subjects who live and reproduce in and of the earth.

According to the latest IBGE surveys (2010), 29.8% of the adult population – 15 years or older – who live in rural areas is illiterate, while in urban areas this rate is 10.3%. Based on these indices, it is possible to infer that illiteracy in rural Brazil is a concern. In this sense, there is a challenge to the subjects of the rural/agrarian environment, especially to the students (as) workers of the professional education of the field, in order to build a development of their territories, which in fact meets the desires and their cultural and historical-geographical needs.

In this sense, the work brings as a debate the proposal of education gestated within the social movements of the field, as an alternative to the dynamics of the existing and dominant professional education in the national territory, and that now be in force in the technical courses of agriculture offered in the Federal Institutes. Thus, we seek to reflect on what contributions Rural Education can bring to the professional training of students in the academic spaces of current professional education.

In these terms, the geographical thinking about the importance of Rural Education, assumes a relevant role in the process of formation of the students, because it enables the perception and knowledge of the space built / lived by them, understanding "the space as an open and continuous production" (MASSEY, 2015, p. 89). After all, space is society (SANTOS, 1996), therefore, it constitutes the matrix in which new actions replace past actions. It is in him, therefore, present, because past and future.

It is worth mentioning that the experience with the PRONERA class, between the years 2006 to 2010, enabled the knowledge and construction of a new pedagogical political practice, based on the principles of Rural Education, which will become the foundation for dialogue in the process of proposing new territorialities with Professional Education, in which it can be focused on the reality of the subjects that it attends in its formation.

In his studies, Carvalho (2009) argues

> The Pronera class inside the school (...) brought a new dynamic regarding the thinking of educational practice, since the work with the Pedagogy of Alternation printed another look and a new way of seeing and understanding the teaching-learning process, that is, education as a whole. Since the Alternation comes and goes to meet the desires of intellectual and human formation of the actors involved in the educational process, enabling the design and materiality of a political consciousness necessary for all subjects, from the thematic axes that guide the teaching-learning process. (2009, p. 78).

Thus, this work aims to deepen the process of human-professional formation of daughters of the working class of the rural/agrarian world, turning to their own historical realities and socio-spatial and socio-territorial specificities.

The principles that sustain and inspire Rural Education, were products and thought from and through the articulations of the struggles and resistances of the Social Movements of the Field, requiring the production of knowledge not as a finished model, due to being constantly in production, but a model of education that is in accordance with the experiences and renovations of the new activities and knowledge historically built, lived and proposed by the subjects, historically.

4 RESULTS AND DISCUSSIONS

Brazilian education and, consequently, school and teaching are in crisis, a fact that leads us to a reflection on the role played by both in the current and dominant teaching-learning process in the country.

Considering the advance of capital towards the countryside and, in turn, the changes caused by it in the agrarian space, it is possible to affirm that the diversity of the Brazilian rural territory is permeated, increasingly, by inequalities and complexities in its social and economic relations; In the meantime, expulsions are generated, at the same time that "complexity tends to to produce elementary brutalities too often" (SASSEN, 2016, p. 10).

According to Caldart (2010),

> [...] in Brazil, in general, the technical courses in agriculture or corresponding and the higher courses of Agronomy and related, are not geared or pedagogically organized to train farmers. Even when it is the peasants themselves or their children who manage to have access to these courses, it is understood that their goal is to stop being peasants or to stop having agricultural production as their work. (CALDART, 2010, p. 236).

According to Casali (2006) the "Paths to an education in the Countryside" shows that today's school, in the Brazilian educational system, does not prepare children and much fewer young people for the urban world or for the world of the countryside. But rather to be subservient to the logic of capital. As long as agrotechnical schools and agronomy courses prepare young people, almost all of

them from the countryside, to serve the multinationals and the rules of agribusiness, education will remain distant from the socio-cultural feeling that is part of the peasant community.

In these terms, the existing and dominant model of professional education in Brazilian technical-professional schools does not allow the social inclusion and continuing education of students, especially those who live in the field. Hence the need to seek to build another alternative education model to the collective subjects of the field. So that it is possible to break with the bonds that have been established for decades in our education and that hinder the transformation and socio-cultural development necessary for the world of life. After all, education is important for the construction of an alternative political-social project because overcoming alienation can only be done through a self-conscious activity, as Cherobini (2011) points out.

Thus, the professional education of the countryside is constituted as a strategy for the production and construction of agrarian territory that integrates and does not fragment, thus enabling an inclusion rather than an exclusion of men and women, children, young people and adults from the countryside, waters and forests.

Thus, it is observed that the strategies to promote the reproduction of the capitalist logic, the State makes use of strategies that include the models of education, the modalities of teaching and the discourses of development. Therefore, it is important that in the academic spaces of human and professional formation, alternatives of resistance to the onslaughts of capitalist interference led by managers and subjects that make up the spaces of socio-educational relations can be promoted.

We understand then that knowledge in Rural Education needs to be thought, taught and built having and understand the work as an educational principle and is directly related to social practice.

For Ciavatta (2005) this proposal seeks to guarantee to the adolescent, the young and the working adult, the right to a complete formation for the reading of the world and for the performance as a citizen belonging to a country, integrated worthily to its political society.

Hence the political-pedagogical project of Education in and in the Field needs to be attentive to the productive processes that today make up being a worker in the field, and participate in the debate on work alternatives and options for local and regional development projects that can return dignity to families and peasant communities. It is therefore in this way that we understand the possibility of transforming reality, from the rural territorial development, built and under construction through Rural Education, since,

Anyway,

> ... Men are beings of praxis. They are of what to do, different, for this very reason, from animals, beings of pure doing. Animals do not "admire" the world. They immerse themselves in it. Men, on the contrary, as beings of whatto do, "emerge" from it and, objectifying it, can know it and transform it with their work. (Freire, p.143)

Thus, the transformation resulting from the actions of the work of the men and women who inhabit the countryside and the cities, needs to be a radical transformation, and there is no radical transformation without theoretical basis, without action and reflection. It means to say, therefore, that the radical transformation is not done with verbalisms and simple activisms, it takes place only with praxis, which in turn must directly affect the structures to be transformed.

Hence, as Freire teaches us, "The revolutionary effort of radical transformation of these structures cannot have, in the leadership, men of what to do and, in the oppressed masses, men reduced to pure doing." (Freire, p. 144. Emphasis added).

Thinking about this from the broader pedagogical point of view, as processes of humanization-dehumanization of the subjects, and thinking about how these processes can/should be worked in the different educational spaces of the field, must permeate the tactics and strategies of a new educational process for the construction of the model of rural territorial development viable to the subjects of the field.

In this perspective, the professional education of the field will have all the more place in the political and pedagogical project of Rural Education if it does not close in on itself, linking itself with other educational spaces and development policies in and of the field, with the social dynamics in which its subjects are inserted. In this way, the professional education of the field will fulfill its universal vocation of helping in the process of humanization of people, freeing them as subjects of their historical time.

According to Arroyo apud Morigi (1999, p. 8) in the preface of the work for a basic education in the field,

> Brazil has not been able to be deaf to the social movement of the countryside because of what it bothers and affirms – the right to land, work, dignity, culture, education – also educators and public policies, curricula, school management and teacher training can no longer be deaf to the set of innovative practices, serious, which emerge placed placed in the social and cultural movement of the countryside. (ARROYO, apud, MORIGI, 1999, p. 8).

For, the historical practice of the Brazilian State of thinking and organizing education for rural workers according to the interests of the maximization of capital, is what gives birth, contradictorily, to its denunciation and a new project of education, the Education of the Field, constituted from the social struggle, collective reflection, alternative educational practices and resistance of the struggle and the construction of the Agrarian Reform of the Social Movements of the Countryside, It is not and is not limited to the struggle for land, but also the struggle for education, as part of a much larger political and social project, a project of life and nation.

5 CONCLUSIONS

Given the reality observed, with regard to the model of professional education practiced in academic spaces, it is urgent to understand that the Professional Education of the Field is not the same thing as agricultural school, because its formation is beyond a conception of field, agriculture and agricultural production.

As it says Caldart (2010, p. 236) the Professional Education of the Field "It includes preparation for different professions that are necessary for the development of the territory whose basis of development is in agriculture: agroindustry, management, education, health, communication", all of it without disregarding that agricultural production is the basis of the reproduction of life and, therefore, Same training for field work, must be the centrality of the formative educational process.

In this way, we understand that Rural Education is inscribed as a clear alternative for the construction and transformation of the dominant professional education model produced by the country's technical-professional training schools.

Rural Education presents as one of its principles that permeates its practice, the Pedagogy of Alternation, which presents itself as a possibility of sociocultural transformation and is an integral part of an education of resistance and radical, because liberating, in which work, science, research and technology are understood as instruments and tools at the service of life and not, Simply, of the logic of capital.

We understand that only through a project of professional education designed and built by the collective subjects of the countryside, the struggle of the peasant mass against pesticides, the exploitation and expropriation of labor, will achieve its concrete materiality. For, in these terms, we believe that, "the construction of a peasant project of territorial development for its autonomy is fundamental for the improvement of the quality of life, because there is an increase in its capacity for resistance" (FERNANDES, 2016, p.22).

Thus, we think that the project of human formation in professional education, product of the struggle and the reflexive actions of the peasant social movements, presents as strategies the defense of Rural Education, therefore, of the struggle for agrarian reform, of the struggle for land and territory and of the socio-territorial movements of the countryside.

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SEVEN
publicações acadêmicas

Computational thinking and problem-solving methodology: Possible approaches in the context of mathematics teaching and learning

Crossref doi
https://doi.org/10.56238/ptoketheeducati-037

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ABSTRACT
Despite being lacking in number of articles, dissertations and theses produced, research relating Computational Thinking and Mathematics are standing out in the country and studies on this relationship are gaining more and more space. In this direction, this work aims to discuss about some theoretical approximations between computational thinking and the methodology of problem solving focused on the process of teaching and learning mathematics. To this end, following a qualitative research approach, at first, theoretical aspects of Computational Thinking and Problem Solving methodology will be presented. Subsequently, it will be discussed about some possible relationships between Computational Thinking and the methodology of Problem Solving, with regard to the process of teaching and learning Mathematics. As a result, it was possible to observe that Computational Thinking and Problem Solving Methodology have their pillars in the constructivist trend of education and conceive the problem as a starting point and essential for the teaching and learning process, in addition to valuing creativity, problem decomposition, abstraction and pattern recognition, important characteristics to improve the learning of Mathematics.

Keywords: Computational Thinking, Problem Solving, Mathematics Teaching, Mathematics Education.

1 INTRODUCTION

Computational Thinking (PC), Problem Solving and Mathematics teaching are very simple terms for subjects with such importance and complexity that they must be treated. Problem solving here will be addressed as a teaching methodology (which will be explained in more detail later).

The objective of this article[1] is to make a discussion about a possible connection between Computational Thinking (PC) and the Methodology of Problem Solving (MRP) in the process of teaching and learning Mathematics. Technology is occupying more and more space in the educational environment, and it is necessary to accompany it and use it efficiently. Santos and Souza Mafra (2020),

[1] An earlier and partial version of this work was presented and published in the annals of the International Congress of Teaching Movements, held on October 14 and 15, 2022, virtually.

highlight the frequent use of new technologies in various sectors of society, including the educational environment. These authors point out that CP has emerged as a necessity of today's society. The PC goes far beyond technology as there is an important cognitive approach involved. Despite being lacking in number of articles, dissertations and theses produced, research relating PC and Mathematics are gaining prominence in the country and studies on this relationship are gaining more and more space. Silva and Meneghetti (2019, p.13), after analyzing recent proceedings of the 25th Brazilian Symposium on Informatics in Education (SBIE), I Teaching Workshop on Computational Thinking, Algorithms and Programming (WalgProg) and XX Workshop on Informatics in Education (WIE), important scientific events in the area of computing, found few studies establishing a relationship between Mathematics and the PC and the authors also highlighted that "(...) there is still much to be researched to implement activities with computational thinking in mathematics in Brazil, but it is a promising path that has been growing over the years."

The present work begins with a presentation of the CP aiming to understand the main characteristics of it from its conception to the present day. The same path is made in relation to the Methodology of Problem Solving. Finally, some possible relationships between CP and MRP will be traced, taking into account the process of teaching and learning of Mathematics and aiming at some approximations between these areas.

2 COMPUTATIONAL THINKING

PC is a term that has been used and widely explored today, not only by computer scientists, but also by educators from various areas of knowledge, but also seeks a better understanding of its scope, meanings and everything that involves it, even if there is still no consensus on its definition. Initially, the term PC was developed by Seymour Papert (1928-2016), mathematician and pioneer of Artificial Intelligence and the use of computers for the development of learning and father of the programming language LOGO, supported by constructivism. Papert (1980) believed in the insertion and use of programming in Education, developing learning and other ways of thinking. For him, computers had great potential, they were not just tools for working in homes or offices.

> In 1967, he created the programming language LOGO, together with Wally Feurzeig, an important educational tool for understanding the learning processes of children in interaction with computers. His contributions were important in recognising the potential of computers in learning. Papert was considered the world's foremost expert on how technology can provide new methods of learning and teaching mathematics, thinking and learning in general. He recognized that computers could be used not only to provide information and instruction, but also to empower children to experiment, explore, and express themselves. (SOUSA, J. et al., 2021)

In 2006, with the article *Computational Thinking*, Jannette Wing, computer scientist rescued and popularized the term PC. Wing (2006) defines some elements that correspond to the PC as a

fundamental skill to all, not being exclusive to computer scientists and such skill is as important as learning to read, write and perform Mathematical operations and should be taught to children and, according to this author, the PC is related to the ability to solve problems. After the repercussion of this article, Wing (2011) perfects the term, this time, pointing out that "Computational thinking is the thought process involved in the formulation of problems and their solutions so that the solutions are represented in a way that can be effectively performed by an information processing agent." (WING, 2011, p.1). And yet, it complements that problem and solution are seen in a general way, in a broad way, without specifying specific problems related to an area of knowledge. The author lists some elements present, and necessary, in the PC, such as abstraction, decomposition, recursive thinking, pattern recognition and parallelism.

Other researchers and computer scientists share the same ideas as Wing, among them, we cite Valerie Barr and Chris Stephenson (2011), who believe that the PC is a way of solving problems that can be elaborated and developed using the computer, leading students to develop their own tools. According to these last authors, there are nine fundamental skills for PC development: 1. Data collection, 2. Data analysis, 3. Data representation, 4. Decomposition of the problem, 5. Abstraction, 6. Algorithms and procedures, 7. Automation, 8. Parallelization and 9. Simulation.

According to Yadav, Stephenson and Hong (2017) developing the PC in students would enable them to create, design and develop technologies, tools and systems with possibilities of evolution in any area of knowledge. According to Silva and Meneghetti (2019, p.1), "Computational thinking encompasses the competencies and skills that are explored through this computational logic and can be developed in several areas of knowledge, including Mathematics." In this same direction, Azevedo and Maltempi (2020) present the importance and meaning of thinking computationally.

> Thinking computationally does not mean programming a computer, it is a way to encourage new ways of thinking and new paths of knowledge production from active learning methodologies that stimulate the autonomy and creativity of the student beyond the curricular guidelines and the walls of the school. (JACKSON; MALTEMPI, 2020, p.3)

Although it is not a consensus among researchers, in general, we can say that the PC represents a way of thinking to solve problems, supported by some elements, such as abstraction, decomposition, simulation, parallelism, algorithms and pattern recognition.

Even though it may seem distant, distant from our context or the reality of our students, the PC is present in our lives, in various activities that We do, however, we don't pay attention to that. When a teacher goes to prepare a class, or a doctor will do a surgery, or a driver is on his way to a customer and is faced with a traffic jam, when we are in line at the restaurant choosing what we are going to eat, or even, when we are going to put the bibliographic references of an article in alphabetical order, illustrate situations in which we use the PC. When faced with a problem, we need to understand

it, divide it into smaller parts to get its solution, recognize patterns, that is, remember if we have already faced a problem similar to this and then draw a strategy to, in fact, solve the problem.

The PC theme has gained a lot of prominence in recent years and has been the focus of many works, such as dissertations and theses, both in computer science and in the educational area, as shown by the work developed by Berssanette and Francisco (2021), in which they present a systematic review of literature that sought dissertations or theses of graduate programs in Brazil, related to the PC, between 2010 and 2019. In all, 71 studies were selected, among 147 found in the search carried out by the authors, and throughout the text, they present various forms of classification of these works, such as number of researches produced per year, federation units with more works produced, study approaches, resources and/or tools used, levels of education (elementary, secondary and higher) where the research was applied, among others. According to these authors, as of 2015 there is a trend of growth in the number of papers presented in graduate programs in Brazil, related to the development of CP, indicating a greater interest of researchers in the subject.

In summary, CP is a very extensive, complex and current topic, with adherence to all areas of knowledge and consequently, most researchers believe that it should be part of school curricula, from the initial grades to undergraduate courses. The goal is to train people capable of solving problems, facing and solving everyday situations, in any area of activity.

3 THE PROBLEM-SOLVING METHODOLOGY

Problem Solving, as an active methodology for teaching and learning Mathematics, represents one of many Trends that Mathematics Education has brought as a tool to assist and enhance student learning. The authors Onuchic and Allevato (2011) point out that in the History of Mathematics, there are records of the use of problem solving in the ancient Chinese, Greek and Egyptian civilizations, for example, and some of these problems have similarities with problems published throughout the twentieth and twenty-first centuries.

For João Pitombeira de Carvalho (1994), during the 70s and 80s some of these Trends in Mathematics Education were consolidating, and problem solving, according to Carvalho (1994) is an activity that requires active participation, there are no ready answers, "it is not sport for spectators". It is worth mentioning the origin of MRP through the works of George Polya and Paul Halmos, as highlighted by this author.

> (...) They have always called attention to the fact that to do Mathematics is to solve problems. The first of them, creator of the Polya heuristic, tried to guide the activity of solving problems at the various levels of mathematical learning in remarkable books, which to this day deserve to be read and meditated on. The second has always encouraged, in his courses, conferences and writings the habit of solving problems. He was the writer of collections of books dedicated to problems of mathematics, at various levels. More specifically in the area of Mathematics Education, studies on problem solving are oriented in two directions that cannot be dissociated: one tries to understand how children and adolescents solve problems, what are the

> characteristics of a good problem solver, etc.; the other tries to elaborate didactic sequences based on problem solving, as opposed to classical expository teaching. (CARVALHO, 1994, p.78).

Highlights include the pioneering work of the Hungarian mathematician George Polya (1887-1985), who in his famous book "The Art of Problem Solving" (translation of "*How to solve it* " written by Polya in 1945) features a problem-solving heuristic specific to mathematics, which remains very current and serves as a starting point for many works in this line of research. In general, Polya (1995) divided the process of solving a problem into four stages: 1. Understanding the problem; 2. Establishment of a plan (construction of a resolution strategy); 3. Implementation of the plan and 4. Retrospect (verification of the result). In addition to these four steps, this author suggests numerous questions pertaining to each step, which can be asked by the teacher to his students, as a form of mediation, throughout the process of solving a problem, aiming at the development of the ability to solve problems in his students.

Like Polya, the works of Paul Richard Halmos (1916-2006), a Hungarian-American mathematician who believed that the problems and their solutions represented the main character of mathematics teaching and complemented

> (...) Problems are the heart of mathematics, and I hope that we teachers, in our classes, seminars, and in the books and articles we write, will emphasize this more and prepare our students to be better troublemakers and problem solvers than ourselves. (HALMOS, 1980, p.524).

At this point, we ask: what is the importance of using Problem Solving in Mathematics? D'Ambrosio (1989) emphasized that, after some changes, Problem Solving is a teaching methodology that the teacher proposes to students problem-situations to be explored and investigated, obtaining new concepts. Onuchic and Allevato (2011) state that problem solving, whose ideas are based on the foundations of constructivism and Vygotsky's sociocultural theory, is considered as a teaching methodology, bringing the problem as a generator of new contents and mathematical concepts, contributing to the construction of mathematical knowledge.

According to Pirola (2000, p. 32), "It is of fundamental importance for the teaching of school mathematics that students understand the concepts and principles involved in the problems, as well as the algorithms used in their solution.". According to Boavida (1992), MRP goes beyond the direct application of formulas or algorithms, it should be challenging for students and aims at them to build their knowledge.

After all, what is the problem? What is the definition for the problem? There is no definition of what a problem is, but some authors, such as Boavida (1992), explain about the difficulties in defining, in a coherent way, the concept of problem, because it is characterized by subjectivity, temporality and the context in which it is inserted. Chi and Glaser (1992), argue that a problem can be obtained in an

attempt to solve a puzzle, a question of Differential Calculus, everyday situations, such as saving money on the water bill, not being restricted only to mathematical problems. For Onuchic and Allevato (2011, p.81) a problem "is everything that one does not know how to do, but that one is interested in doing." It should be noted, because of its specificities, that a problem for one student may not represent a problem for another student, due to their personal characteristics, social context, previous knowledge, among other factors.

According to Onuchic and Allevato (2011, p. 80) in MRP "(...) the problem is seen as a starting point for the construction of new concepts and new contents; the students being co-builders of their own knowledge, and the teachers being responsible for driving this process."

In this methodological approach, the construction and learning of new concepts will be established during the process of solving the problem proposed by the teacher. It is the role of the teacher to encourage and motivate students to participate in the problem-solving process to understand the concepts in them and those that will be presented.

The problems are proposed to provoke curiosity in students, who do not know the concept (the subject) that will be addressed (that content that the teacher intends to teach) and the beginning of the subject to be taught will take place through a problem and will consist of its solution. Onuchic and Leal Junior (2015) present a roadmap for solving a problem using a sequence of ten steps, namely: 1. Proposition of the problem, 2. Individual reading, 3. Reading together, 4. Problem solving, 5. Observe and encourage, 6. Recording of resolutions on the blackboard, 7. Plenary, 8. Seeking consensus, 9. Formalization of the content, 10. Proposing and solving new problems. The authors make it clear that this is a proposal for problem solving and, because of this, teachers can adapt it in the way they deem necessary, taking into account the particularities of their classrooms and their students. The methodology of teaching Mathematics through Problem Solving has the necessary tools to enable students to be the main character in their search for knowledge.

In what follows we present, finally, some approximations which are evidenced when we compare some of the principles of CP and MRP in the light of the process of teaching and learning Mathematics.

4 COMPUTATIONAL THINKING AND PROBLEM-SOLVING METHODOLOGY IN THE CONTEXT OF THE MATHEMATICS TEACHING AND LEARNING PROCESS

This work aimed to discuss about some theoretical approximations between the CP and the MRP focused on the process of teaching and learning of Mathematics.

Analyzing the elements presented up to this point, we can perceive some approximations between the CP and the MRP. Initially we can observe that for CP and MRP the problem has a fundamental role in the teaching and learning process; it is considered the starting point of educational action. The PC as we have seen, represents a way of thinking to solve problems, supported by some elements, such as abstraction, decomposition, simulation, parallelism, algorithms and pattern recognition. Problem Solving, as a teaching methodology, indicates that the teaching and learning process should start with a problem or a set of problems, motivating and generating discussions, to build new mathematical knowledge.

We can also infer that they are constructivist approaches in which the learner is conceived as the subject of his knowledge, the latter should be constructed by the student playing, therefore, an active role in this process, and, it is also worth noting, that it is very important the interest of the learner in wanting to exercise this active role. It is necessary a change of posture of the teacher and the student when adopting this teaching methodology.

We can still observe that some of the steps presented by Barr and Stephenson (2011) resemble those brought by Polya (1995), as well as Onuchic and Leal Junior (2015). The first step of problem solving presented by Polya (1995), called problem comprehension, is identical to the steps called individual reading and reading together, by Onuchic and Leal Junior (2015), which in turn, are similar to the steps that Barr and Stephenson (2011) present as data collection and data analysis, due to the fact that these steps suggest that the student understands the problem, Recognize the situation that has been put to you and realize which way to go and what tools you should/can use.

Continuing this analysis, the second step of Polya (1995), called the establishment of a plan, is coincident with the stages data representation, problem decomposition and abstraction of Barr and Stephenson (2011), configuring the stage of elaboration of the strategies necessary to solve the problem. Onuchic and Leal Junior (2015) do not highlight a step in their resolution roadmap, referring to the elaboration of a plan to solve the problem. However, as has been pointed out previously, these authors have already indicated that this script is a proposal for problem solving. We can suggest the inclusion of an intermediate step, situated after reading together and prior to the resolution of the problem, aimed at the elaboration of a plan to solve the problem, if it is necessary to the reality of the class in which the teacher is working.

The execution of the plan, Polya's third step (1995), is consistent with the item solving the problem of Onuchic and Leal Junior (2015), and the steps algorithms and procedures, automation and

parallelization of Barr and Stephenson (2011), indicating, in fact, the moment to put into practice the strategy elaborated and use it to solve the problem.

At the end of the resolution of a problem, Polya (1995) suggests as a fourth step the retrospect, which we approximate with the items record of the resolutions on the blackboard, plenary and search for consensus, by Onuchic and Leal Junior (2015), and the stage of entitled as simulation brought by Barr and Stephenson (2011) to PC. At this point in the process of solving a problem it is necessary to present, verify and analyze the result obtained after the solution of the problem and make the discussion of the solution obtained. Table 1 below summarizes the comparisons made previously, indicating the corresponding authors, and similar steps of their proposals for problem solving.

Table 1: Comparison between the Troubleshooting steps of Polya, Onuchic and Leal Junior and Barr and Stephenson

Troubleshooting steps according to each author		
George Polya	**Onuchic and Leal Junior**	**Barr and Stephenson**
1. Understanding the problem	2. Individual reading 3. Reading together	1. Data collection 2. Data analysis
2. Establishment of a plan	There is no	3.Data representation 4.Decomposition of the problem 5.abstraction
3. Implementation of the plan	4. Problem Resolution	6.Algorithms and procedures 7.Automation 8.parallelization
4. Retrospect	6. Recording of resolutions on the blackboard 7. Plenary 8. Seeking consensus	9.Simulation.

Source: Prepared by the authors

As seen, after the presentation of this comparative analysis, correlations were found between the resolution steps that these authors enumerate in their previously cited works. In this direction, Silva (2020) highlights that:

> (...) the competencies of Computational Thinking are directly related to solving Mathematics problems. In fact, they emphasize the ability to read and interpret texts, as well as to understand the real situations proposed in the problems and transpose the information extracted from these situations into mathematical models. This correlation has been the object of study of many recent researches, whose main objective is to collaborate with the discussions about the integration of the teaching of Computing to the school curriculum. Such research suggests that the discipline of Mathematics is used so that students can have contact with programming tools. In parallel, there is another line of work whose proposals converge with the objectives of this dissertation, that is, which seek to develop the competencies of Computational Thinking, using concepts and / or computational tools for the resolution of Mathematics problems. (SILVA, 2020, p. 24).

Thus, it is understood that the process of teaching and learning Mathematics could be improved through the use of CP and MRP. In addition, it is present in Mathematics the representation by codes and algorithms, skills such as abstraction, pattern recognition, generalizations, decomposition and creativity, elements that appear in the definitions of PC and MRP, discussed earlier.

Mathematics offers many possibilities for implementing activities related to PC and MRP, from the initial grades to undergraduate courses, because of the diversity of subjects and themes that can be addressed, including "unplugged" activities, that is, those activities that do not need the use of the computer to be applied. We can cite as an example a teacher who selects and proposes a problem to his students in the Mathematics class and to solve it, it is necessary that the students follow the steps of the MRP in conjunction with the elements of the PC, that is, it is necessary that the students understand the problem, decompose the problem into smaller parts, use abstractions and generalizations and use their creativity to, anyway, solve the problem. Once the problem is solved, one should check, analyze and discuss its solution and, simulate whether such a strategy can be adopted to solve problems similar to the one that was initially proposed.

According to Barbosa (2019, p. 54), there are numerous activities that can be planned and developed, according to the students' school level. This author also adds that its insertion in schools requires many efforts, especially with regard to teacher training, since it is up to the teacher to analyze which problems are best suited to their class and the objectives of the content that will be taught, according to the reality of their school environment.

The teacher needs to find challenging and thought-provoking problems for his students to solve and actively participate in during the lessons. An interesting possibility would be to present problems consistent with the reality of the students, making the learning process more meaningful.

We emphasize that there should be a change of attitude in the performance of the teacher and the students, since it is an active teaching methodology. Students will be responsible for building and obtaining their knowledge and the teacher will act as a mediator in the teaching and learning process. We believe that this path is promising for improving the quality of mathematics education.

5 FINAL CONSIDERATIONS

This work aimed to discuss about some theoretical approximations between the CP and the MRP focused on the process of teaching and learning of Mathematics.

Through the course traced we could observe that CP and MRP although they have their own characteristics, with regard to the process of teaching and learning Mathematics it is possible to perceive a rich intersection between them.

Relying on constructivism, the CP and MRP identify the student as the main character in their search for knowledge, conceiving him as an active subject in the construction of new concepts,

motivated from the problems proposed. Both CP and MRP carry similar competencies that are important for students' cognitive development at all grade levels. Also in both CP and MRP the problem has a fundamental role for the teaching and learning process, representing the starting point of this process.

However, it is worth mentioning that they refer to relatively current themes within the educational context and, because of this, still there is much to be done, to be researched, to be developed so that the PC and MRP are implemented correctly and fruitfully in the process of teaching and learning Mathematics, aiming at improving the educational framework in the country. As Ubiratan D'Ambrosio said, "Education is preparing for the future." Are we heading toward the future?

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The view of the physical education teacher on the inclusion of students with disabilities in schools of the municipal education network of Rio de Janeiro

https://doi.org/10.56238/ptoketheeducati-038

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ABSTRACT
Inclusion is a theme that has been gaining importance in recent decades, especially when we refer to people with disabilities who have been stigmatized and suffered prejudice throughout history. This data serves to ratify that there is an ongoing inclusion process, demanding from schools an ability to organize themselves to receive these students. The present study has as general objective to investigate how the process of inclusion of students with disabilities occurs in schools of the municipal education network of Rio de Janeiro under the perspective of the Physical Education teacher. We used the qualitative approach, which studies subjective aspects of social phenomena and human behavior in specific groups, providing the creation of new approaches, review and elaboration of new concepts and categories during the investigation. For data collection, an observation script was used, a semi-structured guided interview, which was supported by an interview script. Participated in the research 12 Physical Education teachers who work in regular classes of 4 municipal schools in Rio de Janeiro, within the scope of the 2nd CRE (Coordination of Education). We use the Yin cycle in data analysis. We conclude that teachers aspire to training with a more inclusive approach, in addition to regular continuing education. We also highlight the importance of improving the school's infrastructure and the provision of specific material to better meet the specificities of students. Flexible planning and the offer of diverse activities that minimize competition and favor cooperation were also cited as strategies and gained strength in the teachers' discourse. Inclusion is everyone's responsibility, not limited to the teacher, mediator of the process. In the case of Physical Education we highlight the need for a special look at the specificity of the environment, which is based on emotions and movements.

Keywords: School Physical Education, Inclusion, Municipal Schools.

1 INTRODUCTION

> The sciences of pure and simple facts produce men who only see pure and simple facts (Husserl apud DARTIGUES, 1992, cited by BRACHT in his chapter "Physical Education, scientific method and reification, 2015).

The above epigraph serves to justify our choice for the topic under discussion: the educational making of the authors who write it. They are not facts pure and simple, because discussing school and inclusion is not simple in our society. Maybe it's not simple in whatever society it is, but it certainly isn't in ours. In addition, we do not intend to use far-fetched language and much less airtight. We will try to discuss 'the facts' using arguments that put us in synergy with our fellow teachers, in a very equal way! We believe that the importance of content does not demand 'searching' in the form of dialogue. Continuing, and perhaps more importantly, we argue that theory and practice should go together and not apart as some colleagues think. Many of us are distancing ourselves and missing out on opportunity to dialogue with the teachers who are in front of our students, and those who need us for the process. Therefore, we fully agree with Bracht (2015) quoted below.

Thus, what we do next is to argue that this process has led to a situation in which scientific practice within the scope of what is still mostly called physical education, tends to be a reified practice and disinterested in the discussion about its own meaning. The consequences are that the production of scientific knowledge has little dialogue with the intervention, and even when this happens, it does so from a supposedly superior position, from which it intends to 'guide' the practice, considering it a mere 'application' of scientific knowledge (p.2).

In the introduction of their article on "Teacher pleasure and suffering in the processes of school inclusion", Smeha and Ferreira (2008) point out that the school has undergone significant transformations in order to adapt to the needs of an increasingly diverse society (p.38). In addition, throughout the introduction the authors also point out that the inclusion process should be studied since it is a process, which to be effective, must be related to the role of the teacher's teaching and the feelings experienced by this teacher, since it is not an easy process to be carried out.

In the development of the research the authors report the way that qualitative research is organized, so as to be able to listen to the teachers who are concretely involved in the process. Thus, the semi-structured interview is the tool used to capture the feelings of teachers. In these interviews, it was clear to the authors how affectivity and feelings, specifically the suffering experienced by teachers, is determinant and distressing. "It is also important to point out that it is not only the inclusion process that is responsible for teacher suffering; many are prone to stress due to their own personal experiences and the demands of contemporaneity, which can be intensified due to the disability of the students included (SMEHA and FERREIRA, p.46, 2008).

For all our arguments above, we can say that inclusion is a relevant topic that has attracted discussions in the field of Brazilian education. The approach to the theme represents a concern in the school environment. For Chicon and Siqueira (2016), "the school needs to rethink its structuring, and this requires changes and a new organization of the educational system to receive, in the regular network, students who were previously in classes and in special schools" (p.48). To get an idea of the relevance of the theme, and how families with children with disabilities have sought schooling, let's look at the following numbers:

> The percentage of students with disabilities, autism spectrum disorders, or high abilities enrolled in ordinary classes has gradually increased for most stages of education. With the exception of EJA, the other stages of basic education have more than 90% of students included in ordinary classes in 2022. The percentage of students included in 2018, in elementary school, was 88.5% reaching 91.4% in 2022.
>
> Source: School Census of Basic Education - Technical Summary - INEP (2022)

The process of school inclusion has been the object of reflection and studies in the context of Brazilian schools. The publication of the Brazilian Law on the inclusion of persons with disabilities (Law nº 13.146, 2015) corroborates this discussion, evidencing the principles of establishing an inclusive society. Faced with this reality and seeking to develop a work that facilitates the process of inclusion and ensures the included student and the others, an effective participation that promotes the development of their potential, and stimulates cooperation and integration, the teacher has to have a more accurate look at the subject, denoting knowledge and experience to deal with this new reality.

To reach all students it is interesting that the differences between them are considered, and not evidenced in their inequalities. The differences exist and should not be denied, but understood and respected (NASCIMENTO et al., 2007). It must be considered that individuals are different, and efforts should be concentrated on rescuing the potentialities of each one, as an individual and as a member of the group.

The inclusion in Physical Education shows us that during the last decades, in Brazil, people with disabilities were on the margins of this area for not having certain skills, not taking into account the human diversity present in the educational context (TOLOCKA, 2008). However, if on the one hand Physical Education is still characterized by selective and segregating practices, on the other hand it presents itself as a promising discipline for school inclusion (FALKENBACH, 2010). Sharing the same thought, Rodrigues (2003) understands that Physical Education presents a great potential for the construction of an inclusive education by presenting, among other factors, a lower rigor in relation to the contents that can be worked allowing a curricular differentiation, which tends to generate greater possibilities of participation of students with difficulties in responding to very strict requests.

Understanding the importance of Physical Education as a tool for inclusion, and of the teacher, as a driver of this process, it is important to reflect on how their training has been. This is a continuous process that involves theoretical and practical knowledge in the search for a qualification, for a better obtaining of pedagogical practice, meeting school needs. To meet the principles of inclusion, the training of teachers should be rethought giving them the opportunity to know and expand their knowledge, to better understand what inclusion is and how to work in this perspective. Therefore, it is important to invest in the training of teachers who are able to understand and develop the welcome to diversity, providing opportunities for new practices and planning classes in line with the needs of students.

Aguiar and Duarte (2005) in their studies discuss the pedagogical training of the Physical Education teacher and point to a direction in the development of physical capacities and skills. Based on this vision, the sports and competitive culture, historically dominant in teacher education, ends up hindering the inclusion of students who do not fit this profile where physical and technical performance is valued, privileging few students.

Many of the proposals for activities made in Physical Education are based on competitive culture and are easily observed in schools. When these practical activities developed in the class ignore the principles of inclusion, they end up disfavoring cooperation and not valuing diversity, which can cause students a certain frustration. This competitive culture constitutes a source of exclusion and can create a barrier to inclusive education (AGUIAR and DUARTE, 2005). According to Chicon (2008) when there is a student with a disability in the physical education class, depending on the way the teacher conducts the discipline, it becomes feasible to legitimize the exclusion of this student in class activities.

The teacher at the center of this process has an important and difficult role, to define the best way to promote inclusion through his work involving the whole class, which in general, is overcrowded, a reality that I feel on the skin, over almost two decades teaching in some municipal schools of Rio de Janeiro. This excess of students in the class makes the teacher unable to control the entire process of development of these students with disabilities, masking possible evolutions and eventual failures, leaving us distressed. In fact, the emotional aspect of our educators is often neglected because we are seen as a "machine" and we cannot fail. According to Faria and Camargo (2018), there is no concern in emotionally preparing professionals for the new work that is required of them.

Given what was exposed, our research has as general objective, to investigate how the process of inclusion of students with disabilities occurs in schools of the Municipal Education Network of Rio de Janeiro, under the perspective of the Physical Education teacher.

1.1 SPECIFIC OBJECTIVES

i. Check with the Physical Education teacher, if the academic and/or continued training was sufficient to support their work with students with disabilities.

ii. To investigate the conceptions about the inclusion of Physical Education teachers in some schools of the Municipal Network of Rio de Janeiro.

iii. To investigate the difficulties perceived by the teacher in the inclusion process.

iv. Identify feelings and/or motivations that mobilize teachers in the task of including students with disabilities.

2 LITERATURE REVIEW

In order to broaden / deepen the discussions on the theme of this research we conducted a narrative literature review that sought to present the main points related to the research in question. In this way the author was free to discuss through several articles found those that had content that would be relevant to the understanding of the proposed objectives. To this end, the theoretical foundation on the theme of the research began with the search in the databases Scielo, Lilacs and Portal Periódico da Capes. The following keywords were used: Inclusion, Physical Education, School and People with Disabilities.

In addition to the search in the database, complementing the theoretical foundation, some books were selected, duly cited in the references, which contributed to support the research.

Analyzing the various publications that deal with the theme of the inclusion of people with disabilities, it is observed several nomenclatures with which these people were called throughout history, showing how they were seen by society. The change in terms follows the evolution of the treatment aimed at these people until the present day, which has gained more visibility in the face of the inclusion process. Currently the term people with disabilities is used. This is part of the text of the Convention on the Rights of Persons with Disabilities, adopted by the UN in 2006. The use of this terminology sought to show with dignity the reality of disability, not hiding or disguising it, valuing differences and defending equal opportunities for these people, among others (SASSAKI, 2013).

Sousa (2019) points out that in Brazil, care for people with disabilities began at the time of the Empire, with the creation of two institutions: the Imperial Institute of Blind Boys, in 1854, now the Benjamin Constant Institute – IBC, and the Institute of the Deaf Mutes, in 1857, today called the National Institute of Education of the Deaf – INES, both in Rio de Janeiro.

According to Nascimento (2014) from the 1970s began the demands through mobilization, of parents of children with disabilities, who wanted spaces in regular schools for their children. This movement resulted in the right to free public education for all children with disabilities. Neto et al. (2018) pointed out that not only parents, but also professionals began to claim and pressure society in

general, in order to guarantee essential rights and avoid discrimination. Even with the access guaranteed by law in regular schools, which represented a great advance for equal rights, it was still not enough to effectively promote their development. The attendance to people with disabilities in regular schools was restricted to special classes, so that they did not meet a perspective of inclusion.

The 1990s represented an advance and a paradigm shift from the conception of school to an inclusive education, which consists of political, cultural, social and pedagogical actions that promote the right of people with disabilities to be together, learning and participating, without any kind of discrimination (UNESCO, 1994; RODRIGUES, 2003).

For Carvalho (2007) apud Neto et. al (2018), Inclusive Education can be defined as the practice of inclusion of all, regardless of their talent, disability, socioeconomic or cultural origin. The proposal of Inclusive Education translates an old aspiration, if properly understood as good quality education for all and with all, seeking means and ways to remove barriers to learning and to the participation of all, indistinctly. The act of including is a lesson in citizenship and respect for others.

UNESCO - an agency of the United Nations (UN) that seeks to promote world peace through education, culture and science - sees inclusion as "a dynamic way of responding positively to the diversity of students and of looking at individual differences not as problems, but as opportunities to enrich learning" (UNESCO, 2005, p.9).

With regard to an inclusive school for all, UNESCO (2005) understands that this:

> [...] It should focus on flexibility and variation, both structurally and at the content level, with the aim of giving each student a relevant education and good opportunities for their development. The characteristics of "a school for all" include the exercise of flexibility according to the individual capabilities of the students, giving priority to their needs and interests. The school for all is, therefore, a coherent but differentiated place of learning. All the knowledge and experience about children's development says that they can improve in a diverse environment where participation and cooperation are encouraged. (p. 14)

2.1 PHYSICAL EDUCATION AND INCLUSION IN SCHOOL

Physical Education as a curricular component of the basic educational system aims to build knowledge about the body and its possibilities of movement, considering the multiple human dimensions, such as affective, biophysical and psychological, in addition to the historical, social, cultural and political-economic context in which it is inserted. For the performance of this function, the teacher was tasked with preparing classes that allow the participation of all, adapting the activities in order to stimulate the potentialities of each student, regardless of the differences they may present (COLETIVO DE AUTORES, 1982; BRAZIL, 1998).

According to Sassaki (2006) inclusion is constituted as a process by which society reorganizes itself, in several dimensions such as human, structural, political and others, to welcome and empower people with disabilities in society. And Physical Education assumes a relevant role in the inclusion process, given that through its classes it is possible to work with the student in their integral

development, that is, in the motor, cognitive, human/social and inclusive aspect, contributing to promote significant changes in the lives of these people.

In order to promote inclusion, school physical education should focus on students and thus develop the skills of all, giving them access to the proposed contents, ensuring full participation and adopting appropriate strategies that avoid exclusion. Enabling the participation of all is very important and according to Silva, Seabra Junior and Araújo (2008) some actions to be taken by teachers, are determinant for this to occur, such as: favoring learning by giving opportunities and adapting activities; guide learning; instruct and give feedback during and after the activity; stimulate participation; encourage and engage students by being accessible to dialogue. The interaction of students with and without disabilities is fundamental in the inclusion process, since everyone benefits. This experience changes the worldview of those involved and develops values such as empathy, tolerance, respect and solidarity.

The historical process of structuring Physical Education as a curricular component is based on the learning and execution of motor skills. The practice in the school is still based on the development of traditional curricular contents, such as sports modalities, especially Handball, Volleyball, Football and Basketball. Inclusion provokes school physical education to offer more significant and relevant content, expanding the possibilities of participation and development of students (ALVES and DUARTE, 2019). It is undeniable that sports content activities end up being exclusionary as the most skilled students end up becoming protagonists in the games, monopolizing the classes. Activities that do not involve competition, such as cooperative games, recreational activities, popular games and dances, for example, have a more inclusive character. Cooperative games seek the formation of more human values, because they are based on cooperation, acceptance, involvement and fun, with the purpose of changing the characteristics of exclusion, selectivity, aggressiveness and exacerbation of competitiveness prevalent in society and traditional games (CORREIA, 2006). In cooperation the feeling of empathy is refined, and the students put themselves in the place of the other, thus being able to perceive their limitations and possibilities, helping each other.

The inclusion of students with disabilities in Physical Education classes presents some difficulties that go beyond the content as pointed out by Ramos et al. (2015), and extend to the unpreparedness of the school to receive them in relation to the physical space, lack of training of teachers, distancing from the pedagogical project of the school, lack of support from the Direction, high number of students in the classes, insufficient time for the preparation of inclusive classes etc. Falkenbach and Lopes (2010) indicated in their research that the difficulties to include could be beyond the working conditions, more precisely in the unavailability of part of the professors to accept changes, reflect and modify their conduct, as well as the lack of interest in deepening the studies and establishing a dialogue with colleagues. For Mantoan (2003), "most teachers have a functional view of teaching

and everything that threatens to break the scheme of practical work that they have learned to apply in their classrooms is initially rejected" (p.40). This recognizes that educational innovations such as inclusion cause a certain discomfort to teachers who resist and remain imprisoned to their experiences and knowledge acquired in the course of their professional lives. We believe it is important that teachers leave their comfort zone and seek to expand their knowledge, contributing to professional growth.

Teachers complain about weaknesses in their academic and continuing education. A recurring complaint of PE academics and teachers already graduated is that in the training process, they had only one discipline focused on the Physical Education of people with disabilities. The latter privileges theoretical contents to the detriment of practice. The studies by Aguiar and Duarte (2005) corroborated the teachers' complaint and found with the participants that 97% indicated that the participation of students with disabilities in regular physical education classes was important, but it was noted that almost all of the teachers interviewed stated that they did not have the knowledge to carry out the process of inclusion in the common school. The difficulties pointed out raised discussions that with the support of the literature, actions were suggested to Higher Education Institutions and their teachers, ranging from involving the other disciplines of the curriculum with the theme people with disabilities, to organizing lectures for people with disabilities to report their experiences, stimulate visits to institutions that serve people with disabilities, provide the opportunity to carry out an internship within the discipline; set up a program in the discipline that is closer to the reality of a school, which includes students without disabilities and students with the most varied disabilities, in addition to students with Global Developmental Disorder and with High Abilities/Giftedness, in addition to partnering with institutions that offer internships (CRUZ, 2008 apud FIORINI and MANZINI, 2014). In general, it is essential to invest in teacher training and regularly stimulate and promote their training, aiming to prepare them in the best possible way to effect the inclusion of all.

3 METHODS

Qualitative research guided the study in question, because according to Thomas, Nelson and Silverman (2012), "it is a systematic method of investigation and, to a considerable extent, follows the scientific method of problem solving, although there are deviations in certain dimensions. Instead, more general questions are used to guide the study" (p.36). As the data is revealed there is an inductive process of hypothesis and theory development. The researcher is the protagonist in the collection and analysis of data, participating intensely in the whole process.

In addition to the qualitative approach, the research is classified into descriptive, applied and field research.

3.1 STUDY DESIGN

The research was conducted with PE teachers who work in the municipal network of RJ, specifically in the 2nd CRE (education coordination). This CRE has 154 schools, among which, we selected 4 schools that are located respectively in the neighborhoods of Tijuca, Maracanã, Vila Isabel and Laranjeiras. The choice of these schools in nearby neighborhoods was to facilitate the conduct of the research.

3.2 RESEARCH SUBJECTS

A total of 12 Physical Education teachers were interviewed. Some criteria were established for the choice of participants, such as: being in full activity professional in the schools indicated in the study design, demonstrate interest in participating in the study, present availability to grant interviews and have already worked with students included in their classes.

3.3 INSTRUMENTS FOR DATA COLLECTION

For data collection, a field diary was used (APPENDIX B), and the researcher through a structured observation combined with freer observations, which according to Alves-Mazzotti and Gewandsznajer (2006), "all these auxiliary instruments of structured observation can be used in qualitative research, provided that they are combined with freer observations" (p.166). In addition to the field diary, semi-structured guided interviews (APPENDIX C) were conducted, with closed questions, in a reduced number, and open questions, with a greater predominance. Serving as support, an interview script (APPENDIX D) was used in its written form, which served as "support" during the interview. To conduct the interviews, the cell phone was used for the recording.

How much the credibility of the research was used the technique of reporting colleagues, which according to Thomas, Nelson and Silverman (2012), "a new look can bring new light to a set of data and to our conclusions" (p.38). The second technique used was the clarification of the researcher's inclinations.

3.4 DATA ANALYSIS PROCESS

The Yin cycle (2016) was used, consisting of five phases, where in the first phase the "analysis begins with the compilation and classification of the field notes gathered and other data collection" (p.159). The second phase requires decomposing the data into smaller fragments by doing a decomposition, which can generate labels or codes. This decomposition process can be repeated several times. In the third phase, substantive themes or codes or agglomeration of data are used to reorganize the fragments "into groups and sequences different from those that could be present in the original notes" (p.159). In the fourth phase, the "decomposed material is used to create a new narrative,

with tables and graphs when relevant, which will become the fundamental analytical part of the draft of your manuscript" (p.160). This can be considered as interpretation of the recomposed data. The fifth phase can be considered as completion. "It requires drawing conclusions from your entire study. Such conclusions must be related to the interpretation in the fourth phase and, through it, to all the other phases of the cycle" (p.160).

In order to be carried out, the research is in accordance with the norms determined by the Resolution of the National Health Council – CNS 510/2016, being approved by the Ethics Committee of the Salgado de Oliveira University – UNIVERSO – CAAE: 54071621.0.0000.5289.

4 ANALYSIS AND DISCUSSION OF RESULTS

This stage of the work aims to discuss the results found through interviews and systematic observations, where initially, a brief description of the schools where the interviews and field observations took place was made, followed by the characterization of the interviewees.

School A is located in the Maracanã neighborhood, north of the city of Rio de Janeiro and serves about 200 students in both shifts. The school has good accessibility conditions with ramps and handrails facilitating the access of students with disabilities to the sports court and other rooms. Two teachers from this school unit were interviewed, being identified by A1 and A2. Chart 1 will facilitate the characterization of the respondents of school A.

Table 1- Characterization of teachers in school A

Teacher	Gender	Age	Training	Post-graduation	Time working in school PE
A1	Female	55 years	Graduation in PE	Lato-sensu	20 years
A2	Male	57 years	Graduation in PE	Lato-sensu	3 years

School B is located in the neighborhood of Tijuca, north of the city of Rio de Janeiro and serves about 180 students in a single shift. This school unit has reasonable conditions of accessibility having few stairs and many ramps, which facilitate access to the school premises, including the classrooms, however, access to the main sports court is through stairs. This teaching unit has a multifunctional resource room. Three teachers of this unit were interviewed, identified by B1, B2 and B3. Chart 2 will facilitate the characterization of the respondents of school B.

Table 2- Characterization of teachers in school B

Teacher	Gender	Age	Training	Postgraduate studies	Time working in school PE
B1	Male	50 years	Graduation in PE	It doesn't.	27 years
B2	Female	52 years	Graduation in PE	Lato-sensu	25 years
B3	Female	62 years	Graduation in PE	It doesn't.	37 years

School C is located in the neighborhood of Vila Isabel, north of the city of Rio de Janeiro and serves about 500 students in a single shift. This school does not have good accessibility conditions, and access to the classrooms of the upper floors, made exclusively by stairs, making it difficult for a wheelchair user or a student with mobility difficulties to move. The rooms on the ground floor are more easily accessed by students with reduced mobility because there is no architectural barrier that hinders this displacement. Access to the sports court is also difficult for the student because there are no handrails and the floor is uneven, in addition to having four steps of stairs to get to it. Four teachers from this school were interviewed, identified by C1, C2, C3 and C4. Chart 3 will facilitate the characterization of the respondents of school C.

Table 3 - Characterization of teachers in school C

Teacher	Gender	Age	Graduation	Post-Graduation	Time working in school PE
C1	Male	43 years	Graduation in PE	Master's and PhD	9 years
C2	Male	44 years	Graduation in PE	Lato-sensu	17 years
C3	Male	49 years	Graduation in PE	Masters	19 years
C4	Male	50 years	Graduation in PE	Lato-sensu	19 years

School D is located in the neighborhood of Laranjeiras, south of the city of Rio de Janeiro and serves about 450 students in a single shift. This school has a multifunctional resource room serving students with disabilities, learning disabilities and high skills, in the countershift. Access to the resource room and sports court is facilitated by ramps and/or level flooring. Access to the other rooms is made by stairs making it difficult for students with reduced mobility to access. Three teachers of this school unit were interviewed, identified by D1, D2 and D3. Chart 4 will facilitate the characterization of the interviewees from school D.

Table 4 – Characterization of teachers in school D

Teacher	Gender	Age	Graduation	Post-Graduation	Time working in school PE
D1	Female	52 years	Graduation in PE	Lato-sensu	18 years
D2	Male	46 years	Graduation in PE	Lato-sensu	19 years
D3	Male	61 years	Graduation in PE	Does not have	37 years

Following the analysis and discussion of the results of the research, after characterizing the schools that served as the basis for the studies and the profile of the participants, we will stick to the other topics that were addressed. At first, after listening to the interviews, the transcriptions were made. In this process, four categories emerged, which are: Initial and continuing education; Inclusion; Challenges and Strategies for inclusion in PE classes; Feelings that guide inclusive practice. A posteriori, according to the notes that emerged from the interviews, we highlighted the phrases that repeated or resembled each other and formed the subcategories, which were created to scrutinize the theme addressed in each category and provide more subsidies for the analysis and discussion of the results. Using the Yin cycle, we separate the categories and subcategories according to the table below:

Table 5 – Elaboration of categories and subcategories:

Categories	Subcategories
1- Initial and continuing training.	▪ Learning content aimed at people with disabilities. ▪ Interest and/or need to expand or revise content in the field of disabilities.
2- Inclusion.	▪ Conception of inclusion. ▪ Perception about the participation of students with disabilities.
3- Challenges and Strategies for inclusion in PE classes.	▪ Challenges to inclusion. ▪ Strategies in promoting inclusion. ▪ Difficulties for inclusion observed in the daily life of the school.
4- Feelings that guide inclusive practice.	▪ Feelings in the face of successful or unsuccessful practices. ▪ Interaction of students with and without disabilities. ▪ Discriminatory attitude and need for integration.

Source: Prepared by the author.

4.1 CATEGORY 1: INITIAL AND CONTINUING EDUCATION

This category, in accordance with the specific objective of verifying with the sample group, if the academic and/or continuing education was sufficient to support their work with students with disabilities, will discuss the academic training, with regard to the learning of contents that address the theory and practice of physical activities aimed at people with disabilities, in addition to continuing education, and check with teachers about which or what contents in the field of disabilities, they would like to learn or review.

The respondents were asked about how was the learning of content that addressed physical activity for people with disabilities, during their academic training. Half of the respondents reported that the learning of specific content for work aimed at people with disabilities was very superficial and that they had only one specific discipline on the subject, taught in a single period.

C4 and B1 made reports similar to the above, reaffirming the superficiality of the content transmitted. Such reports were also pointed out in the research of Fiorini and Manzini (2014), who indicated among some difficulties the focus on theory and the little offer of internship in the area of adapted PE. The studies of Falkenbach et al. (2010), also pointed to a fragile initial and continuing education presenting little content on the theme of inclusion in schools, as well as the studies of Barreto et al. (2013), in which most teachers also reported that they did not feel prepared to include students with disabilities. The studies by Cruz and El Tassa (2016) that discussed the inclusive process in a degree course in PE, suggest a reorganization of the discipline focused on physical activity for people with disabilities in order to offer a content that unites theory with practice, in addition to pointing out an expansion of the workload, destined to practical experiences of everyday school life.

Three teachers (A1, B3 and D3) reported that they did not have any specific discipline focused on learning content aimed at people with disabilities. These teachers have extensive experience in the profession and have been trained for more than 30 years, a fact that explains the non-offer of the discipline that deals with the subject in undergraduate courses in PE, since, according to Duarte (2003) only in the late 1980s and 1990s is that the Physical Education courses included in their curricular programs, contents related to people with disabilities and that the didactic material made available that refers to how to work with this specific audience, written in Portuguese, was scarce.

Still discussing the pedagogical training of PE teachers, we verified that the interviewees highlighted the importance of a continuing education or qualification that addresses the theme. Asked if they have participated in any course or training aimed at people with disabilities, 10 teachers answered affirmatively and highlighted the importance of this type of update.

Two teachers, B1 and D1, stated that they did not participate in any course or training, but would like to participate. The complaint of the interviewees gains consonance in the studies of Obruniskova (2008), where the teachers declared to have little or no training in adapted Physical

Education, and in the studies of Freitas and Araújo (2014), where the teachers of the public network of Hortolândia-SP, complained about the lack of training.

Closing this first category, the research participants were asked about what they would like to learn or review in the field of disabilities that could help in their professional practice. In the reports of four teachers, A1, A2, C2 and D1, we verified a concern to learn or review content that can help in the intervention with autistic students. The exchange of experiences with professionals in the area and the acquisition of more information about the types of disabilities were mentioned by four teachers, B1, C4, D2 and D3, respectively. Other notes made by B2, B3 and C1 were in relation to the learning of adaptive activities to meet the needs of students with disabilities, structuring of classes taking into account the reality of public schools and activities that work on inclusion.

4.2 CATEGORY 2: INCLUSION

This category, in accordance with the specific objective of investigating the conceptions about inclusion of physical education teachers in the municipal network of Rio de Janeiro, deals with inclusion, where the study participants reported their conceptions of inclusion, in addition to discussing how they face the participation of students with disabilities in their classes.

Sassaki (2006), understands that inclusion is a process by which society is organized in several dimensions, among which the human, structural, political and others, promoting the reception and development of people with disabilities in our society. UNESCO sees inclusion as "a dynamic way to respond positively to the diversity of students and to look at individual differences not as problems but as opportunities to enrich learning." (UNESCO, 2005, p.9)

The studies by Aguiar and Duarte (2005), which investigated the concept of inclusion in 67 respondents in São Paulo, concluded that about 70% did not have domains of the inclusion concept. The studies by Boaro et al. (2013), Fiorini and Manzini (2016), are similar in pointing out that most respondents understand that inclusion is to ensure the participation of students with disabilities in regular classes, having the same treatment and participating in the same activities as students without disabilities. The research of Barcelos et al. (2020), highlights in the reports of teachers, the reference to the social function of the school, which permeates the teaching work and seeks social insertion.

The first question addressed to the research participants regarding the second category aimed to find out what understanding they have about inclusion.

Most teachers (A2, B1, B2, B3, C1, C2, C4 and D2) understand that inclusion is about making everyone participate, without exception. The teacher must provide opportunities and encourage the participation of all students, including those with some type of limitation.

Four teachers, A1, C3, D1 and D3, reported that they consider inclusion fundamental, but broadened their views, citing inclusion in the social aspect, beyond the walls of the school.

Concluding the second category, we seek to understand with the respondents, how they face the participation of students with disabilities in their classes. Undoubtedly, depending on how the professionals who deal in the daily school with the students, face their participation, will trigger positive or negative actions in the inclusive context, stimulating or discouraging the participation of students with disabilities. The studies of Gorgatti and De Rose (2009), pointed out that 47.8% of the respondents showed not to like the idea of having students with disabilities in their classes.

Analyzing the interviews, we noticed that most of the respondents think the participation of students with disabilities in their classes is important, as reported by teachers A1, B2, B3, C1, C3 and D2.

The position of D3 drew our attention by conditioning the participation of students with disabilities to the way in which the teacher conducts the class.

Diverging from the other respondents, C2 reports that the participation of students with disabilities is small, and according to him: "Schools and teachers are not prepared."

4.3 CATEGORY 3: CHALLENGES AND STRATEGIES FOR INCLUSION IN PE CLASSES

This category, in accordance with the specific objective of identifying the difficulties perceived by the teacher in the inclusion process, refers to the challenges and strategies used by teachers in PE for inclusion in the daily school life.

Participants were initially asked about the challenges of working with students with disabilities. There were several challenges reported by the teachers participating in the research, from the difficulty in planning the activities due to lack of knowledge about the deficiencies and their characteristics, the lack and/or scarcity of varied pedagogical material, lack of support staff assisting the teacher and the student, precarious structure of the schools in relation to accessibility, excess of students per class making the work difficult, among other notes. Some studies, such as that of Gorgatti and Dante Rose Jr (2009), pointed out that schools are poorly prepared and that there is a lack of material resources and adequate spaces. Rodrigues et al. (2019), also reported on the lack of materials and the precarious infrastructure of schools, in addition to the excess of students, lack of information about the characteristics of disabilities and lack of knowledge about the use of the most appropriate teaching strategies. The studies of Fiorini and Manzini (2016), demonstrated difficulties regarding the adoption of teaching strategies that proved to be ineffective regarding the selection and adaptation of resources and the selection of competitive content that hinder inclusion. The studies of Ramos et al. (2015), pointed out some difficulties already reported in previous studies such as inappropriate physical space, scarce and inadequate materials and equipment, lack of educational support, inadequate choice of contents to be worked that favor inclusion, the result of the absence of a consistent training based on inclusive principles.

Two research participants (D2 and D3) pointed out the lack of knowledge about disabilities as the greatest challenge in the work of inclusion. Four teachers (B2, B3, C3 and C4) reported a lack of theoretical or practical knowledge to deal with students with disabilities. Two teachers (C1 and C2), cited as challenges the infrastructure of the school, the material resources and even behavioral issues of the students.

We highlight the speech of teacher D1, who in isolation, pointed out that his greatest challenge is to make students with disabilities participate in collective activities, because according to D1, depending on their disabilities, these students can not concentrate for the activity.

Next, the teachers were asked about which strategy or strategies they use to promote the inclusion of students in their classes. In an objective way, it was sought to understand what practical actions are used by the teacher to promote the inclusion of students with disabilities. We understand and agree with Manzini (2010), that the strategy must be properly planned and flexible, and if the teacher identifies it as non-functional for the student, it must be modified, so it becomes essential to plan more than one strategy for each activity.

Among the interviews, we noticed on the part of seven teachers (A1, A2, B3, C4, D1, D2, D3) the concern to make the class aware, through debate or conversation circle, calling attention to the importance of the participation of all students, regardless of the differences that may be presented, after all we are diverse.

Two teachers (C4 and D2), in addition to putting as a strategy for the participation of the students the debate and the awareness of these, also mentioned as strategies, the use of varied materials and the prioritization of activities that favor cooperation and that do not require specific skills. The studies of Ramos et al. (2015) also pointed to the use of these same strategies, bringing students together to explain the objectives of the class and the activities, in addition to proposing games and games of a playful nature, encouraging the participation of all. In fact, regarding the choice of activities, three teachers, B2, C2 and C3, mentioned the use of diversified activities as strategies for the inclusion of students.

Subsequently, it was sought to verify with the interviewees if the school is prepared to receive students with disabilities and their considerations about the answers. Of the twelve interviewees, eight teachers answered that the school is not prepared to receive students with disabilities, while four teachers (A1, C1, C3 and D2) answered that the school is prepared. The justifications presented by the eight teachers (A2, B1, B2, B3, C2, C4, D1, D3) who said that the school is not prepared to receive students with disabilities, range from the lack of structure of the school, especially with regard to accessibility, the lack of support staff and the lack of training of teachers. One of the teachers also cited the restricted curriculum as an obstacle for the school to better serve the student with disabilities. The problems reported by the teachers, especially those who referred to the lack of school structure and

accessibility, were observed in the field diary, where we noticed unsatisfactory conditions of accessibility such as reduced number and/or absence of ramps, handrails, tactile floor, absence of adapted bathrooms, etc.

Concluding the third category, we seek to understand what are the greatest difficulties found in the daily life of the school, which hinder the work of the teacher. We noticed in the course of the interviews that part of the answers to this question are similar to the answers given by the interviewees when asked about the challenges of working with students with disabilities.

The answers were varied and the notes of three teachers (C3, D1, D2) referred to the excess of students per class, the reduced amount or lack of adequate material, the lack of a trainee or support teacher and the inadequacy of the physical spaces. Three other teachers (A1, A2, D3) mentioned the lack of information or lack of knowledge of the school community about people with disabilities and the importance that inclusion has in the lives of these students. Three other teachers (B1, C1, C4) made different reports among them, but we believe they are pertinent, which refer to the lack of continuity of work with students with disabilities due to their low frequency. Another respondent reported the difficulty regarding the absence of medical reports, which would hinder the adoption of a more adequate strategy to serve them. Another difficulty pointed out is the repeated cases of indiscipline and aggressiveness on the part of some students, hindering and/or inhibiting the participation of students with disabilities and the work of the teacher.

Differently from the other respondents, B2 answered that she does not find any difficulty in her work routine regarding the inclusion of students with disabilities.

4.4 CATEGORY 4: FEELINGS THAT GUIDE INCLUSIVE PRACTICE

This category, in accordance with the specific objective of identifying feelings and/or motivations that mobilize teachers in the task of including students with disabilities in their classes, refers to identifying how PE teachers feel about inclusive practice in the daily life of the municipal schools in which they work in RJ, investigating how these professionals perceive the interaction relationship between students with and without disabilities, how they react to a possible attitude of discrimination against students with disabilities, and if they feel the need to partner with a multidisciplinary team to support their work. Using the etymology of the word feeling we find that it means affection, opinion about something we experience. In the case of research, a professional process within the school. Then, feelings such as anguish, frustration, guilt, revolt, happiness and others, can appear in the speech of teachers.

Initially, the interviewees were asked how they feel about the advances of students with disabilities in their classes. In response to this question, the respondents in their entirety answered that they feel happy, fulfilled, proud, satisfied, among other adjectives with the same meaning, expressing

how significant it is for the teacher to see the evolution of his student, even if it is small. It is an obvious answer if we understand that the educational process is not linear and occasionally there will be advances and setbacks in this walk, however, the teacher as mediator of this process, feels gratified with the progress of his student, especially when the student with disabilities can participate in the proposed activities and can strengthen the relationship with other students, creating an environment conducive to inclusion.

The next question, comes to oppose the previous one, because it is asked to the respondents, how they feel when the student with disabilities can not follow the class. Regarding this question, the answers were diverse. Five teachers (C1, C2, C3, C4 and D2), reported the feeling of frustration in the face of the difficulty of the student with disabilities when following the class. This feeling, reported by two teachers, C1 and D2, is accompanied by a feeling of guilt and questioning at work. Three teachers (A1, B1 and D3) made references to the planning, citing a concern to revise them to try to reach this student. Three other teachers (A2, B2 and D1) reported a certain tranquility, understanding that it is part of the process, however, they are optimistic about the student's evolution. If we observe, these teachers, are in their 50s and have extensive experience in the profession, which in a way, makes them better absorb a possible failure in the participation of students with disabilities, in addition to the experience to make the necessary adjustments for their best use.

Subsequently, it was sought with the interviewees, to verify their perception of the interaction of students with disabilities with students without disabilities. Six teachers (A1, B1, B2, B3, C3 and C4) answered that they consider the relationship of students with and without disabilities in their classes to be good. Three teachers (A2, D1 and D3), understand that it is not possible to point out a unanimity in the relationships between students, they occur with some and do not occur with others because each one has its individuality, however, they emphasize the issue of respect. Two teachers (C2 and D1), pointed out that there is a good coexistence of students with and without disabilities, however, when class activities turn to sports and competition, students with disabilities and students with less ability are excluded.

We highlight the point made by Professor C1, who in isolation, made a report that caught our attention, mainly because we observed this posture in the field. According to C1, the relationships are more distant proportionally to the severity of the degree of disability presented by the student.

Next, we asked the interviewees if they perceived any discriminatory attitude towards students with disabilities, and if so, how did they act? Eight teachers (A2, B3, C1, C2, C3, C4, D2 and D3), answered affirmatively that they had already witnessed discriminatory attitudes towards students with disabilities, and that they recriminated such attitudes, seeking through dialogue, to circumvent the situation.

The report of Professor D2 drew our attention because it was clear in the field observations discriminatory attitudes in competitive activities. These occur with students with disabilities and with students with less ability.

Another report that caught our attention was that of Professor C2, who reported perceiving discriminatory attitudes, but not out of malice, only because of the natural selection they make and that's why, according to his words: "I am in favor of schools only for the disabled separated by type of disability." We respect the opinion of the professor, however, we understand that this represents a setback in the inclusion process.

Four teachers (A1, B1, B2 and D1) answered that they do not perceive discriminatory attitudes in their classes.

Next, we asked the interviewees if they felt the need to integrate with a multidisciplinary team to support their work. Ten teachers (A1, A2, B1, B3, C1, C2, C3, C4, D2 and D3), answered affirmatively and pointed out the importance of this integration to give more subsidies aiming at a better intervention that will enrich the work. The report of Professor D2 drew our attention because it was clear in the field observations discriminatory attitudes in competitive activities. These occur with students with disabilities and with students with less ability.

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5 FINAL CONSIDERATIONS

Fortunately, the inclusion process has been taking place in the municipal network of Rio de Janeiro. The enrollment of students with disabilities has been increasing every year and schools have sought to organize themselves to receive these students. We understand that including is not only guaranteeing access to school, as this is already guaranteed by law. We need more actions that

guarantee permanence and ensure these students a quality education. Challenges are imposed and there is much to be done to provide conditions conducive to inclusion.

In order to investigate the process of inclusion of students with disabilities in schools of the municipal network of Rio de Janeiro, under the perspective of the Physical Education teacher, and based on the analysis of documents and interviews, we understand that some points need to be improved so that the inclusion of students is more effective, creating conditions for the improvement of learning in conditions of equality with other students, attending to the wishes of the teachers, who are mediators of this process. In this way, we conclude that PE training should offer an inclusive approach in all disciplines, not limited to just one. University institutions should offer internships closer to reality than undergraduates will face in schools. The public authorities in their various spheres must provide qualified and continuous training of their teachers, on a regular basis.

With regard to the challenges and strategies for inclusion in the daily school life, we concluded, based on the feelings and opinions of the interviewees, that it is imperative to improve the school infrastructure by improving access with ramps, handrails, tactile floor, adapted bathroom, specific furniture, specific materials for Physical Education, among others. As for the participation of students with disabilities, we conclude that it is necessary to create a favorable environment through debates and the awareness of all about diversity, since we are different regardless of whether we have a disability or not, and cultivate respect. Once this environment is created, the teacher must encourage the participation of all and create strategies that promote inclusion, such as the choice of activities that favor cooperation, playfulness, body expression through games, dance, fighting, gymnastics, minimizing activities that emphasize competition. Another specific strategy refers to planning, providing a diversity of activities and promoting adaptations if necessary.

Regarding the feelings and/or motivations that guide the inclusive practice, as already reported, the teacher feels rewarded when he verifies the evolution of his student and very distressed when he cannot promote this inclusion. To balance these feelings it is important that the teacher does not feel isolated in the educational context. The responsibility for inclusion lies with everyone. Understanding the teachers' wishes, we conclude that it is essential to join forces and promote integration with a multidisciplinary team, in addition to seeking the support of families, and sharing experiences that promote the autonomy of students.

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SEVEN
publicações acadêmicas

Education and writing: In evidence the characteristics and examples of linguistic-discursive operations

Crossref doi
https://doi.org/10.56238/ptoketheeducati-039

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ABSTRACT
The main purpose of this text is to characterize the linguistic-discursive operations by means of examples elaborated by the author himself. Based on the theoretical assumptions of Applied Linguistics and studies on text rewriting, it aims to exemplify each linguistic-discursive operation and analyze how it is systematized in the rewriting process. In order to do so, it is problematized the fact of the student attend or not the reformulations suggested by the teacher in the revision and rewriting practices. The conclusion is that writing is a continuous action, in which the first version of a text cannot be defined as a finished product with the sole purpose of being evaluated by the teacher. It becomes important to conceive the text as a space for reflections, revisions, rereading, and rewriting, in an interlocutory process between teacher and student.

Keywords: Education, linguistic-discursive operations, rewriting, revision.

1 INTRODUCTION

1.1 INITIAL NOTES

In the process of textual production, it is seen that the text does not have its fixed outcome in a first writing. To direct the production of the learner to significant improvements in terms of content and form, it is important to be guided by correction strategies. In the ideas of Serafini (2004), correction can be defined as all the interventions that the teacher performs in the student's text through notes, questions and comments. As the author points out, "it is the set of interventions that the teacher makes in the writing highlighting the defects and errors, in order to help the student to identify their weaknesses and improve" (SERAFINI, 2004, p. 97).

Thus, correction strategies are understood as linguistic-discursive operations proposed by Fabre (1986), studied by Menegassi (1998), Balieiro and Menegassi (2017), Balieiro and Hila (2020) – and understood as "linguistic-discursive" activities by Moterani (2012). The linguistic-discursive operations are divided into four categories: addition, replacement, suppression and displacement.

Based on a qualitative and analytical method, this text has as its central objective to characterize the linguistic-discursive operations through examples elaborated by the author himself. Based on the theoretical assumptions of Applied Linguistics, in studies on text rewriting, especially Fabre (1986)

and Menegassi (1998), the objective is specifically to exemplify each linguistic-discursive operation and analyze how it is systematized in the rewriting process. Therefore, it is problematized whether or not the student meets the reformulations suggested by the teacher in the practices of revision and rewriting.

Initially, such practices are discussed in order to understand the four interventional correction approaches applied in the textual review. After that, the specificities of the linguistic-discursive operations are explained, based on theoretical and practical analyses of texts, to perceive how they manifest themselves in the rewriting and how they lead the students' production to the textual development. The action of characterizing the operations is justified by the importance of understanding how each linguistic operation works, in order to assist in the quality of the texts of students who value the constructive comments made by the teacher in the productions.

1.2 THE TEXTUAL PRODUCTION PROCESS

The stages of the written production process exposed by the literature are: planning, execution, revision and rewriting (MENEGASSI, 2010). With regard to planning, it is seen that there is the involvement of the set of actions that precede the execution of writing. With regard to the second stage of the writing process, the execution, it is noted that it is the moment in which the writer develops the production of the text from the actions carried out in the first stage, the planning.

When dealing specifically with the act of revising, the third stage of the writing process, it is observed that it is the moment in which the critical evaluation of the written text and the possibility of modifications in the original version occur. The review can be carried out both during and after the execution, in addition to being carried out from three different perspectives: a) the student-producer/writer; b) the classmate(s); c) the teacher himself. Menegassi (1998) explains that the practice of revising is an activity that provides the opportunity for the emergence of a new type of process, so that it enables a new phase in the composition of the text, since it is from modifications made in the text that the rewriting originates, the last stage of the writing process.

Regarding the rewriting, it is important to understand it as a stage of improvement of the text, with the clear intention of making it more intelligible to the reader. From the perspective of writing as a work (FIAD; MAYRINK-SABINSON, 1991; MENEGASSI, 2016), rewriting is not a practice restricted to the elimination of formal aspects inappropriate to the standard written norm of the Portuguese language. As Menegassi (2010, p. 92) points out: "It is also to add, replace, suppress and displace information in the text that is in the process of construction." For this, the student, in addition to analyzing with caution what was pointed out in the review stage, resumes the tasks developed in the planning stage, in order to rescue the production conditions that guide the construction of the text, resuming or performing new readings and analyses for the consolidation of their previous knowledge.

It is for this reason that the stages of the textual production process (planning, execution, revision and rewriting) cannot be studied as species of separate sets, since they occur simultaneously to provide the learner with a coherent set of strategies and skills, in fact, they are concomitant and recursive in the writing process.

In the revision stage, before referring the student to the rewriting, the teacher performs interventional forms of correction in the texts, either to indicate a certain problem and solve it, or to classify the problem by means of known codes and establish an interlocution with the student in the form of tickets. For this, the literature names these interventional forms as indicative, resolutive and classificatory correction (SERAFINI, 1989) and textual-interactive correction (RUIZ, 2001). These four correction approaches are discussed more emphatically in the following section.

1.3 THE INTERVENTIONAL FORMS OF CORRECTION

The work of correction is intended to draw the attention of the student to the problems that the text presents in its materialization; Thus, its realization is carried out by the teacher and, in some cases, by the student aware of the process. From this, it appears that the action of correcting is a kind of "error hunting" (RUIZ, 2001), since the teacher focuses his attention to what the text presents of incoherent and erroneous aspects, and not of aspects that favor the textual development. It is for this reason that the work of correction is based on the act of demarcating in the student's text the probable errors related to the content (theme and attendance to the command of the activity) and form (structure of the genre and linguistic performance).

Regarding the terminology "interventional forms of correction", Ruiz (2001) exposes that such forms are considered interventional texts carried out by the reviewing professor to, in fact, carry out the work of correction, which here are considered approaches, not just forms, as studied in the unfolding of the textual-interactive review by Menegassi and Gasparotto (2016). The intervening text is characterized as a text superimposed on the student's text, that is, to show the problems that the outline presents. It can be employed in three different regions of the sheet of paper: 1) in the body; 2) at the margin; 3) in sequence to the text of the learner, a form of correction named by Ruiz (2001) as "post-text". Ruiz (2001), in order to understand how the intervening forms occur, relies on the postulates of Serafini (1989), an author who recognizes the existence of three correction tendencies, all made by Portuguese language teachers: the indicative, the resolutive and the classificatory. For Serafini (1989), as Ruiz (2001) highlights, most teachers alternate between indicative and resolutive corrections, and the classificatory corrections are used in more sporadic circumstances.

In order to highlight a given aspect in the text, it is common for teachers to employ more than one interventional form, so that there is a mixture of the different correction strategies. Among the four correction methods applied in the writing activity (indicative, resolute, classificatory and textual-

interactive), the indicative correction is performed by the teacher in the margin or in the body of the student's text, marking words, phrases and periods written in an incoherent and disconnected way.

Serafini (1989) explains that the correction of resolutive character is a method used by the teacher-subject to correct all the errors detected in the student's text, rewriting words, sentences and entire periods. Because it has a resolutive character, it is seen that this approach is an attempt by the teacher to assume, through the learner, the reformulation of his text. At the moment of effecting the correction, the resolutive character reflects the four operations of textual reformulation: addition, substitution, suppression and displacement (FABRE, 1986), since, when indicating the probable problems for the student, the teacher points out the places of these reformulation operations in the text, sometimes to add information and replace a specific term, sometimes to exclude a word that compromises the meaning of the text, even, to shift shapes.

Ruiz (2001) enters into the third approach recognized by Serafini (1989): the act of classifying. Thus, the classificatory correction is a strategy that consists of the unambiguous identification of errors from a specific classification. The teacher suggests modifications, but what becomes habitual is the fact that he leads the student to correct the error alone. For this, the correction is effective through a classification of errors that is known to the learner. Teachers, in cases of this correction, use a specific set of written symbols located in the margins of the student's text in order to classify the type of problem identified. These sets of written symbols compose a correction code that alternates from teacher to teacher, in which the initial letters of a metalinguistic expression concerning the origin of the detected problem are used, for example: assigning the symbol "A" to deal with problems related to accentuation.

In view of the presentation of the specificities of the three major correction trends theorized by Serafini (1989), it is important to deal with the last interventional form not recognized by this author: the textual-interactive. Unlike the methods of indicative, resolutive and classificatory character, the textual-interactive correction is carried out through more extensive comments written in sequence to the text of the learner, or, in the terminology of Ruiz (2001), characterized as being the "post-text". Such comments are materialized in the form of tickets, without a determined extension, containing two demarcated purposes: 1) to talk about the review task by the student; 2) talk about the task of correction itself performed by the teacher in a metadiscursive way. It is noteworthy that the textual-interactive approach fosters the work of rewriting by the student, in which the positive commitment of the revision made is confirmed, all this in the materialization of notes that evidence affectivity between the subjects involved in the writing process, in this case, teacher and student.

The analysis materials evidenced here correspond to elaborated texts that present notes constructed by a reviewing professor. After the explanation of the correction strategies, it is pertinent to continue to analyze the practice of textual revision, focusing on the use of the linguistic-discursive

operations systematized by Fabre (1986) and studied by Menegassi (1998), Moterani (2012), Balieiro and Menegassi (2017) and Balieiro and Hila (2020).

1.4 THE LINGUISTIC-DISCURSIVE OPERATIONS: DEFINITIONS AND EXAMPLES

In order to characterize the operations of addition, replacement, suppression and displacement (FABRE, 1986; Menegas, 1998; MOTERANI, 2012; BALIEIRO; MENEGASSI, 2017; BALIEIRO; HILA, 2020), the examples are divided into two versions of writing (the first, considered the original, and the second, considered the rewriting of the first version) to verify the effectiveness that such operations have in the rewriting, to the extent that they provide significant improvements in terms of content and form in the students' writing, provided that they are adhered to.

Relying on the theoretical estimates of Fabre (1986), Menegassi (1998), Moterani (2012), Balieiro and Menegassi (2017) and Balieiro and Hila (2020) on the behavior of students at the time of correcting their drafts of texts, five strategies used by them are defined from the applicability of these operations: 1) fully attend to the correction of the teacher and reformulate from what was suggested by him; 2) partially attend to the teacher's correction and make only some reformulations; 3) attend to the teacher's review and complement only with a reformulation, in addition to that suggested by him; 4) choose not to meet the teacher's suggestions for review or not reformulate from what was suggested by him due to lack of understanding in relation to the comment/appointment/questioning; 5) present reformulations that exhaust the suggestions of the reviewing professor. In this strategy, the student has the need to reread his text and rewrite it going beyond what was suggested by the teacher through guiding notes (MENEGASSI, 2016).

Next, the four linguistic-discursive operations are theoretically discussed: a) addition; b) replacement; c) suppression; d) displacement, with the presentation of examples of texts in which the use of each of these strategies in the rewriting activity is observable.

In the addition operation, it is noted that there is the act of adding new information in the rewriting of the text in order to make its content broad, properly explained and coherent to the reader. As a way to exemplify the use of the addition operation in the rewrite, there is the exposition of two examples of text fragments, specifically the first version (Chart 1) and the rewrite (Chart 2).

Chart 1 – First version of the beginning of a text, with questions that a teacher could ask

Once three boys* decided to make a bet. The postlet was like that [...]. *Who were the boys? What's their name? Where did they live?

Source: own elaboration.

Chart 1 shows the beginning of a text, with markings made by the reviewing teacher. Such markings express characteristics of a textual-interactive correction (RUIZ, 2001), since a dialogue is established with the producer of the text in the form of questions, with mixtures of indicative correction

(SERAFINI, 1989), because it is pointed to the student where he will implement the suggested data. In this case, however, the teacher proposes changes, as it instigates the student to think about some details about the characters.

When writing "Who were the boys?", "What's their name?" "Where did they live?", the teacher requests that new information be added to the materialization of the student's text, in order to make the content complete, coherent and elucidative to the reader, so that it contributes to the thematic progression. In this circumstance, the addition operation is effective from the insertion of new information in relation to the identification of the characters involved in the story. The following is the rewriting of the beginning of the text.

Table 2 – Rewriting of the beginning of the text

Once three brothers: Pedrinho, João and Jorge, who lived in a neighborhood and were the children of a cook [...].

Source: own elaboration.

In Chart 2, the student attends to the teacher's questions in the rewriting of the excerpt, specifying the names of the characters Pedrinho, João and Jorge, who these characters were in the story (children of a cook) and where they lived (in a neighborhood). When answering the questions proposed by the reviewing teacher, it is noted that the addition operation helped the student to amplify the content of the text, to consider that new information was provided for the literal understanding of the characteristics of the subjects that integrate the narrative. In accordance with Menegassi (1998), the student used the first strategy of application of linguistic-discursive operations: to fully attend to the correction of the teacher and reformulate from what was suggested by him, without exhausting the direction of the educator.

With regard to the substitution process, there is a suppression, followed by substitution by a term, a new expression. This operation is applied on a word, a phrasing, a grapheme, or on generalized sets. To exemplify the use of the substitution operation, two examples of excerpts from texts stand out, specifically the first version (Chart 3) and its rewriting (Chart 4).

Table 3 – First version of the excerpt of a narrative, with comment from a reviewing professor

The old man liked Daniel and they became father and son because the boy had neither father nor mother and Daniel went to live more the old man. X, your story is good, but you didn't use punctuation marks. Read your text and see that you have repeated it many times, and in its place, put a period and start new sentences.

Source: own elaboration.

In Chart 3, the reviewing teacher highlighted the letter "e" used by the student throughout the text, in order to indicate the repetition that such use caused. Following the student's text, or, in the words of Ruiz (2001): the "post-text", the teacher makes a comment, praising the developed history, in order to highlight the formal slips found: "X, your story is good, but you did not use punctuation

marks. Read your text and see that you have repeated it many times, and in its place, put a period and start new sentences." From this comment, it is evident the predominance of a textual-interactive correction (RUIZ, 2001), since the comment was affected in a guiding note (MENEGASSI; GASPAROTTO, 2016) to the student, as well as an indicative correction (SERAFINI, 1989), through the act of circulating the problem found: the redundancy of the "e". The rewrite of the text looked like this:

Table 4 – Rewriting of the narrative excerpt

The old man liked Daniel, they became father and son because the boy had no father and no mother. Daniel went to live with the old man.

Source: own elaboration.

When analyzing the rewriting (Chart 4), it appears that the student complied with what had been determined by the teacher, replacing the excessive use of "and" by a full stop: "[...] and went to live more the old man." (Table 3, first version); "[...] He had neither father nor mother. Daniel went to live more the old man" (Chart 4, rewritten). Thus, the student fully complied with the teacher's suggestions, not extrapolating them, restricting himself, therefore, to the first strategy highlighted by Menegassi (1998).

Regarding the deletion process, there is a withdrawal, but, unlike the previous operation, there is no replacement of the element that was suppressed. The act of suppression applies to multiple units, accents, syllables, syntagmatic words, graphemes, as well as to one or several sentences and sentences. Two examples are presented that show the occurrence of the suppression operation. The first refers to the initial version of a text (Chart 5) and the second to the rewrite (Table 6).

Table 5 – First version of the beginning of the narrative, with indicative and resolutive corrections

On a beautiful full moon night in the middle of Friday the 13th? It was me and two other friends, Tamires and Yasmim, but we were passing by the semintério and we heard a noise [...].

Source: own elaboration.

When considering the first version of the text (Chart 5), it is observed that the reviewing teacher does not make any comments or questions, only points out the grammatical slips verified in the body of the text itself. In the fourth line, the teacher crosses out the adversative conjunction "but", performing a correction of a resolutive character (SERAFINI, 1989), without marks of interlocution, that is, there is no existence of a dialogue (BAKHTIN, 2003) established from notes between teacher and student. What is called for is the obvious deletion of the conjunction, which, in view of the context, is not used coherently. The following is the rewriting of the fragment.

Table 6 – Rewriting of the beginning of the narrative

On a beautiful night of the full moon, in the middle of Friday the 13th, I and two other friends, Tamires and Yasmim, were passing near the cemetery and heard a noise. We decided to go in there.

Source: own elaboration.

The excerpt presented (Chart 6) proves that the subject-learner made the resolutive corrections proposed by the teacher, removing the conjunction "but", as is verifiable before the use of the verb "we were" and after the name "Yasmim". By being fully guided by the teacher's correction, the student made use of the first strategy postulated by Menegassi (1998), not extrapolating the teacher's resolutive correction, nor ignoring it. This removal of the adversative conjunction "but" consists in the applicability of the act of suppression, having, in the analyzed situation, a resolutive correction with suppression operation.

With regard to the displacement operation, there is the record of a commutation of elements, which change their order in the process of chaining the information of the student's text. With this, the offset is applied to sentences, words or phrasings. Two examples are presented (Tables 7 and 8), following the same scheme as the previous operations.

Table 7 – First version of the end of a narrative, with a note from a reviewing professor

* The boy was so scared that he ended up falling asleep and slept in the haunted house, the other day the house was locked and the boy could not get out of there anymore and had to live forever with the man, and the man did not give anything to the boy to eat and neither did he eat anything until one day they died, they became ghosts and haunted people. End. *This sentence is very large. Break it down into smaller sentences!

Source: own elaboration.

Chart 7 shows the final part of the narrative. In it, the reviewing teacher demarcates with an asterisk the exact place where the student will pay attention to make any changes in the rewriting. The professor points out: "*This sentence is too big. Break it down into smaller sentences!". Thus, the student will focus specifically on the structure of the text, thinking about how the division of sentences can occur in order to avoid the extension of periods. In this case, there is the textual-interactive correction (RUIZ, 2001) marked by the teacher's comment written in the left margin with direction to the student, as well as the indicative correction (SERAFINI, 1989) made by the demarcation of the asterisk, in which the problem to be analyzed and corrected at a later time is located. The rewriting of the final fragments of the narrative stands out below.

Table 8 – Rewriting of the final fragments of the narrative

The boy became so scared that he fell asleep and slept in the haunted house. The other day, the house was locked and the boy couldn't get out of there anymore and had to live forever with the man. The man didn't give the boy anything to eat and neither did he eat anything until they died, became ghosts and kept haunting people. End.

Source: own elaboration.

Based on this excerpt, the change that the text presented from the first version (Chart 7) to the rewritten version (Chart 8) is notorious. Aesthetically, the organization of the paragraphs is presented adequately. The student, in this way, considered the appointment of the reviewing professor, dividing the sentences by means of displacements for the formation of new paragraphs, as is observable in: "[...] in the haunted house. [New paragraph] The other day, the house was [...]" (Table 8); "[...] and had to dwell forever with the man. [New paragraph] The man gave nothing to the boy [...]" (Table 8). There was total attendance of the teacher's appointment, since the student complied with what had been determined by him, not going beyond the suggestion given (MENEGASSI, 1998).

2 FINAL NOTES

From the theoretical assumptions and the exemplificative analyses (Tables 1-8), it was verified that the work with the linguistic-discursive operations allows the students to think about their own acts of writing, leading them to understand that a text does not have a determined outcome after delivering it to the teacher. You need to review it carefully and rewrite it in search of significant improvements in content and form plans.

Fiad and Marynk-Sabinsin (1991), Sercundes (1997) and Menegassi (2010) confirm this information, postulating that writing is a continuous action, in which the first version of a text cannot be defined as a finished product with the sole purpose of being evaluated by the teacher. It is important to conceive the text as a space for reflections, revisions, rereadings and rewritings, in an interlocutive process (BAKHTIN/VOLOSHINOV, 1997) between teacher and student.

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SEVEN
publicações acadêmicas

Project-based learning: A scope review to support the teaching process in higher education

https://doi.org/10.56238/ptoketheeducati-040

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ABSTRACT
Motivating and preparing students for the changes that the world of work imposes is challenging and requires a renewal in the teaching and learning process. In order for education to fulfill its social and formative role, educational approaches should provide students with experience in real problems. In this sense, Project-Based Learning (PBL) is a suitable proposal for the didactic-pedagogical process of universities. The objective of this study is to analyze scientific publications in recent years on the application of PBL in higher education. For this purpose, a descriptive exploratory research was carried out, based on a scoping review. 355 works were identified in the literature, which after applying eligibility criteria resulted in 52 articles (14.6%), and after analyzing the complete article, 14 (27%) remained and served as a support to substantiate the present work. The analysis allowed us to observe that PBL provides students with a direct relationship with real challenges in the industry, finding solutions and treatments for identified problems, which allows the development of competencies based on applied knowledge.

Keywords: Methodology, Learning, Projects, Teaching method.

1 INTRODUCTION

The application of new teaching methods, or the improvement of existing ones, has become an impetuous requirement in the various spheres that make up the educational sector. It can be said that the volatility of the job market is a direct response to the challenges that the world has been facing. According to Lynch et al. (2021), this is an increasing prerogative for educating, especially, students in the fields of science and engineering, in order to perpetuate the advanced development of scientific and technological knowledge.

The new knowledge space implies a change in traditional university education, establishing a new model for teaching. This new model changes the roles of the teacher and the student, focusing on the facilitator teacher and the active learner. The main objective is the acquisition of competences,

where the student acquires knowledge and skills linked to their future professional performance, meaning that the profile of the new academic is oriented towards acquiring knowledge for professional practice (MORALES; GARCIA, 2016, p. 472).

According to Posada (2004), competency-based education involves integrating disciplines, knowledge, skills, practices, and values necessary for the formation of good professionals. In the face of this new scenario, the methodology of Project-Based Learning (PBL) is an effective tool for acquiring the knowledge and competencies that the digital transformation society is demanding. PBL considers that learning occurs through the effort made by students to develop a project (GONZÁLEZ-CARRASCO, 2016).

Project-based learning, as a methodology focused on student protagonism and investigation, is a teaching strategy that helps students plan, implement, and evaluate their own projects (MORALES; GARCÍA, 2016). According to Cook (2006, p. 3), PBL aims to "[...] move away from approaches that typically see the roles of teachers as information transmitters," since it "[...] brings a more student-centered view, where they are actively involved in creating their own learning environment" (NTOMBELA, 2015, p. 32).

It is important to emphasize that a project is a complex task, based on questions or problems arising from a challenge, which involves the student in the conception, problem-solving, decision-making, and search for information that helps in the solution, giving students the condition to work relatively autonomously but relying on the alignments made in small groups (GONZÁLEZ-CARRASCO, 2016).

In line with PBL, the use of the TheoPrax Method, a teaching method of German origin developed in 1993, for example, allows for the integration of teaching and learning to favor motivation and promote professional maturity of students even in the school phase. The method is based on the development of competencies supported by knowledge, skills, and attitudes that contribute to encouraging an entrepreneurial spirit and improving the employability of students in the industry (KRAUSE et al., 2016).

By working on projects, students put their technical and scientific skills to the test through multidisciplinarity, where they create a direct interface with real demands during the various stages, deal with project requirements, manage deliveries, and present results, which makes them think systematically for successful project completion. Furthermore, the use of PBL in the context of higher education proves to be a challenging strategy, where students develop deeper levels of understanding and acquire new skills that will help them cope with the challenges of the working world (GUTGARTS, 2020; ZAMORA-POLO, 2020; JIANG et al., 2020; PORTUGUEZ CASTRO, GÓMEZ ZERMEÑO, 2020; MORALES, GÀRCIA, 2016).

As an active methodology, the focus on project development in higher education instigates a more specific study, which allows identifying which strategies and approaches are used and how they are observed in the literature, as pointed out in this scoping review.

2 MATERIALS AND METHODS

This study was conducted through a scoping review, following the PRISMA-ScR[1] reporting guideline, without following a specific research protocol. The references obtained in the search were managed using Thomson Reuters Endnote X8 software (Clarivate Analytics, Philadelphia, PA, USA).

The research question that will be answered is: "What are the strategies used to maintain teaching and learning activities through project-based learning?" Regarding the selection criteria, studies that presented any type of educational strategy, method, or technique that used a project-based learning approach from any country were included. Studies that did not meet the eligibility criteria, as well as those that only theoretically reported data or aimed to obtain the perception of PBL practice, were excluded. Commentaries, editorials, conference abstracts, reports, systematic reviews, and other articles with personal information were not considered. Likewise, studies unrelated to teaching and learning were excluded (APPENDIX A).

The search strategy[2] was developed and executed by the reviewers and adapted to the Scopus® (Elsevier) database. The searches were performed on July 25, 2022. The results were filtered by access type (open access), publication stage (final), and document type, where only articles were selected, provided they were written in English, Spanish, or Portuguese and in the 'open access' format.

The article selection was performed in two stages by two reviewers (CC and MS), using the Rayyan® platform. In stage one, both reviewers independently read titles, abstracts, and methods and applied eligibility criteria. In stage two, the same two reviewers read the full text. In both phases, all retrieved information was cross-checked by a third reviewer (VP). The final selection was based on the full text.

Regarding data collection and mapping, the results obtained from the analysis of both reviewers were gathered in a spreadsheet. Subsequently, a table was generated with the collected data, which included the characteristics of the studies (author, year, and location), the title, the objective, and the main strategic measures for the teaching and learning process. The synthesis of the results was performed narratively in the discussion, and the studies were grouped in descending order based on the year, as shown in Table 1.

[1] Available at: http://annals.org/article.aspx?doi=10.7326/M18-0850, accessed in May/2022.
[2] (TITLE-ABS-KEY (project AND based AND learning) AND TITLE-ABS-KEY ("higher education") AND TITLE-ABS-KEY (universit*)) AND (LIMIT-TO (PUBSTAGE , "final")) AND (LIMIT-TO (DOCTYPE , "ar")) AND (LIMIT-TO (LANGUAGE , "English") OR LIMIT-TO (LANGUAGE , "Spanish") OR LIMIT-TO (LANGUAGE , "Portuguese")) AND (LIMIT-TO (OA , "all")).

3 RESULTS

The Scopus® database returned 1,779 references. After removing duplicate articles using reference management software, 1,689 remained. After applying filters for language, publication type, and open access format, 355 (20%) articles remained for analysis. These were screened by title and later by abstract using the Rayyan® Platform. Of these, 52 (14.6%) studies were selected, but only 14 (27%) remained in the sample because they met the inclusion criteria. A summary of their descriptive characteristics is available in Table 1.

Table 1 - Characteristics of the included studies

AUTHOR, YEAR, PLACE, TITLE	OBJECTIVES	STRATEGY
(ARAUJO et al., 2021) United States of America Innovation in the teaching of introductory physics in higher education: the Applied Physics 50 course at Harvard University	Present a teaching methodology based on teams and projects, created in the context of Applied Physics 50 (AP50), a course at Harvard University.	Project-Based Learning (PBL)
(MARTÍN-GARIN et al., 2021) Spain Pedagogical approaches for sustainable development in building in higher education	To use the conception, development, and implementation of innovative and alternative educational proposals to current teaching models, with a clear focus on sustainability-related concerns.	Project-Based Learning (PBL)
(HASLAM; MADSEN; NIELSEN, 2021) Denmark Problem-based learning during the covid-19 pandemic: Can project groups save the day?	Discuss how digital PBL, through project groups, had a positive impact on student motivation during the COVID-19 lockdown.	Project-Based Learning (PBL)
(FERNANDES; DINIS-CARVALHO; FERREIRA-OLIVEIRA, 2021) Portugal Improving the performance of student teams in project-based learning with scrum	To analyze the effectiveness of Scrum for project and team management in PBL teams in higher education.	Project-Based Learning (PBL) linked to Scrum Methodology
(HERGET, 2020) Portugal Project-based learning in the languages for specific purposes classroom	Present an approach with PBL, introducing the students of the Master's degree in "Languages and Business Relations" at the University of Aveiro to two Translation Management Systems (TMS).	The Traduction Management System (TMS), providing a set of hands-on projects.

AUTHOR, YEAR, PLACE, TITLE	OBJECTIVES	STRATEGY
(JIANG et al., 2020) China Teaching towards design-based learning in manufacturing technology course: Sino-Australia joint undergraduate program	Following the seven principles of design-based learning (DBL) to carry out a process planning project for teaching and learning in the Manufacturing Technology course.	Design Based Learning (DBL)
(GUTGARTS, 2020) Russia Practical aspects of project-based learning in the study of the discipline "developing information systems"	To apply the design thinking approach to students with study profiles related to the study of disciplines focused on information systems (IS) design.	Project-Based Learning (PBL)
(PORTUGUEZ CASTRO; GÓMEZ ZERMEÑO, 2020) Mexico Challenge based learning: Innovative pedagogy for sustainability through e-learning in higher education	Implementing Challenge Based Learning (CBL) as an innovative pedagogy through online education in this specific study group.	Challenge Based Learning (CBL)
(ZAMORA-POLO et al., 2019) Spain Developing project managers transversal competences using building information modeling	Analyzing the experience of PBL in projects carried out within the context of a project management course at the University of Extremadura.	Building Information Modeling (BIM) Methodology using Project-Based Learning (PBL)
(MORALES; GARCÍA, 2018) Spain Project-based learning: A university experience	Encourage and develop teamwork competencies, management skills and strategies, locating, researching, and evaluating information from electronic documentary sources, verifying reflection, investigations, and knowledge construction.	Instructions for the students to determine the problem to investigate, describe the purpose of the project, specify the design, rules, and evaluation method.
(VIRTANEN; RASI, 2017) Finland Integrating web 2.0 technologies into face-to-face PBL to support producing, storing, and sharing content in a higher education course	Present and discuss the development and implementation process of a PBL-based course, held at the University of Lapland, Finland, during the year 2014.	Project-Based Learning (PBL)
(LEAL FILHO; SHIEL; PAÇO, 2016) United Kingdom Implementing and operationalising integrative approaches to sustainability in higher education: the role of project-oriented learning	Explore the role of PBL and discuss how the pedagogical philosophy not only allows students to implement and enhance the skills necessary for employability, but also raises awareness about sustainable development.	Project-Based Learning (PBL)

AUTHOR, YEAR, PLACE, TITLE	OBJECTIVES	STRATEGY
(GONZÁLEZ-CARRASCO et al., 2016) Spain The development of professional competences using the interdisciplinary project approach with university students	Describe the experience conducted by a group of teachers from different departments of the University of Girona (Catalonia, Spain) through an interdisciplinary work, to promote relevant skills for the professional sector.	A project should be analyzed and diagnosed from different perspectives to generate various alternative solutions.
(NTOMBELA, 2015) South Africa Project-based learning: In pursuit of androgogic effectiveness	Present the effort of a University in Oman to introduce PBL through a project component offered at the foundation level.	Project-Based Learning (PBL)

Souce: Authors(2022).

In summary, the years 2020 and 2021 presented the highest number of studies on the researched topic. Analyzing the highlighted area, the main focus was on Social Sciences, followed by Computer Science, Environmental Science, and Engineering. Among the most representative keywords are: learning, teaching, students, education, and Project-based Learning (PBL). Spain, the United Kingdom, Russia, Portugal, Finland, and China stood out as reference countries for the application of projects as a teaching and learning strategy.

In studies that explicitly aimed to investigate the use of PBL, the specific focus was on the pedagogical approach of the course in terms of meaningful learning, development of critical thinking, acquisition of soft-skills competencies and abilities, collaborative work, and the possibility of solving real problems in the educational context (DINIS-CARVALHO; FERREIRA-OLIVEIRA, 2021; HASLAM; MADSEN; NIELSEN, 2021; HERGET, 2020; ZAMORA-POLO et al., 2019; VIRTANEN; RASI, 2017; LEAL FILHO; SHIEL; PAÇO, 2016; FERNANDES; NTOMBELA, 2015).

Portuguez Castro, Gómez, and Zermeño (2020) discussed Challenge-Based Learning (CBL), involving the application of knowledge during professional training. Fernandes, Dinis-Carvalho, and Ferreira-Oliveira (2021) conducted a study to analyze students' perception of the use of PBL through the application of the Scrum method, a project management approach.

In the next section, it is possible to see the different and innovative strategies resulting from the use of PBL as a teaching and learning methodology, as pointed out by the cited authors.

4 DISCUSSION

Fernandes, Dinis-Carvalho, and Ferreira-Oliveira (2021) conducted their study in the fourth year of the Integrated Master's in Industrial Engineering and Management program at the University of Minho, Portugal. The study evaluated the performance of student teams in project-based learning

with the Scrum framework. Scrum is an agile methodology developed and used in software companies to help teams manage their projects and develop effective applications to meet customer expectations. With a focus on analyzing the effectiveness of Scrum for project management in PBL teams in higher education, the authors used an exploratory case study. The perception of 92 students was conducted through an online questionnaire made available to students at the beginning and end of PBL projects. In addition, direct observation with the teams that worked on the projects, group meetings, analysis of documents (Sprint Planning, Burndown charts, Scrum boards, etc.), and informal conversations were carried out during the years 2017 to 2019. The results show that task assignment, performance monitoring, visual management, and regular feedback pointed to the main advantages of using Scrum in PBL teams, with a positive impact on student performance. For the success of Scrum, students recognize the role of the Scrum Master and the Project Owner as vital to guiding teams sustainably. According to the authors, research on the application of Scrum in education is scarce and mainly exploratory, making this study a valuable contribution to improving the performance of PBL teams with the use of agile approaches such as Scrum.

Araújo et al. (2021) applied a team-based and project-based teaching methodology, created in the context of the 'Applied Physics 50' (AP50), a course at Harvard University, USA. The objective was to increase student engagement in teaching activities, teamwork skills, self-directed learning, and professionalism. Students were organized into small, self-selected groups, guided by the professor based on real-world problems that made sense to them. Before classes, a synchronous preparatory activity was conducted, where students collaboratively read textbook pages in a flipped classroom format. Next, each of the activities was presented, indicating the pedagogical principles and ways to implement them. The proposed activities emphasized the conceptual understanding of physics concepts using peer instruction (PI) and the application of these concepts. Tutorials were made available as support for the professor, who assumed the principle that a student can learn from another and that discussions among peers foster the ability to question, listen, and identify. In detail, the authors described the pedagogical principles of AP50, as well as teaching techniques and strategies as a stimulus for reflection on the possibilities of reinventing introductory-level physics teaching, considering the specificities of each educational context. In conclusion, the authors emphasized their position in defense of the importance of differentiated pedagogical aspects and expanding horizons on what is taught, guiding the search and adoption of didactic innovations.

Martín-Garin et al. (2021) work presented education for sustainable development (ESD) as one of the great challenges that university teachers need to face. Thus, a multidisciplinary team from the Faculty of Engineering of Gipuzkoa (EIG), at the University of the Basque Country (UPV/EHU), in Spain, developed different pedagogical approaches that were applied in construction courses, namely Civil Engineering and Technical Architecture. Pedagogical tools such as problem-based learning

(PBL) or research-based learning (RBL), and environmental tools such as life cycle assessment (LCA) and computational thinking (CT) were used, following the logic that in doing so students acquire a sustainable approach to working on soft skills competencies in sustainability. The authors emphasized that research-based tools helped to revalue waste both outside and inside the university, contributing to more sustainable industrial processes, as well as academic projects and designed tools that were deemed suitable for teaching. However, to demonstrate their potential in terms of sustainable education, holistic rubrics based on in-depth quantitative educational research are needed.

A study conducted by Haslam, Madsen, and Nielsen (2021) describes how a Danish university adapted to the circumstances brought by the COVID-19 pandemic. The institution has a long tradition of using Problem-Based Learning (PBL) as the central educational principle for all student learning activities, based on the idea that students learn best while engaged in problem-solving. The study found that prior to the pandemic, programs of study focused on group projects, with semester-long projects accounting for 50% of the semester grade and consuming 50% of the students' time. The focus was on providing a social structure that would allow students to work closely with their group colleagues, apply the knowledge gained in lectures and classes, collaborate with public or private organizations to understand the complexity of the problem and the potential solution in a real-world scenario.

With the advent of COVID-19 and the need for social distancing, this traditional approach to learning became impossible, forcing the PBL groups to become digital and distributed. Through semi-structured interviews with students, teachers, managers, and the digitalization team, the authors investigated how those involved experienced the lockdown and how they adapted to distance learning, its speed, benefits, impact, and intentional consequences. They also surveyed 632 social science students about their experience with online learning and the usability of software such as MS Teams from the perspective of the IT department.

The study found that 60% of students evaluated online supervision positively, 54% evaluated live lectures positively, and 48% evaluated recorded lectures positively. However, the majority of students (60-62%) reported a preference for traditional face-to-face classes and supervision. The study also found that online learning brought various challenges related to limited social interaction, but being part of a PBL project group and collaborating digitally helped to neutralize feelings of isolation, lack of interaction, and concentration problems. Because activities continued to center around PBL projects, students met online frequently to interact with their colleagues, supervisor, and the case company. This motivation and sense of belonging helped to maintain positive interpersonal relationships, providing fundamental psychological energy and responsibility for engagement.

The study challenges the established idea that PBL requires face-to-face interaction among students in designated group rooms on campus and that digital PBL plays a more projected role in learning outcomes. The authors noted that further research during and after the COVID-19 pandemic

is needed to analyze the long-term impact of this rare event on PBL practices, including how to balance in-person and digital instruction.

The study by Portuguez Castro and Gómez Zermeño (2020) presented an innovative teaching methodology called '*Aprendizaje Basado en Desafíos* (CBL)', which involved students and put them to solve real-world challenges, while applying the knowledge acquired during their professional training. It is a qualitative case study that explores several real-life cases with observations, interviews, audiovisual materials, documents, and reports. The sample consists of 20 university students from different areas of a university in northern Mexico. During five weeks of activities, the students worked collaboratively and participated in challenges related to the United Nations' Sustainable Development Goals (SDGs), seeking solutions to social problems by proposing products and services that could be converted into entrepreneurial businesses using the e-learning modality. The information was collected through discussion forums, questionnaires, observation guides, evaluation of activities and proposed solutions. The results showed that the participants generated sustainable business ideas, oriented towards solving local, national, and global problems. The authors concluded that CBL as an innovative pedagogy presents students with multidisciplinary and specific real-world study fields and challenges, strengthening motivation to conduct research and find solutions that address the realities of their surroundings. CBL is a communication tool that facilitates collaborative work and interactions between participants at different times and places, as well as allowing the integration of innovative and low-cost communication technology tools.

Gutgarts (2020) provided an example of the use of project-based learning (PBL) elements in Soviet higher education in the specialization course "Information Technology," as well as its projection on a modern educational platform. The goal was to consider individual methodological issues and practical recommendations for the application of the PBL method for students in study profiles related to disciplines focused on information system (IS) design. The result of the study focused on the possibility of introducing interdisciplinary project-based education, in particular, the participation of students from other specializations in projects aimed at creating functional IS. The authors concluded that the introduction of project-based learning in university-level information technology education enables the resolution of distinct problems, such as: (1) the ability to respond to rapid changes; (2) redistributing functions among project participants if necessary; (3) interacting with all project participants; and (4) demonstrating creativity. They emphasized that the introduction of project-based learning in higher education cannot and should not be understood as just another process, as it will require a review of the curriculum and content of disciplines due to its scope.

As reported by Herget (2020), for many decades, higher education institutions have incorporated the use of PBL into their curricula as a response to preparing students for new professional challenges and expanding their opportunities. This article explored the implementation of two

Translation Management Systems (TMSs), Memsource and memoQ, in the language classroom and aimed to identify specific project activities that can be carried out to promote foreign language learning in the 'Languages and Business Relations' master's classroom at the University of Aveiro, Portugal. According to the author, the PBL methodology aims to add value to language learning and better prepare students for professional practice. Both Memsource and memoQ provided a set of interesting features that can be explored with the help of collaborative and problem-solving strategies in real-world scenarios, providing students with knowledge in a different field of study and promoting the creation of transversal competences. Both TMSs provided an ideal work environment for practical project management activities, as all stakeholders have the possibility to interact and gain work experience by carrying out a set of practical exercises. The classroom activity described aimed to familiarize students with TMSs and provide them with a basic understanding of the workflow of a translation project. Given the importance of adopting PBL methodologies in higher education settings, the exploration of how TMSs can be used in the language classroom to increase student language proficiency is an interesting research question that deserves further exploration by the authors.

Jiang et al. (2020) used a Design-Based Learning (DBL) approach for students in a joint degree program facilitated by the Wuhan University of Science and Technology in China, along with Deakin University (DU) in Australia. DBL is a form of inquiry-based learning that integrates design thinking and design processes in the classroom to enhance 21st-century skills such as communication and collaboration, promoting deeper learning. DBL, being an active, collaborative, and integrative teaching methodology, is used in various engineering courses. It is a self-directed approach that starts with the student's learning process, with the teacher as a supervisor. DBL is a form of project- or problem-based learning where students work in teams to gain knowledge while designing a meaningful solution (object, artifact, or report). It involves collecting information, identifying a problem, suggesting ideas to solve it, and evaluating solutions. Once students have chosen the problem to focus on, they design a solution to solve it. Finally, students receive feedback on the effectiveness of their project, both from the facilitator and other participants. The authors focused on the seven general principles of DBL (clear concepts, problem definition, problem analysis, identifying possible solutions, defining the task set, researching for a solution, and synthesizing the results achieved) and conducted a process tutoring planning project in the Manufacturing Technology course. Many awards were won by the students, demonstrating satisfactory results in the case study on teaching practice with DBL. The authors concluded that the pedagogy with DBL improves the quality of teaching in joint courses and programs, further strengthening the internationalized engineering education for sustainable development of regional universities in China.

Zamora-Polo et al. (2019) analyzed a PBL experience carried out in the context of a project management course at the University of Extremadura in Spain. The project included an environmental

impact study and a health and safety study based on the analysis of a technical project using the BIM (Building Information Modeling) methodology. Students were required to understand the advantages and disadvantages of BIM tools and methodologies, create a construction project and its complete documentation, and integrate the information into a digital model, detecting conflicts, defining schedules, and simulating costs. The activity was carried out by groups of four students (two from mechanical engineering, one from electronics, and one from electrical engineering), totaling 66 project participants. The results suggested that BIM can be considered a virtual learning environment from which students value the transversal competencies developed, as well as bring potential benefits to project management. The observed emotional performance was quite positive, and in the future, students will be able to manage negative emotions such as anxiety, fear, and frustration. The authors concluded that the students valued the usefulness of the initiative, expressing a desire for a methodological change in university classes, and found that the BIM methodology could be useful for other courses. The results obtained showed a line of work to be done to improve student training and university teaching.

Morales and Garcia (2018) conducted an innovation experiment with 107 students from the Early Childhood Education undergraduate program at the University of Seville, Spain. The experiment involved the use of PBL methodology, a teaching strategy in which students plan, implement, and evaluate projects that have real-world applications, going beyond what happens in university classrooms. For the authors, PBL is a student-centered methodology that makes them protagonists of their own learning. The objective was to promote and develop competencies related to teamwork, management strategies, research, and evaluation of information contained in electronic documents for the construction of knowledge. The 107 students belonged to different classes, with group 1 composed of 56 students and group 2 composed of 51, forming 30 small work groups of three or four participants. A series of elements were organized and directed to guide each phase (problem to investigate, project purpose, specifications, rules, and evaluation), what the teacher's role should be, and what results were expected to be achieved. The results showed that 70.6% of the students in group 1 and 84.6% of group 2 achieved a notable qualification in the development of projects, indicating that PBL has a positive effect on fundamental knowledge and the construction of skills such as collaboration, critical thinking, and problem-solving, as well as an increase in motivation and commitment of students. Among the main advantages of this type of methodology, the authors listed the level of student satisfaction, as well as the creation of a positive learning environment.

In the article entitled "Integrating web 2.0 technologies into face-to-face PBL to support producing, storing, and sharing content in a higher education course", Virtanen and Rasi (2017) presented and discussed the development and implementation process of the "Moving Images in Teaching and Learning" course based on PBL, which was carried out at the University of Lapland in

Finland. Throughout the project, the traditional face-to-face course was redesigned as a mixed PBL course, integrating Web 2.0 applications. The pedagogical logic was to support students' meaningful learning in various phases of the PBL process and to allow for easy storage and sharing of ideas produced in groups. A questionnaire including 30 questions about processes, resources, and learning evaluations was presented to the students, as well as questions that evaluated the experienced emotion, the main reasons for experiencing the emotion, and interviews about previous experiences with PBL and Web 2.0. The idea was to create more opportunities for students to report their process during independent knowledge acquisition and for the teacher to monitor and support students' information-seeking processes. The authors pointed out that characteristics of meaningful learning, collaboration, cooperation, and conversation were favorably evaluated. Although all students in the course agreed that they were in an active role, they realized that this role was not always fulfilled in practice when students arrived at the session without preparation and prior knowledge acquisition. Furthermore, students critically evaluated self-direction, including time management skills.

The concept of sustainable development has gained significant attention since the Brundtland Report. Higher education institutions worldwide have increasingly emphasized the acquisition of a broader range of skills or attributes within the taught curriculum, which should lead students to a widening of their chances of academic success, particularly in the job market. Among others, issues related to sustainable development play a fundamental role, but many universities still do not adopt integrative approaches that can help them address sustainability issues in a transformative manner. With the aim of exploring the role of PBL and discussing the pedagogical philosophy for promoting awareness of sustainable development, the study entitled "Implementing and operationalizing integrative approaches to sustainability in higher education: the role of project-oriented learning" was structured. Data collection occurred in three stages, a secondary survey to understand the processes used in PBL, analysis of documented case studies, and personal contacts with potential examples that were identified. The authors concluded that PBL is a valuable pedagogical approach, but it requires the selection of appropriate projects, with support for students seeking more sustainable and innovative solutions, while enhancing the knowledge and skills of participants. Furthermore, experiential learning, in real-world scenarios, allows the development of competencies that will not only be valued in the workplace, but vital if the world wants to rectify sustainable development. (LEAL FILHO; SHIEL; PAÇO, 2016).

González-Carrasco et al. (2016) described an experience conducted by a group of teachers from different departments at the University of Girona, in Catalonia (Spain). This experience arose from the need to develop interdisciplinary work in order to promote relevant competencies for the professional sector. Undergraduate students from different courses were challenged to work collaboratively and interdisciplinarily on a project related to the management of a school canteen. The objective was to

promote the development of competencies closely associated with the professional world, such as teamwork and problem-solving through a contextualized project that required interdisciplinarity. For two years, the teachers met to organize an activity that involved collaborative work in an educational project based on PBL methodology. The structuring was based on the discursive logic of WHAT (specific objectives and necessary strategies), HOW (definition of the key elements that the proposal should contain), and WHY (experimenting and obtaining the maximum individual and teamwork performance). Two levels were specified, namely: the first required students to develop a management model for the school cafeteria, with changes in the food model and activities offered; the second was defined as the Messi Project of Vall d'Aro (in Catalan, meaning sustainability). The project was developed over two months and completed after four joint work sessions of 2 hours between teachers and students, involving 22 students, including five from the agri-food program, four from industrial engineering, four from medicine, and five from psychology. The activity showed that it is feasible to carry out innovative, contextualized, real-life, and interdisciplinary research, as it allowed students to structure and organize their knowledge through problem-solving, resulting in greater retention and understanding of the studied knowledge and its practical application. According to the authors, this type of environment helps students understand why, how, and when they can apply their knowledge, contributing to increasing student motivation and commitment to their team.

In an attempt to standardize the Fundamental Programs for higher education providers in Oman, providers should offer programs that ensure andragogical effectiveness. The term andragogy comes from the Greek word "aner" with the root "andra", which means man, or adult, and "agogos", which refers to leader, being widely known as 'the art and science of helping adults learn'. In light of this, Ntombela (2015) presented the attempts of a University College in Oman to introduce the PBL methodology, since recent graduates demonstrated a deficiency in soft skills. As a result, the project was designed with the aim of achieving learning outcomes such as teamwork, meeting deadlines, critical thinking, and research skills. These projects focused on: (i) Employee Portrait Gallery, in which students collected information about college employees they interviewed; (ii) Brochure aimed at communicating the research results that students conducted around a university theme, such as Road Safety; and (iii) Class Magazine that presents information collected through interviews and research on university topics that should be presented in an informative and fun way. Most importantly, the project relied heavily on the six-step approach that supported the delivery and learning mode, namely: think - brainstorming through spider diagram; research - retrieving information through interviews, research, internet, library, among others; plan - categorization, ensuring only relevant information is recorded; record - recording stage, writing, contributing as a group; edit - treating texts, errors and corrections, first by students and then by the teacher; and present - demonstrating the final product, ensuring compliance with expectations. This process required a change in the traditional role of the

teacher as the center of the learning process to that of students who took responsibility for their learning. According to the author, andragogical principles are not only true for adult learners but apply equally to most students in general. However, the project, in this case, is not an approach, but a subject, the chances of transferring skills to other components are compromised; and also because projects are largely initiated by teachers, andragogical principles seem compromised.

5 CONCLUSION

The literature review from this scope review allowed us to observe that the current educational context seems to emphasize that the teaching and learning process should be student-oriented, and that the teacher should act as a mediator, observer, and questioner, leading the students to rethink their acquired knowledge.

The project-based approach is an inductive approach that underlies the principles of PBL. This is demonstrated by the increase in 21st-century skills, reported by different authors, who seek to equip students with a modern, work-oriented learning approach. Although not an easy methodology to apply, the results obtained can be demonstrated by high student satisfaction and excellent interactions with teachers, creating a positive learning environment.

It is also noteworthy that the interdisciplinary nature of the project increased student motivation and commitment to other team members, as well as building relevant competencies for the professional world, fulfilling the main characteristic of competency-based education, which integrates disciplines, knowledge, goals, practices, and values for good professionals.

In summary, PBL is a teaching strategy where students plan, implement, evaluate, and apply their projects in the real world, far beyond the university classroom. It is an innovation that when put into practice fosters and develops a variety of competencies, mainly related to teamwork, management skills, research, evaluation of information, and above all, knowledge construction.

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APPENDIX A - Studies not eligible for the sample with respective description.

AUTHORS	DESCRIPTION
(AZEVEDO et al., 2022)	Apresentation and description at the MathE Plataform for use and learning environment.
(CUNHA et al., 2022)	Assessment of the long-term impact of the course, focusing on identifying relevant metrics that characterize the career evolution and professional status of former students.
(FEIXAS; MARTÍNEZ-USARRALDE, 2022)	Research case study on the transfer of assessment to teaching innovation projects, based on an interview and discussion group.
(JÄÄSKÄ; AALTONEN, 2022)	Semi-structured qualitative interviews, data analysis, to gain understanding of teachers' perceptions on the application of game concepts in the educational context of project management.
(MELGUIZO-GARÍN et al., 2022)	Application of questionnaires to measure undergraduate students' group work skills, using the PBL methodology.
(ALAMRI, 2021)	Research on the perception of the potential use of PBL and combined learning, through the application of a questionnaire that assesses the perceived self-efficacy, pleasure and usefulness of the approach
(AL-BUSAIDI; AL-SEYABI, 2021)	Research study based on students' perception of the project-based approach to teaching design principles as part of the undergraduate educational curriculum.
(ÁLVAREZ et al., 2021)	The study focuses on the evaluation, through a questionnaire, of the incorporation of SDGs in the curricular trajectory of the civil engineering course, supported by PBL.
(DÍAZ; GARCÍA; HERNÁNDEZ, 2021)	Theoretical studies on project planning, negotiation skills, teamwork, among others, using the logical framework approach (LFA).
(DINCĂ et al., 2021)	Research carried out together with a collaborative project to better understand the different characteristics of a group dynamics in relation to the composition of the disciplinary group, a mixed methodology.
(GALVÃO et al., 2021)	Focus on the contribution level of doctoral students to the resolution of sustainability problems, based on the research perspective.
(MIELMANN, 2021)	Case study analysis, structured questionnaire and student engagement survey.
(NGUYEN, 2021)	Analysis of data collected on student responses to activities used to check knowledge, group work, team involvement, communication skills, and project management skills.
(PUENTE et al., 2021)	Theoretical study on a project that analyzes the implementation of learning services in an engineering course, with social impact.
(ROYLE, 2021)	The study brings a set of findings on the use of PBL from interviews in semi-structured groups, with students and staff of undergraduate courses in arts and sciences in the Palestinian context.
(ABUHMAID, 2020)	Research carried out through a questionnaire to examine the impact of the online learning environment on the implementation of PBL, using a post-test with an experimental group and a control group.
(ARÁNGUIZ et al., 2020)	Qualitative analysis of pedagogical results linked to the development of critical thinking in project-based learning.

AUTHORS	DESCRIPTION
(FEIXAS et al., 2020)	Use of interview techniques to verify students' perception of collective projects.
(GRANADO-ALCÓN et al., 2020)	Exploratory cross-sectional study based on a questionnaire to identify the perception of academics in the acquisition of competences through PBL.
(MIHAELA; AZTEFANIA, 2020)	Study based on interviews that analyzes the challenge of preparing teachers and researchers to implement PBL.
(PEDERSEN; HOBYE, 2020)	Use of a single case study to explore problems with a focus on raising reflections on evaluative practice, not limited to bringing a discussion on the use of projects.
(SALMINEN-TUOMAALA; KOSKELA, 2020)	Exploratory qualitative study, using a questionnaire, which sought to describe the experiences and views of university professors on simulation as a teaching and learning method.
(ALMEIDA; SIMOES, 2019)	The study used the results of 25 innovative projects, with educational practices that include games and emerging practices in IoT, AR, big data and cloud computing for data investigation and comparative analysis of results.
(CAZORLA-MONTERO; DE LOS RÍOS-CARMENADO; PASTEN, 2019)	Application of a self-assessment questionnaire focused on the perception of the teams after implementing the planning and sustainable development program in graduate programs.
(HÖGFELDT et al., 2019)	The study describes, evaluates and discusses a participatory implementation project of challenge-oriented education, focusing on Activity Theory (AT)..
(KUMPULAINEN; VIERIMAA; KOSKINEN-KOIVISTO, 2019)	Study of the social interactions, behaviors and perceptions that occur within groups, teams, organizations and communities, with a focus on connective pedagogy and culture.
(STRACHAN et al., 2019)	The study is configured as a report and focuses on sharing the experience of incorporating research-based education for sustainable development and the use of innovative pedagogy in vertically integrated projects.
(PALAZUELOS et al., 2018)	Descriptive approach based on the analysis of students' perception of PBL and on the demonstration of positive effects on knowledge.
(STOKES; HARMER, 2018)	Activities developed with a focus on testing three learning theories (experiential learning, constructivism and transformative learning) and investigating, using interviews, the findings applied to projects from the perspective of the participating groups.
(AUSÍN et al., 2016)	Application of a questionnaire to assess the appreciation of students with the project carried out in the course.
(HUBER; HARVEY, 2016)	Analysis of final project reports and interviews with leaders (systematic review)
(RODRÍGUEZ-SANTERO; TORRES-GORDILLO; PERERA-RODRÍGUEZ, 2016)	Opinion poll based on a questionnaire on different aspects of the PBL methodology.
(IMAZ, 2015)	Development of a project based on the analysis of a social context, an exercise in applied sociology.
(SMITH; THONDHLANA, 2015)	Research done by a study group to assess demands of an undergraduate group case study, focusing on the task analysis framework used to examine project documents.

AUTHORS	DESCRIPTION
(STOZHKO et al., 2015)	Application of tests to assess the cognitive level regarding the quality and results of the learning process.
(DICKERSON; JARVIS; LEVY, 2014)	Evaluation of a project focused on increasing support for academic reading at the master's level, using blended learning.
(JOYCE et al., 2013)	Feedback from a strategy describing the transition from a paper-based exercise to one based on a building design project, treated as a pedagogical approach.
(TORRES GORDILLO, 2010)	Application of a valuation test to know the results of the implementation of PBL, with a focus on psychopedagogical intervention.

Source: Authors (2022).

The complex method applied to the teaching of law

https://doi.org/10.56238/ptoketheeducati-041

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ABSTRACT
This is a theoretical reflection whose scope is to approximate Edgar Morin's concept of complexity with the Teaching of Law. The work focuses on showing that Morin's proposal is admissible and interesting for changing the paradigm of legal education in Brazil.
Therefore, the text reconstructs the concept of knowledge, method and legal teaching. To establish this relationship, the authors built the study under the aegis of bibliographical analysis, articulating the deductive methods with the complex. It is concluded that Law can be taught in several ways, but the methodology or theory of complexity proves to be interesting as it makes the scholar think with his own epistemologies.

Keywords: Complex Method, Legal Education, Morin.

1 INTRODUCTION

Today there is an extremely complicated problem for the educator, for the trainer, namely: how to respond to the challenges of the vertiginous transformations of the means of communication, of information technologies, disseminated on a global scale? In a world where the process of knowledge is atomized, how to make teaching an exercise for the progress of society, human capital, citizenship?[1] The answer, it seems to us, is simple! Use the methods appropriately.

Knowledge is acquired through methods. But the method is not only the way by which knowledge is given. The method is the very knowledge employed for the new knowledge. It is the opposition between knowing and knowledge. It is the making of knowledge[2]. It is how knowledge

[1] CITELLI, Adilson. *Comunicação e Educação*: A Linguagem em Movimento**.** São Paulo. Editora Senac. pg 246
[2] Human activities aim to create, invent, conceive, transform, modify, produce control and use products or systems. We can say that generically these actions correspond to interventions of a technical nature, constituting the basis of the pedagogical process itself.

employs its characteristics in a new approach, in a new prospect of knowledge.

The bipolar relationship between the subject and the object is called knowledge. The relationship begins timidly, moving from the subject's tolerance towards the object, to the subject's recognition of the object. As the subject takes possession of the essence of the object, the relationship between the two is narrowing, to the point of being an intimate relationship, generating modes, models, paths, techniques of approximation and apprehension of the object by the subject. In other words, generating the ***Method***.

The method, employed in the perspective of Edgar Morin, or, in the light of complex thinking, is a method that translates into macroconcepts, macrounderstanding, that is, through the association of hitherto separate atomic concepts, sometimes antagonistic, but which, in their interrelationship, generate complex figures that, without this interactive dynamic, volatilize and cease to exist[3]. Now, this method is possible in every scientific application, therefore also applicable in the science of law.

In this perspective, the objective of this study is to verify whether legal knowledge, or more precisely, legal education, as it has been developed in law schools and by professionals in the area, is or is not acquired through method or methods, and, if so, how it is characterized and what its suitability for the science of law[4].

2 THE INTELIGIBILITY OF REASON: KNOWLEDGE

What is it to know? "To know is to bring to our consciousness something that we know or that we suppose outside of us, teaches us Professor Miguel Reale, in his book ***Introduction to Philosophy***[5]. It really is just that. To know is to bring to oneself, into oneself something that is outside. Thus, the process of knowledge implies and involves the existence of two terms, that is, a subject, which is precisely the one who knows, or the one who seeks and brings something into himself, and an object, the one that is outside and that will be known.

The etymological structure of these two words - ***object and subject*** - helps us to understand them well. ***Ob*** means in Latin, before of, in front of; and the word ***jectum,*** cast or posted. We then have ***object,*** put or thrown forward. Therefore, object is that which is before us, which lies before a subject, available to be known. Put another way, the object is that which is in front of it, placed at its disposal to be thought, captured by the cognoscent subjective consciousness. Already ***subjectus*** has several meanings, such as underneath, added, submitted, always suggesting the idea of apprehension and

[3] MORIN. Edgar. *Educating in the Planetary Age*: Complex Thinking as a Method of Learning in Human Error and Uncertainty. St. Paul. Ed. Cortez. pg. 58th

[4] Science of Law: positive science or moral science? The science of law (or legal science) is a science that has as its object the study of the application of law in society. It studies the process of drafting or creating the law and its application. It governs, therefore, the function which consists in producing the juridical norm and which consists in applying it in the relations between men.

[5] REALE, Miguel. *Introdução à Filosofia*. 2 edição. São Paulo. Saraiva. 1989

internalization of something, that is, what is under (we, those who know); what was before (**ob**) became incorporated, under (**sub**). So, ***subjectus***, giving the word subject.

It can be stated that knowledge is, then, the bipolar relationship between the cognoscente subject and the knowable object captured and incorporated into the consciousness of the subject who knows.

There are deep relationships between the subject who knows and the known object, a subject studied by gnosiology and epistemology, but it is not the case to develop this study here. At the moment, it is enough for us to establish that the object is apprehended in its representation, with the interference of the subject that, in a certain way, constitutes it.

Knowledge has different shapes and degrees, exhibits different planes. Knowledge is a human need, without which society would not be what it is today in its most varied aspects, as well as in its most varied sciences.

If knowledge needs two elements, or supposes its existence, that is, the subject and the object, the relation of these being what constitutes knowledge, one asks: what does it take to know? Apparently the immediate answer would be: it takes a subject capable of knowing and an object capable of being known. However, the hermeneutic knot that underlies the question is how the subject apprehends the object, whether there is a way, a criterion, or whether there is a method that enables the subject to capture the object in its entirety. It is important to say, therefore, that the object is who determines the use of this or that method.

Several were the thinkers who addressed this problem, from the pre-Socratic naturalists to the present day in the most diverse currents of thought, there is the concern of how it is possible for the subject to know his object and the methods used by him to unravel the mysteries of each object studied, or placed before the thinking self.

We are only concerned with highlighting the method in terms of its conceptuality and not its forms of expression. Each science corresponds to the use of one or more orderly and disciplined ways of thinking about the objective reality being studied. These forms of rational and disciplined apprehension of reality are called methods of approach. The main ones among them are the deductive, inductive, hypothetical-deductive, dialectical and phenomenological methods. Each of them having its own starting points and its own stages of development translates into stages, logically coordinated, the type of approximation of reality made possible by the corresponding epistemological perspective.[6]

In other words, the challenge, in all research, is to account for the chosen object of study, that is, that phenomenon or set of phenomena that one intends to know. This implies finding ways to describe it, characterize it, identify the variables that affect it, understand the laws that govern it, understand its genesis, evolution and disappearance. None of this can be achieved off the cuff. Common sense is not enough. It is necessary to find a way, a strategy that allows extracting information

[6] POZZEBON. P.M.G. *Minima Metodologica*. Campinas, SP: Ed. Alínea. 2004. pg. 27

from that reality, disconnection from its elements and even its decontextualization.[7]

The method is this strategy, carefully elaborated, that the researcher uses to make "speak" the phenomena he researches, that is, a path or set of procedures that allows him to obtain information from a natural or human reality that he is studying.[8]

3 THE POLYSEMY OF THE METHOD

In a broad sense, method is the process, or set of processes, that allows to know a certain reality, produce a certain object (product), or perform this or that type of behavior. Confusing with the notion of process, of means, employed in the achievement of a certain end. The notion of method also coincides, to a large extent, with the notion of technique, of knowing how to do. Whether it refers to the knowledge of the real, the production of beautiful or useful objects, or the discipline of conduct, the method is always the means or technique that is employed to achieve a previously established goal.[9]

The word method is not univocal. Sometimes it refers to a certain way of thinking, to a certain specific kind of reasoning; other times it is used to designate the set of procedures proper to a particular science, or even scientific work. This word is also used to translate a specific and special way of examining some theme, and there are still those who seek to distinguish methods from techniques. In short: the use of the word method generates misconceptions, and it is useful to specify in what sense we will use it during this essay.

Implicit in all forms of human activity – theoretical or practical, productive or 'poietic' – to adopt Aristotelian classification and terminology, the term method, as already stated, has been used with quite varied meanings, which causes some confusion. In this confusion, the word technical also appears. Most of the time, the difference is only that of degree of generality and abstraction: methods are paths, the strategic options that one chooses to go through to know a certain phenomenon. They are general and abstract. To be fulfilled, they require a set of techniques. Techniques are the concrete procedures, which put the researcher in direct contact with the phenomena. They are specific to each type of phenomenon and can be used by different methods.[10]

The polysemic status of the term "method [11] " encourages us to walk towards the Cartesian episteme, however, by virtue of speculation, and by the aegis of understanding, it seems feasible to us

[7] Ibid. pg. 27
[8] Ditto, pg. 27-28
[9] MÉTODO. *Enciclopédia Mirador Internacional*. Encyclopaedia Britannica do Brasil Publicações Ltda. SãoPaulo - Rio de Janeiro. vol. 14. pg. 7530
[10] POZZEBON. P.M.G. *Minima Metodologica.* Campinas, SP: Ed. Alínea. 2004. pg. 27
[11] As stated by Paulo Pozzebon (2004, pg. 28) in a first sense is found in the expression scientific method used frequently, indicates, generically, that scientific knowledge uses planned procedures. In a second sense, the term method is used to indicate the epistemological perspective under which the methodology of a research is inserted. A third sense of the word method is represented by the logical models used to investigate reality. A fourth sense of the term method designates the specific operational arrangements of the different scientific areas, such as those used by the natural sciences, i.e., experimental method, statistical method, and by the human sciences, i.e., historical, comparative method.

to set out along the paths of another French thinker, however, contemporary, I speak of Edgar Morin, for whom, the foundation of the method lies in the absence of any foundation.[12]

4 COMPLEX THINKING AS A METHOD

For Edgar Morin "there is a relationship between method as a path and the experience of knowledge research, understood as a crossing that generates knowledge and wisdom".[13] Thus, he says, "the method as a path that one experiences to follow is a method that dissolves in walking."[14] Now, the method is dynamic. It is a process of perennial consubstantiation of the being and ceasing to be of the method in its use and application to a certain science, to a certain area of knowledge.

The method moves towards an end, that is, to bring to light the complexity inherent in the specific case studied. The problem with the method, says Edgar Morin, lay in its possible aptitude for capturing complexity.[15] The complexity of knowledge lies in its dynamism, in its dialectic. Knowledge is and ceases to be at every moment. It is being built and deconstructed with the research itself. The same process goes on with the method. Its relativity does not allow mediate programming, but rather the immediate construction for the end set, the knowledge of the object placed before the subject.

The method does not produce any knowledge, it only makes it possible, for the method itself is knowledge. For Edgar Morin, only a deficient and unreflective vision can reduce the multiple dimension of the method to a programmatic activity and a technique of knowledge production.

To elucidate the circumstances, to understand human complexity and the future of the world, requires a thinking that transcends the order of constituted knowledge and the triviality of academic discourse. A writing and thinking that embody the wandering and risk of reflection. It is impossible today to frame the search for knowledge in the stereotypes of inherited discourses and literary genres.[16]

The method in the complex perspective, says Morin, to be put into operation, needs strategy, initiative, invention, art. A recursive relationship is established between method and theory. The method, generated by the theory, regenerates the theory itself.[17]

The accumulated knowledge, built continuously, growing and complementary, gradually constitutes a coherent body and deconstituting others that become, by virtue of new knowledge, new techniques, new methods, inadequate for a given sphere of problems, or observable objects. However, for complex thinking, for everything that has been observed, studied, constructed, to be or constitute a new knowledge, a totalizing sense is necessary. Thus, a set of new ideas and behaviors by which the

[12] MORIN. Edgar. *Educar na era Planetária*: o pensamento complexo como método de aprendizagem no erro ena incerteza humana. São Paulo. Ed. Cortez. pg. 20
[13] Idem. pg. 20
[14] Idem. pg. 20
[15] Idem. pg. 21
[16] MORIN. Edgar. *Educar na era Planetária:* o pensamento complexo como método de aprendizagem no erro ena incerteza humana. São Paulo. Ed. Cortez. pg. 23
[17] Idem. pg. 24

experience was assimilated and expressed rationally. It should be noted that to discover the "new" the scholar used a method, a knowledge. Given the new knowledge, a new method springs up. Hence the complex thought says that method is method and knowledge at the same time.

Edgar Morin states that the method is the work of an intelligent being who rehearses strategies to respond to uncertainties. In this sense, to reduce the method to a program is to believe that there is an a priori way to eliminate uncertainty. Method is, therefore, that which serves to learn and, at the same time, is learning. It is what allows us to know knowledge. It is for all these that Gaston Bachelard asserted that every discourse of method is a discourse of circumstances. There is no method outside the conditions in which the subject finds himself.[18]

In its most general sense, the method is what teaches to know and to learn. It is the order that is imposed on the different processes necessary to achieve an end, in this hypothesis knowledge. Knowledge, for Morin, is a journey that does not begin with a method; It begins with the search for the method.[19] It's a trip that doesn't improvise. Of course, the method is also an exercise in organized spiritual resistance, which, as Adorno intended, involves a permanent exercise against the blindness and rigidity generated by the conventions and clichés coined by social organization, Morin says.[20]

Complex thinking does not propose a program, but a path (method) in which to test certain strategies that will prove fruitful or not in the dialogical path itself.21 Whatever form or modality it presents, the method is always the logic of the scholar's interest in rationalizing his relationship with his object of study. For Edgar Morin, complex thinking is a style of thinking and approximation to reality. [22] In this sense, it is aimed at the total expression of knowledge about the object and the whole reality of life.

In short, complex thinking, with regard specifically to method, it should be said that it is not the method that makes the knowledge and nor the knowledge that makes the method, but it is the dialectical relationship between the being knowledge of the method and the method of being knowledge that makes and remakes the way by which knowledge can be achieved.

5 THE COMPLEX METHOD APPLIED TO THE TEACHING OF LAW

The teaching of law breathes method. It is inherent in the thinking of the law the questions related to the techniques, the procedures, the varied ways to reach the right. All this reveals, however, only the concern with the applicability of norms, confused with the law science. This is a common mistake, almost inevitable. However, one cannot confuse the meanings of the word right as designating

[18] Idem. pg. 29
[19] Idem. pg. 29
[20] Idem. pg. 30
[21] Idem. pg. 30
[22] Idem. pg. 30

a branch of human knowledge or a science with the object of that science. It remains clear to us that a science cannot be confused with its object: who would confuse the human soul or psyche with Psychology, or the vital phenomena with Biology, or even the movement with Mechanics, or even the measurable quantities with Mathematics? In these cases science is designated by one name and the object studied by science by another, in order to facilitate understanding. In the case of law, no. Both the object studied and the science or branch of knowledge that studies it, are designated by the right name. Thus, considering these elements, it is worth asking: is law a science? It is obvious that one does not want to know if a set of norms is a science, because this is known from the outset that it is not. What matters is whether the knowledge developed over centuries by jurists and other legal scholars, having as their object, directly or indirectly, norms of conduct, constitutes a scientific knowledge, or not.

If science, or scientific knowledge, is marked, characterized by having a determined or determinable object, being a conceptual or typological knowledge, organized, configuring a system or systems and be acquired through method or methods, and its purpose is the transmission of true information, through statements about findings made about the object chosen for the study, Then the doubt about whether or not law is a science is exhausted to the extent that all these characteristics are verified in law. Law is a science.

It must be said that whether or not there is a science called law, or, to put it another way, whether or not law can be the object of science is not a peaceful question, but a problematic one. However, admitted as a science, therefore, systematic, coherent, rigorous, we are concerned about its method. Much has been said about a crisis in the teaching of law, whether it is the result of ideological, economic, political, or even structural issues. But the greatest difficulty encountered for the teaching of law has long been the problem of method.

To understand law only as a set of norms and rules is to reduce it too much to what in fact it is not. Law deserves a method of macro-understanding, of macro-conceptualization. In other words, it seems reasonable to us to say that the law is lacking and deserving of a complex method.

According to the perspective of Edgar Morin, the main goal of the complex method is the awakening of a world-society.[23]

To awaken to a world-society is to build paths that lead to the exercise of citizenship, that transform citizens into protagonists, aware of their participation in the construction of the world-society, so that they know that the knowledge built is not finished, and that it cannot be. In other words, the complex method makes it possible to build a critical and thinking consciousness.

To think, study, and teach law in the light of Morin's complex method is to think, study, and

[23] MORIN.Edgar. *Educar na era Planetária:* o pensamento complexo como método de aprendizagem no erro e naincerteza humana. São Paulo. Ed. Cortez. pg. 63

teach the totality of law. It is to see law as a complex knowledge. This does not mean that the simplifying thinking of law is outdated, bankrupt, finished. On the contrary, complex thinking does not reject, says Morin, simplifying thinking, but reconfigures its consequences through a critique of a mode of thinking.[24]

Finally, the complex method applied to the teaching of law is the practice of macroconceptualization, of macro-understanding, because with this reference the teaching of law only has to gain with regard to its epistemological status the character of a science of totalizing understanding. For Edgar Morin, an education that aims at a complex conception of reality and that effectively leads to it, would be collaborating to end cruelty and all the negative elements of the world, be they economic, social, political or cultural.

6 CONCLUSION

Considering that the practice of law is the just means, or pacification, complex thinking, or complex method opens the way to better understand the problems of the world, human problems.

Moreover, using what Edgar Morin says, evidently translated into other words, the teaching of law has been characterized by a piecemeal, compartmentalized, mechanical, disjunctive, reductionist teaching, which breaks the complex of the world, produces fragments, fractionates problems, separates what is connected, uni-dimensionalizes the multidimensional. It is a teaching at once myopic, presbytery, colorblind.[25]

Finally, it remains for the teaching of law the mission of breaking the current paradigms and immersing itself in totalizing, complex thinking, capable of encouraging a fruitful path towards the complex structures of real and true knowledge.[26]

[24] Idem. pg. 58
[25] MORIN, Edgar. *Da Necessidade de um Pensamento Complexo*. Tradução de Juremir M. da Silva. pg 27Available at: < https://edisciplinas.usp.br/mod/resource/view.php?id=3040967&forceview=1 >. Access on: 13 jul. 2023.
[26] Idem. pg. 26-27

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SEVEN publicações acadêmicas

Higher education in angola: From colonity to decolonity

https://doi.org/10.56238/ptoketheeducati-042

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ABSTRACT
In Angola, Higher Education has undergone several transmutations. This communication aims to show the transformations that Angolan Higher Education has undergone in its history and the associated process of colonity and decolonity. Through a bibliographic and documentary research in this area will deconstruct this objective. The history of Higher Education can be divided into phases: Non-existence (until 1962), Final Colonial (until 1975), Civil War (until 2002) and Post-Peace (since 2002) and Current. Its origin had a religious initiative. Without this option, those who wished to pursue higher education went abroad, particularly to Portugal. These were from families with greater financial resources or supported by religious missions. In 1962 the General University Studies appeared, initiating public higher education in the territory. The number of students was small, as the migrations to Portugal continued. In Angola, Higher Studies constituted an elitist-exclusivist system, promoter of colonial culture and defender of the interests of the regime, where individuals of the black race had almost zero access. Independence in 1975 provoked a massive departure of teachers. The lack of staff hindered the evolution of education. For example, in 1977, the year of the first educational reform, there was a drastic decrease of 73.4% in the number of university students. All the political-military and socio-economic constraints of the civil war, and later years, prevented decolonization and the intended advancement in Higher Education. Peace in 2002 boosted the growth and expansion of universities, expanding the offer of institutions and higher education courses. In national development, Higher Education has a key role in the training of cadres to boost the growth and reconstruction of the country, so its growth in quantity and quality and territorial expansion are targets that Angola seeks to achieve. The process of colonity/decolonity leads us to a pertinent research and reflection.

Keywords: Higher Education, Angola, History, Colony, Decolonity.

1 INTRODUCTION

Angola, a country located in southwestern Africa with a population of 24.3 million,[1] was a Portuguese colony for 493 years (from 1482 to 1975). These almost five hundred years of colonialism have left deep marks on all sectors of the country. One of the determining sectors for any nation is education, and in this area the effects of colonialism left a less positive footprint that harmed and limited the development of the country after independence. Because, in Angola, the Basic Law of the Education System (Law no. 17/2016, of 07 October) intends in its applicability "to ensure the growth and economic and social development of the country".

[1] Estimated in 2014 in the first post-independence census.

If we consider, in this case, *decolonity* as the process of liberation from the heritage and colonizing influence *(colonity*), and this linked to the educational system, it can be assessed that this (process) has not been easy, especially for reasons linked to the history of the country.

This work highlights the process of colonity to decolonity linked to Higher Education, for the primary role that this level of education plays in the creation and preparation of cadres in Angola, as this aims at "the training of high-level cadres for the different branches of economic and social activity of the country, ensuring them a solid scientific preparation, technical, cultural and human, as well as the promotion of scientific research and the provision of services to the community".[2] This subsystem of education is, therefore, considered governmentally as a decisive foundation for national reconstruction and the building of the economy for a solid development of the country.

This study aims to show the transformations that Angolan Higher Education has undergone in its history and the associated process of colonity and decolonity. Through a bibliographic and documentary research in this area will deconstruct this objective.

This history could be divided into two phases: the phase of *colonity* and the phase of *decolonity*. One can point to the beginning of the first one for 1482 (the year in which Angola was considered a Portuguese colony), however, although one can link the beginning of decolonization to the[3] wars of liberation that began in 1961, it would be difficult to specify a specific date for *decolonization*, because it is a process still active and not totally suppressed.

Therefore, it was decided to divide according to the phases of the history of Angolan Higher Education: Non-existence in the Colony (until 1962), Final Colonial (until 1975), Civil War (until 2002), Post-Peace (since 2002) and the Current Situation. Before the phases, the context of colonization and formal education is presented, and after the phases, a reflection on Angolan educational colonity/decolonity is proposed.

2 COLONIZATION AND FORMAL EDUCATION

Before starting the historical phases of Angolan Higher Education it is worth mentioning, for a better understanding of them, some historical aspects.

Angola was a Portuguese colony from 1482 to 1975. But the first contacts between Portuguese and natives of Angola, organized in kingdoms, were of a commercial nature and not of domination. However, "the conflicts originated by the competition between the various European powers led to the

[2] Decree No. 90/09 of 15 December, Article 3: p. 3952.
[3] Decolonization "is the generic name given to the process by which one or several colonies acquire or regain their independence, usually by agreement between the colonial power and a political party (or coalition) or liberation movement." Source: https://pt.wikipedia.org/wiki/Descolonização.

political domination of these kingdoms, which culminated in the partition of the Black Continent by the European states at the Berlin Conference in 1885."[4]

For Moutinho (2000) the three pillars of colonization were: "(1) Superiority of the colonizer; (2) Right to intervene in men and things; and (3) Colonization is permanent" (p. 20). The two colinian economic foundations were the Portuguese immigration with mostly business purpose, and the native population that in its bulk were pushed to agriculture (of products established by the settlers, namely coffee, corn and sisal) and / or to low-paid functions. It was in this colonizing context that the formal education in Angola brought by the Catholic missionaries began, creating elites consequently linked mainly to theology, history, culture and literature.

In schools, students were taught to read and write Portuguese, as well as Christian values and Portuguese culture. For authors such as Almeida (n.d.) and Neto (2014) this implied *de-Africanization,* because this education did not take into account the diversity of cultures, endogenous languages and the native reality, nor was it adequate to the specific characteristics and contexts of local populations.

Munanga in his reasoning (presented in Almeida, n.d.) comments that the colonizer despised the local culture and "initiated a movement of deculturation of blacks and their distancing from native traditions. This process of *deculturation* had as its main ally education. The school was then used as one of the vehicles of oppression used by the colonizer." (id., s.p.). As in the rest of Africa, native languages have been banned from education.

Through education the native incorporated the culture and values of the Portuguese, and after his conversion to Christianity classified the native culture as superstitious, antiquated and uncivilized. Thus, showing that the educated/schooled internalized the image that the European had of the traditional culture of Africa (Chung, 1996).

For Almeida (2005) "the educational process postulated that the African was an inferior being and, as such, could only clarify and progress, that is, free himself from the condition of savage, through the incorporation of the culture of the metropolis." (s.p.). In colonial times formal education was elitist and black people had little access to state education. It was the time of the dominance of colonial thought.

3 HISTORICAL PHASES

3.1 LACK OF HIGHER EDUCATION IN THE COLONY

There were no higher studies in the Angolan territory. The Catholic Church started a seminary with higher studies in 1958, in Luanda and Huambo. For those who wanted to advance to higher studies, there was only this religious option or else they would have to travel outside the colony, especially to Portugal (metropolis).

[4]Excerpted from https://pt. wikipedia.org/wiki/Angola#Processo_de_descoloniza.C3.A7.C3.A3o.

Campos and Lima (2012) portray this reality alluding that at that time the young people of the colonies who aspired to do a higher education, and had this opportunity, was a minority composed of children of assimilated with greater possessions or supported by religious missions. They left their land and headed to Lisbon, Coimbra and Porto, places where most of them had no relationship or any family support. It was the students of Angola who were the first to form a charitable association to support their own, then imitated by students from the other colonies.

According to the same authors (id.), the Estado Novo was concerned with what could originate from these different associations and had intentions to gather them into a single unit and sought to keep them under control. To this end, it instituted a political initiative based in Lisbon and with a delegation in Coimbra. However, the result of the same was contrary to what was expected, because from this sprang the formation of African thinkers and political leaders, among them, guides and militants of the liberation movements, namely Amílcar Cabral, Mário Pinto de Andrade, Marcelino dos Santos and **Agostinho Neto** [bold added to emphasize the Angolan leader].

Public higher education in Angola began in 1962 with the birth of General University Studies (EGU). This education was concentrated in Luanda, only in this entity, which changed its name to the University of Luanda in 1968. However, despite this option, most young people continued to move to universities in Portugal. Fituni (1985, p.56, cited by Neto, 2014) states "students, forced to assimilate Portuguese culture, were compelled to do their university studies in the metropolis." (p.170). Anderson (1966, p. 64, cited by Neto, 2014) points out "higher education was almost inaccessible; Only a few Angolans have ever been able to reach Portuguese universities." (p.165). These, as mentioned above, were those from wealthier or religiously supported families. In Angolan territory there were very few students, according to Teta (n.d.) in the academic year 1973/74 there were about 2354 students instructed by 274 teachers.

Higher Education was completely in the phase of its colonization: the thought, culture and values of the colonizer dominated teaching and its didactic content, not taking into account, as mentioned, the culture, values, languages, contexts and realities of the native Angolans.

3.2 HIGHER EDUCATION IN THE FINAL COLONIAL PHASE

Education was a pathway to colony, but it was also used for decolonity, as not all native students were assimilated, that is, those who reproduced and helped the dominant culture. Almeida (n.d.) alludes to a group composed of those who used the knowledge coming from the school and the language taught there as means of affirmation. About these the author states:

> They saw education as a means of liberation, refused cultural whitening and sought to value their roots, to accept their socio-cultural heritage. These blacks did not deny European knowledge, they used it to give birth to a movement of reaction to the domination of which they were victims. The Portuguese language was treated by them as a resource to fight against

> the colonizer. This school came to represent the environment in which the colonized becomes aware of their roots and seeks in the incorporation of elements of the colony, its object of struggle and preservation. (id.).

Gradually, resistance is emerging and the desire to transform this colony into an independent country is growing. Other national and international socio-political factors contribute to this independence will. The climax of this reality occurred from 1961, demonstrated in an armed struggle against Portugal, starting the *war of liberation* in 1961 and ending in 1974.

The Carnation Revolution in 1974 (military coup that ends the dictatorship in Portugal) with the immediate suspension of fighting by the Portuguese military in Angola and the subsequent national events - in which the new holders of power in Portugal announced their intention to consent to the access of the Portuguese colonies to their independence - help the independent movements. Angola's independence was declared on November 11, 1975, the so-called "Independence Day".

In the balance of independence he was faced with a precarious educational condition. The percentage of literate Angolans was too low, according to the Strategic Plan for Revitalization of Literacy 2012-2017, of the Ministry of Education (MED), the Estimated Illiteracy Rate in 1975 was 85%, of these 70% were women. Therefore, soon after independence one of the priorities was to expand education, giving in 1977 the first educational reform.

One of the obstacles to this goal was an exodus of teachers at independence, consequently there was a huge shortage of cadres at all levels of education. This negative reality occurred notably in Higher Education, because the lack of staff led to the closure of some courses, decreased the quality of teaching and hindered its evolution.

The climate of uncertainty and national instability also reduced the number of university students, for example, in 1977 there was a drastic decrease of 73.4% in the number of university students. All the political-military and socio-economic constraints of the civil war, and later years, prevented the advance and decolonity intended in Higher Education that goes through an abysmal quantitative and qualitative low.

3.3 HIGHER EDUCATION IN THE CIVIL WAR PHASE

After colonialism, a civil war broke out for control of this country, especially Luanda, the capital. This conflict led to the exodus of the approximately 350,000 Portuguese[5] who were based in the country. As a result of colonial policy, these formed the majority of local cadres, consequently industry, public administration, commerce and agriculture collapsed. The successful Angolan economy has collapsed and is in successive decline.

[5] Source: https://pt.wikipedia.org/wiki/Angola#Processo_de_descoloniza.C3.A7.C3.A3o.

The civil war was markedly a time of negative consequences: political instability, destruction, precariousness, insecurity, national underdevelopment, socio-economic mismanagement and the expansion of poverty, among others.

In this disturbed context, Higher Education undergoes transformations: EUG changes its name to the University of Angola in 1976 and later, in 1985, to the Agostinho Neto University (UAN). However, there were still other contradictions for the development of this level of education, in addition to the factors mentioned above and the aforementioned deficits of professors and university students, there were also destroyed infrastructures, low didactic, pedagogical and economic resources that brought bad conditions to teach, in addition to the implicated and notorious lack of security. The state of higher education was one of great weakness, there were governmental efforts in its development, but there were few conditions for effective decolonization initiatives.

3.4 HIGHER EDUCATION IN THE POST-PEACE PHASE

This long and hard war ended in 2002, leaving a devastating trail that affected and inhibited all its development in the various national sectors, including education.

In the balance sheet of the country it is verified that despite independence, there were strong consequences of its historical past in all social, moral and cultural aspects due to the slave trade, Christianity and **colonization** (PAN/EPT, 2005) and the long civil war.

After decades of civil armed conflict, the reconstruction of the country was cogent. There is a manifest growth of the economy, and consequently of the other sectors, however there were great regional dissimilarities and strong social inequalities.

Peace has made possible the development of Higher Education and there has been a remarkable growth in this. This subsystem of education now had the opportunity to move forward with its process of decolonisation. For, it could really meet the real internal needs of the country, seek no longer the interests of the settler, but its own developmental interests and to be restructured adjusting to the Angolan reality.

UAN, the only public for a long period, even expanded into 40 colleges across the country. According to Teta (n.d.) until 2007 there were three public and thirteen private Higher Education Institutions (HEIs). In 2009, the UAN was divided, continuing only in Luanda and Bengo, while six autonomous public universities were established from the existing faculties with probational coverage by Resolution No. 4/07 of February 2 and by Decree No. 7/09 of May 12. According to this Decree, the reorganization of the network and the creation of higher education institutions were aimed at their adaptation "to the strategic objectives of economic, social and cultural development of the country, in accordance with the programs of the Government".

Mendes and Silva (n. d.), stated that this restructuring procedure of this subsystem sought to add efficiency to the management of HEIs, because there was a certain lack of this (effectiveness) in practices and processes, due to various factors internal and external to the education subsystem.

In 2014 there was a reorganization and the 18 provinces of Angola were divided into eight academic regions, each constituting a public university. In 2020 there was a new reorganization in this network of Public Institutions of Higher Education (IPES) by Presidential Decree No. 235/20 of October 29. This organizational action "is based on the resizing of existing institutions, the merger of some institutions and the creation of new public institutions of higher education" (MESCTI, 2020, p. 1).

3.5 CURRENT SITUATION OF HIGHER EDUCATION

Currently Higher Education is implemented in accordance with the reorganization of IPES initiated in 2020 and mentioned above. All institutional forces are concentrated on their full adaptation to this recent organization and its previously defined targets. It is recalled here that the main purpose of Angolan higher education institutions, according to Presidential Decree No. 236/11 of August 29, is: "the production of the dissemination of scientific and cultural knowledge, as well as the creation of a dynamic training space open to all areas of science and technology" (p. 4065).

And that, according to article 60 of the Basic Law of the Education System (Law no. 17/2016, of October 7) the Higher Education Subsystem aims at the "training of high-level staff and technicians, the promotion and realization of scientific research and university extension with the aim of contributing to the development of the country, assuring them of a solid scientific, technical, cultural and human preparation" (s. p.). In Article 62 the first general objective of this subsystem is to "prepare cadres with a high level of scientific, technical, cultural and human training, in various specialties corresponding to all areas of knowledge" (s. p.).

It is reinforced that since the national peace there has been a "rapid progression of the supply of higher education, public and private" (Government of the Republic of Angola, 2012, p. 37), but still inferior to the demand as well as the evidence of its presence being reduced in many of the 18 national provinces, highlighting the lack of the necessary scope for the development of this subsystem of education. This fact, of insufficient HEIs, happens throughout Africa: Chung (1996) points out that less than 1% of the population of Africa has access to this level of education (Higher Education).

In the process of national development, Higher Education continues to play a key role in the training of cadres to boost the growth and reconstruction of the country, so its growth and territorial expansion are targets that Angola seeks to achieve, that is, the training offer in this area needs to grow not only in quantity, but also in quality to respond to the internal and external needs of the country.

The process of decolonization does not seem to be a priority at this stage of Angolan Higher Education, although this process may never be resolved as can be seen in the reflection below.

4 REFLECTION: ANGOLAN EDUCATIONAL COLONITY/DECOLONITY

A close look at the Angolan reality leads to agreement with Freire's ideas (in a speech transcribed by Torres, 2005) when he states that an educational revolution is not easy to introduce:

> Even if a country makes its revolution, the school continues for a long time to repeat the previous school; The explanation for this lies in what one author calls the dialectic of overdetermination, that is, the old superstructure of society that has been modified remains, in contradiction with the new infrastructure that is constituted. For a long time this contradiction occurs [...]. In the first place it is not the school that changes society, but it is the society that makes the school and it seems that the school is built with this dialectic. (p. 92).

According to this thought the school continues for a long time to repeat the previous school (op. cit.). Angola, despite its independence in 1975, despite some changes, the current educational system remains very similar to that of the time of the colonizer. In fact, this happens throughout colonized Africa, Chung (1996) states that in this continent an elitist education is maintained and "based on systems and structures of the colonial period" (p.198).

The National Plan for Education for All (PAN/EPT) points out the causes for educational delays in Angola as "**the educational policy inherited from Portuguese colonialism** [bold added] and from the political, military and economic-social contradictions registered after national independence" (2005, p.13). These setbacks position Angola as one of the countries in sub-Sharia Africa with the highest rates of under-schooling.

The inheritance of the low quality of education of the settler justifies, in part, the low qualitative level of teachers and students, as well as the difficulties that students have due to the lack of bases for correct learning aiming at achieving academic success. This may be one of the consequences: a high level of student dropout. Another consequence of the educational deficit inherited from colonial times, among other reasons, is also the low quality of the staff that the HEIs offer and make available to the labor market.

Chung (1996), after an analysis of the African educational system at the different levels of education and the failure to generalize them to the entire population, stresses the need to redefine the concept of education in view of the real African context, so *as not to preserve the colonial structure and its feudal past*, that is, to decolonize itself.

Ferreira (n.d.) says that formal education has nothing to do with African roots and traditions and therefore needs to be changed. He adds that these (roots and traditions) are devalued and ignored by international organizations that try to establish in Angola a development of the Western kind, imitating an educational system of this origin, especially that of Portugal. Now, that is, the one

belonging to its former colony, reversing and devaluing the necessary process of decolonity, which in other words was referred to by Chung (id.).

For Ferreira (id,) the formal education, imposed by the State, does not succeed in the common people, but only in the elites, because this is culturally "foreign" to the native - nowadays referring especially to those coming from the less victims of colonization areas, especially the rural ones - adds that non-formal education would be the natural one, following the African tradition.

However, the author does not explain how this type of education could be applied to effective teaching, such as Higher Education or staff training, with Angola in a globalized and competitive world. After centuries of colonization it is difficult to imagine a Higher Education with the process of complete decolonization and following the true Angolan traditions and values, but one can fight for a greater approximation to these.

5 CONCLUDING NOTE

Angola was a Portuguese colony for 493 years, consequently Higher Education in this country went through a process of colony. Since national independence this shows signs of a process of decolonization (in this case considered as the process of liberation from the heritage and colonizing influence), but still unfinished, especially for reasons linked to the history and reality of the country.

This study aimed to show the transformations that Angolan Higher Education has undergone in its history and the associated process of colonity and decolonity. This is done through a bibliographic and documentary research.

For a better understanding, some historical aspects related to colonization and colonial thought linked to formal education at that time were presented. Education was a means of deculturation of the native, causing a distancing to their culture and values. The educated/schooled internalized the culture of the metropolis. Formal education was elitist and black people had little access to it.

The educational system was a route to colony, but it was also used for decolonization by native students resistant to the process of assimilation, contributors to the origin of the independence movements.

By describing the phases of the history of Angolan Higher Education: Non-existence in the Colony (until 1962), Final Colonial (until 1975), Civil War (until 2002), in the Post-Peace (since 2002) and the Current Situation, it was also shown the situations of colonity or decolonity at this level of education considered as a decisive foundation for national reconstruction and the building of the economy for a solid development of the country.

Since peace, and up to the present day, there has been a rapid and remarkable growth of Higher Education Institutions, despite their insufficiency in the face of demand and the still unequal coverage in all national provinces.

In the reflection on Angolan educational colonity and decolonity, presented as the last point of this work, with the support of some authors, it is shown that the process of decolonity is necessary for the revaluation of Angolan traditions and values and of a teaching closer to this specific reality and its own characteristics, which have to be taken into account in the current educational restructuring. However, it is a non-priority, difficult and time-consuming process, of total almost utopian realization.

After centuries of colonization it is complex to imagine the practice of Higher Education with the process of decolonity finalized and adopting Angolan traditions and values, but one can continue to fight for a greater approximation to this ideal, and leave in future generations the practical application of an effective and effective decolonity in this African country with so much potentiality.

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SEVEN
publicações acadêmicas

Self-objectification in university women not heterocentrated

https://doi.org/10.56238/ptoketheeducati-043

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ABSTRACT
Self-objectification refers to the internalization of the other's gaze on one's own body. From studies by Frederickson and Roberts (1997) it is perceived that, in the macho culture, people are objectified, the body becomes sexually objectified, controlled, "the target of looks and criticism". The greater the objectification, the greater the impact on mental health resulting in the occurrence of numerous conditions, such as eating disorders, anxiety, depression, stress and others. There is little research on self-objectification in college women and even less on self-objectification in non-hetero-transgender, transvestite, and non-binary college women. This paper aims to measure self-objectification in non-normative hetero university women. It was observed (1) there is high objectification in transgender, transvestite and non-binary university women. (2) The highest average of self-objectification was with transvestite university women, (3) There is a need to establish policies aimed at non-heterocentric gender relations

Keywords: Self-objectification, University, Gender, Femininities.

1 INTRODUCTION

The Self-objectification refers to the internalization of the other's gaze on one's own body (Frederickson and Roberts, 1997; Loureiro, 2014; Bercht, 2018). This concept allows to identify the strength and relevance of the socio-cultural environment in the behavior of different actors in the social context. When they are objectified, the external subject looks, analyzes, evaluates and judges someone for their external characteristics, often occurring acts of physical, mental and psychological violence in the face of situations of discrimination, humiliation, occupational segregation entailing the need for a process of struggle and empowerment for the place of speech of the objectified people (Colagero, Tantleff-Dunn & Thompson, 2011).

The present work is inserted in the reading of the self-objectification of university women and contributes to deepening discussions about gender and sexuality. It is pointed out that, when objectified, they are consumed within a macho and conservative society, many are the acts of violence and misogyny. Within this view has been perceived impact on body image, experiences of shame on one's own body, psychopathological conditions such as Eating Disorders, Mood Disorders, Anxiety Disorders, Depression, Stress (Davidson & Gervais, 2015, Holmes & Johnson, 2017; Poon, Chen, Teng

& Wong, 2020; Santos, Trindade, Pereira and Santos, 2020; Moradi & Tebbe,2022; Peci, Guizzo, Bonache, Borges-Castells, Morera & Vaes, 2023) with femicide being an outcome in many cases (Mariano and Souza, 2023).

This issue translates into suffering for the modus vivendi of women in a culture that objectifies them (Frederickson and Roberts, 1997; Colagero, Tantleff-Dunn & Thopson; Bercht, 2018) and makes them more vulnerable to feelings of shame, negatively impacting on mental health with anxiety, depression, eating disorders and other psychopathological conditions (Morai and Huang, 2006; Tiggemann and Williams, 2012; Loureiro, 2014; Bercht, 2018).

Much has been said about recent advances in relation to gender policies, such as greater female participation with greater access to political positions and spaces of power. This fight is not recent. It is worth remembering that only in 1879, women won the right to attend college, in 1932 they could vote, in 1960 with the contraceptive pill they reflected on the reproductive right, in 1962, they could work without needing the approval of their husband, in 1977 they could divorce from an unhappy marriage, in 2006 with the Maria da Penha law they obtained the strength to combat domestic violence and only in 2015 did the femicide law emerge (Teles, 1993; Pinto, 2003).

These advances are recent and very important, however, it is still necessary to discuss about what it is to be a woman, the role of women and the struggle for equity, for participation in different decision-making, for social spaces and for their place of speech.

However, there is still a difficulty of a large portion of the population in differentiating between sex and gender. Sex refers to an anatomical reading, while gender is a social construction where one relates social roles (with expectations of behavior according to what is expected by society), gender identity (subjective experience one has about oneself and relations with other genders) (Maracci, 2013; Cruz et als, 2020).

The postmodern view and Feminist Psychology bring gender as a process and a construct, not as a fixed response (Nogueira, Conceição, 2001). People who identify with the gender that was determined to them at the time of their birth are called cisgender, and, as trans, those who present gender identity and sexuality in non-conformity with the assigned sex, being this group is often unknown and, also excluded, canceled, assaulted, murdered (Ferreira, 2021).

The theory of objectification offers criticisms regarding biological determinism for gender attribution (Frederickson and Roberts, 1997; Berch et al, 2019). One cannot reduce "being a woman" only to the anatomical and phallocentric aspect of the patriarchal logic that mobilizes the misogynistic reading of the scenario we currently face. It is worth remembering that, due to this phallocentric reading, gender violence occurs, different psychopathological conditions, the submission of women to processes to jobs with wage inequality and invisibility of the different femininities.

Certainly, talking about female self-objectification in the face of Different femininities makes it possible to discuss the historical construction and narratives of corporeities and the issue increases before the theoretical-conceptual density when one realizes that there are femininities with different expressions, roles and gender identities.

This construction of the feminine denaturalizes the solely anatomical and biological aspect attributed to the body and notes the insertion of a broader reading by focusing on the different expressions, roles and ways of expressing gender (Ferreira, 2021).

1.1 UNIVERSITY WOMEN

Statistical data recently published by INEP on the Higher Education Census indicate higher participation of women in Higher Education, higher rate of completion of courses and lower dropout rate compared to men (Brasil, 2022) and this reflects the result of a hard achievement that was only achieved after an arduous struggle waged for a long time by women.

Despite these advances, there is still a need to better understand the space of women in universities, considering that there is still an exclusionary social space with differences in social treatment and less space for speech in decision-making positions (Cerezetti Almeida, Barbosa, Guimarães, Ramos, Lessa, Túlio, Silva, Junqueira, Alves, Campos & Ferraro 2019) and invisibility of different femininities.

It's relThe reading of the different corporeities with desires, sexualities and needs also in the University environment and the body can also be understood as a relationship with rights, power, instruments of control of actions (Foucault, 1988). In our Latino culture, sexist and patriarchal, any expression that escapes normativity is considered deviant and impacts on dominance/dominated relations.

Every day women are occupying more spaces of power. They are already a majority in higher education, however there is still wage inequality and access to decision-making positions that are predominantly male and these have been objectified. Most of the literature focuses on cis women, but we still know little about the spaces of other femininities, and there is a need to understand the bodily objectification of cis, trans, transvestite, asexual, non-binary women, who attend different areas of knowledge in higher education.

Progressively, women have been occupying space for their competence, education and work, but there is still a long way to go. It is perceived that cis women gradually have been occupying an important public and social space initially occupied by men, but there is an invisibility about this role for non-cis women. A common point among all femininities is the body's self-objectification and makes us think about the different forms of violence and their insertion in the academic space (Scavone, 2015;

D' Oliveira, 2019; Silva and Vaz, 2019; Labiak, De Novis, Silva, 2020; Maito, Panuncio-Pinto and Vieira, 2022).

Women, black, and non-heteronormative students are six times more likely to experience violence than men, whites, and hetero-normative (Montrone et als, 2020). Understand-if the theme "non-cis female self-objectification" is extremely relevant to give social visibility so that actions are planned to minimize the psychic suffering of this population and, thus, enabling the Universities to be protagonists in the space of listening and welcoming this group.

1.2 HISTORY

We live in a society cisnormative, where cis people decide for non-cis people, who are usually invisible, however there is a growing movement for visibility and struggle for rights.

It is worth mentioning the speech of Sojouner Truth on asking "And I'm not a woman?" It asks a profound and beyond obvious question about the exclusionary treatment that black women received (Truth, 2020) in a society that privileged white, cis and American women. She discourses the look of the black woman, enslaved and the need to look that there is also for other women and, thus, resizes femininity or womanhood.

Readings on the Womanhood (or femininity) wasn't always easy (it still isn't). The dissident women of the cis hegemonic profile for many years were perceived with the pathologizing, medicalizing, biologizing look where the other is the one who names the identity and this fact generates psychic suffering. The DSM-V still pathologizes as gender dysphoria. Preu and Brito (2019) criticize this pathologization of transsexuality of the DSM-V, which cites gender identity beyond binarism but describes it from the perspective of cisgenderism.

Being a woman is not centered on genitality and for existence there is a need to focus on the socio-historical context and offer spaces for different femininities.

In the history of feminism in Brazil it is perceived that in the last century when talking about women referred to as the "fragile sex", dependent on men and without autonomy. The black woman was the object of pleasure of the Lord of the white Mill and the white woman was destined only to procreate, to take care of the children and the house. Until women founded the first school for women, they began to publish and discuss the female condition, the right to vote, freedom, sexual identity and reproductive rights and gradually took a stand in their struggle for rights and conditions of existence (Teles, 1999).

From the 80's it breaks with the predominant view of the Eurocentric woman (white, blonde with blue eyes) whose issue made many black women wish to straighten their hair or change their nose, non-cis women mobilize for bodily changes.

The reading of other femininities arose later as a result of the dissent of the feminist movements since there were different agendas between cis and trans women, and these began to organize themselves as transvestite transsexual groups and others.

Many discussions have arisen since the process of slavery, subservience, and objectification of the feminine in its patriarchal and phallocentric society to the present day. From the pathologizing view of decades ago, in which the woman had no right to pleasure, to her body and defined the imposition of sexual identity to the power of current self-determination. The guidelines were gradually modified. It is worth mentioning that only in 2018 it was possible to change the name without needing a psychiatric report to recognize the right of transgender people to rectify the name and gender in the documents without the need to prove sexual redefinition surgery or hormones.

Faced with these issues that permeate the struggle for existence, it is added that Brazil is the country that most kills transsexual and transvestite people (ANTRA, 2021), and by virtue of this is sanctioned the law 13.104/2015 that adds another qualifying condition for homicide that embraces transgender women, transvestites and other femininities. Transphobia, violation of rights, exclusion of trans peopleGender and transvestite is a problem to be faced.

Given this, this work aims to

a) to measure self-objectification in non-cis university women;

b) to analyze the impact of high objectification of non-cis normative college women in the university environment.

2 METHODOLOGY

This is quantitative and exploratory research that addresses female self-objectification in women self-perceived as transgender, transvestite, and non-binary. The Body Objectification Scale (female EOC) was used for data collection, which was applied online after free and informed consent and the description of the following variables: gender, age and socioeconomic status.

Through the instrument, university women were freely invited to participate in the research, including people who identify with the female gender and who are Brazilian university students, excluding cis women, trans mengender and cis men as well as people not belonging to the student of higher education.

2.1 ENVIRONMENT

In order to obtain the necessary data, an online survey was conducted through a self-administered and structured questionnaire through the platform *Google Forms*.

2.2 PARTICIPANT

The people participating in this work were invited through the "snowball" technique. The inclusion criteria were legal majority and self-declaration as a transvestite, transsexual and/or non-binary. Participants were 12 people who declared themselves non-cis university women.

2.3 PROCEDURE

The online questionnaire that begins with the Term of Free and Informed Consent was applied, in accordance with the ethical precepts established by the Resolution of the National Health Council CNS No. 466, of 2012. To guarantee the anonymity of the people who participated in the research, a system of alphanumeric identification and if they felt any discomfort they could contact the researchers and would be directed to care at the school-clinic of the IESB University Center.

After the free confirmation of the respondent, the questionnaire follows with filter questions about gender, color and education, prioritizing those who identify with the Brazilian female identity and are regularly enrolled in a higher education course. Respondents who do not meet these requirements already have the questionnaire closed.

Next, there is a section on socioeconomic aspects of the respondents, containing 6 objective questions in order to collect data on the reality of the economic class, thus outlining a more dynamic profile on self-objectification in Brazil.

Next, the EOC ladder (Body Objectification Scale) was applied, validated and translated by Loureiro (2014) for a simplified version of the OBC scale (*Objectified Body Consciousness*) and the validity and internal reliability of university women was identified (Loureiro, Guerra, Cardoso, Rodrigues, Almeida and Pedruzzi, 2022)

2.4 DATA ANALYSIS

After collection, the data were analyzed through EXCEL from the basic statistics (mean and standard deviation of each variable) and analyzed the EOC (Body Objectification Scale)

3 RESULTS AND DISCUSSION

Table 1 presents the description of the sample as a function of its description as a self-declared gender identity. Of the total, 162 people who identified as university women participated, and 12 people declared themselves Transvestite, Transgender or non-binary, being, therefore, approximately 7.5% of the sample.

The sample consisted of 7 non-binary, 4 transgender women and 1 transvestite. As might be expected, the percentage of transgender female undergraduates, transvestites and other females is small. In a recent survey published by ANDIFES in 2018 it found 0.2% among all university students

throughout the country (Andifes- 2018). Our sample recorded 7.5%, which may suggest that, through an instrument applied online, have felt more comfortable for self-declaration in relation to gender and/or there is an increasing number of access to higher education for non-heteronormative women

Brazão and Dias (2021) point out the little knowledge of university students about non-binary gender and the different situations of embarrassment that many experience. The scarcity of publications has been pointed out, and it is necessary to give voice to people who have historically been silenced and assaulted (Pereira and Andrade, 2020) and establishment of affirmative policies by HEIs. Borges and Bueno (2023) emphasize that Brazil is the country that most kills transvestites and transsexuals, this shows an abominable socio-economic inequality, and it is relevant that actions are taken to facilitate access, permanence and equity

Table 1- SELF-DECLARED IDENTITY DESCRIPTION OF THE PARTICIPANTS

Subject	Self-declared description
1	Non-binary
2	Transvestite
3	Non-binary
4	Non-binary
5	Transgender Woman
6	Non-binary
7	Non-binary
8	Transgender Woman
9	Non-binary
10	Non-binary
11	Transgender woman
12	Transgender Woman

It is worth remembering that gender is a category that refers to a social and historical dimension, which differs from sex (attribution depending on the biological aspect of the internal, external or genetic genitalia).

The diversity of gender in the university, revealed in the data above, is a potential condition for the questioning of exclusivity cis-normativity in university spaces and these people experience situations of violence and harassment the further away from heteronormativity (ANDIFES, 2018), in addition to the invisibility of transgender women, transvestites and other femininities in Higher Education.

TABLE 2- PERCENTAGE OF THE SAMPLE AS A FUNCTION OF SELF-DECLARED GENDER

Self-declared gender	Total	Percentage
Non-binary	7	58,33 %
Transvestite	1	08,33%
Transgender woman	4	33,33%
Total	12	100%

Table 2 describes the sample (absolute values and percentages) consisting of 1 (8.33%) by transvestites, 4 (33.33%) by transgender women and 6 (58.33%) by non-binary women. It is noteworthy that "Transgenders" are people who have a different gender identity than the one assigned to them at birth; "Non-Binaries" are people who do not define their identity within the binary system of gender (male and female) and cis normativity. According to the LGBT foundation, the binarism embraces other femininities such as queer gender, gender fluid, agender, neutral, bigender, pangender, multigender, intergender; Transvestite, on the other hand, is the person who does not identify as the biological gender, but understands himself as a female figure, dressing and behaving as expected by the other sex (Moreira, 2022).

It is noteworthy that 58.33% of the participants declare themselves non-binary. Given this fact, it is necessary to broaden the reading and bring LGBTQIAPN+ issues to the scene of debates. Moreira (2022) also applying an online questionnaire found that even teachers of an HEI in the area of education were unaware of much information about gender.

Goes (2019) emphasizes that binary (heteronormative) discourse promotes situations where non-binaries feel embarrassed, seen as different or deviant, suffering violence due to heteronormative disagreements, with the need for interventions by university managers and planning of effective institutional policies (Goes, 2019; Costa, 2020; Brazao & Days, 2021)

Table 3 describes the sample as a function of self-reported color/race and family income.

TABLE 3- DESCRIPTION OF THE SAMPLE BY RACE AND FAMILY INCOME

Subject	Self-declared description	Color/Race	Household income
1	Non-binary	**Brown**	**From 6 to 9 minimum wages**
2	Transvestite	**White**	**From 9 to 12 minimum wages**
3	Non-binary	**Brown**	**From 3 to 6 minimum wages**
4	Non-binary	**Brown**	**Up to 1 salary**
5	Transgender Woman	**Brown**	**From 1 to 3 minimum wages**
6	Non-binary	**Black**	**From 3 to 6 minimum wages**
7	Non-binary	**Brown**	**No**
8	Transgender Woman	**Brown**	**No**
9	Non-binary	**Brown**	**From 3 to 6 minimum wages**
10	Non-binary	**Brown**	**From 9 to 12 minimum wages**
11	Transgender woman	**White**	**From 12 to 15 minimum wages**
12	Transgender Woman	**White**	**From 6 to 9 minimum wages**

3 women (25%) declared themselves white, 8 as brown (66.66%) and 1 as black (8.34%). Analyzing the data in table 3 presented above, it is clear that:

a) One non-cis normative woman had a family income of less than 1 minimum wage.

b) non-normative cis white women have higher family income than normative non-cis black and brown women

c) 1 transvestite had a higher family income (from 12 to 15 minimum wages)

d) Despite the ease of access to higher education, black women with non-normative cis sexuality are the minority.

e) Family income below 1 minimum wage was presented by a single person (brown and non-binary)

f) There is a need to broaden this discussion and address it so that we can address discriminatory violations

Table 4 presents the mean values of the body objectification scale. It is noticed that the sample presented high mean values in all categories. All (non-binary, transvestite, and transgender women) have high self-objectification. It is pointed out that, due to this objectification, they are exposed to situations of violence and murder, marginalization and difficulties in entering the labor market (ANTRA, 2021; Baptista, 2021)

TABLE 4- MEAN VALUES OF THE EOC - BODY OBJECTIFICATION SCALE

	EOC Average	Result
Non-binary	50,58	Discharge
Transvestite	65	Discharge
Transgender women	58,25	Discharge
Total	54,34	Discharge

The data in table 4 point to a high objectification of non-cis women in the university environment. noting greater objectification of transvestites (M=65), followed by women transgender (M=58.25) and non-binary (M=50.58).

The values considered high of body objectification signal that non-cis women are highly objectified and this dehumanizes them as a woman, being Often objectified and seen as an object of pleasure or repulsion, such a situation leads to assuming roles of submission to the gaze of man.

Analyzing these data, it is noted

a- High objectification –

To perceive this high objectification is to realize that non-binary, transgender and transvestite women are reduced to sexual objects, as bodies to be enjoyed

It is known that Brazil is the largest consumer of trans pornography in the world. (Borges & Tilio, 2018). There is a cruel paradox between desire, fetish, and hatred. Therefore, there is a need to deal with transphobia, exclusion and prejudice (social and gender) by women who are objectified by a cis centered external gaze.

Many transgender university students have feelings of insecurity and non-belonging, prejudice and discimination (Viana et als, 2022), high dropout rates and there should be university management policies to promote respect for diversity and combat transphobia.

It is worth remembering that heated discussions have been offered on this issue, such as access, quota policies, affirmative action programs, however there is a need for further deepening, there is still much to discuss on this agenda.

It is known that a small percentage reaches higher education with a significant dropout rate. Many are abandoned by the family, violated by the cis normative society and end up living through underemployment or prostitution, due to transphobia there is a low life expectancy

a) UNIVERSITY – institutional affirmative policies should be instituted for access to and permanence in higher education for non-binary, transgender and transvestite women.
b) PSYCHOSOCIAL SUPPORT IN THE FACE OF HIGH OBJECTIFICATION AND PSYCHIC SUFFERING- one should have processes of listening and welcoming to deal with body shame, with feelings of non-social belonging. Give voice not just to cis women and men. It is also necessary to give a voice to transgender, transvestite and non-binary women who are invisible and victims of a patriarchal and phallocentric society
c) DISCUSS PROFESSIONAL GUIDANCE, ENTREPRENEURSHIP AND THE LABOR MARKET- It is estimated that many transgender women and transvestites in Brazil have prostitution as a source of income and only possibility of subsistence (Silva, Bezerra and Queiroz, 2015), possibly promoted by several factors such as the difficulty of insertion in the formal labor market and deficiency in professional qualification caused by social exclusion, family and school

Family breakdown and social exclusion give rise to school exclusion, which hinders the educational, training and technical qualification process. Heteronormati logicva assaults these women daily, either by the hand of the family that excludes, the police, the population with different forms of violence, this justifies the small percentage of access and permanence to higher education

Given the high rate of body objectification, there is a need to recognize the existence of non-cis women also in higher education and that "being a woman" is not reduced to the anatomical aspect. Foucault (1988) and Butler (1988) highlight the history of sexuality, the different mechanisms of body control and analyze the different resistances, the place of speech, the power relations in a condition of suffering, the conflicts and tensions in people dissonant with the heteronormative gender

From an early age, we learn that our bodies must be framed in pre-established control systems, which insert us into thought-out, limited and limiting behavioral models of the various subjective potentialities and the various objective contradictions, but all this, when it diverges from the cis normativity, there is self-objectification and suffering

4 CONCLUSION

There is a high objectification by non-cis normative (non-binary, transvestite, and transgender) college students. There is resistance in the university environment in the face of a normative cis context, it also reflects a phallocentric logic of society;

In the face of this self-objectification In non-heteronormative university women it is revealing to reflect on mental suffering, sexualization of their bodies and it is imperative to have changes in society, culture and affirmative policies.

If cisgender women already suffer from body self-image because they are all the time being bombarded with messages about "the perfect body," imagine a transgender, transvestite, non-binary woman.

It is concluded that there is suffering of non-heteronormative university women due to the high rate of self-objectification, affecting their body perceptions, body images, self-esteem, sense of security, well-being and satisfaction with themselves, as a result directly afflicting mental health, their relationships, quality of life, and the experiences of these women in a total way.

a) There is high female body objectification by both non-binary, transgender and transvestite women.

b) The female self-objectification by transvestites is far superior to that of transgender women and non-binary women

c) There is a need for affirmative policies in universities

d) Identify the discursive and normalizing devices that are used by university society to, when dealing with sex and gender, produce a stereotyped view of non-cis women

e) Establish processes that deal with exclusionary discourse

FUTURE DIRECTIONS

Future studies will focus through qualitative methodology to investigate different perspectives on the issue, such contemporary issues as self-objectification and facial harmonization, rights of body modification in the face of different discursive coercions and narratives of violence in the academic environment, because the other is different, self-objectification of the LBGTQIAN+ population among others

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SEVEN
publicações acadêmicas

Psychology and HIV/AIDS: An academic view in the extension

Crossref doi
https://doi.org/10.56238/ptoketheeducati-044

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ABSTRACT
In the course of the discovery of Human Immunodeficiency (HIV), stigmas and prejudices were created and disseminated in the social space. Having this condition brings with it a break in friendship cycles and the creation of affective bonds, given the label that bodies with a confirmed diagnosis carry with them. The insertion of Psychology in the areas of action of public policies, especially HIV and Acquired Immunodeficiency Syndrome (AIDS), brought a fundamental role of being alert and acting to social chains, that is, to reduce the potential of the implications constituted about all stigma and stereotypes thrown at the bodies of those who have the virus infection. In this context, to help the dialogical exchange, the extension project entitled: "Knowing and Promoting Nutritional Care, Self-Perception of Body Image and Quality of Life of People Living With HIV/AIDS through Interdisciplinarity and Interprofessionality in the Municipality of Macaé - Group APHETO" of the Multidisciplinary Center/UFRJ-Macaé-RJ, in partnership with the multidisciplinary team of SAE/IST/Aids from Macaé-RJ/Brazil, enables multidisciplinary team actions, in addition to sharing informative posts and polls on the project's instagram through bibliographic research, making visible the reliable information on this pathology within the field of health and interpersonal relationships.

Keywords: HIV, University Extension, Psychology, Public Policies.

1 INTRODUCTION

In the course of the life of any human being we go through processes of social interactions that in the future will contribute to the development and learning of each individual. Given this, it is normal, over time, from the result of the experiences acquired and the family / social context present, to form cycles of friendships with people who have the same interests as ours or are part of the family life, subjects these belong to the social groups to which we are inserted, such as: schools, academies, religious institutions, among others. Therefore, the formation of an affective bond of friendship is very important and necessary to live and remain healthy in society.

However, in the same way that this connection can be beneficial to the physical and mental health of the individual, it can also present its negative side when the discovery of the infection of a virus that causes a discriminatory look and promotes intolerance and invisibility to the bodies that

carry it (Parker & Aggleton, 2001). Since its inception, HIV/AIDS caused the rupture of several bonds of friendship throughout its discovery, since it was considered a punitive and shameful disease for those who possessed it, so the withdrawal was something that "correct" to do.

However, even today, in the face of the technological age and easy access to information via the internet and social media such as TV and radio, social ignorance continues to be manifested in the present. This act of distancing after diagnosis is still due to the stigmas imposed and the low disclosure about prevention, self-care and health promotion (Santana et al., 2021). In this case, the insertion of psychology in the public policies involved can be seen as responses to social problems, generated meeting the demands and tensions engendered in society.

The entry of Psychology in these debates and studies was of paramount importance, since psychologists can play a relevant role in the elaboration of efficient public policies aimed at AIDS, in addition to evaluating actions from the guidelines of the programs of the federal, state and municipal governments (CREPOP, 2008). In this sense, in view of the great impact caused by the HIV/AIDS epidemic, it was necessary to insert psychology and the performance of a multidisciplinary team in public health. For, the entry of psychology in this field made it possible to guide in the formulation of policies and programs in the application of actions, evaluation of these methods and their monitoring. However, the execution of these works are promoted together with multidisciplinary groups, which contributes to the foundation of the work of psychology in the space of health and public policies.

2 GOALS

Thus, thinking about the expansion of information and forums about the virus would advance a step to deconstruct and resignify all current prejudice, given the dissemination of booklets, projects, lectures, congresses on the subject and the support of a friend, his friendship cycle or the family, is fundamental for long-term treatment. Given this, the university extension project emerges as a strategic device whose function is to generate a dynamic resource for professional training and health promotion (SAMPAIO et al., 2018).

In the meantime, since the advent of the promotion and implementation of extension activities within Brazilian universities, its objective has been characterized as a dynamic educational process that favors the junction between teaching in the classroom and learning in the face of the demands of the community. In this sense, the extension activity stands out for the integrative and multidisciplinary characteristic proposed, in which they enable students to form networks with other professions for the benefit of the community (DESLANDES & ARANTES, 2017).

3 METHODOLOGY

The extension project "*APHETO",* even if its creation comes from UFRJ, the research was not limited only to the municipality of Macaé or the intermediations of Rio de Janeiro. His research seeks to give visibility to peoples who within the HIV exclusion group themselves fall into subgroups that determine or further aggravate social repudiation. This amplitude in investigating and highlighting the eminent social gaps in an integrative way, seeks to re-signify their impact and erroneous information in front of stigmatized and subalternized subjects (ALVES et al., 2016).

In this sense, the proposal of the project was to develop in social media debates and posts that emphasized the importance of talking about the theme among the different bodies crossed by HIV, namely: indigenous, quilombolas, women, pregnant women, children, homosexuals, blacks, among others. The stigmas generated to the bodies that carry the mark of intolerance only aggravates the formation of the affective and social bond after the diagnosis, in this way, the program was presented with the intention of developing a look with apheto in front of the social notes.

4 THEORETICAL FRAMEWORK

Promiscuous! Careless! Irresponsible! These are words that reach people living with HIV on a daily basis. Loaded with prejudice, they are phrases that hurt and violate bodies that fight every dawn against the stigmatization that surrounds this theme. In addition to the words uttered without the slightest reflection, serophobia - the name given to discrimination against people living with HIV - moves in the face of the personal experiences of a portion of the population. That is, in addition to this spoken violence that is felt as a punch in the face, serophobia is present in several other veiled forms, such as prejudice related to the donation of blood of gays and bisexuals, the lack of assistance in the public sphere and the scandalization of the sexual life of these people. Thus, it is understood that despite the immense progress as a society and the increase in information on the subject, there are still instruments of oppression directed at people living with HIV.

The individual carrying the HIV virus is commonly faced with questions such as "Why didn't you use a condom?" "Do you take care of yourself?" questions that direct a criminalization to the person you listen to. When talking about care and, however, in the doubt of the lack of it, the concern that many people who have tested positive for HIV have when starting an affective relationship is discussed. The responsibility of a caregiver, in many cases, is placed as assigned to only one part of the relationship. In this sense, it is worth thinking about how these thoughts disguised as sincere concern, that is, entangled in the pressure for the partner, the one who carries the virus, to always take care of himself, also express a veiled discrimination against these people, since the responsibility of care is attributed not only individually but in both parties.

Nevertheless, talking about HIV/AIDS brings out increasingly relevant discussions about sexuality, since it is related to certain power relations. Research from the Joint United Nations Programme on HIV provides important examples that reinforce stigmas regarding gender role. Thus, it is understood that, in a relationship, men commonly earn the right to forgiveness for the behavior that resulted in their seropositive diagnosis. On the other hand, women are blamed, often abandoned by their husbands, who are responsible for this infection. These women are determined to be contempt, judgmental, and rejected by family and friends. Thus, taken by a fear that is evoked through a sexist and serophobic society, many of them prefer not to know their condition with the virus, their rights and choose, at the highest level of oppression, to keep their experience with HIV a secret.

Thus, entering into the depths that the theme proposes, encompassing the relationships with the other and, in the same way, with oneself, thinking about the initial process that is to receive the news that one is a carrier of the HIV virus, opens space to discuss a very important point in this process: the issue of self-esteem. It is understood that the analysis of the construction of self-esteem must, necessarily, include the real relations and the historical and social context of the subject, because the other has great influence on the constitution of this. Self-esteem is built in the relationship with other members of the culture, since socioeconomic, cultural, family and school contexts and the like exert varied influences on the web of interactions that are constitutive of the individual (FRANCO, DAVIS, 2010). In this way, the social representations of a person living with HIV is fostered and structured through interpretations diluted in moralistic beliefs that place the subject in a position of immorality, raising ideas where women are seen as irresponsible and gays are seen as promiscuous. These relationships affect not only the relationship with the mirror but affect a thought of oneself, about one's own personality, about one's own experiences and one's own way of being and acting in the world.

With this, the project "Knowing and promoting nutritional care, self-perception of body image and quality of life in people living with HIV/AIDS through interdisciplinarity and interprofessionality in the municipality of Macaé-RJ – APHETO Project", carried out at UFRJ, sought to enable new ways of relating to the body, understanding that the image reflected in the mirror, impregnated by phrases that call into question the appearance, presentation and the being itself does not define and does not represent the subject living with HIV. The project seeks to provide self-perception of body image beyond a diagnosis, beyond stigmas, beyond the invisibility of access, beyond the wounds by words, beyond the violence experienced.

Therefore, it is worth thinking that there is no more tolerance for instruments that imprison these bodies in a determined stigma. The freedom of the body is a right of all and the fight against prejudices against people living with HIV must walk along a horizon where the body has political, ethical and sexual freedom. Thus, the meaning of the word HIV and its other meanings should not be related to repulsion or rejection but should be synonymous with care, empathy and awareness. That

this welcoming look does not come only from those who identify with the cause, but that they cover public agencies and policies that promote visibility and, above all, care. May we continue with the message that the artist Maria Sil (2017) echoes in her song "yellow eyes":

> "From my yellow eyes I know. There is no shame in all this that I am. Now there are still dreams. On this road I'm going to tread. With all the history they shut up. Of my rewritten dreams I know. I bring in my mouth every song that has changed. Whoever fights shows his teeth and my soul I will wash. With the force of my singing. In this old new closet. I'm not going in... Parceled out in days of affliction. I wasn't asked if I wanted to go. And they just pointed me in the direction. Of the secret, the shame, and the fear of being like this: PositHIVo!"

5 RESULTS AND DISCUSSIONS

Considering that HIV/AIDS is still denoted as taboo in our society, mixing misinformation with prejudice, there is an urgency to make debates about this theme more comprehensive in the social environment, in order to overcome the stigmas experienced by people who have this condition. The experience of acting in the Apheto project, as stated above, goes against this proposal. Regularly, social networks were used to share information about HIV, from publications about living with the virus among different social groups to tips on food and lifestyle, aiming to promote well-being for those with the disease, understanding that such a circumstance does not mean, as already thought, a cessation of life. Thus, more than sharing psychopathological data on HIV, the project sought to disseminate studies on the quality of life of these people.

By looking at this theme in a macro way, it is possible to affirm that the realization of a quality of life after HIV diagnosis demands a set of aspects that do not end only in the carrier, but surround throughout their social sphere. Coast et. al. tells us that the necessary biases for this issue involve "care by health services and relationships with health professionals; work and employment ties; experience of sexuality; body changes and perception of self-image; and social support and family relationships" (COSTA et. al., 2015, p. 366). Thus, while the debate leaves an individualistic vision to go through the entire field to which the subject with HIV belongs, it is necessary that the institutions and social roles involved in this front are engaged in a present, genuine and empathetic way.

Among these roles, we highlight the presence of Psychology in the prognosis of the virus carrier. In particular, to the fact that this area allows the rescue of the identity of that subject who, sometimes, is suffocated by the diagnosis and even more suppressed by social stigmas, as previously addressed. Thus, it is possible to conclude that:

> Psychology, recognized as a contributor in the scope of health interventions, is inserted in the context of HIV/AIDS, evidencing the human being in his integrality - a subject who suffers far beyond the disease he carries. This view made it possible to break with a partial understanding of the health-disease process, which valued only the organicity of the pathologies and which blamed, almost exclusively, the subject with the disease. [...] This allowed a global view of the health system and the engagement of the professional with broader issues, such as those related to people's quality of life. (PERUCCHI et. al., 2011, p. 72)

Therefore, it is evident that the psychological support provided by a professional in the area rescues the subjectivity of the subject, making him able to trace new possibilities of life after the diagnosis of the disease, which can have full quality and vigor. However, this performance of Psychology needs to be supported by a social commitment to that individual who seeks the health system to perform his treatment, diverting from a strictly biological look at the disease to broaden the perspectives of the subject, bringing parallels about his body, his trajectory, his habits and desires, being a path that has different paths to be followed. And, when entering one of them, the project brought debates about the benefits of paralleling psychology with the debates about HIV/AIDS.

Added to this, it is known that the public policies established with the help of Psychology need to be aligned for different populations. In our posts on social networks, for example, we have already addressed topics such as HIV and the LGBTQIA+ community in order to dissolve the common sense that the disease is related only to this class, aiming to promote information that deals with the prevention and care of the disease without classifying it in an undue and prejudiced way, but emphasizing the social root of this epidemic that excludes vulnerable groups and the so-called minorities from access to health. In addition, we have also addressed the issue of infection among the elderly, since it is known that the lifestyle among those over 60 years of age has changed both in the professional, social and sexual bias.

Thus, we raise the question about the importance of promoting accessible information for this group so that there is no increase in infections in this age group. There were also debates about the prejudice that is seen in relational contexts, such as family, friends and in the work environment, which sometimes exclude HIV patients due to misinformation about their condition, taxing them, even if indirectly, as different and, consequently, inferior. Thus, the lack of support can negatively affect the self-perception of the individual and their care for their physical and mental health, bringing losses in all spheres of their life.

Therefore, it is possible to perceive that Psychology, by promoting a qualified listening and welcoming for this subject, goes against the adherence to HIV treatment. However, it is necessary that the scenario in which the subject is inserted also fully embraces him, respecting his condition and encouraging care for himself. With this, it is realized that nothing is seen in isolation, since all roles social are implicated with each other. Thus, psychological support is only effective if the individual is also contemplated by this support.

And, by uniting the universe of HIV/AIDS with multidisciplinary fronts, the Apheto project has advanced some steps in the fight against misinformation on the subject generated by a social ignorance that, for years, has silenced these lives that deal with an HIV-positive diagnosis. Therefore, we sought to overcome these negative affectations to explore and disseminate content that positively

affects carriers of this condition, showing that the treatment process is a walk together and full of affections.

6 FINAL CONSIDERATIONS

The possibility of expanding and giving visibility to the agenda of bodies in HIV condition was the pillar for the foundation of this university extension project, in view of the expectation of producing a look with apheto regarding post-diagnosis care. Regarding the strategies elaborated in order to encompass a whole reflection and social responsibility about the discrimination produced and imagined on top of HIV, the work was carried out in a thorough way and with great affection in order to re-signify all information acquired in an erroneous and traumatic way in a place of reception and safe elucidations. In short, the main considerations of the project were to share reliable psychosocial surveys without any support based on the imposed social knowledge, with the willingness to break stereotypes and stigmas in the face of some bodies that become susceptible to violence.

Thus, despite our society advancing in awareness in the discussion about HIV, it is still evident that there is suffering caused by stigmas that place people living with HIV in certain social roles. It is then understood that prejudice, whether it is blatant in words spoken or veiled in certain questions, intimately affects these bodies in the relationship with the other and especially with oneself. These social representations, loaded with moralism, place, especially, women, gays and bisexuals in a place of rejection, of exclusion, of "risk" where the ways of being and interacting in the world are permeated by looks that judge and annul lives. In this sense, prejudice corrupts the main message to be reproduced, that is, the sense that care is not a relationship that should stick to a single individual but is a public responsibility, that is, of all.

Therefore, it is possible to affirm that psychological support becomes an effective aid in the reconstruction of the link of the individual with HIV with his own subjectivity, so that before the labeling that society imposes on people with this condition there is the rescue of their personality. However, it is known that along with this point, it is also necessary that the nuclei in which the subject participates also engage in this cause, annihilating with any prejudice and untruths on the subject of HIV/AIDS, which comes both with the support dedicated to the carrier of the virus and by the sharing of information and truthful data about their treatment process. Thus, it can be inferred that affection, something so stimulated in our project that carries this same signature, will be perceived both in the subject's interpersonal relationships and with himself, ending in the improvement of his self-perception and, consequently, adherence to treatment and construction of new perspectives of life after diagnosis.

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SEVEN
publicações acadêmicas

Paulo Freire and the educational links of knowledge: Contributions of his thought to Contemporary Brazilian Education

Crossref doi
https://doi.org/10.56238/ptoketheeducati-045

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ABSTRACT
This text aims to conduct reflections on the contributions of Paulo Freire's ideas to Brazilian education. For this, it approaches in a synthetic way the history of Education from Antiquity to the present day, going through several theoretical studies based on authors such as Vernant (2011), Le Goff (n.d.), Descartes (1996), Durkheim (2013), Dewey (2007), Ferreira and Bittar (2008), Boto (2007), Marcondes (2007), Santos (2003), Garcia (2007), as well as works of the author himself highlight of this work: Paul Freire. To this end, it seeks to answer the following question: what is the contribution of Paulo Freire's ideas to contemporary Brazilian education? With this, we realize that such a thinker contributed and still contributes, through his works, significantly in the education that has as perspective the human emancipation and the search for the transformation of the social reality. Although, analyzing the neoliberal context that we live, his theory is the target of criticism, since it acts against the hegemony is a landmark at the world level and collaborated in the elaboration of new educational paradigms, which now make it possible to think about the relationship between popular knowledge and scientific knowledge.

Keywords: Knowledge, Education, Society, Social transformation.

1 INTRODUCTION

Education is the object of study of the whole society in the most diverse times, since it is a primordial phenomenon for human development. Since the beginning of human existence it is noticed, through historiographical studies, that there is the insurgency of writings, which we recognize as symbolism of the path to education. Being this a precursor process of the actions and relations of development of human beings for their experience in society, the present work seeks, primarily, to reflect on the influence of the theory of the thinker Paulo Freire in the preponderance of contemporary theoretical assumptions.

To this end, we resume some central points of rumination of the historical script briefly going through the studies of Classical Antiquity, in which it situated the "discovery" of the world by reason. In sequence, we deal with the Age of Modern Philosophy, which awakens the logic of thought and reason without the command of the church, which was before that, the main center of educational

ideas. Thus, elucidating and increasingly expanding the image of education free of religious dogmas and the premises of its social perspective. That is, of its influence on social relations.

Based on the perspective of development of social relations and trusting in the democratization of education, we point to the rescue of the value of this model and highlight the relevance of educational institutions in this process. With this, as the central axis of this work we approach the thought of Paulo Freire, and this faithfully incorporates concepts that denote a perspective of social transformation. Considering this aspect as the most pertinent to the current context, when we think of a liberating education, we also trace new theoretical currents.

Through this synthetic trajectory, in a bibliographic character based on studies based on Vernant (2011), Le Goff (n.d.), Descartes (1996), Durkheim (2013), Dewey (2007), Ferreira and Bittar (2008), Boto (2007), Marcondes (2007), Santos (2003), Garcia (2007), as well as works by Paulo Freire, we seek to answer the following question: what is the contribution of Paulo Freire's ideas to contemporary Brazilian education? In this sense, we understand that this thinker added a lot and still adds to the perception of education as a practice for freedom, as he himself points out. Thus, while it manifests its conception of education as a means for the emancipation of subjects and social transformation, it also reflects on the movements of action and reflection to generate new or reformulated actions that consider the subject as a producer of his own knowledge.

By noting that his ideas still have significant repercussions of a new paradigm of education, since it is perceived as an essential axis for this, he outlines the consideration for popular knowledge and the return of scientific knowledge to the community. In order to democratize access to and production of knowledge also for those who were once placed on the margins of philosophy, we realize that Freire has contributed a lot and continues to contribute to thinking about education, even though, within a neoliberal context, he is much criticized.

Given this, we present below the following points of discussion of the research: Historical assumptions of education in the world; What Paulo Freire thought: highlights of his theory of transformative education; Contemporaneity: current education and the new paradigm of knowledge construction. Finally, we present our conclusions from the study.

2 DEVELOPMENT

2.1 HISTORICAL ASSUMPTIONS OF EDUCATION IN THE WORLD

Thousands of years ago, man already felt the need for writing and consequently reading, because he began to make rock inscriptions on the walls of caves representing animals and scenes of his daily life. Which later evolved into a cuneiform script. Making room later, for the first books that were created by the Sumerians.

These books were written on clay tablets around 3,200 B.C., in Mesopotamia, present-day Iraq, which had the greater purpose of sedimenting laws, administrative and religious matters, but also had writings on legends and even poetry. Fischer (2006, p. 14) conceptualizes writing as "the sequence of standardized symbols (characters, signs or components of signs) for the purpose of generally reproducing human speech and thought."

We perceive there, the fascination of the human being for the letters, for the books, since the beginning times. This writing was evolving, in ancient Greece appear with important figure the scribes the only ones versed in the art of writing, helps the king in social life with a multitude of records and after the Dorian invasions the king loses his status decentralizes power and begins a social formation and the written language is transformed and begins to spread among the demos (common population) arise the first schools.

In the period of Classical Antiquity it was possible to perceive the relationship between society, the social model lived and the precepts of education in their agreement, as Vernant (2011) exposes when saying of the emergence of philosophy in the polis (city) whose structure was geared to reason by the form of organization of that moment, which relied heavily on the appeal of poetry, of religion and its socio-political particularities that favored the expansion of Greek thought. In this period, philosophers tried to understand the world by reason and encourage others to do the same, thus uniting philosophy, science and art to face and reflect the mysteries of the existence of the world.

Already in the Middle Ages, what is noticeable, based on the studies of Le Goff (S.d.), is the emphasis on the university and the intellectual. In this period, the diminution of the forces of belief in myths is emphasized, as experienced in Classical Antiquity, the elaboration of thought by reason is expanded and the vision of a new social reality is designated, which projects the so-called Renaissance of society. With these changes, we enter the Age of Modern Philosophy when we start to point to secularism. It is through this metamorphosis that the logic of thought and reason begins without the command of the church. In this period, man is regarded as a "free thinker", whose initial problem is to explain man's relationship with the world without the interaction of religion.

René Descartes, a highly educated thinker who, although focused on the humanities, developed his interest in physics, mathematics, geometry, enabling his questioning before the humanities themselves, in his writing on the Discourse of Method (1996), presented a way of rational application of explaining, understanding and recomposing reason within a new totality by proposing the incentive for reason beyond religious dogmas. Thus, making it possible to recognize the truth without submission from a Catholic sphere.

Thus, initiating the break with the Catholic sphere, another free thinker with relevant contributions to the history of education and knowledge in society is Immanuel Kant, a liberal, Protestant and Enlightenment who problematized the scope of reason, seeking to bring it also closer to

experience. For him, reason must be in favor of the individual and the State, in this way, he synthesized empiricism and rationalism as philosophical currents that allowed to overcome the primitive nature of men, and Education, therefore, would act in this sense.

Considering education as a social fact, another thinker who contributed to the basic premises of knowledge is Émile Durkheim, who treats education as something eminently social, as he addresses in his work "Education and Sociology" (2013). For him, education is a key point for the development of man in civilization and that for the model of civilization, that is, for each social environment, it is pertinent that education be lived in a way that corresponds to the customs, cultures and needs of that environment. Thus, the child is seen as a "tabula rasa" that will be formed as a man before everything that is around him, such as morals, language, sciences, religions, among many other diverse artifacts that one has in society (DURKHEIM, 2013, p. 15).

Moving further in this direction, John Dewey in his work Democracy and Education verses pedagogical concepts, methods, models that were circumscribed to pedagogy about his experiences that he put into practice, the school should not be isolated from life. An educational objective must be based on the activities and intrinsic needs (including natural instincts and acquired habits) of a given individual to be educated (DEWEY, 2007, p.23), as this enables the individual to continue his education in a constant development, continuous process like life itself.

Bringing to light the struggles for a public school space, as Dewey already intended in his ideas, and with access to education for all as an element of democratization of society without distinction of social classes, we point to the thoughts of Marx. For this thinker, knowledge should serve for the integral formation of people, projecting, therefore, the fall of alienation and the struggle against capitalism. However, since the school originated in bourgeois ideas, there was a distancing from these ideals that Marx defended and Gramsci postulated of a better way of seeing the school in society:

> At the same time, the public school, as it developed in bourgeois society, failed to realize the effective relationship between school education, technological training and gymnastics, as Marx advocated, that is, the combination of intellectual and physical training with productive work. Perhaps, today, it should be more requested in the sense that Gramsci foresaw, that is, with a strong emphasis on general, humanist and intellectual formation. (SMITH JR., A.; BITTAR, 2008, p. 639)

Incorporating the thought about the relationship between Education and Society in the XXI century, the author Carlota Boto exposes the understanding of the ways and knowledge as we arrived in this century, being what we are. At the beginning of his book "The School Liturgy in the Modern Age" he postulates a reflection on the transformations that happen in the processes of schooling, in the past and in the present and how it will be up to the school not only to teach reading, writing and counting, but also the exposure of habits and actions to be internalized in the person's own identity (BOTO, 2007, p. 12). She still continues to expose that the school is her existence, therefore, the

school is her history, to reflect on the school we desire it is necessary to meditate on the school we received (BOTO, 2007, p. 12).

Given this, by recognizing this historical path, reflecting on its contributions to the perspective of education of the thinker Paulo Freire, which has as its centrality the human emancipation and social transformation, as well as the implications of his ideas in the current educational paradigms, aims to weave reflections on the perspective of this article Freirean education and its contribution to education today. As the axis of discussion of the theme we present as a question-problem the following question: What perspective of education developed Paulo Freire and how does it contribute today?

To this end, we used as methodology the bibliographic research, considering that it is based on the studies of classic works of the author, in addition to other authors such as (insert authors used), as well as presented in items 2.1 "What Paulo Freire thought: Theoretical assumptions of his vision of education", in which we present this thinker and his main ideas with regard to education. And in item 2.1 "Contemporaneity: current education", in which we highlight the thought of Boaventura de Souza Santos. Finally, in the conclusions we bring the alignment between the historical process, the premises of the thinkers and the relationship with the society in which we live, establishing the critique of what we perceive in the current social and educational model.

2.2 WHAT PAULO FREIRE THOUGHT: HIGHLIGHTS OF HIS THEORY OF TRANSFORMATIVE EDUCATION

Paulo Reglus Neves Freire, our acquaintance Paulo Freire was born in Recife on September 19, 1921 and died in São Paulo, May 2, 1997, was a Brazilian educator, pedagogue and philosopher. Patron of Brazilian Education, he is considered one of the most remarkable in the history of world pedagogy, having influenced the critical pedagogy movement, believing that education was the essential tool for the transformation of society, as well as we see in the work 100 years: life, thought and works of Paulo Freire, this being a work organized by Poletto, Almeida, Gross and Aparecida (2021) in commemoration of the thinker's centenary.

When studying his educational trajectory it is possible to notice that the beginning of his process of learning the letters by his mother, Edeltrudes Neves Freire. At the age of 6, when she entered the school she already knew how to read and write, her first teacher was called Eunice Vasconcelos, in the 20's. Paulo Freire declared that his literacy was not monotonous, due to the fact that he started from words and phrases linked to his experience and wrote with sticks on the dirt floor of the yard. In his words, he points out that there was no break between the world of his own experiences, since Eunice's school did not hinder his curiosity.

Through these reports we can perceive the influence and importance of how he was taught the first letters and of his first teacher in his life, which will reflect throughout his trajectory as an educator

and philosopher that was, especially, when it comes to literacy and the understanding of it, since literacy activities require the research that Freire calls the "minimum vocabulary universe" among the literate. In this way, the words that will be part of the generating words within the vocabulary repertoire of the life context of these literati are chosen, and the mere repetition of words is denied, a method that has expanded throughout the world.

Soon, we realized that the literacy thought by Paulo Freire was not only the techniques linked to the learning of reading and writing. It was an invitation to men and women to perceive themselves and within the economic-political and ideological context and, thus, to take the first step towards the transformation of society through the reading of the word in consonance with the reading of the world and with a view to a critical positioning.

> Paulo Freire, the educator of souls, sought in his trajectory to reveal that education goes from the local reality to the global reality. When traveling along straight and tortuous roads, Paulo Freire has always had an educational purpose for the realization of the human condition, and for this, a constant approach was required of those who seek the same ideals and of what provides the glimpse of a human, pedagogical and dialogical meaning. (Smith, 2021, p. 14)

Thus, knowing even briefly who Paulo Freire was and his ideas and returning to the reading of Durkhein (2013), in which he states that education is eminently social because its substantial function is to transmit the sociocultural legacy of a given context, resulting in a socialization process that he calls being social, his sociological behavior, we approach the ideas of Paulo Freire. In the book Education as a Practice of Freedom begins with the phrase "There is no education outside human societies and there is no man in the void" (FREIRE, 1967, p. 35), presents society as a whole for an emphatic analysis based on the construction of critical thinking and approximation of the study with the reality of the students, in a libertarian communicative process, pedagogical principles that lead to critical reflection of reality, providing protagonism to the popular classes.

We note that from this perspective, learners, as part of the institutions is a social being, creates a link intertwining with the process of education as a practice in search of freedom through awareness and that, in turn, leaves us contributions over time. With this, the role of the educator is paramount, since it goes beyond the teaching of the contents, exposing the certainty that it is part of the teaching task to also teach to think critically, as Freire (2001) affirms. In the conditions of true learning, the students are transformed into real subjects of the construction and reconstruction of teaching knowledge, alongside the educator, also the subject of the process.

In his book "Education as a practice of freedom" (1967) is exposed the relationship between society and education, as well as we note in the historical process of education. In the work, it is valuable to mention the political character of education, which exacerbates the understanding of the construction of beings capable of understanding their reality and understanding their space and political-social role through dialogical exchanges and considering the reality and knowledge of the

people. It is based on this revolutionary proposal that Paulo Freire is considered one of the most remarkable thinkers of world pedagogy, since, postulated a critical pedagogy in which the educational process happens through the dialogue of the student, their families and social interactions, provides the process of national development, including and valuing the knowledge of the people. According to him,

> The CONCEPT of relations, of the purely human sphere, holds in itself, as we shall see, connotations of plurality, transcendence, criticality, consequence and temporality. The relations that man has in the world with the world (personal, impersonal, corporeal and incorporeal) present such an order of characteristics that they are totally distinguished from the pure contacts typical of the other animal sphere. We understand that, for man, the world is an objective reality, independent of him, possible to be known. It is fundamental, however, to start from the fact that man, being of relations and not only of contacts, is not only *in* the world, but *with* the world. Being *with the* world results from its openness to reality, which makes it be the entity of relations that it is. (FREIRE, 1967, p. 39)

In this sense, the thinker's view of people as beings of relation, beings that are not only in the world, but that are part of it, is emphatic, making it relevant to reflect on education as a factor of human development. Incumbent in the social context, with the diversity of existing characteristics, its pedagogy has repercussions on the integral development of the subjects, on the construction of knowledge that goes beyond the teaching of the contents and also contemplate - and primarily - the taking of political and social awareness, by which it intends to achieve emancipation.

In order to raise awareness and recognize the social reality lived, based on the division between those who are holders of power (oppressor) and those who sell their labor power (named by Freire as oppressed), as we recall by Marx's ideology, the thinker seeks to ensure a process of literacy that contemplates rigor with loving-kindness, that is, embraces in the dialogical actions of teaching-learning the sensitivity towards the people and methods capable of promoting the desired development, as well as is evident in the work "Pedagogy of the Oppressed" (1987). In it, we reaffirm the power of educational praxis, because "to free oneself from its strength requires, indisputably, the emergence of it, the return upon it. This is why, only through authentic praxis, which is not "blablablah", nor activism, but action and reflection, is it possible to do so. (Freire, 1987, p. 21).

When dealing with the movement of praxis, it is pertinent to understand such a process of action - reflection - action for the process of construction and reconstruction of knowledge that establishes the capacity of awareness. According to him, "Praxis, however, is reflection and action of men on the world to transform it, without it, it is impossible to overcome the contradiction oppressor-oppressed." (Freire, 1987, p. 21). Therefore, highlighting the importance of the act of educating for social transformation, a remarkable prism as the central axis of the search for knowledge since the beginning, although in different ways, since the social context varies over time. Thus, it turns to the conception of education as a practice of freedom:

> Education as a practice of freedom, as opposed to that which is the practice of domination, implies the denial of the abstract, isolated, loose, detached man from the world, as well as the denial of the world as a reality absent from men. The reflection he proposes, because it is authentic, is not about this man abstraction nor about this world without man, but about men in their relations with the world. Relationships in which consciousness and the world occur simultaneously. There is no consciousness before and no world after and vice versa. (Freire, 1987, p. 40).

Paulo Freire dedicated himself to thinking about popular education and for the work developed that received the name of Paulo Freire Method that would be carried out with adult literacy. This method explored sound and images with the generative words, which should be born from the search for the students' vocabulary universe and not from a selection that we made in our work office, no matter how perfect it is from the technical point of view (FREIRE, 1979, p. 23). It was in the city of Angicos, in Rio Grande do Norte, Freire carried out his best-known experiment: the literacy of about three hundred people, adults who worked local sugarcane plantations, in a forty-hour course. This method has had excellent results in the literacy of these people and, therefore, is recognized worldwide.

Observing analytically the life and works of Paulo Freire, we perceive its magnitude, being a Brazilian educator with projection in other countries, with a method created and elaborated specifically with the conditions of Brazil, but with universal traits with regard to literacy. Corroborating, therefore, for the reflections of his contribution in the educational field to the present day, because we note that his theory and his method are still notoriously marked in the educational actions that envision the adoption of the social and popular field as a means of transforming the reality in which we live.

Education has transformative social potential and should be seen as essential for all. From the critical point of view, it is as impossible to deny the political nature of the educational process as to deny the educational character of the political act (FREIRE, 1989, p.15). The policy is intrinsic in the processes of teaching and learning, incorporated in the methodologies used and, as agent subjects we have to analyze which part belongs to us for the stages of involvement. Have theoretical repertoire, have the didactic transposition and certainty about the concept of meaningful learning within every social context. Observe, investigate, reconsider and have the sensitivity to take as a didactic laboratory your day-to-day, as research has been teaching us, since mechanical repetition does not constitute meaningful learning.

In this sense, based on the theoretical studies of the present discussion, we realize that achieving meaningful learning is a challenge. Freire's studies help us in the change of human consciousness in relation to the social structure of the subjects, placing the students as protagonists of their actions and constructions of knowledge. The educator, in this perspective, is the mediator of these ideas in a liberating way, valuing and stimulating the process so that they seek to think on their own and reflect critically on reality, in addition to instigating the passive non-acceptance of everything that was imposed on them socially, thus having an emancipatory character, walking towards social

transformation. In this regard, Freire (2001, p. 29) states that teaching is not exhausted in the "treatment" of the object or content, superficially done, but extends to the production of the conditions in which learning critically is possible.

Thinking about the links that the history of education has brandished us over time and about the whole process through which it has passed over the years, having as agents of the educational process, the teacher is in evidence due to its importance and, historically, its centrality in this process. We notice, years later, that Paulo Freire discusses these educational statements for the construction of knowledge with transformative action, presenting us with constitutive elements of the understanding of teaching practice as a social dimension of human formation (FREIRE, 2001, p.12).

With a critical educational practice, Paulo Freire argued that the act of teaching was directly related to learning;

> [...] In the conditions of true learning, the students are transformed into real subjects of the construction and reconstruction of the teaching knowledge, alongside the educator, also the subject of the process. Only in this way can we really speak of knowledge taught, in which the object taught is learned in its reason for being and, therefore, learned by the learners. (Freire, 2001, p. 29)

In this segment, we understand the relevance of the centrality of students in the process of construction and reconstruction of their knowledge, mediated and instigated by the teacher, who is also seen, in this perspective, as an eternal learner. Thus, rooting human meaning in the educational process, which happens dialogically and based on the own experiences of all those involved. However, to reflect on this perspective in the current context, marked by a neoliberal State that prioritizes the commodification of education, it is necessary to think of new paradigms and, for this, we add below a brief discussion on the new paradigm of education, raising the role of science in this new construction of knowledge.

2.3 CONTEMPORANEITY: CURRENT EDUCATION AND THE NEW PARADIGM OF KNOWLEDGE CONSTRUCTION

In the midst of ideas focused on education as a means for social transformation in view of a more just society, more recent studies carry the reflection beyond the change in the sense of economic power relations, increasingly incorporating the relations of decolonization of social knowledge, valuing them. This expansion of the discussions between oppressors and oppressed, taking as nomenclature those used by Paulo Freire, becomes even more fruitful, since it recognizes the diversity of the possibilities of social relations through the construct of humanity.

In the educational field, we highlight the construct of a new paradigm, which is a model that presents a perception of reality based on the current needs of formation, comprising a reading of the world, again making reference to the words of Paulo Freire, which exercises a liberating function while

we recognize ourselves in a social model that does not allow everyone a free experience. This new paradigm, in turn, is a change caused by discomfort with other models already seen, as Marcondes (2007) points out:

> A crisis of paradigms is thus characterized as a conceptual change, or a change of worldview, a consequence of a dissatisfaction with the previously predominant models of explanation. The crisis of paradigms usually leads to a paradigm shift, with the most radical changes consisting of scientific revolutions. (MARCONDES, 2007, p. 17-18)

In the sense of such a search for changes in the educational sphere and based on studies about the importance of scientificity for the security of the promotion of these changes, as already mentioned in the historical premises and in the Freirean premises presented in this work, Boaventura de Souza Santos, in his work "A discourse on the sciences" (2003) regales the criticism of positivism, also pointing to the crisis of the dominant scientific paradigm and deals with the centrality of the social sciences for the resignification of what is called "common sense". According to him,

> To understand this epistemological confidence it is necessary to describe, albeit briefly, the main features of the new specific paradigm. Aware that separating them from the still dominant Aristotelian and medieval knowledge is not only a better observation of the facts as above all a new vision of the world and of life, the protagonists of the new paradigm conduct a passionate struggle against all forms of dogmatism and authority. (SAINTS, 2003, p. 24)

That is, in this new perspective of the sciences, which reverberates in the educational process, the protagonists of thought, philosophy and the construction of knowledge are the struggles against the authoritarian impositions that are still seen in society. We understand that, despite the passage of time and the changes that have occurred due to the changes that have already happened in the social context, the sciences still have a strong appeal of positivism and the colonization of knowledge. However, we emphasize that the new epistemological currents aligned with anti-dogmatic theories do not express the reduction of the rigorous content of research, but rather the consideration of the humanities and popular knowledge for its validation.

Still on this, the same author leads to think of social phenomena and natural phenomena, returning to Durkheim's idea. Thus, Santos (2003) measures the conception of social facts as objects in order to enable their study, analysis and signification or resignification. For this, it lists the importance of not establishing general laws for social study, because it highlights the way of developing knowledge inserted in the field of social sciences as being a local knowledge and that, as a result, will become a total knowledge through exemplarity.

In other words, with regard to the way this author perceives the edification of the social sciences in his new paradigm, he points out that the research will take place in the involvement of a social group, which has its culture, its habit, its particular way of living in the face of what is historical, political, economic. However, this kind of sampling becomes an example of the study and this has the

potential to have repercussions in other similar groups or not, because it can bring to light a knowledge directly pertinent to the group, but it can also bring the search for other new knowledge that differs from such.

In the yearning for the fall of the old educational paradigm, the attempt for a scientific revolution becomes necessary when we assume the ambition for the fair life of citizens. Santos (2003) states that

> Being a scientific revolution that takes place in a society itself revolutionized by science, the paradigm to emerge from it cannot only be a scientific paradigm (the paradigm of prudent knowledge), it must also be a social paradigm (the paradigm of a decent life). (SAINTS, 2003, p. 60)

In this sense, the humanistic production of the sciences is reinvigorated, placing people as subjects participating in the attributes of research because they are in interaction in and with the world. Therefore, people become authors and participants in the focus of knowledge. For this author, modern science has the increased prospects of survival, it is about living itself. "Today it is not so much about surviving as knowing how to live", still according to him, for this to be the intention it is necessary to elucidate "another form of knowledge, a comprehensive and intimate knowledge that does not separate us but unites us personally to what we study. (SAINTS, 2003, p. 85-86).

We perceive, therefore, that in the new paradigm of knowledge, scientificity in the social sphere is in the act of living, reflecting on it, studying it, analyzing it and incorporating it again in the various social groups in order to promote discussions and understandings that lead in the direction of breaking with the current model, which affects so crucially the majority of the population. This paradigm values practical knowledge, starting from common sense and returning with new learnings to popular knowledge itself.

> Postmodern science seeks to rehabilitate common sense by recognizing in this form of knowledge some virtualities to enrich our relationship with the world. It is true that common sense knowledge tends to be a mystified and mystifying knowledge but, despite this and despite being conservative, it has a utopian and liberating dimension that can be amplified through dialogue with scientific knowledge. This dimension emerges in some characteristics of common sense knowledge. (SAINTS, 2003, p. 88-89)

Popularizing the knowledge of the social sciences soon becomes a form of resistance against the liberal vision of doing science, fulfilling the function of originating a new reason. Reason for this, coming precisely from popular knowledge, community practices, collective events. For this same author, scientific knowledge in this new paradigm is justified by issues such as the constitution in common sense, by the proportion of self-knowledge it generates, by its local character and, see exemplarity, total

Thus, we resume its incidence in education, because this scientific knowledge must return to the community and one of the forms of interlocution of this are the educational movements. For Brandão (2007, p.66), education can have two ambiguous perspectives: the maintenance of the model already placed in an uncritical way and the weaving of critical reflections to what is placed valuing equality, freedom and justice. In this way, we conceive of education as a source of opinion formation through the exchange of knowledge between educators/as and educandos/as/as.

In line with the thoughts of Santos and thinking about how to expand and stimulate knowledge, Garcia (2007) points out that

> Do not lose the playfulness, the pleasure and the joy of penetrating the unknown in search of partial answers, always partial, part of this fire that maintains the elan of living. And this is linked to a search for solutions to the problems that run roughshod over us and threaten our very survival. Survival that, in order to be valid, has to be worthy. That is, it has to be shared in a more egalitarian world. (GARCIA, 2007, p. 64)

The search for a more egalitarian world devotes a humanistic sense to the process of education that, as conferred by Garcia/Brandão in the excerpt exposed above, must occur in a playful way, that is, it should not be something massive or sacrificial for those who are involved in the process. This principle for teaching-learning together with the principles of emancipation and liberation corroborates the model that is expressed in critical reflection and, therefore, for the overcoming of inequalities.

According to the same author, it is in the act of learning and relearning on a daily basis that we project enthusiasm for this constant human formation. Still for him, "Education, which takes place in multiple and diverse places, has to be disseminated in the social field, so that experiences can be exchanged in a creative process of mutual feedback. (GARCIA, 2007, p. 66), rescuing the expansion of the educational condition in several spaces that are not only the school, although we are reflecting in short the perceptions within this environment.

With regard to what we have seen happen in reality in line with what we intend to incorporate with the precepts pointed out, we note that there is still a discrepancy today, because the State model in which we are inserted acts against a liberating education. He claims, with optics under his capitalist interests, the opposite, treating education as a commodity to be sold to the more affluent and based on their ideological interests of maintaining power. In this logic, it becomes evident the distance of the popular layers of scientific knowledge that should come and go back to them. Thus, we agree with Garcia (2007) in his observation about the crisis of paradigms:

> [...] The "crisis of paradigms" is a matter limited to a small intellectual circle. Probably, 95% of the population does not even know what paradigm means and makes their day-to-day life a daily struggle for survival. Without any populism, there is much to learn from this contact. And learn by joining, joining forces, seeking collective solutions together. Without them, there is no way out. (GARCIA, 2007, p. 68)

Thus, we realize that although the concept of "crisis of paradigms" is not part of the great social mass, it lives, in its own routine, the struggle for survival and could, with the possibility of access to scientific knowledge, expand and intensify its struggles. As soon as making even more difference in the entire social public sphere, in benefit of the reduction of inequality and in struggle for the conquest of emancipation, as already sowed Paulo Freire.

3 CONCLUSIONS

By researching and analyzing pedagogical practices over time, it made us revisit history with a critical eye, seeking to understand how these moments supported the incorporation of the educational demands that existed in each era. To this end, educators and thinkers postulated and made the knowledge developed by themselves a means of changing the reality in which they lived, within their reality and their philosophical possibilities. These, in turn, reflected in the current paradigms, because nothing is created at random, but is transformed according to social changes.

In 1649, for example, Comenius wrote the Didática Magna, also known as the Treatise on Universal Art, which provided as Boto described (2017, p. 184) founded pedagogy as an area of human knowledge. To this end, education became a territory of inquiry and production of knowledge, which had the anchor of didactics. Kant, the main philosopher of the Modern era, states that man cannot become a true man if not by education in which he postulates the ideas appropriate to the formation of the human being and internalization of concepts and attitudes towards society.

Thus, we note that the numerous contributions of thinkers and philosophers have been given over the years conceptualizing being, society, teaching, the educator and the learner, through the fabric of pillars for education in order to form, transform and envision paths that should be followed for living in community. Postulated by this assumption to overcome the obstacles before the possibilities posed culminates in a movement for transformation, which, in our context, configures such a responsibility to the school as a primordial social institution for human formation.

The history of education, training of students has been structured with various proposals over the years around the world and, in Brazil, we note the contribution of the various philosophers and thinkers to the development of this process. An example of this is that by recalling the history of education as a resource for the formation of knowledge with regard to education itself as an object of study, we trace an educational trajectory and build perceptions of a work aimed at changes and improvements in the quality of teaching and learning within the current reality.

In view of the entire course of Education, we highlight the popular educator Paulo Freire, because with the writing of his works he left a legacy about the pedagogical practice that elucidates educators to become aware of how a critical teaching is carried out, based on the knowledge of the students, overcoming the idea of only transferring knowledge already put as "right". And yet, we note

that his theory points to social transformation, since it presumes to the students the role of protagonists of educational actions, with a political and emancipatory formation, therefore, potentiating them for the change of their reality.

So accurate was his legacy that we notice, still, in the most recent premises of educational paradigms that focus on the incorporation of scientific knowledge to popular knowledge, because it is noticeable that his works to be based on the experiences of literacy of young people and adults of popular class carries as impact the modeling of education made by and for people from this class. This is seen, even today, in the new paradigmatic theories of the educational field, while the optics of the most recent theories permeate the scientific knowledge uttered from popular knowledge and suggests the return of such to this public.

Given this, we believe that the historical reflection on Education should be done always and by everyone in our day-to-day, in the main purpose of enabling the understanding of the implications of all social moments in education and, soon, in the current conceptualizations of this field. However, in an analysis of the current political and social conjuncture, we understand that this is still a challenge that is increasingly aggravated in the capitalist logic. In this aspect, we point to a constant, even if slow, movement of resistance and reinforcement of the struggle for the guarantee of secular and quality education for all people.

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SEVEN
publicações acadêmicas

The use of manga for the teaching of reading: An investigation on the insertion of japanese literature with elementary school students

Crossref doi
https://doi.org/10.56238/ptoketheeducati-046

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ABSTRACT
Mangas can be seen as a teaching tool, enabling the student to be the protagonist of the process of encounter between the word and the subject who reads and establishing an experience that can modify the conception that both have of the world and their own existences. The main objective of this article is to investigate the acceptance of the use of Manga as a methodological practice in the classroom, as well as to analyze the contribution that it has been bringing to students after a school period by participating in activities with readings with this new literature. In order to verify the students' acceptance of this methodology, we conducted an investigation study of the initial conceptions through an investigative questionnaire. With the result of the investigation, it was possible to find elements that enable the use of manga as part of the teaching and learning process and also realize the potential of such materials as didactic resources capable of contributing to the mediation in the teaching of contents and concepts of Portuguese Language and New Literatures.

Keywords: Education, Reading, New ways of reading, Japanese Literature, Manga.

1 INTRODUCTION

Currently teachers have been facing many challenges in the classroom, one of them is to mediate so that students can relate content considered difficult to understand with topics that call their attention. One proposal would be the use of manga to facilitate the understanding of content, an alternative that has been drawing the attention of students (BRAGA; SPADETTE, 2018).

For Macuso (2010) the main ingredient of manga is the ability to make people immerse themselves in the stories, showing their emotions and feelings and delighting readers. Thus, building individuals full of knowledge and experiences to be considered and thought in the school environment. Therefore, this system of reactions is determined by the construction of the environment in which this individual grows and develops, giving a social character to education, emphasizing that the experiences of students are extremely important for pedagogical work (VIGOTSKI, 2003; Nemerski, 2016).

However, manga in Brazil are still seen as an example of entertainment literature, without exploring its pedagogical functions. Linsingen (2007) points out that in addition to entertainment, manga contain in its plot a search for identification with the reader, both by everyday discourses, that is, by experiences similar to those that the reader has experienced or wants to experience, and by the

characters, so that there is a greater interactivity between the reading and the reader, an invitation for him to participate in the action and atmosphere of the stories.

Some authors highlight this importance for the use of Manga in the classroom, saying that we can use it as a pedagogical tool not only to develop in the student the habit of reading and writing, but to stimulate in the students the desire for drawing, to improve communication with human experiences and to relate the images with the reality experienced by them (LUYEN, 2012; LINSIGEIN, 2007; Nemerski, 2016).

From the above, the main objective of this article is to investigate the acceptance of the use of Mangas as a methodological practice in the classroom, as well as to analyze the contribution that it has been bringing to students after a school period by participating in activities with readings of this new literature.

1.2 KNOWING MANGA AND ITS POTENTIAL AS A DIDACTIC RESOURCE

Manga is the word commonly used to refer to Japanese comic books. Luyten (2012) explains that this term was conceived by the artist *Katsushika Hokusai* (1760-1849), a specialist in the production *of ukiyo-ê*, an art and technique of making relief engraving on wood and creator of the famous work *The Great Wave of Nakagawa*.

According to Schodt (1996) the word Manga was originally written with the two kanji characters *man*, in Japanese (meaning "involuntary", "in spite of oneself", with a secondary nuance of "morally corrupt") and ga (meaning "images"). Technically, "manga" can now mean "caricature," "comic book," "comic strip," "comic book," and sometimes even "animation," though younger generations invariably use "anime" for the last on the list.

Luyten (2012, p.32) points out that "[...] The word manga itself has the meaning not only of comic books, but of comic book magazine, caricature, cartoon and even cartoon [...]". Showing that manga is not limited only to the format of comic book magazines, but goes beyond that, combining caricatures, cartoons, among other formats, because the term manga in Japan is used to refer to comic books, soon a comic book of Monica's Gang will be considered manga in Japanese lands.

As a result of the end of the Edo period (1603-1868) and the isolation of Japan with foreign countries, the opening of the ports provided the entry of books, newspapers and magazines from the West that added to the productions already existing in the country, generating an intense cultural exchange that had not occurred since the blockade of the ports (LUYTEN, 2012).

Faced with this context, cartoonists such as *Charles Wirgman (1835-1891) and* Georges Bigot *(1860-1927)* insert cartoons with their Western style in Japanese society and in their productions the same cartoonists had the practice of using sequenced balloons within the cartoons, hence the manga such a characteristic, because until now it was not used balloons (LUYTEN, 2012). However, it was

after World War II (1939-1945) that the manga acquired, under the influence of *Osamu Tezuka* (1928-1989), a more cinematic style and the famous characteristic of characters with large, bright eyes, which continue to this day.

From the emergence of manga to the present, this cultural asset has undergone several transformations to have the form it has, either by Eastern, Western influences or by "requirement" of the context. For example, the characteristic newsprint is due to the poverty that existed in the post-war period, a period in which several products became scarce and required the use of cheaper paper, making the manga cheaper. With this, a striking feature refers to a well-segmented publishing market, so as to reach a wide variety of readers. Amaral and Carlos (2014, p. 15) explain that each magazine has specific audiences, according to age and gender, because of this, the main divisions are:

> [...] Shogaku for children aged 6 to 11, Shounen for boys aged 12 to 17, Shojo for girls of the same age, Seinen and Redikomi/Josei, respectively, for adult men and women, whose themes are more mature. In addition, the manga market is quite articulated with the audiovisual market, resulting in adaptations of the same title for television (in serials, telenovelas, cartoons, for the cinema, for the radio and also for the games) (AMARAL; CARLOS, 2014, p. 15)

Another peculiar feature concerns the form of reading that happens in an inverse way to Western reading, which causes the following comment "the manga is read by the end", because its reading happens from right to left, but to avoid problems to the reader, Brazilian publishers usually put a warning to draw the attention of beginners. Thus, even with peculiar characteristics, the manga did not fail to gain popularity outside the Japanese nation, spread worldwide and reached Brazil still with immigrants, in 1908, with the function of entertainment and as educational material so that children could maintain contact with the mother tongue and its culture as a whole, because they had the goal of returning to Japan (LUYTEN, 2012).

But even before the manga became popular in Brazil, several anime were televised (name given to the cartoon produced in Japan), and after its acceptance and success of the series *Knights of the Zodiac and* Dragon Ball *that there was, in fact, the opening of the market for production and sale of manga, occurring an avalanche of publications in the early twenty-first century.*

It is noteworthy that comic books were not always well accepted in Brazilian society, but were classified as subliterature and as dangerous material by parents and educators in relation to young readers. The aforementioned conception occurred from the book *Seduction of the Innocents (*1954), in which the psychiatrist and author *Fredric Wertham* (1895-1981) argued that comics were causes of violence and damage to the minds of young people. In this context, changes have occurred and comic books are currently configured as entertainment material, pedagogical material and object of study of academic research. The PCN also recognized the importance of comics as a didactic resource and indicated the material in the PCN of Arts and Portuguese Language.

Many scholars and teachers already recognize the importance of using comic books as a didactic resource. Given this, Santos (2001) states that the union between text and image of the comic book help children to better understand concepts that could present difficulty if it were treated only with writing. Vergueiro (2009) explains that comic books increase the motivation of students in relation to the contents worked in the classroom, sharpening curiosity and challenging their critical sense. In addition, the strong identification between students and icons of mass culture is, therefore, an element that reinforces the use of comic books in the process of teaching learning.

In this way, comic books constitute a valuable form of language to be used as didactic material, both to entertain and to educate, but there is still much to explore, especially when it comes to manga. Thus, in the current context of the information society, which provides a large amount of means of communication, it is interesting to think about the use for the learning of contents.

2 METHODOLOGICAL PROCEDURES

The present research has a qualitative character as a procedure, seeking to "explore and understand the meaning that individuals or groups attribute to a social or human problem" (CRESWELL, 2010, p. 26). For Lakatos and Marconi (2010) the qualitative approach is a research that aims to analyze and interpret deeper aspects and provide more detailed analysis on investigations, attitudes and behavioral trends.

The study was developed with 29 students of the 5th year of Fudamental Education, aged between 11 and 13 years of a public school in the North of the State of Espírito Santo. Thus, throughout the 2022 school year, the class teacher worked with the students using manga as a form of didactic methodology through reading. In order to verify the students' acceptance of this new methodology, we conducted an investigation study of the initial conceptions through an investigative questionnaire. To perform the same, a questionnaire with 10 questions was distributed to the students, containing 5 objective questions and 5 discursive questions.

In this context, we used content analysis (BARDIN, 2011) to explore the data produced by the answers to the questionnaires. It was chosen, as a specific technique of content analysis, the so-called thematic analysis, which is based on the theme, understood as an assertion about a given subject, in the form of a sentence (subject and predicate), a set of them or a paragraph (FRANCO, 2005; BARDIN, 2011). Thus, the themes were constituted by the questions and the answers generated.

Finally, we analyzed the most relevant expressions described by the students in the discursive questions and the quantity of answers in objective questions. The answers recorded by the students in the questionnaires were used to verify the knowledge acquired and other factors such as whether the manga influence the students; whether they take readings daily or frequently; whether there is a reflection of these influences in their ways of thinking, in their schoolwork, in their leisure, in

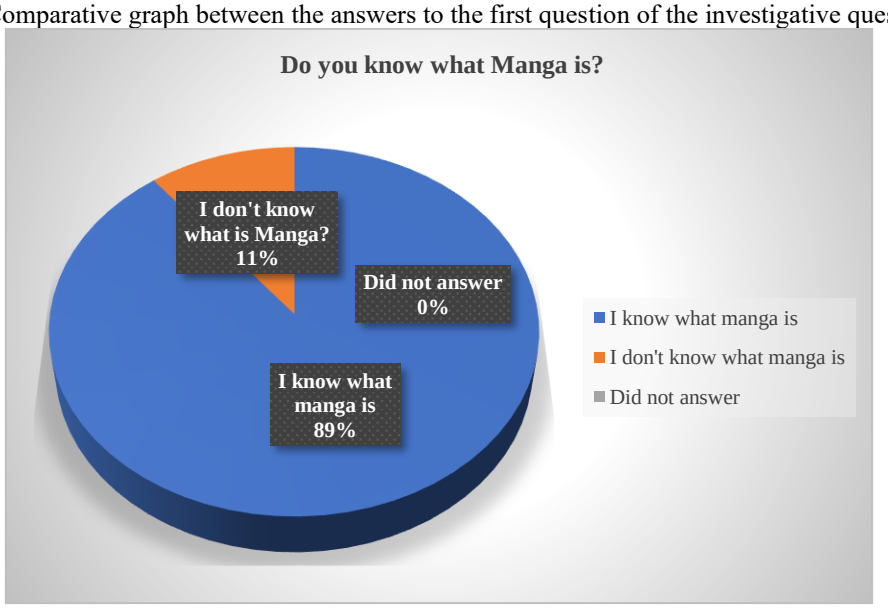
friendships; and why these manga are important in the lives of these students. The answers contained in the questionnaires remained the way the students recorded without any correction.

3 RESULTS AND DISCUSSION

In order to investigate the initial conceptions of the students regarding the use of manga, as well as the acceptance of this methodology in the classroom, we performed an analysis through a questionnaire answered by the students. The analysis of these questions will take place through categories. According to Bardin (2011): "Classifying elements into categories imposes the investigation of what each of them has in common with the others. What will allow their grouping is the common part existing between them" (BARDIN, 2011, p. 118).

In the first question, the students answered the question *"Do you know what Manga is?"*. This question required the student only to know if he understood the concept of the type of reading activity that was worked during the school year in the classroom. Of the answers recorded, 89% of the students answered that they knew what manga was about and only 11% of the students answered that they did not know what it was, thus showing that most of the students understood what was the type of activity that was carried out throughout the school student. In the graph of Figure 1 we reveal a comparison between the answers of the first question of the investigative questionnaire

Figure 1. Comparative graph between the answers to the first question of the investigative questionnaire:



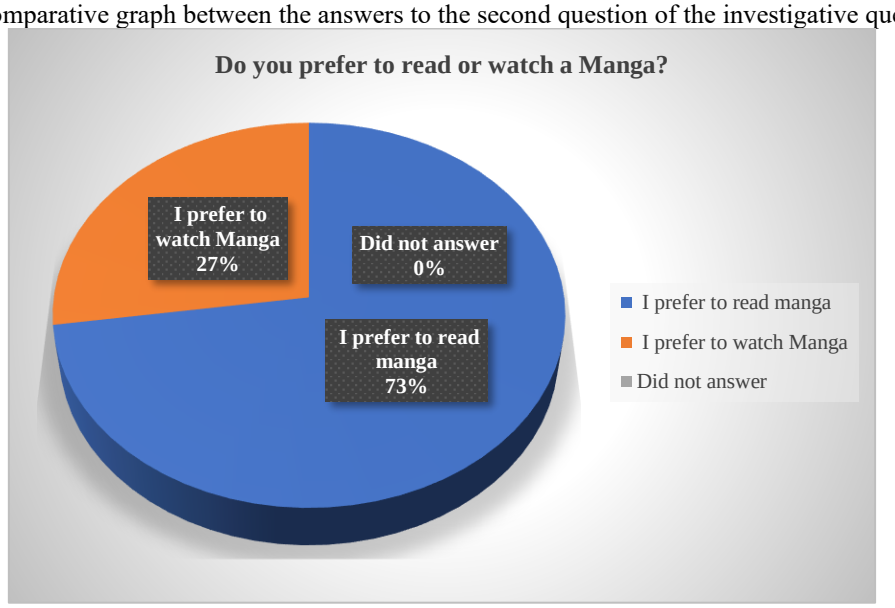
Source: Research data (2022)

In the second question, the students answered the question "*Do you prefer to read or watch a manga?* ". Through this question, it was possible to analyze if the students acquired the interest in reading through the manga, or if they were only interested in the drawings and engravings of the livres

that are often expressed in the cartoons. Of the responses recorded, 72% answered that they prefer to read the Mangas and 27% answered that they prefer to watch.

Through this question, we can infer that a large part of the class acquired the habit of reading, but a large part was still interested in the engravings and drawings expressed in this type of literature. In the graph of Figure 2 we reveal a comparison between the answers of the second question of the investigative questionnaire

Figure 2. Comparative graph between the answers to the second question of the investigative questionnaire:



Source: Research data (2022)

In the third question, the students answered the question "*When you think of Manga, what are the first 3 words that come into your head?* ". In this question, we seek to understand what else was present in the imagination of the educating the use of manga. Through the answers found in the questionnaire, we verified the diversity of subjects that the students related. Thus, of the most commonly found words, we identified a higher percentage of students who highlighted the words "Reading," "Art," and "Competition" as the terms that most come to mind when they think of manga.

Thus, we highlight that the use of manga in the classroom can come as a didactic alternative stimulated by reading in order to be able to work grammar, literature and linguistics, as well as interdisciplinary themes by addressing scientific, technological and historical subjects that can be chosen by the reader himself.

In Figure 3, we present a word cloud with a comparison between the answers to the third question of the investigative questionnaire, allowing us to analyze in this image the large number of terms found, as well as their diversity.

Figure 3. Word cloud with the answers most found in the second question of the investigative questionnaire:



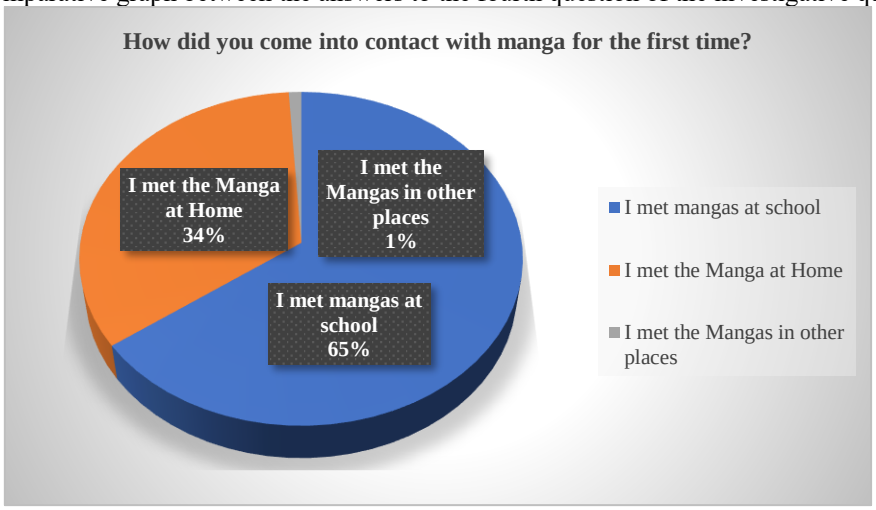
Source: Research data (2022)

In the fourth question, the students answered the question "*How did you first come into contact with manga?* ". In this question, it was intended to identify how was the first contact, if someone presented the manga to the student, they ended up knowing on their own, indication of colleagues, or it was in the school environment. Of the answers recorded by the students, 65% scored that they know the manga at school, 34% pointed out that they had the first contact with the theme at home and 1% reported that they met elsewhere, such as events, etc.

About this, Nemerski (2016) points out that it is important to know when the initial contact with the listed media took place, to know if the contact occurs from childhood age, when the child does not yet have a great discernment between reality and fiction, or if the contact was established during adolescence, although in both cases the person can be influenced. The sooner we have contact with a particular object or custom, the more familiar we will be with it; and the later the contact, the more estrangement it will cause us.

In the graph of Figure 4 we reveal a comparison between the answers of the fourth question of the investigative questionnaire.

Figure 4. Comparative graph between the answers to the fourth question of the investigative questionnaire:

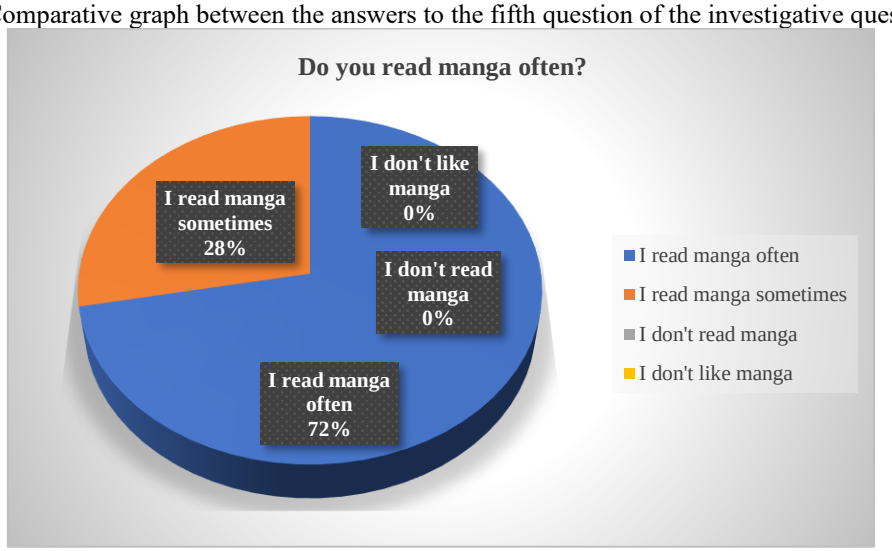


Source: Research data (2022)

In the fifth question, the students answered the question "*Do you read manga often?* ". In this question, we try to perceive how immersed the student is in the universe of reading. Thus, situations were taken into account in which the student does not read every day, due to other activities that he may perform, but that, in his leisure moments, he does so by reading manga. Of the recorded answers, 72% answered that they always read manga, 28% scored that they do not do this reading as often, and none of the students pointed out that they do not do any reading or do not like manga.

In this way, we noticed a great interest in the reading that the manga brought to them, so that they choose to spend hours or at least the time free of their obligations reading manga. In the graph of Figure 5 we reveal a comparison between the answers of the fourth question of the investigative questionnaire.

Figure 5. Comparative graph between the answers to the fifth question of the investigative questionnaire:

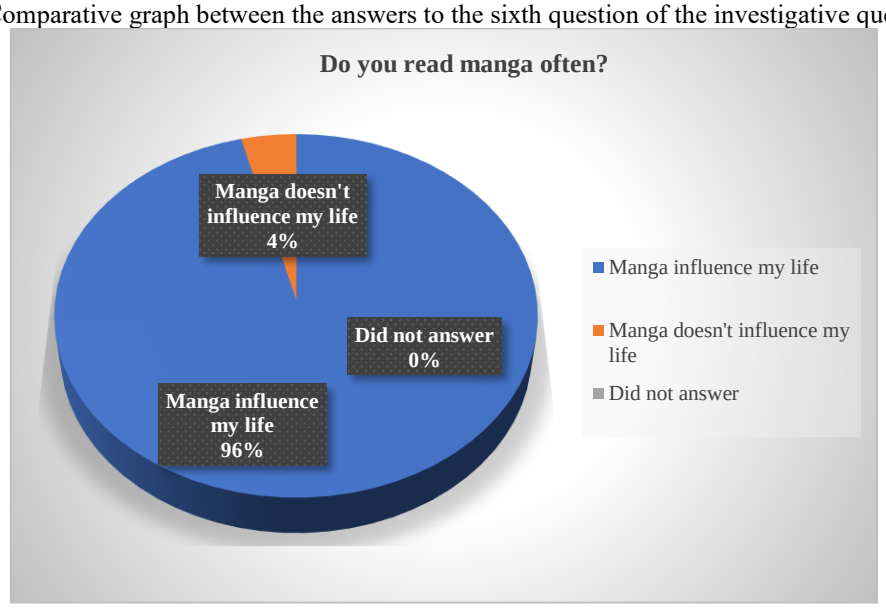


Source: Research data (2022)

In the sixth question, the students answered the question "*Does contact with manga influence their way of thinking and/or acting? Cite examples*." In this question, we seek to identify the direct or indirect influences that contact with manga exert on students, such as their ideals of not giving up on a dream, defending friends and working together to achieve their goals; if they dress, they use lines or gestures used by their favorite characters.

Of the responses recorded, 96% scored that there was some change in their way of thinking or acting and 4% said no. In the examples cited, students point out that they have learned new words, slang, styles of clothing and clothing, among others. Therefore, we infer the influences that reach the level of vocabulary, visual and behavioral aesthetics. In the graph of Figure 6 we reveal a comparison between the answers of the sixth question of the investigative questionnaire.

Figure 6. Comparative graph between the answers to the sixth question of the investigative questionnaire:

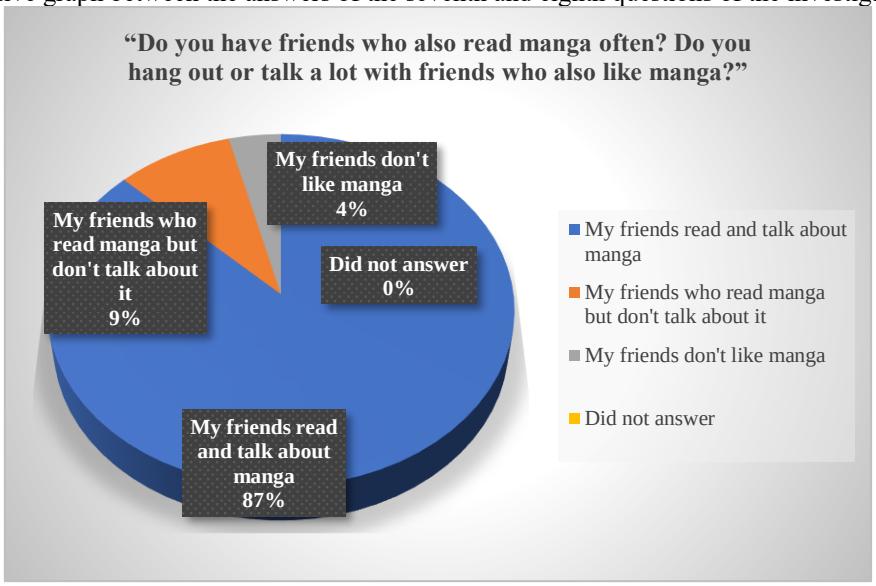


Source: Research data (2022)

In the seventh and eighth questions, the students answered the question *"Do you have friends who also read manga often?" and "*Do you go out or talk a lot with friends who also like manga? ". In this question, we seek to investigate whether students have friends who share the same taste for manga anime, discuss about a certain chapter or argue about what they think will happen in the next episode, thus influencing them to practice reading.

Of the responses recorded, 89% point out that they and their friends read and talk about manga, 9% say they have friends who read manga but do not talk about it and 2% point out that they do not have friends who like manga. In the graph of Figure 7 we reveal a comparison between the answers of the seventh and eighth questions of the investigative questionnaire.

Figure 7. Comparative graph between the answers of the seventh and eighth questions of the investigative questionnaire:

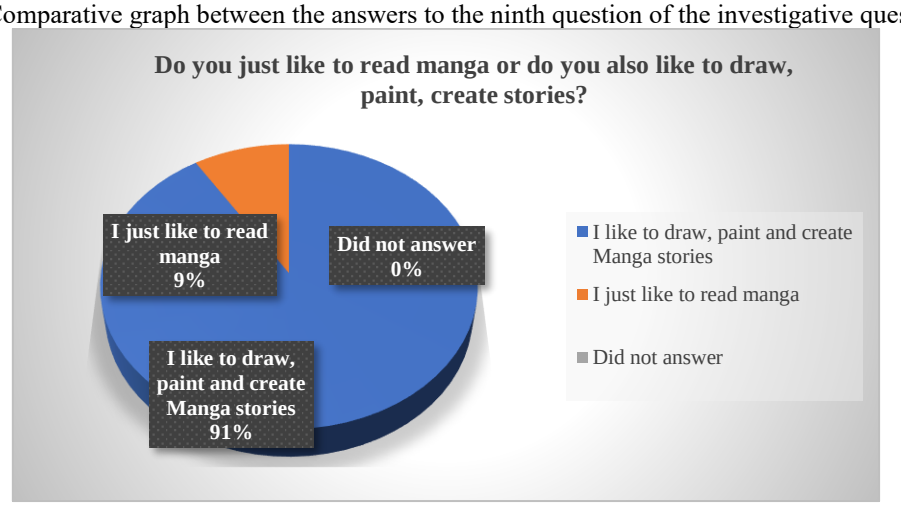


Source: Research data (2022)

In the ninth question, the students answered the question "*Do you just like to read manga or do you also like to draw, paint, create stories*?" In this question he sought to investigate the students who like to create their characters, stories and make illustrations. Of the answers recorded, 91% score that they like *to draw, paint, create stories* and only 9 score that they just like to read, thus showing an enabling environment for working with writing.

In the graph of Figure 8 we reveal a comparison between the answers of the ninth question of the investigative questionnaire.

Figure 7. Comparative graph between the answers to the ninth question of the investigative questionnaire:



Source: Research data (2022)

In the tenth and final question, the students answered the question *"What draws your attention most in manga?"* This question was linked to the previous question and seeks to investigate which type

of reading was most attracting students. Thus, it is possible to infer that the characteristics cited by the students are fundamental factors in the choice of manga that they will read.

Thus, due to the great diversity of answers, we were unable to categorize their analysis. However, we inferred that the physical characteristics of the manga characters were scored by the students as the biggest factor that draws attention. It is quite common these days to see groups of teenagers at events, related to Japanese pop culture, wearing clothes made by themselves or by experts, so that anime and manga aficionados can have fun, take pictures and even compete in events to see who looked more like or best represented the character. Therefore, these are fundamental conceptions that attract them in the choice of a manga for reading and the teacher can contribute in this process by knowing the characteristics of each student, bringing this factor in the elaboration of their didactic proposals.

4 FINAL CONSIDERATIONS

The development of the present study allowed us to analyze the use of manga as a methodological practice of teaching with students of the fifth year of elementary school. We highlight that manga can be seen as a teaching tool and can be adapted to various contents, enabling the student to be the protagonist of the process of encounter between the word and the subject who reads, establishing an experience that can modify the conception that both have of the world and their own existences.

Thus, with the research carried out, we observed that manga can indeed be used to arouse interest in students since the large audience of manga readers is young, stimulating them in learning, which teachers can bring as another teaching proposal for their class, thus making it fun, relaxed and introductory content.

With the result of the investigation presented here, it was possible to find elements that enable the use of manga as part of the teaching and learning process and also to realize the potential of such materials, more specifically manga, as didactic resources capable of contributing to the mediation in the teaching of contents and concepts of Portuguese Language and New Literatures. It is important to think of the different sources and didactic resources as possibilities for the production of knowledge that incorporates different realities and worldviews. Manga isn't the only one, but given its popularity among young audiences, it can be the catalyst for debates, themes, and analysis in the classroom.

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Impact of COVID-19 on education in Mexico

https://doi.org/10.56238/ptoketheeducati-047

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ABSTRACT
It must be recognized that we were not prepared to face this atypical situation caused by the coronavirus disease (COVID-19), which has caused a crisis that will have significant negative effects on all social sectors, particularly health and education. , as well as employment and the evolution of poverty. (CEPAL1, 2020)
This disease put people of all ages at risk and traveled from the most privileged places to the most modest; it lodged the same in those who are outside of letters, as in those who are distinguished by their knowledge, and indistinctly infected those who cultivate the highest values, as well as those who show off their detachment from them.
In the field of education, the confinement and closure of schools and universities as measures to contain the pandemic, led governments to design educational strategies such as distance education, to guarantee the continuity of learning.
Faced with this health emergency, emerging pedagogical practices arose where there was a unique transfer from the classroom and the recreation and rest spaces, to the living room and dining room of the house and, in the case of basic education, the participation of mothers and fathers to address academic problems.
There are many limitations that both teachers and students have had to deal with, from the low or null connectivity and the lack of training in the use and management of Information and Communication Technologies (ICT), based on the assumption of that there would be a computer with internet access or a television, as well as the necessary human capacities to advise mothers and fathers or tutors of students on scientific, humanistic and artistic issues.
According to World Bank estimates, the pandemic caused a lag in Mexico equivalent to two years of schooling. Before the pandemic, Mexicans reached an average learning level corresponding to 3rd grade of secondary school. Today your knowledge will only reach the equivalent of 1st grade of high school. (IMCO, 2021)

Keywords: Covid-19, Education, Confinement, ICT, Lag.

1 INTRODUCTION

The educational area has been one of the most affected by the changes generated by the Covid-19 pandemic, since education is regularly taught in person: that is, within a classroom and with the support of a teacher who shares his knowledge and seeks feedback with his students. (Hernández Suárez et al., 2022)

According to data from the United Nations Educational, Scientific and Cultural Organization (UNESCO), by mid-May 2020 more than 1.2 billion students at all levels of education, in more than 190 countries, had stopped having face-to-face classes in school. Of these, more than 160 million were students from Latin America and the Caribbean.

In the Mexican case, more than 35 million students and 2 million teachers were affected by the closure of schools that will not only cause delays in learning and increase in school dropout, as well as inequality, but will also have a cost in the immediate and long-term well-being of girls. children and young people who saw their education interrupted as a result of the pandemic. Schooled education is fundamental, it is the engine of individual and social development, as well as the key to the empowerment of people and their improvement in the quality of life, so that educational lag is a social problem of the first level, since it represents an obstacle to the development of society as a whole.

The Mexican Educational System has undoubtedly been the most affected at all levels, both higher education institutions as well as basic education: Preschool, Primary, Secondary and Higher Secondary Education, after the economy and the productive and labor sectors, by the ravages and consequences of the pandemic.

As an initiative of the government of Mexico and the Ministry of Public Education (SEP) they began the production of the "Aprende en Casa" program, officially launched on April 20, 2020 so that students could continue their learning through the use of platforms or television channels, since the 2019-2020 cycle was one quarter away from ending.

One of the disadvantages suffered with the "Learn at Home" program is that it resulted in a high dropout rate at all educational levels, since many families do not have a computer, internet or television signal, due to inequalities in income distribution and job loss caused by the pandemic. One aspect noted as deficient is that distance education "could not replace the educational experience in the classroom." In addition, a large number of parents cannot accompany the efforts of their children, due to lack of time, knowledge or ability to transmit them.

While it is true that students are mostly familiar with ICT, there is a large number of teachers who do not master new technologies, which is exacerbated in rural areas, where the population must also get rid of the fear that still hinders them in the management of these tools. (Ortiz Herrera et al., 2022)

2 OBJECTIVES AND GOALS

The main objective is to know the impact that the pandemic has had with the closure of schools and universities mainly in Mexico and what proposals have been made to combat it.

This work is justified because in the country there is a complex scenario that deserves an exhaustive and deep investigation, since the consequences are very serious, especially for the most

vulnerable groups, from an increase in the lag in education to the increase in inequalities that already existed before the health contingency.

3 MATERIALS AND METHODS

This research has as main sources of information documents such as ECLAC and UNESCO reports, executive summary of the WORLD BANK, books and magazines that talk about education and COVID-19, national and local newspapers, as well as official internet pages such as INEGI, the [1]Mexican Institute for Competitiveness, A.C. (IMCO), CONEVAL, [2]in addition to studies that experts have carried out on the subject.

Therefore, it is considered that this work is documentary and descriptive.

4 RESULTS

In Mexico, the order issued by the Federal Government in conjunction with the Ministry of Health and the Ministry of Public Education (SEP) requesting the temporary closure of schools due to the health contingency was complied with in a staggered manner by the 32 states.

To continue with the training processes, the Aprende en Casa program was launched, which served to provide distance education, through ICT, radio and television (Castellanos-Pierra et al., 2022). This remote program was beneficial for some due to time constraints, but it showed a latent inequality in several areas of the country.

INEGI carried out the Survey for the Measurement of the Covid-19 Impact on Education (ECovid-Ed). The objective of the survey was to identify the repercussions of the momentary suspension of classes in the schools of each state, in the population of children, adolescents and young people from three to 29 years old, in the period 2019-2021 (two school cycles). (INEGI, 2020).

The results of the ECovid-Ed revealed that 1.8 million students between three and 29 years old did not finish the school year (2019-2020) because of the pandemic, 1.5 million were from public schools and 243,000 from private schools.

In the school year (2020-2021) 32.9 million students were enrolled, but the lack of resources and the Covid-19 pandemic aggravated school dropout: 5.2 million students between three and 29 years old were no longer enrolled.

Of that group, 2.3 million did not enroll for reasons directly associated with the Covid-19 disease, either because they consider distance education not very functional, because parents lost their jobs or because they do not have the electronic devices and internet to take virtual classes, and 2.9

[1] National Institute of Statistics, Geography and Informatics.
[2] National Council for the Evaluation of Social Development Policy.

million more did not enter due to lack of money or resources, that it is not a new barrier to school dropout.

The figures show that more than 16 million households in Mexico are offline, indicating the digital divide that prevents millions of students from accessing educational content online. Distance education was the main cause of school dropouts.

58.3% of households with someone of school age say that with studies from home "you do not learn or learn less than in person", while 27.1% say that there is a lack of follow-up to the learning of students and 23.9% believe that there is no technical or pedagogical capacity of parents or guardians to transmit knowledge.

School closures also represented an emerging expense for families. The study reveals that 28.6% of households with a population aged three to 29 years made an additional expense to buy smartphones for students to follow distance courses, 26.4% to hire some fixed internet service and 20.9% to acquire furniture "such as chairs, tables, desks or adapt spaces for study". (INEGI, 2021)

According to INEGI, it is estimated that in Mexico there are almost 900,000 children and young people from zero to 18 years old with a disability, only 46.5% attend school and only 5.2% have completed at least one year of higher education. 0.4% of women with disabilities in Mexico complete a bachelor's degree. In education, persons with disabilities have been excluded and marginalized. The pandemic came to highlight what already existed in society: barriers of exclusion rather than inclusion.

According to CONEVAL,[3] 48% of the population with disabilities is behind in education, as opposed to 15% of the population without disabilities.

According to the 2015 CONEVAL Intercensal Survey, the indigenous population amounts to 12 million 25 thousand 947 people and constitutes 10.1% of the total population. Historically, this population has lived in conditions of social and economic deprivation, since it is indicated that 69.5% of the indigenous population (8.4 million people) is in poverty and 27.9% in extreme poverty (3.4 million people).

During the closure of schools, some indigenous students did not receive the breakfast and lunch that was contemplated in the Full-Time Schools program (disappeared by the SEP on February 28, 2022), of which a high percentage of indigenous education schools were part. This greatly affected their development and nutrition.

Additionally, in indigenous communities there is less coverage and accessibility to both the internet and the open television signal, and the lack of equipment such as computers, tablets, and cell phones, which represented a challenge to participate in the "Learn at Home" program, implemented by the Ministry of Public Education of Mexico. (UNESCO, 2020a)

[3] National Evaluation Council.

Among the various consequences that the Covid-19 pandemic had on children, adolescents and young people are:

- Socio-emotional problems such as fears, stress, anxieties, anxieties and fears.
- Rebound of violent acts, especially in indigenous, Afro-Mexican and low socioeconomic populations, which in turn has impacted on the mental health of youth and childhood and on cycles of violence such as gender inequality and discrimination.
- The excessive use of screens to follow classes on TV or online and confinement at home, limited physical activity and encouraged sedentary lifestyle, thus increasing the risk of overweight and obesity. This leads to irregular sleep and other physical and mental health consequences, such as irritability, anxiety and lack of concentration.
- With social distancing and distance learning, students had to drastically change their routines and social interactions.
- In many countries, school feeding services have been disrupted, and for children, adolescents and young people, this meal was the most important and nutritious meal of the day. (Kánter Coronel et al., 2022)

5 DISCUSSION

Even before the COVID-19 pandemic, the world was already facing a learning crisis, with 258 million school-age children and youth out of school. (UNESCO, 2020b)

And a low quality of education meant that many of the children who were in school learned too little. The learning poverty rate in low- and middle-income countries was 53%, meaning that more than half of 10-year-olds could not read and understand a simple story appropriate for their age. (World Bank, 2019)

Worse, the crisis was not evenly distributed: the most disadvantaged children and youth had the least access to school, with higher dropout rates and greater learning deficits. (World Bank, 2018)

All this implies that the world was already too far from being able to meet Sustainable Development Goal number four, which commits all nations to ensure that "all girls and boys complete primary and secondary education, which must be free, equitable and of quality", among 17 goals that make up the 2030 Agenda.

The impact that the pandemic has had with the closure of schools and universities represents the largest simultaneous crisis that all education systems in the world have suffered.

The closure of schools not only caused delays in learning and increased school dropouts, as well as inequality, but will also have a cost on the immediate and long-term well-being of children and young people who saw their education interrupted as a result of the pandemic. Schooled education is fundamental, it is the engine of individual and social development, as well as the key to the

empowerment of people and their improvement in the quality of life, so that educational lag is a social problem of the first level, since it represents an obstacle to the development of society as a whole.

"It is estimated that in a school year during the pandemic, 35% of learning was lost and this impacts the education, health and income of students throughout their lives.

If fundamental learning is not recovered and if abandonment is not reversed, the generations that are of school age today will accumulate disadvantages and problems that will last throughout their lives. This puts them at risk of being a generation of stigmatized adults with fewer educational opportunities, poorer health, and fewer resources.

Each educational level that is not completed is related to a loss of life expectancy of two years, because a lower educational level is related to poor health management." (Soto, 2023)

If the educational crisis is not reversed, students with less learning mean future workers with fewer skills, which can reduce their income by 8% per year, which is equivalent to one month's salary per year for the rest of their productive life. (IMCO, 2021)

With the health emergency, thousands of children and young people with one or more disabilities have lost all possibility of academic and social adaptability. Several special education institutions chose to leave these students at home, but for them training through a computer or a smart device is not an option. Many cannot use them because of the disabilities with which they live: visual, hearing, motor, autism spectrum disorder, among others and that require face-to-face interaction with a specialized teacher psychopedagogue or a classmate.

Online classes are incompatible with special education, the routines they had with these students were lost with the pandemic, children and young people who had already managed to be self-sufficient ceased to be so due to the impact of changes in their daily routine.

6 CONCLUSION

Mexico must build a recovery system that supports students as they recover from the academic and social-emotional impacts of the pandemic, starting with understanding the needs of each student.

The Mexican Education System must reinvent itself by committing to quality education for all, doubling the foundations of educational excellence and innovating to achieve an adequate adaptation to the new reality of the post-pandemic world.

The distance education system should not be discarded, but valued in all its dimensions and analyze in which cases it could subsist in an integral way and implement a Teaching Methodology that uses new technologies that help recover lost learning.

The educational authorities of Mexico must apply an effective strategy for the rapid recovery of learning in key areas and thus avoid dropping out and lagging so as not to repeat the failures that the Educational System had before the pandemic.

The consequences will be seen in the coming years, at least 30% of students of all levels, did not receive classes in any way, the younger and poorer, the more serious the problem.

Society and government must work together to urgently reduce this enormous backwardness, because failure to do so will create a generation of children and young people without a future, condemned to poverty or to enlist as "soldiers" in the ranks of organized crime.

For David Calderón Martín del Campo, executive president of Mexicanos Primero[4], school recovery after the pandemic can take up to two or three years, so an effective strategy has to be designed that has as a priority to bring them up to date, because it will be a bit like in the economy, not because they open businesses it reaches the level it was before.

The main objective of the educational response to the pandemic must be to recover students' skills to prevent learning losses from condemning them to precarious jobs when they enter the labour market.

Special education institutions demand the construction of public policies that allow this vulnerable group to enjoy the options for their development and training, since there is an impressive educational lag that people with disabilities already faced before the pandemic.

Safeguarding financing for education is a key priority to protect the National Education System from exacerbating inequalities in access to education and the learning crisis.

It is essential to calculate the costs of the Education System and prioritize spending, as well as ensure the protection of education as a fundamental human right and harness the transformative potential of education, not only to build a resilient system but also to contribute to social recovery.

Measures should be implemented to project educational continuity, equity and inclusion, that is, focus on the most vulnerable and marginalized population groups, including indigenous peoples, the Afro-descendant population, refugees and migrants, the most socioeconomically disadvantaged populations and people with disabilities, as well as on sexual and gender diversity. (ECLAC/UNESCO, 2020)

[4] Mexicanos Primero is an organization dedicated to the analysis of State policies to guarantee the right to education of children and young people.

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Higher education and professional and technological education in Brazil

https://doi.org/10.56238/ptoketheeducati-048

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ABSTRACT
This article presents an overview of the expansion of higher education in Brazil, the right to education with the Federal Constitution of 1988 and the social rights guaranteed by it. The importance of the LDB/1996 for the reformulation and expansion of education in the country, including higher education and Professional and Technological Education (EPT) in the Brazilian scenario, is highlighted, instituting the Higher Technology Courses (CSTs) and their guiding principles, the verticalization and revitalization of Professional Education. The LDB/1996 is contextualized in the political-economic scenario of the 90s, in the context of the reform of the State and under the influence of international financial organizations. We sought to clarify how the LDB incorporated recommendations from these organizations, which had repercussions on the restructuring of Brazilian higher education and resulted in the expansion of higher education institutions, emphasizing their privatization, diversification and flexibility. It presents an overview of the origin and development of Professional Education in Brazil and the various reforms carried out in education. CSTs are presented in the context of higher education in its revitalization process. The history and development of EPT in the state of São Paulo, the creation of the Paula Souza State Center for Technological Education (CEETEPS), the Faculties of Technology and their CSTs are presented.

Keywords: Professional and Technological Education, Higher Technology Courses, Higher Education.

1 INTRODUCTION

1.1 BRAZILIAN HIGHER EDUCATION: A BRIEF OVERVIEW

The educational system of a country plays a strategic role in its socioeconomic development, as it influences the dynamics of the processes of production and diffusion of science, culture, technological development and innovation of the nation. It is a key piece in the task of qualifying the human resources that are and will be responsible for the development and modernization of the nation (SOUZA, 2012).

In Brazil, the educational system has an elitist history and for a long time favored the privileged classes, excluding the economically disadvantaged or the underprivileged for reasons of ethnicity, social class and gender (GISI and PEGORINI, 2016; Detregiachi Fo., 2012). However, in 1988, in the period of redemocratization of the country, after the end of the military regime, the new Federal Constitution was drafted, the Citizen Constitution, anchored in democracy, which recognizes and ensures the social rights of citizens. According to Silva (2008), the Magna Carta of 1988 established a democratic regime based on objectives of promoting the principle of equality through the realization

of social rights and the universalization of services to be offered to society, such as security, health, social security, social assistance, culture and education. According to the same author, the foundation of the Democratic State of Law consists in the democratization of social benefits and it is expected that such legal systems will be carried out in practice.

One of the social rights guaranteed by the Federal Constitution is that of education, enshrined in article 6 and article 205, as being "the right of all and the duty of the State and the family", that is, as a shared responsibility of the State with civil society, thus reaffirming the right to education in the country (BRASIL, 1988, n.p.).

The right to education appears in more detail in Article 208 of the Constitution, which speaks of the guarantees, gratuity and obligation of education in the country from then on. Souza (2012) reminds us, however, that "the right to education in Brazil still encounters obstacles to its materialization" (SOUZA, 2012, p. 101). In Brazil, only in 2009 occurred the universalization of Basic Education, elementary and high school, for students from 4 to 17 years of age, becoming free and compulsory with the promulgation of Constitutional Amendment No. 59/2009, and its offer was also assured to those who did not have access to it at the appropriate age. With the universalization of high school and a greater number of graduates of this level there was a greater demand for places in higher education and an increase in pressure for the expansion of vacancies at this level of education (FIALA, 2016).

However, with regard to higher education, specifically, the situation is more complex, because it is linked to the effort and merit of the citizens themselves and is not mandatory. With regard to higher education, the Federal Constitution makes this explicit in article 208, item V: "access to the highest levels of education, research and artistic creation, according to the capacity of each one" (BRASIL, 1988, n.p.).

The Brazilian State recognizes, however, in the Law of Guidelines and Bases of national education, Law No. 9,394/1996 of 12/20/1996 (promulgated in the government of Fernando Henrique Cardoso, marked by neoliberal tendencies) the importance of higher education for the development of the country. Chapter IV of this law, which deals specifically with Higher Education, provides for its purposes, quality of teaching, undergraduate and graduate courses and programs, as well as the expansion and diversification of higher education institutions.

The purposes of Higher Education are presented in Article 43 of the LDB/1996 in its various items:

> I – to stimulate cultural creation and the development of the scientific spirit and reflective thinking;
> II – to train graduates in the different areas of knowledge, able to enter professional sectors and to participate in the development of Brazilian society, and to collaborate in their continuous training.

> III – to encourage the work of research and scientific investigation, aiming at the development of science and technology and the creation and diffusion of culture, and thus develop the understanding of man and the environment in which he lives;
> IV – to promote the dissemination of cultural, scientific and technical knowledge that constitute the patrimony of humanity and to communicate knowledge through teaching, publications or other forms of communication;
> V – to arouse the permanent desire for cultural and professional improvement and to enable the corresponding implementation, integrating the knowledge that is being acquired in an intellectual structure that systematizes the knowledge of each generation;
> VI – to stimulate knowledge of the problems of the present world, in particular the national and regional ones, to provide specialized services to the community and to establish with it a relationship of reciprocity;
> VII – promote the extension, open to the participation of the population, aiming at the diffusion of the achievements and benefits resulting from the cultural creation and scientific research generated in the institution (BRASIL, 1996, n.p.).

It is important to clarify and emphasize, however, the historical-political and economic context of the 1990s, of neoliberal content, which sought to minimize the performance of the State in relation to social policies as a way to resume economic development through the reform of the State. This logic suggests the downsizing of the state machine, as well as the privatization of goods and services, effecting the transfer of the production of goods and services to the private initiative (DOURADO, 2002). The thesis is that of the minimal State, since it is understood that the market is the most efficient mechanism of resource allocation and, in this way, the State must be emptied in size, role and functions. This ideology gained notoriety in the early 70s, with the crisis of the economic model in which high inflation rates and low growth rates combined. The first country to adopt the neoliberal agenda was England, in 1979, which was followed by other advanced countries in the 80s (CARVALHO, 2007). In line with the neoliberal premises, Bresser Pereira - Minister of Federal Administration and State Reform of Brazil, from 1995 to 1998 during the government of President Fernando Henrique Cardoso (FHC) - advocated changes in the organization and management of the State (PEREIRA, 1998). In this project, health, education, culture and scientific research made up the sector of non-exclusive services, provided by the State, but which could also be offered by the private sector and the non-governmental sector. Thus, changes in the educational field were implemented with regard to the legal organization of Higher Education Institutions (HEIs) and new formats of regulation/management and privatization of educational institutions (DOURADO, 2002).

In the political-economic scenario of the 90s, FHC's management, of neoliberal tendencies, reoriented public policies, changing the patterns of state intervention and placing mainly educational policies in tune with multilateral organizations, understood as entities created by the main nations of the globe with the objective of promoting the full development of the various areas of human activity (CARVALHO, 2007).

According to Sguissardi:

> In the shadow of the recommendations of the 1994 World Bank document, *Higher Education: the lessons of experience*, which proposed, among other things, much greater institutional

> differentiation and diversification of sources of education maintenance, including student payment of public HEIs; which considered the research university *inadequate for developing countries and in its place proposed the adoption of the* teaching university (no research); which recommended that the authorities be "attentive to market signals", the Law of Guidelines and Bases of National Education (LDBEN) was approved in December 1996. This law, approved as a kind of "legal umbrella", allowed the edition of several normalizing decrees imbued with the spirit of these recommendations (SGUISSARDI, 2008, p. 1000).

In this context, the LDB/1996 was promulgated, a period in which Brazil, the spectrum of social and economic policies were under the neoliberal agenda, which influenced the Brazilian educational policy and gave specificity to this era in the history of higher education (CARVALHO, 2007). The guidelines for higher education that are presented through the LDB/1996 are related to the process of reform of the State in force at the time and linked to world organizations (DOURADO, 2002).

Scholars of Brazilian education, such as Carvalho (2007), Dourado (2002) and Sguissardi (2006), among others, have written extensively about the policies for higher education in Brazil in the 90s in the context of state reform and under the influence of international or multilateral financial organizations. These authors analyze the university reform of this decade, revealing external influences and recommendations coming from these international organizations - International Bank for Reconstruction and Development (IBRD) and International Monetary Fund (IMF) - which were incorporated by the LDB/1996 and had repercussions on the restructuring of Brazilian higher education. Among the proposals for financial and administrative aid from the IBRD is the need for reform in the country's educational policy, in order to give rationality and efficiency to the system, with the introduction of new concepts, such as: evaluation, university autonomy, diversification, flexibilization and privatization (CARVALHO, 2007).

Sguissardi points out that:

> The integration of the country into the world economy is emphasized by emphasizing the new role attributed to the market in the allocation of resources and reducing the functions of the State, especially when it is thought of as a provider of social services, including education. The recommended measures, as we know, were: combating *the public deficit*, fiscal adjustment, privatization, price release/adjustment, deregulation of the financial sector, commercial release, incentive to foreign investments, reform of the social security/social security system and reform, deregulation and flexibilization of labor relations (SGUISSARDI, 2006, p. 1026).

This allows us to understand the changes that came into force in higher education since the elaboration and implementation of the LDB/1996 (DOURADO, 2002). Dourado (2002) points out that from the guidelines of the World Bank it is possible to deduce the prescription of educational policies guided by the logic of rationalization, which would accompany the logic of the economic field. Already in the 80s, with the beginning of the crisis and the indebtedness of the country, there was a transformation in the role played by the World Bank and multilateral financing organizations. The World Bank went from inducing investments to guardian of the interests of large international creditors and, in this way, became responsible for ensuring the payment of the external debt and for restructuring

the economic opening, mainly of Latin American economies according to the current requirements of globalized capital (SOARES, 1996).

The same authors previously mentioned (CARVALHO, 2007; Golden, 2002; SGUISSARDI, 2006) present criticisms of the guidelines established by the LDB/1996 for higher education, denouncing the influences of international organizations on policies for national education. In his analysis of the educational policies for higher education implemented in Brazil in the 90s, of the twentieth century, Dourado (2002) highlights how much such policies were influenced by sociopolitical options and interests articulated to the changes in the contemporary scenario, this marked by historical determinants arising from the ongoing neoliberal tendencies, which are configured, as already mentioned, by minimizing the role of the State (DOURADO, 2002). This author denounces and criticizes the predominance of the privatization character in the policies of expansion of higher education in this period. Sguissardi (2008) points out that the recommendations of multilateral organizations supported the opening *of the higher education educational market* in Brazil to private initiative or *free business initiative,* which would attribute to higher education many of the characteristics of a private good. The increase in the number of private enrollments had a great rise in the FHC government. However, this alternative exalted by the World Bank as a solution to meet the expansion in the supply of vacancies, encountered obstacles such as the fall in the purchasing power of the population (CARVALHO, 2007).

According to Golden:

> [...] this expansionist process was deliberately driven by official policies, having been embodied by nature and predominantly private character, such as the creation of new HEIs, the creation of new courses and organizational formats, restructuring of HEIs, among others. Such policies have resulted in an intense process of massification and privatization of higher education in Brazil, characterized by the precariousness and privatization of the scientific agenda, neglecting the social role of higher education as a space for investigation, discussion and dissemination of projects and models of organization of social life, having as its north the guarantee of social rights (DOURADO, 2002, p. 246).

Also according to the same author:

> Higher education in Brazil is emblematic to the extent that it is restructured, breaking with the principle of inseparability between teaching, research and extension, through deliberate actions in favor of a growing expansionist process, guided by policies that induce institutional diversification and differentiation, which, in the Brazilian case, has meant an expansion guided by hegemonically, by the lightening of training and the privatization of this level of education (DOURADO, 2002, p. 245).

Oliveira and Catani (2002), highlight that in the LDB/1996, the university model based on teaching, research and extension was not maintained as a model of expansion for higher education, being replaced by a diversified and differentiated system, in line with the observations of Dourado

(2002), already previously presented, in order to meet the recommendations of the IBRD, diversification and flexibilization of higher education institutions.

Rosa, relying on Sguissardi (2009), points out that:

> [...] the logic of expansion did not allow the continuity of the link between teaching, research and extension, a model that began to be replaced by others, with a view to expanding the chances of access to undergraduate courses (ROSA, 2014, p.242).

Article 45 of the LDB/1996 deals with the expansion of higher education and the diversification of higher education institutions in the country:

> Art. 45: Higher education will be taught in higher education institutions, public or private, with varying degrees of scope or specialization (BRASIL, 1996, n.p.).

Article 48, in its 1st paragraph, states that:

> Art.48: The diplomas of recognized higher education courses, when registered, will have national validity as proof of the training received by their holder (BRASIL, 1996, n.p.).

It should also be noted that in the context of the reform and expansion of higher education engendered and made possible by the LDB/1996, there was a revaluation of Professional and Technological Education in the country, so that this LDB is considered the legal framework in the history and evolution of this modality of education. Chapter III establishes the guiding principles and verticalization of Professional Education, as well as the Higher Technology Courses in Brazil. The higher technology courses are part of the strategies to sustain a policy of expansion of the higher level of the Brazilian education system, a policy that began in the FHC government and deepened in the Lula government (SOUZA, 2012).

In summary, based on what was established in the LDB/1996, a process of reformulation of the higher education system in Brazil was triggered, aiming at the expansion and democratization of higher education, which was made possible by the diversification and flexibilization of higher education institutions. The expansion of the system resulted in the expansion of the number of higher education institutions, mainly private, and the consequent increase in enrollment, resulting from the increase and accreditation of new institutions and the opening of new courses. This growth occurred mainly in private institutions, although there has also been an expansion in the public school system (ROSA, 2014).

Then, other educational institutions, colleges and university centers emerged, characterized by institutional diversification and curricular flexibility, necessary for the adaptation of these institutions to the demands of the market.

Over the last few years, there has been a significant increase in the number of HEIs in Brazil, as well as a large increase in the number of enrollments registered in these institutions. According to the 2019 Brazilian Higher Education Census, prepared by the Anísio Teixeira National Institute of Educational Studies (INEP) and released by the MEC, there are 2608 HEIs in the country, between public and private, with a predominance in number of private institutions (BRASIL, 2020).

According to the statistical notes of the 2019 Census (BRASIL, 2020), of the 2608 institutions of higher education existing in Brazil currently, 88.4% are private and 11.6% are public. Of the total HEIs already mentioned (2608), 79.65% are colleges. Among the private HEIs, colleges predominate, which correspond to 83.8%.

Also according to the 2019 Census, of the federal HEIs, 60.0% correspond to universities, 36.5% to the Federal Institutes of Education, Science and Technology (IFs) and Federal Centers of Technological Education (CEFETs).

According to the 2019 Census (BRAZIL, 2020), between 2009 and 2019 the number of enrollments in HEIs increased by 43.7%, with an average annual growth of 3.6%. In 2019, a total of 8.6 million enrollments were recorded, 1.8% higher than in 2018. In 2019, more than 16.4 million vacancies were offered in HEIs, of which 837,000 were in the public network and more than 15 million in the private network.

According to Census/2019 data, enrollment in higher education increased by 43.7% between 2009 and 2019, with an average annual growth of 3.6%. Compared to 2018, the positive change was 1.8%. In 2019 the number of enrollments continued to grow, reaching 8.6 million.

According to the 2019 Census, 3.6 million students entered higher education courses, of which 84.6% in private institutions. In 2019, the number of entrants had a growth of 5.4% compared to 2018. The census charges that the private network continues its expansion. In 2019, the number of tickets increased by 8.7%. In the period between 2009 and 2019, the private network grew 87.1% and the public network increased 32.4% in the same period.

The Secretariat of Professional and Technological Education (SETEC / MEC) has developed actions to promote, expand and consolidate a culture of professional and technological training within the institutions, networks and educational systems of the country, in order to offer a professional and technological education of quality, public and / or private, through partnership with private institutions throughout the national territory, in order to reach and benefit millions of young Brazilians and offer them training opportunities (BRASIL, 2018). In this context, the Higher Technological Courses (CSTs) are inserted, expanding in the national territory.

According to the 2019 Census, bachelor's degree courses continue to concentrate the majority of higher education freshmen (57.1%), followed by technological courses (22.7%) and undergraduate courses (20.2%). Between 2018 and 2019 there was an increase in the number of entrants to the

bachelor's degree (3.1%). However, the CSTs showed the greatest variation, 14.1%. Undergraduate courses recorded a 3.5% increase. In the period from 2009 to 2019, the number of entrants to the CSTs registered the highest growth in percentage terms, 132.5%, a very expressive percentage, according to the INEP Statistical Notes, 2019 (BRASIL, 2020b). Regarding the number of enrollments, the Census shows that bachelor's degree courses predominate in national higher education, participating with 66% of the total enrollment.

The CSTs showed the highest growth (11.5%) in relation to bachelor's and bachelor's degree courses in 2019, when compared to 2018 (BRASIL, 2020).

However, in recent decades, in the era of globalization (defined by sociologists Martin Albrow and Elizabeth King (1990) as the era that concerns all the processes through which the peoples of the planet are incorporated into a single and global world society) modern Brazilian society has been undergoing major transformations with recent technological and communication developments that interconnect the different countries and societies on a global scale, "shortening borders", expanding contact with different cultures, facilitating access to knowledge and information before difficult access and increasingly valuing knowledge. That is why we speak of a 'knowledge society'. This has mobilized young Brazilians for the importance of higher education.

At the same time, the federal government knows that Brazil occupies an underprivileged position with regard to the gross enrollment rate of higher education compared to other countries, including Latin American countries such as Chile and Argentina, as Souza (2012) reports. According to this author, according to UNESCO data, Brazil is one of the countries that have one of the lowest rates of higher education. In this context, the offer of Distance Education (EaD) was included in Art. 80 of the LDB/1996, aiming at its implementation in Brazil as a means of expanding access to education at all levels and modalities of education, expanding the access of students to higher education and continuing education.

> Art. 80. The Government will encourage the development and dissemination of distance learning programs, at all levels and modalities of education, and continuing education.
>
> §1 Distance education, organized with special opening and regime, will be offered by institutions specifically accredited by the Union (BRASIL, 1996, n.p.).

Currently, undergraduate, specialization and graduate courses and programs are quite popular and widespread in Brazil. According to the statistical data of the 2019 Higher Education Census, these present an evolution of the number of distance education undergraduate courses in Brazil, from 2000 to 2019.

The distance learning modality of higher education is offered in both public and private HEIs, being predominant in public institutions. The number of vacancies for undergraduate courses offered in the distance modality already exceeds the number of vacancies available for face-to-face courses,

although the number of courses, enrollments, freshmen and graduates is still higher in the face-to-face modality.

As already explained, in recent decades there have been efforts to enable the expansion and democratization of higher education, through the expansion, flexibility and diversification of institutions and higher education courses, with a view to expanding the contingent of Brazilians with higher education and also overcoming the gap in this regard in relation to other Latin American countries.

1.2 CONSIDERATIONS ON HIGHER EDUCATION IN THE XXI CENTURY

The current society goes through constant changes and the education sector, as well as the other social sectors, are updating themselves in order to meet the various demands. As higher education advances, society is benefited, for example, by public policies that favor expansion and access to graduation. In this way, the documents that originate from national and international conferences and meetings focused on this theme contribute positively to the elaboration of such policies, since they support governmental decisions (ROSA, 2014).

At the end of the 90s, in 1998, the World Conference on Higher Education was promoted by UNESCO and held in Paris, France. From this conference originated the *World Declaration on Higher Education in the XXI Century: Vision and Action*, which recognizes the great demand for higher education and the diversification of the system. This statement points out the relevance of this level of education for socio-cultural and socioeconomic development and for the construction of the future, emphasizing that the new generations must be well prepared, with ideal skills and knowledge, to be able to act appropriately. This document highlights the challenges and difficulties inherent in the expansion and development of higher education, highlighting the following issues: financing; equal conditions of entry and permanence in studies; development of skills and competencies; quality of teaching, research and extension; employability of graduates of the courses; access to the benefits of international cooperation (ROSA, 2014).

The UNESCO Declaration points to the fact that, although there has already been a significant advance in the process of expansion of higher education worldwide in the second half of the twentieth century, there is still a great disparity in the resources allocated to higher education, research and educational opportunities, both in developed and developing countries (UNESCO, 1998).

According to UNESCO:

> Without higher education and adequate research institutions that form the critical mass of qualified and educated people, no country can ensure genuine and sustainable endogenous development or reduce the disparity that separates poor and developing countries from rich countries (UNESCO, 1998, n.p.).

The Declaration emphasizes that the essential missions and values of higher education must be strengthened and expanded, as well as stresses the objective of this level of education to contribute to the sustainable development and general improvement of society. Still, according to the document, higher education is presented as a driving factor for the development of individuals and nations, contributing to their socioeconomic development. There is a tendency to expand the opportunities for access and participation in higher education of socially discredited layers of the population.

It is observed that at the end of the twentieth century and the beginning of the twenty-first century there was an engagement of the social instances in Brazil and abroad with regard to the realization of events, conferences and elaboration of guiding documents of educational policies, in its various levels. Under the influence of these events, Brazil recognized the problems related to higher education in the country and elaborated the first National Education Plan (PNE) in 2001, affirming the need to create public educational policies for the expansion, renewal and development of national higher education. This document is prepared every ten years and determines the guidelines, goals and strategies for education in our country.

The current PNE was prepared in 2014, established by Law No. 13,005/2014 and created to be in force from 2014 to 2024. It aims at the expansion, universalization and improvement of education and its quality at its various levels in the country. The current PNE (BRASIL, 2015) has 20 goals, among which the following stand out, related to higher education in Brazil:

> Goal 12 - Raise the gross enrollment rate in higher education to 50% (fifty percent) and the net rate to 33% (thirty-three percent) of the population from 18 (eighteen) to 24 (twenty-four) years, ensuring the quality of supply and expansion to at least 40% (forty percent) of new enrollments, in the public segment (BRAZIL, 2015, p. 207).
>
> Goal 13 - Raise the quality of higher education and increase the proportion of masters and doctors of the teaching staff in effective exercise in the whole system of higher education to 75% (seventy-five percent), being, of the total, at least 35% (thirty-five percent) doctors (BRASIL, 2015, p. 225).
>
> Goal 14 - Gradually increase the number of enrollments of stricto sensu graduate programs in order to reach the annual degree of 60 thousand masters and 25 thousand doctors (BRASIL, 2015, p. 241).

The current Public Educational Policies for higher education were created to favor the access and permanence of students and also to favor the inclusion of historically underprivileged groups and traditionally excluded from this level of education.

In the previous items, the importance of Higher Education for the development of the country was highlighted. The historical-political and economic context of the 90s was highlighted, which resulted in the introduction of new concepts for this level of education, such as diversification, flexibility and privatization of HEIs, accreditation of new institutions and opening of new courses. The changes that came into force in Higher Education from the elaboration and implementation of the

LDB/1996 and the increase in the number of enrollments, especially in private HEIs, were commented. The university model was highlighted, which remained as the expansion model, which is based on teaching and not on research and extension.

The revaluation of the EPT in the context of the reform and expansion of Higher Education was highlighted, and the insertion of the CSTs in this context was highlighted. These courses contribute to the expansion of Brazilian Higher Education, initiated by the FHC government in the 90s, which contributes to raising the gross enrollment rate in higher education according to the goal established by the current PNE. Due to its relevance in the present Brazilian educational scenario, the following is a history about the origin and development of the Brazilian EPT, as well as its historical-political contextualization.

1.3 PROFESSIONAL AND TECHNOLOGICAL EDUCATION IN BRAZIL: ORIGIN, DEVELOPMENT AND HISTORICAL-POLITICAL CONTEXTUALIZATION

It is considered that the beginning of Professional Education in the country officially occurred in 1909 with the creation of 19 Schools of Artificer Apprentices by President Nilo Peçanha, in different federative units and destined to professional education, primary and free, through Decree No. 7,566/1909 (BRAZIL, 2009).

In 2009 was celebrated the centenary of the Federal Network of Professional, Scientific and Technological Education, which consists of a set of educational institutions distributed throughout the national territory. Its creation by Law No. 11,892/2008 constituted a milestone in the expansion, internalization and diversification of Professional and Technological Education in the country (BRASIL, 2009).

The origins of Professional Education in Brazil, however, date back to the times of colonization, when the teaching of crafts was directed to indigenous people and slaves (BRASIL, 2009).

With the progress of the colony and the advent of gold mines in Minas Gerais, the Foundry Houses were created, which offered a more specialized education, aimed at the children of white men, employees of the House itself. During this period, the Craft Learning Centers were created in the Arsenals of the Brazilian Navy, recruiting people interested in learning a trade and who had some condition to produce.

Then, from 1785, came a period of stagnation of technological development in Brazil, due to the prohibition of the Royal Crown of Portugal regarding the creation of factories in the country. From the 1800s there are records of teaching manufacturing trades aimed at the less privileged layers of Brazilian society, offering the learning of crafts of typography, bookbinding, tailoring, turning, carpentry, shoemaking, among others.

With the coming of the Portuguese royal family in 1808 was created the College of Factories by D. João VI, considered the first establishment installed by the public power and directed to the education of artists and apprentices.

In 1889, at the end of the imperial period and after the abolition of slavery, there is a record of 636 factories installed in the country, with about 54 thousand workers. Later, already in the period of the republic, in 1906, Nilo Peçanha, then governor of Rio de Janeiro, created in his state, four professional schools for the teaching of crafts and agricultural learning. The year 1906 was marked by the consolidation of technical-industrial education in Brazil and it was recorded that the President of the Republic Afonso Pena, in his inaugural speech on November 15, 1906, declared that the creation and multiplication of institutes of technical and professional education could greatly contribute to the progress of industries, providing them with learned and skilful masters and workers. In July 1909, having died Afonso Pena, the presidency of Brazil was assumed by Nilo Peçanha (BRAZIL, 2009).

In 1927, the National Congress approved the compulsory provision of vocational education in the country. In November 1930 the Ministry of Education and Public Health was created, which structured the Inspectorate of Technical Vocational Education, which began to supervise the Schools of Artificer Apprentices. In 1934, this province was transformed into the Superintendence of Vocational Education. The 1930s were marked by the expansion of industrial education, which was driven by a policy of creating new schools and introducing new specializations into existing schools.

The Brazilian Constitution of 1937 dealt specifically with technical, professional and industrial education, determining in its article 129:

> To children and youth, who lack the resources necessary for education in private institutions, it is the duty of the Nation, the States and the Municipalities to ensure, through the foundation of public educational institutions in all their degrees, the possibility of receiving an education appropriate to their faculties, aptitudes and vocational tendencies.
>
> Vocational pre-vocational education for the less favoured classes is, in the field of education, the first duty of the State. It is responsible for carrying out this duty by founding institutes of vocational education and subsidizing those initiated by States, Municipalities and private and professional individuals or associations.
>
> It is the duty of industries and economic unions to create, in the sphere of their specialty, schools of apprentices, intended for the children of their workers or their associates. The law will regulate the fulfillment of this duty and the powers that will fall to the State over these schools, as well as the aids, facilities and subsidies to be granted to them by the public power (BRASIL, 1937, n.p.).

Later, in 1937, the Schools of Artificer Apprentices were transformed into Professional Lyceums, intended for the vocational education of all branches and degrees.

In the 1940s, education was marked by several reforms and in 1942 the Industrial and Technical Schools were created, which offered vocational training at a level equivalent to that of secondary

school and students graduated in technical courses were allowed to enter higher education in an area equivalent to that of their training.

The period of the government of Juscelino Kubitschek, from 1956 to 1961, was marked by great industrial development and education was contemplated with 3.4% of the total of the massive investments foreseen by the government's Plan of Goals, aiming at the training of professionals oriented to the development goals of the country. In 1959, the Industrial and Technical Schools were transformed into the Federal Technical Schools, intensifying the training of technicians, considered indispensable labor in the face of the acceleration of the industrialization process of the country.

In the 1960s there were several changes in the organization of education in the country, encompassing high school and professional education. At that time, of great expansion of the economy and the industrial park in the country, it was proposed the creation of Short Term Engineering Courses, called Operation Engineering, with three years of duration and intended to meet the industrial demand, especially the automobile industry, due to the lack of professionals focused on this sector. However, this modality of Operation Engineering generated many problems related to its nomenclature with the Engineering Councils and Class Associations. Subsequently, in 1968, in the context of the University Reform, these courses ended up being extinguished and the federal government created a working group to study the implementation of the Technology Courses, succeeding the Operation Engineering courses and lasting two years (SOUZA, 2012).

In 1969 was implemented in the Faculty of Technology of Bauru, state of São Paulo, the first technology course in the area of civil construction. That same year, the State Center for Technological Education of São Paulo was created, which, in 1973, was renamed the Paula Souza Technological Education Center (CEETEPS). The purpose of the Centre was to develop technological education and provide technology courses for the training of technologists. The creation of these courses was inspired by positive experiences with this professional training in European countries, such as Germany, France and England, and also in the United States. At that time, of the states of the federation, it was in the state of São Paulo that the CSTs had greater penetration, mainly due to the performance of the Paula Souza Center (SOUZA, 2012).

In 1978, three Federal Technical Schools - from Paraná, Minas Gerais and Rio de Janeiro - were transformed into Federal Centers of Technological Education - CEFETs and this change gave the institutions the attribution of training technologists.

The 1980s, a time of redemocratization of the country, was marked by the drafting of the new Federal Constitution of 1988, which guarantees the right to education and training to all citizens in terms of equality.

In 1994, at the end of the Itamar Franco government, the National System of Technological Education was instituted and the Federal Technical Schools and the Federal Agrotechnical Schools of

the country, in general, were transformed into Federal Centers of Technological Education - CEFETs, according to criteria established by the Ministry of Education, which was effected through Law No. 8,948/1994 (BRAZIL, 2009).

In the following years, according to Ramos (2014), the government of Fernando Henrique Cardoso (1995 - 2003), was marked by neoliberal ideology and brought new trends to the country's professional education policy. The government's proposal for Education was the idea of the urgent need to improve and change the quality of the school in order to train workers capable of adapting to the technological innovations of the labor market.

According to Ramos:

> Based on formulations that seem to be in line with the guidelines of international agencies, such as the IDB (Inter-American Development Bank) and IBRD (International Bank for Reconstruction and Development), education was conceived as a requirement for technological development and citizenship, the latter being a simple additional element to the process. In the same way, professional education was conceived as one of the strategies to solve the problem of the qualification of the Brazilian workforce (RAMOS, 2014, p. 52).

According to the author cited above, this was a time marked by the ideology of employability that:

> [...] spread the idea that the more skilled the worker, the greater his chances of entering and/or remaining in the labor market. Seduced by these ideologies, the working class began to mobilize for the improvement of its schooling standards. The return to school became one of the characteristics of these years (RAMOS, 2014, p. 57).

According to Ramos (2014), this was a period in which there was a search for qualification or professional training courses, driven by the National Plan for Professional Training - PLANFOR, by the Ministry of Labor, in 1995, predominantly developed by civil society institutions. This era was also marked by the expansion of private initiative in the area of education, with the adhesion of civil society to the Program for the Expansion of Professional Education - PROEP, of the Ministry of Education, and data from the 2003 Census show that the offer of professional education by the private sector surpassed the public offer (RAMOS, 2014).

In 1996, the second LDB of National Education was created, Law No. 9,394/96, which is considered the legal landmark in the history and evolution of Professional and Technological Education in the national scenario, for providing for it in its own chapter, establishing its guiding principles, instituting the CSTs in Brazil and the verticalization of Professional Education (BRASIL, 1996).

Following the government of Fernando Henrique Cardoso (1995-2003), during the term of Luiz Inácio Lula da Silva (2003-2010), there was a great boost given to Professional Education in the country, at its various levels. In 2008, the Federal Institutes of Education, Science and Technology were created, public institutions within the Expansion Plan of the Federal Network of Professional and

Technological Education, which, among other aspects, was marked by President Lula's determination to ensure technological education a privileged place in the policies of his government, considering it of great importance for a sovereign national development, sustainable and inclusive (RAMOS, 2014).

1.4 THE HIGHER TECHNOLOGY COURSES IN THE CONTEXT OF HIGHER EDUCATION AND ITS REVITALIZATION IN THE BRAZILIAN EDUCATIONAL SCENARIO

The literature review made by the author reveals that in the mid-twentieth century there was a devaluation of vocational courses in relation to the traditional bachelor's and licentiate degrees, because they are associated with the history of professional education in Brazil, originally aimed at the disadvantaged and underprivileged classes of society, while the others were destined to the elite, creating a "duality" within Brazilian education (DETREGIACHI Fo., 2012; RAMOS, 2014). The vision of an education focused on professional training persisted and the fact that there was the initiative to offer higher education courses within the scope of professional and technological education, since the 1970s, did not alter the thinking of the elites. This thinking privileges full higher education courses, and prejudice still remains about professional education (TAKAHASHI, 2010).

Due to the requirement of increasingly qualified professionals and the need for continuous qualification, Brazil began to foster higher professional education. Contributing to this situation were the contingent of students who completed high school and sought to continue their studies, the pressure on educational systems to promote continuing education and the worldwide trend of investments in professional education. According to Takahashi (2010), this trend can be observed in the United States and in some European countries, where more than half of the students graduate from higher education courses in this modality of education. From the new LDB/1996, which understands that professional education is integrated with the different forms of education (CNE/CP Opinion no. 29/2002), this prejudice began to be changed. The educational and post-LDB/1996 policies emphasize the value and importance of professional education for the development of the country and its insertion in the technological area for the formation of higher education and qualification of young people, as well as for the improvement of the levels of employability and income of the population, contributing to the overcoming of this duality and prejudice (RAMOS, 2014; MARIN *et al.,* 2019).

The current Law of Guidelines and Bases of National Education, Law No. 9,394/1996, is considered the legal framework in the history and evolution of Professional and Technological Education, for providing for it in its own chapter, establishing its guiding principles, instituting the CSTs in Brazil and the verticalization of Professional Education (BRASIL, 1996). Chapter III of that law provides that:

- Professional and Technological Education is integrated with the different levels and modalities of education and with the dimensions of work, science and technology;

- the courses may be organized by technological axes, enabling the construction of different training itineraries;
- this type of education shall cover: 1) initial and continuing training courses or professional qualification; 2) high school courses; 3) undergraduate and graduate courses;
- undergraduate and graduate courses will have objectives, characteristics and duration according to the national curriculum guidelines established by the National Education Council.

According to the CNE/CP Opinion: 29/2002, which provides for Technological Education in the current Educational Legislation, the LDB/1996, in its article 39, grants professional education a special emphasis (BRASIL, 2002). Also according to this Opinion:

> The higher education course in technology must contemplate the training of a professional able to develop, in a full and innovative way, activities in a certain professional area, and must have specific training for: application and development of research and technological innovation; diffusion of technologies; management of production processes of goods and services; development of entrepreneurial capacity; maintaining their skills in tune with the world of work; and development in the context of the respective professional areas (BRASIL, 2002, p. 03).

Also according to the aforementioned Opinion, "Professional Education is no longer conceived as a simple instrument of assistentialist policy or linear adjustment to market demands" (BRASIL, 2002, p. 14). The new professional education is conceived as an important strategy for citizens to have access to the scientific and technological achievements of society, aiming, in addition to specific technical training, the global understanding of the production process, in an integral approach. Currently, CSTs are considered of great importance in the scenario of national development and should not be confused with mid-level vocational technical courses. According to Rosetti Jr. and Schimiguel (2011), according to the LDB/1996, currently in Brazil the expression **technological** education has a precise legal meaning, which is the training of short-term higher education aimed at training for the professions, especially in the industrial area, while **technical education** refers to the professional training of medium level. Therefore, the CSTs cannot be confused with the secondary and sequential level courses, which constitute a modality of higher education in which the student, after completing high school, can expand his knowledge or his professional qualification in a relatively short period (BRASIL, 1998).

According to Rosetti Jr. and Schimiguel:

> The graduations, as a formation in higher level, have their origin and composition in the structure of the Brazilian vocational education, in the same way as the technical courses in the secondary level. This graduation has its molding from economic demands and needs of the world of work (ROSETTI Jr. and SCHIMIGUEL, 2011, p. 02).

To Favretto and Moretto:

> The Higher Technology Courses are legally regular undergraduate courses, with National Curriculum Guidelines defined by the CNE, focused on the domain and application of scientific and technological knowledge in areas of knowledge related to one or more professional areas. They allow all kinds of graduate studies. They seek the development of professional skills that enable the correct use of technology. Access to the technology course occurs as in other undergraduate courses: it is open to candidates who have completed high school and have been classified in the selection process (FAVRETTO and MORETTO, 2013, p. 408).

According to the Basic Legislation of Professional and Technological Education of higher education, Opinion CNE/CP no 29/2002, the CSTs:

> Their purpose is the development of professional skills that allow both the correct use and application of technology and the development of new applications or adaptation in new professional situations, as well as the understanding of the implications arising therefrom and their relations with the production process, the human person and society. The objective to be pursued is the development of qualifications capable of allowing graduates to manage processes of production of goods and services resulting from the use of technologies and the development of skills for technological research and the dissemination of technological knowledge (BRASIL, 2002a, p. 271).

The current society is in constant transformation and rapid changes have been occurring in Brazilian higher education in recent decades as a result of new social demands, nationally and internationally. As a consequence, CSTs are being offered in response to these demands. These courses are structured in a more targeted way to this new reality and offered in a shorter period (two or three years of duration) than those of bachelor's and licentiate degrees, which are longer. They are thus a great opportunity for the higher education of students. These characteristics have a great appeal to young people, causing their demand and supply to grow rapidly in recent years (ROSETTI Jr., 2007). The CSTs have been increasingly attracting the interest of young Brazilians interested in higher education, involving research work and scientific investigation. In this way, these courses have been gaining space in a scenario previously dominated by bachelor's and bachelor's degrees, according to data from the Higher Education Censuses of 2017, 2018 and 2019, already presented previously.

In 2006, through Decree 5773/2006, the Ministry of Education prepared the first "National Catalog of Higher Technology Courses", which presented 98 course designations. A second version was made available in 2010, featuring 113 courses. The catalog is updated periodically and in its third and last edition, with the publication of Ordinance No. 413, of May 11, 2016, presents 134 denominations of higher education courses, divided into 13 technological axes, which structure its organization (BRASIL, 2006). In the second half of 2021, with the intention of preparing a new catalog, the Secretariat of Professional and Technological Education (SETEC) of the MEC began the training phase of the coordinators who will act in the updating of the catalog. The updating process aims to strengthen the Professional and Technological Education policy in the country (BRASIL, 2021).

The CSTs are offered in public educational institutions that are part of the Federal Network of Professional and Technological Education, such as the Federal Centers of Technological Education (CEFETs), the Federal Institutes of Education, Science and Technology (IFs) and also in public and private universities or colleges, which offer Professional and Technological Education (BRASIL, 2009). According to Rosetti Jr. and Schimiguel (2011), the private higher education network is more attuned to the new needs and current demands for higher education professionals. **This is due to the fact that in private institutions there is less bureaucracy for the implementation of new courses and more resources for their accreditation with the MEC, which provides the offer of courses according to the demands of the regions and students. In this way, private HEIs** have been leading the offer of new training courses for technologists, with abundant and diversified offer (ROSETTI Jr and SCHIMIGUEL, 2011).

Currently, the CSTs are in evidence, because in the last decade there has been a significant increase in the offer of higher education as a result of the government policy of expansion and democratization of higher education. Many university centers, colleges, universities, technological education centers, technology colleges, schools and higher institutions began to offer new modalities and new courses, fruits of changes in educational legislation and also of the new social and economic contours of the country. Also contributing to this were the public educational policies of the federal government, which, aiming at the democratization and expansion of higher education among the Brazilian population, created programs that aim to encourage and support the access and permanence of young students in higher studies, both in public institutions of the federal network and in the private network.

During the government of President Luiz Inácio Lula da Silva (2003-2010) Professional Education received a great boost at its various levels (RAMOS, 2014). In 2008, the Federal Institutes of Education, Science and Technology were created, public institutions within the Expansion Plan of the Federal Network of Professional and Technological Education, which was considered of great importance for sovereign, sustainable and inclusive national development. The creation of these institutes is presented and analyzed in an article by Pacheco, Pereira and Sobrinho (2010), who point out that the Secretariat of Professional and Technological Education of the Ministry of Education - SETEC / MEC - has been striving to offer opportunities for schooling and professionalization to thousands of young Brazilians, who are on the margins of society, with regard to their human and professional training. According to the authors, SETEC/MEC seeks to offer a professional education guided by the inseparability between general and professional training in the perspective of an integral education. Pacheco, Pereira and Sobrinho (2010), highlight the new face of Brazilian Professional and Technological Education. From the 90's began the reform of Professional and Technological Education in Brazil and, in this context, to regulate the Law of Guidelines and Bases of National Education - Law

No. 9,394/96, in April 1997, the government issued Decree No. 2,208/97 assigning to technical and vocational education its own and independent organization of high school. This new face was also signaled with the proposal to revitalize the CSTs from the 90s. Accordingto Souza (2012), the current higher technology courses hardly resemble their counterparts of the 60s and 70s. In these decades, the courses of technologists presented a terminal character. Currently, they are consolidated as a relevant higher education modality. The consolidation of the professional category of technologists also comes from the legal determination that equates CSTs to bachelor's and bachelor's degree courses. Today, the CSTs have the same validity as traditional undergraduate degrees and allow graduates access to graduate programs of any nature (SOUZA, 2012).

Rosetti Jr. and Schimiguel (2011) refer to CSTs as a "technological phenomenon of university education". However, the literature review shows that, while some authors currently consider Professional and Technological Education, at its various levels and its higher education courses, an academic solution to the current demand of the Brazilian labor market - which, as a result of the internationalization and globalization of the economy, has raised the demands for education and higher education of workers and employees - other authors see the situation differently and criticize the expansion of the higher education through a non-university route, whether public or private, which is not characterized by the inseparability between teaching, research and extension. This type of expansion, within this vision, would be a way for Brazil to compensate for its unfavorable position among Latin American countries regarding the low rates of young people between 18 and 24 years old enrolled in higher education (SANTOS and XEREZ, 2016).

Despite the great offer and acceptance of CSTs in the Brazilian higher education scenario, these courses are the target of criticism by several authors. Santos and Xerez (2016), for example, criticize the legal provisions that were created to ensure the structuring of a higher education in Brazil that would train professionals related to specific trades and whose higher education courses would meet the demands of the labor market. The authors claim that the policy of expansion of higher education, by valuing the expansion of CSTs, favors the precariousness of the university, pointing out that government incentives prioritize the expansion of access to higher education through lightened, flexible and practical courses. Their criticisms fall on a higher education that trains professionals immediately connected to the demands of the labor market, playing an important role in the process of social reproduction, since technological graduation figures as an alternative that attracts young people from popular strata to a "smaller" higher education. According to Santos and Xerez (2016), the defenders of this pedagogical proposal imagine solving with it the problem of the shortage of qualified workers, reducing the problem of unemployment, as well as expanding access to higher education. In this way, then, education would be secondary to economic development instead of favoring the integral development of society. However, these authors do not fail to recognize that education in a capitalist

society has no way of escaping the needs related to the world of capital. Authors such as Jucá, Oliveira and Souza (2010) affirm that the valorization of the CSTs, fostered by the Educational Policies for this type of education, needs to be seen with reservations, since both funding agencies and large industries are interested in the qualified graduates of technological higher education.

Still nthe context of the criticisms that focus on professional and technological education, Cazarotti and Bernardes (2018), emphasize that human capital is not properly considered, since the intention is only the formation of the working class. The government alleges an alleged improvement in the quality of education that does not occur in practice. According to Frigotto (2007), the inequality and the difficulty of students to remain in studies and complete basic education is a consequence of the inequalities prevalent in Brazil. He says that educational policies aimed at professional and technological education in Brazil are not concerned with the expansion of scientific, technical or technological production or with the right to citizenship and that their focus is only on the training of workers to work in the labor market. Thus, there is no interest in integral, quality education, aimed at the citizen and his performance in the social and political scenario. Still according to Frigotto (2007), the ideal type of integral education is obtained only by those who can afford the education of their children, who will attend universities in regular courses seeking an integral formation. The children of the working class would opt for short courses, focused on technique, to quickly enter the labor market. The universalization of education, according to the author, should be focused on theoretical, technical and political quality, which should be valid for all Brazilians, children and young people (FRIGOTTO, 2007).

Among other authors who criticize the CSTs, Coan (2014) and Ramos (2014) stand out, who also claim that the CSTs are intended to train professionals focused only on the interests of the market and that the training offered by them is not "integral", does not follow the principles of "polytechnics", when they should offer training according to their principles, with a view to training not only professionals for the world of work, but also that they master the scientific contents that underpin the techniques with which they work, that they know how to develop research and that they receive a training focused on citizenship, to form critical and reflective citizens (COAN, 2014; RAMOS, 2014). Santos and Xerez (2016), also relate technological higher education to a qualification of little solidity and aligned with an alleged polyvalence, which does not contribute to a comprehensive and critical training and that also does not produce basic science.

In order to understand the meaning of these criticisms, the following is the conception of "polytechnics" according to Saviani:

> Polytechnics refers to the mastery of the scientific foundations of the different techniques that characterize the modern productive work process. It is related to the fundamentals of the different modalities of work and is based on certain principles, certain foundations, which must be guaranteed by polytechnic training. Why? It is assumed that, mastering these foundations,

> these principles, the worker is in a position to develop the different modalities of work, with the understanding of his character, of his essence. It is not a case of a worker trained to perform a certain task with perfection and who fits into the labor market to develop that type of skill. On the other hand, it is a question of providing it with a multilateral development, a development that embraces all the angles of productive practice to the extent that it dominates those principles that are at the basis of the organization of modern production. As modern production is based on science, it is necessary to master the scientific principles on which the organization of modern work is founded (SAVIANI, 2003, p. 140).

Saviani's conception of Polytechnics seems to be in line with what was found in some of the texts of the MEC referring to professional and technological education, already presented previously, such as the CNE/CP Opinion: 29/2002, on pages 03 and 14 (BRASIL, 2002), and the SETEC/MEC document of 2008 (BRASIL, 2008), of which some excerpts are cited and which show the concern to present a "new professional education", At least in the proposed theory, as presented in terms of public policies of the federal government for this modality and for the qualification in professional education at the higher level. The organization and encouragement given by SETEC/MEC to this educational modality brought a new perspective of higher education to Brazil that already exists in other countries (CNE/CES Opinion No. 436/2001). The most recent and updated literature on Professional and Technological Education highlights a "revitalization" of CSTs in the Brazilian scenario, the "new face of technological professional education" (PACHECO, 2008; NEPHEW, 2008; TAKAHASHI and AMORIM, 2008; PACHECO, PEREIRA AND SOBRINHO, 2010; SOUZA, 2012; FAVRETTO and MORETTO, 2013; MARIN *et al.* 2019).

Cazarotti and Bernardes (2018) say that to the present day duality remains in the history of education. The level of professional education is raised, previously carried out at the basic level, then at the middle level and now at the higher level. However, it must be admitted that there has already been a development, a breakthrough. There are now technological courses with less technical curricula that explain ethical values, offer disciplines in the area of humanities focused on political-critical and citizen training, as observed in graduate courses of federal institutes of education, science and technology, with the intention of seeking an education based on integrality (CAZAROTTI and BERNARDES, 2018).

Saviani in his article *The Theoretical Shock of Polytechnics* also comments on the opinion of Manacorda, who in his work opts for the expression "technological education" to designate the unity between theory and practice in education because he considers it more appropriate, instead of "polytechnic education" (MANACORDA, 1991). However, Saviani (2003) argues that beyond the terminological question, regardless of the preference for the denomination "technological education" or "polytechnics" it is important to note that, from the conceptual point of view, what is at stake is the same content, since it is the union between intellectual training and productive work, which can also be understood as the "unification of instruction with material production" or, also, "technological, theoretical and practical instruction".

In turn, the document entitled *Bases for a National Policy of EPT,* prepared by SETEC/MEC (PACHECO, 2008), which has worked on the construction of public policies for the qualification and expansion of professional and technological education throughout the national territory, proposes the following set of actions:

> a) The inseparability between general and professional training in the perspective of integral education;
> b) The organic link between the educational policies for Professional and Technological Education (EPT) and the productive, social and cultural arrangements of the different Brazilian regions.
> In other words, SETEC/MEC has sought to articulate integral education (general and professional and technological training) to economic and social development in a dynamic whose main objective is the inclusion of thousands of women and men left on the margins of Brazilian society, either with regard to schooling or from the perspective of work (PACHECO, 2008, p.01).

In addition, the document of SETEC/MEC (PACHECO, 2008), outlines eighteen (18) guiding axes of his work, from which some selected excerpts are presented:

> - the strengthening of the role of EFA in national development and social inclusion policies;
> - the democratization of access to professional training at its various levels, supported by public policies of access and permanence;
> - the articulation of various instances of government and civil society with a view to the integration of public policies to ensure: a) the conception of integral education; b) the conception of EPT as a process based on scientific research in order to promote the development of science and technology, technological innovation;
> - growing incentive in the field of research in the federal network, with a conception of education in which research, in addition to scientific principle also becomes an educational principle, seeking to unite knowledge/doing, science/technology, theory/practice, making the environment favorable to research and knowledge production (BRASIL, 2008, p.2-14).

As previously stated, by analyzing the documents presented, it is observed that the bases elaborated for the current Brazilian Professional and Technological Education advocate the principles of inseparability between general and professional training in the perspective of an integral education focused on the formation of autonomous, critical and reflective subjects. Such principles must be materialized in a pedagogical practice and conditions that sustain the inseparability with its valorization in the curriculum and its practical development. According to Cazarotti and Bernardes (2018), it is impossible for society and governments to neglect technological education, as both benefit from its offer. CSTs train professionals in areas where there are no other degrees. These degrees are sought after by people who need to qualify or requalify, and if they were long courses like bachelor's degrees, they probably wouldn't have the same demand. The CSTs, even of a professionalizing character, need to be thought within a conception of integral education that combines the knowledge of the method of production of this knowledge with its application in the practice of the profession. In addition, they are of great importance within the expansionist movement of Higher Education,

contributing to the struggle of the working class in the search for the continuity of its formation (SOUZA, 2017).

In contrast to some of the main criticisms of the CSTs, authors such as Limena and Ramos (2011) point out that the reduction of the time of completion of the courses does not necessarily imply in low quality or fragmented and not integral training, since there is no evidence of unsatisfactory performance of the graduates in the social, political and economic context. Likewise, meeting the demands of capital or the current economic system are not exclusive characteristics of the modality of technological higher education and are also observed in bachelor's degrees. According to the authors, the criticisms are related more to a repudiation of the system than to the proposal of the model of these courses. The fact that they are offered preferentially by the private sector, also the target of criticism, is characterized in the Brazilian education model and not specifically in the Technological Graduation. In addition, the alleged lack of commitment to the integral formation of students does not find support in any analysis of the national guidelines or pedagogical projects of these courses.

Despite the criticisms of several authors to the CSTs, as previously exposed, the technology graduate is increasingly in demand and has become a strategic professional, since he has aptitude for the application of technologies that can contribute to scientific research, in addition to presenting solid training in his area of expertise. With the globalization and internationalization of the Brazilian labor market, there has been an increase in the demands for schooling and higher education. As a result, the technological higher education is being considered as a timely academic solution to this demand and comes to meet this need for higher education required by the current Brazilian productive system, with agility, specificity and competence. These courses represent a lot for young people who, thanks to them, have been inserted into the labor market and have had an improvement in their education, income and status. It should be recognized, despite the criticism, the importance of these courses, since they enable many young people from 18 to 24 years old, as well as older people who return to study, to improve their career, their professional situation and that of their family.

The CSTs have demonstrated a significant capacity to adapt to the new context of Brazilian higher education and, because they are offered in a shorter period of time, make it possible for a huge portion of the Brazilian population to have higher education (ROSETTI JR. and SCHIMIGUEL, 2011), contributing to the expansion and democratization of higher education in the current Brazilian educational scenario, in alignment with the current public educational policies of the federal government.

This item presents considerations about the CSTs in the context of Brazilian higher education, focusing on their revitalization in the educational scenario, as well as the various criticisms of which these courses are targeted. It should be remembered, however, that many of them are part of generalizations that do not reflecton opposing academic proposals, which focus on ethical, political-

critical and transformative training. In the view of Cazarotti and Bernardes (2018), there is an evolution in this sense in technological courses, especially in graduate studies. The improvement of the academic quality of the CSTs involves the insertion of scientific contents aimed at reflection and research, general training and the training of teachers to act in vocational education at higher level. CSTs provide opportunities for many to reach higher academic levels and pursue their studies.

1.5 PROFESSIONAL AND TECHNOLOGICAL EDUCATION IN THE STATE OF SÃO PAULO: THE STATE CENTER FOR TECHNOLOGICAL EDUCATION PAULA SOUZA AND FATECS

Professional Education in Brazil has a centenary history and has undergone several transformations over time, which can be observed since the colonial, imperial, republican period and also according to the different governmental periods. Originally, it had a welfare character, but it was gaining new configurations due to the changes that the country was going through in terms of industrialization, urbanization and transformations in the economic sector.

With the increase of industrialization in the country, over the decades, the demand for qualified and specialized professionals has also increased. The Federal Constitution of 1937 was the first to specifically address professional, technical and industrial education in the country, instituting professional pre-vocational education as the first duty of the State, and it was responsible for founding institutes of professional education, subsidizing those of initiative of the States and Municipalities and of individuals or private and professional associations.

With regard, particularly, to Professional and Technological Education in the state of São Paulo, it is worth mentioning the relevance of the State of São Paulo in the innovation and provision of public professional and technological education in Brazil. The first technology courses were offered by the State Center for Technological Education (CEET), today known as the State Center for Technological Education Paula Souza (CEETEPS). According to data from the Electronic Portal of the institution, it was created by the decree-law of 06/10/1969, in the administration of Governor Roberto Costa de Abreu Sodré (1967-1971). Sodré had a great interest in technical education, considering it essential to the development of the country. In his visits to the United States and also to France, he verified the importance that this type of education received abroad, in addition to having had the chance to know the appreciation of the technical area in Japan. He was an advocate of vocational technical education, emphasizing the creation of technical schools rather than colleges, which went in the opposite direction to the desires of society, which demanded higher education. Through Sodré's initiative, which resulted in the creation of the State Center for Technological Education of São Paulo (CEETSP), there was a great incentive to professional education in the state of São Paulo (DETREGIACHI Fo., 2012).

According to data from the Paula Souza Center's electronic portal, accessed in November 2021, it was created in 1969 and celebrated 50 years of foundation in 2019. His memory blends with the centennial history of public vocational education in São Paulo. The Paula Souza Center (CPS) is an autarchy of the state government, linked to the Secretariat of Economic Development. Currently the institution is present in 369 municipalities, manages 224 Technical Schools (ETECs), 74 State Colleges of Technology (FATECs) and has more than 322 thousand students in technical courses of medium and higher technological level. The Center was created with the mission of structuring the first Higher Technology Courses in the country, but its activities extended to all levels of education, contributing to the expansion of professional education in the state by also encompassing existing high school units (ETECs) and consolidating itself as the largest public institution of professional education in Latin America (CENTRO PAULA SOUZA, 2021).

The institution began operating in 1970 under the name of State Center for Technological Education of São Paulo (CEET), offering three courses related to the area of Civil Construction (Earth Movement and Paving; Construction of Hydraulic Works and Construction of Buildings) and two related to the area of Mechanics (Designer and Workshops). Thus, the first two FATECs of the state of São Paulo emerged, located in the cities of Sorocaba and São Paulo, still in the management of Sodré, marking the beginning of the Faculties of Technology of the state.

According to Feitoza (2017), the teaching model implemented by the first FATECs was intended to train professionals to meet the demands of the labor market and the economic sector, unlike the traditional higher education in force at the time. Subsequently, this perspective was broadened and currently the faculties also aim to promote culture, the development of applied research and the extension of their services to the community.

As for technological education, the vacancies for the courses offered by CEETEPS have expanded in order to meet the local productive sectors. In the 80s, 90s and 2000s there was the creation of new units of FATECs, contributing to the increase in the supply of vacancies in the CSTs.

According to the Paula Souza Center Portal, this autarchy is linked to the Universidade Estadual Paulista Júlio de Mesquita Filho – UNESP. The courses offered by the CPS are evaluated by the State Council of Education of São Paulo, which, in 2011, through Deliberation No. 106/2011, granted university autonomy to the institution. As a result of this Resolution, according to Feitoza (2017), the CPS is authorized to:

a) create, modify and extinguish its technology, specialization and extension courses;

b) increase and decrease the number of vacancies in their courses, as well as the shift in which they are offered;

c) develop the programs of its courses;

d) start the operation of the courses;

e) issue and register their own diplomas.

The institution operates according to the demands of the various regions of the state of São Paulo and aims to train professionals to meet them. Currently, the ETECs of the Paula Souza Center offer High School, Technical and High School integrated to Técnico, aimed at the Industrial, Agricultural and Services sectors. The courses are offered in face-to-face, semi-face-to-face, online, Youth and Adult Education (EJA) and technical specialization. Altogether there are 212 courses, aimed at the public and private productive sectors. The agency, linked to the Secretariat of Economic Development, administers the FATECs and ETECs, in addition to the decentralized classes – units that work with one or more technical and integrated courses under the supervision of an ETEC – in more than 300 municipalities in São Paulo.

The FATECs of the Paula Souza Center, which offer the Higher Technology Courses, have expanded to the various regions of the state, but most of their units are in the metropolitan region of the city of São Paulo. At the present time, the colleges offer 84 undergraduate courses in various areas, such as Civil Construction, Mechanics, Informatics, Information Technology, Tourism, among others. The Center also offers postgraduate courses (*stricto* and *lato sensu*), technological updating and extension. In addition, it is recognized for the high quality standard of its courses (CENTRO PAULA SOUZA, 2019).

The name of the institution is a tribute to Antônio Francisco de Paula Souza (1843-1917), an engineer, politician and professor, who studied Engineering in Germany and Switzerland and was the founder of the Polytechnic School of the University of São Paulo (Poli-USP). He wanted to implant in the country an education focused on professional training and work, which would differ from an education focused on the European academic model. He distinguished himself as a man ahead of his time, an educator who defended the role of the school as a means of training professionals and not just a place of academic discussions (CENTRO PAULA SOUZA, 2021).

CSTs have been gaining prominence in the higher education scenario in recent years. In 2002, the Federal Government took the initiative to expand technological higher education within the Federal Network of Professional Education, which was already being done by the private initiative, which, in 2001, had created dozens of new CSTs throughout the country. Since then, the popularity of these courses has increased, both in the public and private schools (DETREGIACHI Fº., 2012).

According to the 2019 Higher Education Census (BRASIL, 2020), the data indicate that the search for the academic degree of technologist has been growing in the national territory. In the state of São Paulo this is no different, and this expansion is related to the increase of institutions, public and private, that offer such courses and the LDB/1996, considered a milestone in the legitimation and revitalization of Professional and Technological Education in Brazilian higher education.

In the state of São Paulo, the CPS has developed programs and actions to favor access and permanence in the courses offered in its units. In order to democratize access and also favor the right to permanence and successful completion of students until the end of their academic career, some benefits and aids are offered by the institution.

Currently, CEETEPS meets the policy of expansion of professional and technological education in the state of São Paulo and is the largest state institution in the country dedicated to technical and technological professional education (FEITOZA, 2017).

2 FINAL CONSIDERATIONS

Presented here is an overview of higher education and professional and technological education in contemporary Brazil, as well as a brief overview of Brazilian higher education, with its expansion in the 1990s and under the new LDB/1996, elaborated in a historical-political context of neoliberal tendencies and under the influence of multilateral organizations. This resulted in the expansion of higher education institutions and courses in the country, with a view to the democratization of this level of education, being instituted the diversification and flexibilization of these institutions, which caused a great increase of private institutions of higher education in the country and the increase in enrollment in this segment of education.

The origin, development and historical-political contextualization of EFA in Brazil were explained, as well as the contextualization of CSTs in higher education and their revitalization. Finally, the creation of the Paula Souza Center and the implementation of the EPT in the state of São Paulo were addressed. Today, unlike the initial idea of training professionals to only meet the demands of the economic sector, the faculties of the CPS - FATECs - are guided by a broader perspective of this training, focusing on an integral education.

Professional education has undergone several transformations over time and has gained new configurations. The creation of CEETEPS in the state of São Paulo gave this state a relevant role in the innovation and offer of public EPT.

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Agroecological environmental education: An integrated approach for the promotion of sustainability

https://doi.org/10.56238/ptoketheeducati-049

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ABSTRACT
Agroecological environmental education emerges to break the paradigms of conventional environmental education. Emerging an approach that seeks the integration of the subject with the environment in which he is inserted, taking into account the preservation of the ecological environments that are part of the reality of the students. This perspective recognizes the importance of interaction between humans, nature and the agroecological system, promoting a broader and more meaningful understanding of the environment. This article aimed to reflect on a practical experience and the challenges encountered in the development of the agroecological environmental education project. The project was developed during the year 2022 at the Casemiro Karman State College in Campo Largo/PR. The school has the modality of integral education that provided educators, students, community and university to unite to develop collectively the project. The initial proposal was the construction of an agroecological garden, which expanded to soil restoration by carrying out processes such as composting and vermicomposting. Given the results obtained and the lessons learned throughout this project, we emphasize the importance of agroecological environmental education as an essential tool in the formation of a sustainable consciousness. This integrated approach, which considers the interaction between society, agriculture and the environment, is fundamental to promote environmental preservation, food security and the well-being of communities.

1 INTRODUCTION

This article proposes to understand and promote the theme of agroecological environmental education from an integrated and holistic approach to the understanding and transformation of environmental, social and food systems. Looking at soil restoration, sustainable food production and the transformation of social environments.

This expanded approach to environmental education recognizes the importance of the connection between the human being and the ecological environment in which he is inserted. It proposes a holistic view, in which students are invited to understand and experience natural cycles and biodiversity. Looking at agroecology as a field of knowledge and as a practice of socio-environmental transformation.

In the current context, we face challenges such as the pressure for immediate results and the search for quick solutions. However, we believe that building an agroecological and sustainable

awareness in environmental education requires time, patience and respect for the cycles of nature. Leaving aside egoistic wills for the sake of collective well-being and learning to look at the whole, recognizing that all forms of life have their role and contribution in the agroecological system and that everything is connected.

Therefore, this article aimed to reflect on a practical experience and the challenges encountered in the development of the agroecological environmental education project. Through reflections and results obtained, we hope to contribute to the construction of a more sustainable consciousness and a harmonious relationship with nature.

1.1 CONVENTIONAL ENVIRONMENTAL EDUCATION

Conventional environmental education, often adopted, has been shown to be fragmented and disconnected from the social, educational and economic reality of society. Its main focus is on the preservation of isolated ecological environments, distant from the daily life of students, and often restricted to places of elitist access. This limited approach to environmental education neglects to understand the importance of the interaction between humans and their immediate environments, such as the soil they tread on and the food they consume daily.

> Art. 1 Environmental education is understood as the processes through which the individual and the community build social values, knowledge, skills, attitudes and competencies aimed at the conservation of the environment, a common good of the people, essential to the healthy quality of life and its sustainability. (BRAZIL, Law No. 9795/99).

By prioritizing the preservation of geographically distant natural areas, conventional environmental education fails to contemplate the needs and realities of individuals in their social and cultural environment. This fragmented approach prevents subjects from recognizing themselves as transforming agents of their own environments and marginalizes them, making them powerless to promote ecological changes in their communities.

> Agroecology emphasizes the need to study both the parts and the whole. Although the concept that the whole is greater than the sum of its parts is widely recognized, it has been ignored for a long time by modern agronomy and technology. (GLIESSMAN, 2001, p. 438).

Therefore, a new perspective in environmental education is needed, which goes beyond this fragmented approach and seeks a more integrated and holistic vision. Agroecological environmental education emerges as an alternative that prioritizes the understanding of natural cycles, looking at the soil, the restoration of the environments experienced and the connection between food production and sustainability. This approach seeks to reconnect the subjects with nature and its surroundings, providing a more meaningful and transformative environmental education.

1.2 AGROECOLOGICAL ENVIRONMENTAL EDUCATION

Agroecological environmental education emerges to break the paradigms of conventional environmental education. Emerging an approach that seeks the integration of the subject with the environment in which he is inserted, taking into account the preservation of the ecological environments that are part of the reality of the students. This perspective recognizes the importance of interaction between humans, nature and the agroecological system, promoting a broader and more meaningful understanding of the environment.

> The main challenge for agroecology is to revolutionize and then reconstruct and transform the dominant societal structures since the strategy outlined in the previous definition, which found in the local dimension the stronghold that allows it to resist and survive the neocolonizing forms of domination cultural, social, economic and technological-scientific. To develop this task, agroecology introduces, along with scientific knowledge, other forms of knowledge. It develops, therefore, a critique of scientific thought to, from it, generate a pluriepistemological approach, which accepts sociocultural biodiversity. (GUZMAN, 2011, p. 13)1.

Agroecological environmental education values the restoration of the soil and the environments experienced, encouraging sustainable practices and respectful of natural cycles, recognizing the importance of food production in a conscious and integrated way with nature encouraging the community in the promotion of urban agroecological agriculture.

> Agroecology moves by articulating both natural and social knowledge, breaking its disciplinary fragmentation by orchestrating the natural and social results in a single research investigation. (GUZMAN, 2011, p. 18)[2].

In this way, agroecological environmental education promotes an integrated approach, in which subjects are encouraged to become active agents in the transformation of their social and ecological environments. This perspective broadens the view of learners, allowing them to understand the complex interactions between natural and social systems, and enables them to make informed and sustainable decisions in their daily lives.

1.3 AGROECOLOGICAL ENVIRONMENTAL EDUCATION AND INTEGRATIONS

It is essential to contextualize the importance of agroecological environmental education and its close relationship with the social, educational and economic reality of today's society. In this

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[1] Non-original: "*The main challenge facing agroecology is to revolutionize and then reconstruct and transform the dominant societal structures from the strategy indicated in the previous definition, which has found in the local dimension the stronghold that allows to resist and survive the neo-colonizing forms of cultural, societal, economic and technological-scientific domination. To develop this task, agroecology introduces, along with scientific knowledge, other forms of knowledge. It develops, therefore, a critique of scientific thought to, from it, generate a pluriepistemological approach that accepts sociocultural biodiversity*" (GUZMAN, 2011, p. 13).

[2] Non-original*: "Agroecology moves by articulating both knowledge: natural and social, breaking its disciplinary parcelling and orchestrating natural and social findings in a single inquiry"* (GUZMAN, 2011, p. 18).

context, a holistic approach that takes into account the connection between the environment, society and agriculture becomes indispensable.

> Stable production can only happen in the context of a social organization that protects the integrity of natural resources and stimulates harmonious integration between human beings, the agroecosystem and the environment. Agroecology provides the methodological tools necessary for community participation to become the generating force for the objectives and activities of development projects. (ALTIERI, 2004, p. 21).

Agroecological environmental education recognizes that the environment cannot be dissociated from the social reality in which it is inserted. It seeks to understand the interdependencies between natural and social systems, recognizing the mutual influence between them. By considering agriculture as an integral part of this context, this approach aims to promote sustainable practices that value the conservation of natural resources, food security, social justice and economic equity.

> If Agroecology proposes to design and manage sustainable agroecosystems and build sustainable rural development strategies encompassing the ecological, social, cultural and economic dimensions, we can affirm that Agroecology is a science that serves society as a whole, current and future generations, the actors of the rural and urban world. (EMBRAPA, 2006, p. 39).

In an increasingly globalized world, in which socio-environmental issues become increasingly urgent, agroecological environmental education plays a fundamental role in the formation of conscious and engaged citizens. By connecting students with the land they tread, with the food they consume and with the importance of agriculture for society, this approach stimulates critical reflection, the appreciation of traditional knowledge and the search for sustainable solutions to contemporary challenges. This approach demands,

> [...] an education that would lead man to a new posture in the face of the problems of his time and space. Intimacy with them. That of research rather than mere, dangerous and tedious repetition of passages and statements disconnected from their very conditions of life. The education of "I marvel" and not just of "I manufacture". [...] It would not, however, be with this education detached from life, centered on the word, in which it is highly rich, but on the word "miraculously" emptied of the reality that it should represent, poor of activities with which the student gains the experience of doing, that we would develop in the Brazilian the criticality of his conscience, indispensable to our democratization. (Freire, 1978, p. 93-94).

Therefore, agroecological environmental education goes beyond the isolated and fragmented view of the environment. It proposes an integrated and systemic understanding, in which the connection between the environment, society and agriculture is recognized as fundamental to building a more sustainable and equitable future.

1.4 AGROECOLOGICAL ENVIRONMENTAL EDUCATION: OBJECTIVES AND JUSTIFICATION

The project was developed during the year 2022 at the Casemiro Karman State College in Campo Largo/PR. The school has the modality of integral education that provided educators, students, community and university to unite to develop collectively the project. The initial proposal was the construction of an agroecological garden, which expanded to soil restoration by carrying out processes such as composting and vermicomposting.

The choice of the theme of agroecological environmental education is based on the need for an approach that goes beyond conventional and fragmented approaches, seeking a broader and more integrated understanding of environmental issues. In this sense, this project aims to build an agroecological environmental education, with emphasis on soil restoration and awareness about the recovery of spaces.

Soil, as a vital element for agriculture and environmental sustainability, plays a central role in this proposal. Recognizing the importance of a healthy and fertile soil for the production of quality food, as well as for the preservation of biodiversity and natural cycles.

In addition, the project aims to make participants aware of the importance of recovering the spaces in which they live and study. From the understanding of the interaction between human beings and the environment, we seek to awaken a critical and engaged environmental awareness, which promotes transformative actions in favor of sustainability.

In this way, the proposed agroecological environmental education project aims to contribute to the formation of conscious citizens, capable of understanding the importance of soil, agriculture and environmental preservation, and of acting responsibly and sustainably in their life contexts.

2 EXPERIENCES AND CHALLENGES IN THE AGROECOLOGICAL ENVIRONMENTAL EDUCATION PROJECT

In this chapter we describe the trajectory of the project from the choice of the garden as a starting point to the stages of the project and the actions taken to deal with the challenges faced. These experiences and challenges were fundamental for the maturation of the project and the understanding of the importance of the agroecological approach in environmental education.

2.1 CHOOSING HORTA AS A STARTING POINT

The garden was chosen as the starting point for the implementation of the agroecological environmental education project. The decision was based on the importance of this space as a practical tool for learning, allowing participants to directly experience the relationship between agriculture and the environment.

By growing their own food, participants can concretely experience natural processes, from soil preparation to harvesting produce. This experience provides a deeper connection with nature and awakens awareness about the importance of producing food sustainably.

> Conceiving these policies imposes on us the challenge of producing new inter and transdisciplinary knowledge, which are capable of articulating different dimensions of the life of the subjects of the field, allied to their educational process, that is, a school glued to the floor of life, linked to the processes of the production of the social existence of these subjects. (MOLINA, 2008, p. 30).

Participants have the opportunity to integrate knowledge from various areas, such as biology, chemistry, geography and mathematics, through the cultivation of plants and the observation of the ecological processes that occur in the garden environment. Participants have an opportunity to live a meaningful and enriching experience, enabling the understanding of the importance of sustainable agriculture and the intrinsic relationship between human beings and the environment.

2.2 PROJECT STAGES AND ACTIONS TAKEN

At the beginning of the project, we faced several challenges related to the state of the soil, which was compacted and lifeless. Aware of the importance of a healthy and fertile soil for the development of the agroecological garden, we have established a detailed plan with specific steps and actions aimed at soil restoration and the promotion of biodiversity.

2.2.1 Analysis and Awareness of Soil Problems

We carry out detailed analyses of the soil, evaluating its components, pH and nutrients present, identifying its deficiencies in terms of nutrients and microbiological life. This stage allowed the participants to understand the problems faced by the soil, collecting essential information for the elaboration of recovery strategies and the importance of its recovery for plant health and environmental sustainability.

During one of our field classes in the schoolyard, we carried out an activity of observation and analysis of the soil, in which the students could directly experience the problems faced by our soil. While we were in a circle, discussing the challenges and possible solutions to build a soil richer in biodiversity and nutrients, something unexpected happened. An earthworm appeared in the dry, lifeless soil, as if it were crying out for help.

One of the students was the first to notice the presence of the worm and immediately caught the attention of the educator and the other colleagues. Everyone was surprised to witness the resistance and survival of this small animal in an arid and unwelcoming environment. It was a remarkable moment that made us reflect on the importance of life in the soil and how it is fundamental to plant health and environmental sustainability.

This encounter with the earthworm awakened in us the awareness of the need to create a soil more conducive to life and biodiversity. We realized that we needed to integrate the nutrients that are discarded daily in the garbage and incorporate the organic materials produced within our school and our homes. It was from this experience that we became even more committed to composting and soil recovery.

The presence of the earthworm showed us that even in an arid and unfavorable soil, there is still hope and possibility of transformation. From that moment on, we seek to create a more diverse and welcoming environment for all forms of life that inhabit it, allowing life in the soil to develop and promote the health of the entire ecosystem in which we are inserted.

2.2.2 Implementation of Agroecological Practices for Soil Improvement

Based on soil analyses, we implement agroecological practices to improve soil conditions and structure. This included crop rotation, the adoption of cover crops, incorporation of organic matter such as composting, the use of natural fertilizers and the adoption of soil conservation techniques such as no-till and vegetation cover, aiming to enrich the soil with essential nutrients for plant growth, stimulate biodiversity and strengthen its water retention capacity.

Another important action was to encourage the active participation of students, teachers and community members in the maintenance of the garden and in the implementation of agroecological practices. We conduct workshops and trainings with the support of the university to provide the necessary knowledge on sustainable farming techniques, encouraging the adoption of a holistic approach towards agriculture and the environment.

2.2.3 Construction of the School Garden from the Restored Soil

Throughout the project, participants were actively involved in the construction of the school garden. They learned about space planning, proper crop selection, proper plant management, and the importance of teamwork. The garden became a practical learning environment, where students could experience natural cycles, understand the importance of healthy eating and develop cultivation skills.

> It is necessary an education that promotes the development of uninhibited creativity, free, without aiming at rewards, and that leads to new forms of intercultural relations, proposing a new organization of society. These relations must characterize mass education and at the same time provide adequate space to preserve diversity, which will have as a consequence the elimination of discriminatory inequality, which is responsible for intolerance and fanaticism. (D'AMBROSIO, 2019, p. 24).

The stages of the project took place in an integrated manner considering the interdependence between soil restoration, biodiversity promotion and agroecological practices. These actions provided the construction of an agroecological and sustainable space with the healthy development of plants.

This experience has enabled a deeper awareness of the importance of adopting sustainable practices in agriculture and the positive impact this can have on the environment and people's quality of life.

2.3 CHALLENGES FACED

During the implementation of the agroecological environmental education project, we faced significant challenges such as the need for adjustments and adaptations of the techniques to the specific conditions of the place, in the search for sustainable solutions. Each environment presents its particularities in relation to soil, climate and availability of resources, which required flexibility and creativity in the search for adapted solutions. It was necessary to constantly evaluate the needs of the garden, monitor the soil conditions and make adjustments in the practices used, thus ensuring the best use of the available resources.

One of the main challenges we faced was the initial resistance of some participants to abandon conventional farming practices. Many were accustomed to the use of chemical fertilizers and pesticides, which made it difficult to accept the proposed agroecological techniques. It took a constant work of awareness and information to show the benefits of these more sustainable practices in terms of soil health, quality of food produced and preservation of the environment.

Another challenge was the pressure for immediate results, the need to speed up processes and the lack of patience in respecting natural cycles. However, these challenges were seen as opportunities for learning and awareness about the importance of an agroecological approach. Just as it was a propitious time for the collective to develop a collaborative and mutually learning approach. Resisting this destructive scenario summarized by Primavesi (2016):

> Current agriculture has radically modified ecosystems, implementing mechanistic, unnatural systems with a very short-term vision, in favor of momentary profits, which destroy the soil, waterways, climate and the future of humanity. (PRIMAVESI, 2016, p. 191).

Despite the challenges, collaboration and community engagement were essential to the success of the project. Involving parents of students and community members in the construction and maintenance of the agroecological garden, strengthened ties between all involved and promoted greater awareness of the importance of sustainable agriculture.

These challenges required patience and a participatory approach, in which all participants had the opportunity to express their opinions, share experiences, exchange knowledge, and learn and grow together. Over time, it was possible to observe a change of mentality and a greater acceptance of agroecological practices, opening a path in the promotion of an agroecological environmental education, capable of transforming people's view of nature, agriculture and their role as agents of change.

3 REFLECTIONS ON THE PROCESS OF AGROECOLOGICAL TRANSITION IN ENVIRONMENTAL EDUCATION

In this chapter we explore the challenges of the agroecological transition in environmental education. The current educational context values immediate results, which limits the construction of a sustainable agroecological environmental education. The transition to an agroecological consciousness requires a shift in the collective mindset, moving away from quick fixes and prioritizing understanding of natural cycles. Promoting ecological dialogue and recognizing all forms of life as collaborators in the agroecological system are fundamental to overcome these challenges.

3.1 ANALYSIS OF THE DIFFICULTIES ENCOUNTERED IN THE CURRENT EDUCATIONAL CONTEXT

In the current educational context, the pressure for immediate results and quick solutions represents a significant challenge for the implementation of agroecological environmental education. The education system is increasingly focused on achieving tangible goals and results, often neglecting the importance of longer, more gradual processes. This approach prevents the building of a deeper environmental awareness and integral understanding of the natural cycles that sustain life.

> These reflections call into question the set of current concepts and models, to the extent that survival depends on a global and holistic view of reality, a view that emanates, in turn, from the great traditions and the most recent conclusions of science. This requires a radical change, which applies to all levels of knowing and doing. Clearly, the living interaction of all things in the universe implies our environment and the translation of our knowledge into a process of integration, encompassing the finer aspects of reality. Essentially, a total unity of life is sought between man, nature and the cosmic body. (D'AMBROSIO, 1991, p. 171).

In the project in question, we also face these dilemmas. The view that everything is separate and fragmented went hand in hand with the need to accelerate processes to meet the demands of the educational system, which in turn can compromise the integrity and effectiveness of agroecological environmental education. This disciplinary and fragmented view of education disregards the importance of a more contextualized learning, which takes into account the interactions between human beings, nature and agriculture.

It is essential to recognize that the transition to an agroecological environmental education takes time and patience. It is a process of gradual construction of agroecological awareness, which involves a look at the connections between knowledge and the adoption of a more holistic and integrated perspective. Valuing learning processes that promote the understanding of natural cycles, the connection with the environment and the strengthening of the harmonious relationship between humans and nature.

> Educators are understanding that we are in a propitious, opportune and historical time to radically rethink education, because the field in Brazil is going through tensions, struggles,

> debates, organizations, extremely dynamic movements. [...] What is missing is to discover those nuclei, or those pillars, or those matrices, which will end up being the master beams that will build a basic education project. This is one of the central tasks at this moment: to capture the school, the education that is springing up, to capture what is educational in the set of actions, gestures, struggles of the social movement of the countryside. (ARROYO; CALDART, 2004, p. 70-71).

It is urgent to start a critical reflection on the current educational model and seek alternatives that value the construction of an agroecological and sustainable consciousness. Agroecological environmental education must go beyond the transmission of knowledge and engage students in a participatory way, through dialogue and reflection on the relationship between society, agriculture and the environment, advancing towards a truly transformative environmental education.

3.2 PATHS OF TRANSFORMATIONS OF COLLECTIVE ENVIRONMENTAL CONSCIOUSNESS

It is important to break away from the fragmented mindset that separates humans from the environment and adopt an integrated approach that recognizes the interdependence between all elements of nature. This implies understanding and respecting natural cycles, recognizing the relevance of each element in the balance and sustainability of the system.

> Integral ecology seeks to accustom the human being to this global and holistic vision. Holism does not mean the sum of the parts, but the capture of the organic totality, one and diverse in its parts, always articulated among themselves within the totality and constituting this totality. (BOFF, 1999, p. 34).

To achieve this transformation, it is necessary to promote awareness of the interconnection between society, agriculture and the environment. It is necessary to stimulate ecological dialogue, creating spaces for reflection and discussion that allow participants to broaden their vision and understanding of the importance of agroecology and its relationship with environmental sustainability.

In addition, it is crucial to keep a close eye on the future and continue to build an agroecological and sustainable awareness. This entails expanding the scope of the project, encompassing areas other than soil restoration. Exploring themes and practices such as biodiversity conservation, water resources management, agroforestry, healthy food production and the valorization of local culture. In this way, we broaden the horizons of environmental education, promoting an integral vision of nature and stimulating the active participation of individuals in the construction of a more sustainable future.

3.3 ECOLOGICAL DIALOGUE AS A TOOL OF AWARENESS

During the implementation of the project, we had significant experiences that highlighted the importance of ecological dialogue as a powerful tool for awareness. One of these experiences was experienced through observation and interaction with ants, which generated a valuable educational opportunity.

At one point, a giant anthill appeared near the spot where we were starting our first vegetable garden. This situation generated some concern and uncertainty among the participants, because there was a fear that the ants could harm the garden. However, we took this opportunity to conduct an ecological dialogue, with the aim of breaking paradigms and building a broader environmental awareness.

During the dialogue, we explained to the students that the ants were not enemies, but collaborators of the agroecological system. We shared the understanding that the presence of ants indicated a compacted and unwelcoming soil, since they play a key role in aeration and soil turnover. This awareness awakened in the participants a new vision, allowing them to understand ants as allies in the construction of a healthy agroecological environment.

As we move forward in the project, ants have become a living example of how interaction between living things is critical to the sustainability of the system. Through the ecological dialogue, the students were able to recognize the importance of each element in the agroecological ecosystem and understand how their individual actions impact the whole.

> I cannot investigate the thinking of others, referred to the world if I do not think. But I don't think authentically if others don't think either. I simply cannot think for others either for others or *without* others. The investigation of the thinking of the people cannot be done without the people, but with them, as the subject of their thinking. And if his thinking is magical or naïve, it will be by thinking his thinking, in action, that he himself will surpass himself. And overcoming is not done in the act of consuming ideas, but in the act of producing them and transforming them into action and communication. (Freire, 1987, p. 58).

Building dialogue with the community was important to share the importance of maintaining the balance of the system without resorting to the use of poisons or harmful substances. It was essential to convey the message that the diversity of life and the promotion of nutrients in the soil were more effective and sustainable strategies. We faced resistance and ingrained beliefs that the only way to deal with ants was through the use of chemicals.

During these dialogues we explained that the use of poisons and chemicals could cause damage not only to ants, but also to other species and soil quality. We emphasize that the agroecological approach to pest control and the balance of the ecosystem promote the diversity of life and the addition of nutrients to the soil. Building a healthy and resistant environment, able to naturally regulate the presence of ants and other pests.

Gradually, they came to see ants as valuable collaborators and understood the importance of preserving biodiversity. The dialogue was instrumental in actively engaging participants and promoting a change of mindset regarding the use of poisons. Building a collective vision that the best way to keep the system balanced and harmonized is to promote the diversity of life and nourish the soil in a natural and sustainable way.

This experience with ants was just one of several experienced during the project, highlighting the effectiveness of ecological dialogue as a powerful awareness tool. Ecological dialogue, therefore, emerges as a fundamental practice in agroecological environmental education, promoting the connection between humans and nature and stimulating the collective consciousness for the construction of a more balanced and harmonious future.

4 FINAL CONSIDERATIONS

Through this article, we explore the importance of agroecological environmental education in building a sustainable consciousness. Throughout the project, we faced challenges and overcame obstacles, achieving significant results that reflected improvements in soil, increased biodiversity, and changes in participants' perspectives on nature and agriculture.

During the implementation of the project, we observed soil restoration as one of the main results achieved. Through detailed soil analyses, it was possible to identify soil deficiencies and needs, as well as to develop recovery strategies. By adopting agroecological practices such as composting and the addition of organic matter, we observe an improvement in soil quality, promoting plant health and the fertility of the environment.

In addition, throughout the project, we witnessed an increase in biodiversity in the garden space and in the surroundings. Awareness of the importance of preserving biodiversity led participants to adopt practices that favor the diversity of plant and animal species. The presence of pollinators, beneficial insects and other forms of life became more evident, evidencing the relevance of a balanced and healthy environment.

One of the most impactful aspects was the change of perspective of the participants in relation to nature and agriculture. Through ecological dialogue, awareness of the interdependence between humans, the environment and agriculture has been disseminated. Participants came to understand the importance of an integral view of nature, respecting natural cycles, promoting diversity and adopting sustainable practices.

Given the results obtained and the lessons learned throughout this project, we emphasize the importance of agroecological environmental education as an essential tool in the formation of a sustainable consciousness. This integrated approach, which considers the interaction between society, agriculture and the environment, is fundamental to promote environmental preservation, food security and the well-being of communities.

For future research and educational practices in this field, we suggest the continuity and expansion of this project. It is essential to advance in the promotion of agroecological environmental education, covering other areas besides soil restoration. The conservation of biodiversity, the

management of water resources, agroforestry, the production of healthy food and the valorization of local culture are themes that deserve to be integrated into agroecological environmental education.

In short, agroecological environmental education has the potential to promote a profound transformation in our relationship with nature and in the construction of a more sustainable society. The results achieved throughout this project reinforce the importance of this approach and motivate us to continue on this path, aiming at a more harmonious and balanced future for current and future generations.

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Statistical literacy and meaningful learning: A dialogical counterpart

https://doi.org/10.56238/ptoketheeducati-050

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ABSTRACT
In this chapter, we discuss the relevance of David Ausubel's model of meaningful learning for the development of statistical literacy. To this end, a rereading of the model of statistical literacy proposed by Iddo Gal is made from the dialogical perspective of language and culture that emerges from the work of Russian scholars commonly referred to as Bakhtin's Circle. The chapter is structured in three main parts, in addition to the introduction, conclusion and references. In the first, the general lines of the significant learning model are presented. In the second, the dialogical model of statistical literacy is discussed as a counterpart to the learning model described. In the third, the feasibility of such a counterpart is considered by examining BNCC guidelines. The main contribution of this discussion is the demonstration that learning theory, methodology and teaching practice and prescriptions of teaching work do not need to be separated, but can be articulated to enhance the effectiveness of formal education.

Keywords: Mathematics Education, Statistical literacy, Meaningful learning, Dialogism, Basic Education.

1 INTRODUCTION

Teaching long predates the relations of formal education such as those we experience today. In addition, the intellectual production on learning, although not as old as tradition, is also not recent. If, on the one hand, tradition and science have long informed teaching practice, on the other hand, professional practice seems to segregate what is discovered by it and inherited from it. Thus, learning in the context of formal education often occurs by the mere repetition of old procedures that do not necessarily enjoy scientific evidence or procedures that do not see in the intellectual production counterpart to the reality of teaching. In this scenario, the documents that guide formal education, such as curricula, tend to appear for teachers as prescriptions of a political nature, without guidance and pedagogical or academic foundations themselves.

The teaching of Mathematics is one of the processes challenged by such tensions and segregations, and the field of Mathematics Education has sought to intervene in order to produce knowledge that favors formal education. Not only from there, but also from there, a niche of interest arises in relation to social practices mediated by statistical knowledge: statistical literacy. In alignment with the contemporary understanding that *literacy* refers not to skills, but to social practices, which are not restricted to fine letters or the prestigious cultural canon, but encompass diverse social relations,

(BROCKMEIER; OLSON, 2009) *statistical literacy* has been recognized as "the motivation and ability to access, understand, interpret, critically evaluate, and, if applicable, express opinions about statistical messages, data-related arguments, or issues involving uncertainty and risk." (GAL, 2021, p.41). We note that statistical literacy is not an object of teaching in Mathematics in Basic Education, but one of the objectives of its teaching. We study mathematics not to have intrinsic abilities, but to participate in numerous social relationships in which measures, graphs and proportions, for example, are crucial.

In this chapter, we demonstrate, albeit briefly, how the dialogical approach of statistical literacy is presented as a counterpart to the orientation of pedagogical practices based on the model of meaningful learning. By this approach, guiding documents of formal education, such as the National Common Curricular Base (hereafter, BNCC), configure clues on how to promote learning.

The text follows with a brief presentation of the model of meaningful learning proposed by David Ausubel. Next, we discuss the model of statistical literacy proposed by Iddo Gal in the light of the dialogical dynamics of culture that emerges from the body of work of the so-called Bakhtin Circle. Finally, we ponder how some BNCC discriminations can be interpreted by the articulation of the theory of significant learning and the teaching of Statistics in Basic Education in order to develop statistical literacy in students.

2 WHAT IS MEANT BY "MEANINGFUL LEARNING"?

It is very common in texts about the teaching and learning process to find the adjective "significant" referring to the type of learning that the teacher should develop in his students. However, this term is used inadvertently with its common, everyday meaning, denoting something important, relevant, useful and interesting. And, here for us, who doesn't want such an apprenticeship? It is obvious that every teacher wishes, through his teaching methodology, to promote such meaningful learning in his students. However, what few realize is that the term "meaningful learning" in the area of Education and Educational Psychology studies is much more than an expression of common sense; in fact, it is a technical term that references an entire psychological theory - of the same name - developed by the physician and psychologist David Ausubel.

For Ausubel (1963, 1968), the information in our mind – which he called the cognitive structure – is highly organized and hierarchically arranged in such a way that the more general information or knowledge forms large blocks of knowledge in which are located the more specific information related, in some way and at some level, to this general information. In current language, it is as if a broader theme functions as a large conceptual umbrella under which lie the sub-themes related to it. In Ausubel's language, these more general concepts existing or pre-existing in a person's cognitive

structure are called subsumers and function as true ports or anchor points for the most specific information.

With this metaphor of cognitive structure – as a port where ships anchor in an organized and hierarchical way – Ausubel argues that the most important and facilitating variable of learning is what the learner already knows – his previous knowledge, that is, whether he has the appropriate ports with the appropriate anchors to support or dock the new knowledge ships – more specific information/knowledge – in an adequate and safe way. Thus, when anchoring is done appropriately, that is, when the new information to which one is having access finds a more general prior knowledge with which it can be anchored—a subsumer—Ausubel says that significant learning has occurred.

But what does Ausubel mean by "significant"? Moreira (2012, p.2) answers us clearly:

> Meaningful learning is one in which symbolically expressed ideas interact in a substantive and non-arbitrary way with what the learner already knows. Substantive means non-literal, not literally, and non-arbitrary means that the interaction is not with any previous idea, but rather with some specifically relevant knowledge already existing in the cognitive structure of the subject who learns. [...] It is important to reiterate that meaningful learning is characterized by the interaction between previous knowledge and new knowledge, and that this interaction is non-literal and non-arbitrary. In this process, new knowledge acquires meaning for the subject and previous knowledge acquires new meanings or greater cognitive stability.

Therefore, learning is significant for those who learn: the learner gives meaning to the new information with which he is having contact and this is both modified by what he already knows and modifies and expands his pre-existing cognitive structure in order to (trans)form a new subsumer – a new anchor capable of docking new ships of knowledge. For Ausubel, if learning does not take place in this way – meaningful and substantive – it will be nothing more than machine learning. If the information is not repeated or continued, it will get lost in the person's cognitive structure, without meaningful (and therefore arbitrary) connections, like a ship lost haphazardly on the high seas without guidance. In this way, the information thus processed will not be relevant and, consequently, discarded – forgotten.

In addition to previous knowledge, two other factors are pointed out by Ausubel as being the main influencers or promoters of meaningful learning:

- The didactic material used by the teacher needs to be potentially significant for the student, that is, "it is up to the teacher, therefore, in addition to identifying the students' previous knowledge, to develop didactic resources that relate to this previous knowledge in a non-arbitrary and non-literal way." (NOBREGA, 2023, p.33)
- The student/learner needs to be predisposed to learn. In other words, if the student is not interested in learning meaningfully, meaningful learning will not occur, "for learning meaningfully will involve effort and an active attitude of the student so that he can compare the new knowledge with his previous knowledge, analyze the differences and similarities

between them, and reflect on the meaning and significance of what he has learned again." (NOBREGA, 2023, p. 34). After all, "he who does not want does not learn." (SIMPLE; HAASE, 2020, p. 93).

3 A DIALOGICAL APPROACH TO STATISTICAL LITERACY

Fresh off a global Covid-19 pandemic, expressions such as "exponential growth", "mortality rate", "speed of contagion", "vaccine efficacy rate" among several were present in the most trivial conversations of everyday life. Similarly, in election years, especially state and national elections, "voting intention index," "percentage of ballots counted," "technical tie," "margin of error," etc. appear in news coverage of races and hence permeate various interactional instances. It is curious, however, that all these expressions of marked presence in the interactional dynamics seem distant from the didactic contents of Mathematics in Basic Education.

Active participation and interaction in these processes requires minimally technical training in these themes. For this, it is of fundamental importance that the teaching of Mathematics offered in Basic Education can provide the necessary theoretical elements. What is the conceptual basis for recognizing a "technical tie"? When, in the coverage of the counting of votes, is it possible to state that candidate *X* has already been mathematically elected, even if there are still ballots to be counted? What is the difference between efficacy and efficiency of a vaccine? What does it mean that the death rate from Covid-19 is higher in the elderly than in the young? More than political opinions or passions, social debate develops rationally and responsibly if we master key statistical concepts. If the achievement of this interactional resourcefulness is one of the objectives of the formal teaching of Mathematics, we can say that statistical literacy is one of the desired results for formal education.

In Gal's (2002) model of statistical literacy, there are two axes: the elements of knowledge and the elements of disposition. Knowledge elements involve the statistical, mathematical, and context knowledge necessary for the development of statistical literacy in a given specific content. The elements of disposition refer to the beliefs, attitudes and critical posture of the subject in relation to the data and statistical information presented. However, based on dialogism as a principle of sociocultural relations, we categorize, at another time, (MAGALHÃES; NÓBREGA, 2023) the constitutive items of the literacy model in three axes. On the one hand, we grouped what, in Gal's (2002) model, concerned the theoretical-conceptual domain. On the other hand, we listed the items that described aspects of the subjects' experiential domain. We argue, however, that the effectiveness of literacy requires the dialogical dimension that unites these two other dimensions.

Table 1: Dialogical Model of Statistical Literacy

Theoretical Dimension	Dialogical Relations	Experiential Dimension
• Statistical Knowledge • Mathematical Knowledge	Beliefs, Attitudes ⇜⇝ Critical stance ⇓	• Literacy Skills • Knowledge of Context
Statistical Literacy		

Source: Magalhães & Nóbrega (2023)

According to Bakhtin (2016, 2017), dialogical relations transcend logical relations, without denying them, and are personalistic in nature, in the sense that they imply the ethical responsibility of the subjects (BAKHTIN, 2010). In the model of statistical literacy in dialogical key, beliefs, attitudes and critical posture constitute the ethical signature of those who engage in an interactional process in which statistical knowledge is relevant. By this signature, conceptual knowledge, of a theoretical nature, is articulated with the skills developed in the experiential domain. From this articulation, the conditions to access, understand, interpret, evaluate, express opinions on statistical messages and formulate arguments related to data or issues involving uncertainty and risk emerge.

Take, for example, the challenge of reading and interpreting information made available by the Ministry of Health regarding the Covid-19 situation in Brazil in 2023 (figure 1). Since the declaration by the World Health Organization of a global pandemic by SARS-CoV-2 in 2020, the theme of Covid-19 has taken hold in various fields of culture. The sanitary measures to contain the virus and remediate its effects on the population mobilized the legislative and executive institutions, the journalistic media reserved significant space for the dissemination of data, propaganda campaigns were broadcast, etc. The theme has permeated the most trivial conversations of everyday life that, although not governed by the same social coercions as the media, Journalism, health units, feed on what these institutions circulate.

In this context, the understanding of measures, proportions, rates, indexes, among other mathematical and statistical conceptual constructs are fundamental for the exercise of citizenship. How to position oneself in relation to a decree of the State Government, for example, to contain the number of Covid-19 cases without being able to properly assess the data released? How to know if the numbers presented signal not only the effectiveness, but also the efficiency of vaccination? Was there a technical basis for scaling vaccine "brands" by efficacy? Without theoretical repertoire and technical skills to interpret the widely available data, the beliefs and attitudes implied in the critical stances taken by citizens with regard to knowledge about the coronavirus would not be able to be converted into

meaningful learning. This is because crucial elements would be missing for the learner to discern indicative data from evidence from which subsumers could be constructed that would significantly organize the informational flow to which he was exposed. Without the foundations to identify evidence, beliefs and attitudes can reinforce cognitive dissonance, rather than fostering knowledge construction.

Let's see, for example, what previous knowledge is necessary to understand the information shown in Figure 1, which presents the Coronavirus Panel published on the Ministry of Health website, updated until 07/11/2023.

Figure 1: Covid-19 case fatality and mortality rate in Brazil



Source: Ministry of Health. Available at: <https://covid.saude.gov.br/>

Let's start with the lethality measure. The case fatality rate tells us the percentage of deaths among infected people and is calculated using a fairly simple formula:

$$Taxa\ de\ letalidade\ = \frac{número\ total\ de\ óbitos\ num\ determinado\ período}{número\ total\ de\ casos\ confirmados} \times 100 \qquad (1)$$

For the correct understanding and interpretation of the lethality rate are necessary, initially, the knowledge of division (ratio) and percentage, since rate refers to a percentage and this, in turn, refers to the product of a division by 100. The resulting value of this operation, the percentage, represents which part or fraction of the whole considered was affected by the object of interest, which, in the specific case, is the accumulated Covid-19 deaths recorded until 07/11/2023. According to the data presented, the total number of deaths from Covid-19 (cumulative deaths) in the period considered was 704,320, while the total number of confirmed cases in the same period was 37,693,506. Substituting these values into equation (1), we obtain the following lethality rate:

$$Taxa\ de\ letalidade\ =\ \frac{704.320}{37.693.506}\times 100\ =\ 1{,}868545\ \approx\ 1{,}9\% \quad (2)$$

We noticed that the case fatality rate in the period considered was approximately 1.9%, which means that two out of every hundred people with Covid-19 evolve to death. If the one who accesses the site does not have these operational records in his cognitive structure will not form the necessary subsumers to relate to the definition of lethality rate, thus hindering its interpretation as well as its decision making in relation to the best attitudes in this scenario.

It is worth asking: what is the difference between lethality and mortality rates? Isn't lethality synonymous with mortality? Well, in the interpretation of epidemiological data, no. The mortality rate tells us the ratio of deaths among the entire population, and is calculated through the following expression:

$$Taxa\ de\ letalidade\ =\ \frac{número\ total\ de\ óbitos\ num\ determinado\ período}{número\ total\ de\ pessoas\ na\ população}\times 100T.000 \quad (3)$$

Note that, this time, the multiplicative factor of the ratio is 100,000, because the interest is to relate the number of deaths per 100,000 inhabitants. To arrive at this index, in addition to the knowledge of division (ratio), it is necessary to know the concepts of population and sample that will be objects of investigation in the study. Population refers to the complete collection of all the data to be considered – in this case, the estimated total number of inhabitants in Brazil as of 07/11/2023 – whereas sample is a subcollection or subset of selected members of a population – in this case, the total number of deaths. (TRIOLA, 2017). We should repair the asterisk next to the mortality data (figure 1). Apparently, the calculations of the Ministry of Health operate with the projection of a total of 210,119,332 inhabitants, a number estimated before the release, on June 28, 2023, of the official result of the last census made by the IBGE. Substituting these values into equation (3), we get:

$$Taxa\ de\ mortalidade\ =\ \frac{704.320}{210.119.332}\times 100.000\ =335{,}2 \quad (4)$$

The result displayed in equation (4) is interpreted as follows: for every 100,000 inhabitants, and not just people infected with the coronavirus, approximately 335 have died from Covid-19 as of 7/11/2023. This shows the impact of the disease on the entire population.

Given this example, we note that it is not enough to have a critical stance for the good performance of citizenship, as well as it is not enough to have theoretical and technical knowledge. Therefore, the dialogical model of statistical literacy, in which dialogical relations articulate the

theoretical and experiential dimensions, is shown as a counterpart to the model of meaningful learning. For formal education to achieve this endeavor, it is essential that Basic Education prescriptions and theoretical foundation about learning are articulated in teaching.

4 FOR A THEORETICAL-METHODOLOGICAL ARTICULATION BASED ON THE DOCUMENTARY PRESCRIPTIONS

The knowledge implied in the calculations previously performed, namely, reason, calculation of percentages, rates, population, sample, interpretation of data and statistical information, are included in the curriculum of Basic Education according to BNCC standards. Take, for example, the curricular guidelines of the area of Mathematics and its Technologies for the stage of High School. The proposal of BNCC for the teaching of Mathematics in High School is, in addition to consolidating, expanding and deepening the knowledge developed in Elementary School, to contribute so that students can

> develop skills related to the processes of investigation, model building and problem solving. To do so, they must mobilize their own way of reasoning, representing, communicating, arguing and, based on joint discussions and validations, learning concepts and developing increasingly sophisticated representations and procedures. (BRAZIL, 2018, p. 529)

For this, five specific competencies are proposed for the area of Mathematics and its Technologies and, related to each of them, skills to be developed are indicated. In table 2, we present the competencies and skills corresponding to the contents of Mathematics addressed in the previous section.

Table 2: Curricular guidelines for the teaching of Mathematics in High School

Competence	Skills
Specific competence 1 (EC01): Use strategies, concepts and mathematical procedures to interpret situations in various contexts, whether daily activities, or facts of the Natural and Human Sciences, socioeconomic or technological issues, disseminated by different means, in order to contribute to a general formation.	(EM13MAT101) Critically interpret economic, social situations and facts related to the Natural Sciences that involve the variation of quantities, by analyzing the graphs of the functions represented and the rates of variation, with or without the support of digital technologies. (EM13MAT102) Analyze tables, graphs and samples of statistical research presented in reports published by different media, identifying, when appropriate, inadequacies that may induce misinterpretation, such as scales and inappropriate samples. (EM13MAT104) Interpret rates and indices of a socioeconomic nature (human development index, inflation rates, among others), investigating the processes of calculating these numbers, to critically analyze reality and produce arguments. (EM13MAT106) Identify everyday life situations in which it is necessary to make choices taking into account the probabilistic risks (use this or that contraceptive method, opt for one medical treatment over another, etc.).
Specific competence 2 (EC02): Propose or participate in actions to investigate challenges of the contemporary world and make ethical and socially responsible decisions, based on the analysis of social problems, such as those focused on health situations, sustainability, the implications of technology in the world of work, among others, mobilizing and articulating concepts, procedures and languages of Mathematics.	(EM13MAT202) Plan and execute sample research on relevant issues, using data collected directly or from different sources, and communicate the results through a report containing graphs and interpretation of measures of central tendency and measures of dispersion (amplitude and standard deviation), using or not technological resources. (EM13MAT203) Apply mathematical concepts in the planning, execution and analysis of actions involving the use of applications and the creation of spreadsheets (for the control of family budget, simulators of simple and compound interest calculations, among others), to make decisions.
Specific competence 3 (EC03): Use strategies, concepts, definitions and mathematical procedures to interpret, build models and solve problems in various contexts, analyzing the plausibility of the results and the adequacy of the proposed solutions, in order to build consistent argumentation.	(EM13MAT313) Use, when necessary, scientific notation to express a measure, understanding the notions of significant numerals and dubious digits, and recognizing that every measure is inevitably accompanied by error. (EM13MAT314) Solve and elaborate problems that involve quantities determined by the reason or the product of others (speed, demographic density, electrical energy, etc.).

Specific competence 4: (EC04) Understand and use, with flexibility and precision, different mathematical representation registers (algebraic, geometric, statistical, computational, etc.), in the search for solution and communication of problem results.	(EM13MAT406) Construct and interpret frequency tables and graphs based on data obtained in surveys by statistical samples, including or not the use of software that interrelates statistics, geometry and algebra.
Specific competence 5 (EC05): Investigate and establish conjectures about different concepts and mathematical properties, employing strategies and resources, such as observation of patterns, experiments and different technologies, identifying the need, or not, for an increasingly formal demonstration in the validation of these conjectures.	(EM13MAT508) Identify and associate geometric progressions (PG) with exponential functions of discrete domains, for property analysis, deduction of some formulas and problem solving. (EM13MAT511) Recognize the existence of different types of sample spaces, discrete or not, and events, equiprobable or not, and investigate implications in the calculation of probabilities.

Source: Brazil (2018)

Now, applying these curricular prescriptions to the dialogical model of statistical literacy, (MAGALHÃES; NÓBREGA, 2023) we obtain a configuration such as that presented in table 3.

Table 3: Dialogical model of statistical literacy

Theoretical Dimension	**Dialogical Relations**	**Experiential Dimension**
● Statistical knowledge ○ EM13MAT101 ○ EM13MAT102 ○ EM13MAT104 ○ EM13MAT202 ○ EM13MAT406 ● Mathematical knowledge ○ EM13MAT203 ○ EM13MAT313 ○ EM13MAT508	● Beliefs and attitudes ○ EM13MAT102 ○ EM13MAT202 ○ EM13MAT314 ↭ ● Critical stance ○ EM13MAT101 ○ EM13MAT106 ○ EM13MAT203	● Literacy skills ○ EM13MAT102 ○ EM13MAT104 ○ EM13MAT314 ○ EM13MAT406 ○ EM13MAT508 ○ EM13MAT511 ● Knowledge of context ○ EM13MAT106 ○ EM13MAT202
Statistical literacy in dialogical key		

Source: The authors

By way of application, we propose below a didactic sequence that develops meaningful learning so that students are competent consultants of the interactive panel of the Ministry of Health. What is desired is the promotion of statistical literacy for the responsible exercise of citizenship in decision-making processes regarding public health issues. For this, the application in a formal teaching context should: (i) pay attention to the documentary guidelines that describe the specific competencies and skills related to the didactic sequence, as highlighted in table 3; (ii) verify the prior knowledge necessary for the production of a potentially significant activity; (iii) select pertinent didactic material that addresses the teaching object and favors the student's motivation to learn; (iv) assess the extent to which the learning was non-literal and non-arbitrary.

Table 4: Orientation diagram for teaching the concept *of mortality rate and lethality* in the 3rd grade of high school

Guiding questions	**Teaching Objects and Instructional Resources**	**Strategies**
(i) What competencies and skills are envisaged?	• See Tables 3 and 5	• Consultation with BNCC • Consultation of the local curriculum • Consultation to the Pedagogical Project of the School
(ii) What prior knowledge is required?	• Ratio and proportion • Percentage • Indices and rates • Variability • Population and sample	• Proposition of problems • Probing tests
(iii) What didactic material to select that is relevant in the extra-class context?	• Online text of scientific dissemination • Interactive panel of the Ministry of Health	• Reading challenges: schematic reading, scanning, for example. • Proposition of problems • Probing tests
(iv) How to verify the non-literality and non-arbitrariness of learning?	• Different contexts and applications of *lethality and mortality rates*	• Proposition of problems • Applications in other areas • Use and discussion of other datasets • Request that students come up with research problems or proposals

Source: The authors

The diagram serves to organize the preparation of the didactic sequences, whose proposal can be formally transcribed as follows:

Proposal:
Meaningful Learning of Mathematics in the 3rd grade of High School

Theme:
Learning to calculate Covid-19 case fatality and mortality rates

Goal:
Differentiate case fatality rate and mortality rate

Content to be worked on:
- Ratio and proportion
- Percentage
- Indices and rates
- Variability
- Population and sample

Required skills:
- CE01
- EC02
- EC03
- EC05

Skills to be developed:
- EM13MAT102
- EM13MAT104
- EM13MAT202
- EM13MAT313
- EM13MAT511

Material required:
- Text of scientific dissemination made available online by the Government of the State of Minas Gerais: MACHADO *et al*. Covid-19 death rate: understand this concept! *In: Coronavirus - State Department of Health of Minas Gerais*. 2020. Available at: <https://coronavirus.saude.mg.gov.br/blog/81-taxa-de-mortalidade-da-covid-19>
- Interactive panel of the Ministry of Health. Available at: <https://covid.saude.gov.br/>

Instructional resources:
- Devices with internet access (mobile phones, computers or tablets)

Estimated time: 04 hours/class

Methodology:

Step 1:
- Gymkhana with tasks that mobilize the previous contents required. [Tasks developed in groups favor the exchange of knowledge and, when there is competition, favor the motivation of the learner]

Step 2:
- Consultation of the website of the State Department of Health of Minas Gerais to perform three consecutive tasks. [It is important that the next task is presented only when the previous one is completed]
  - What is the difference between mortality rate and lethality? [Scanning of the text to locate the concepts-object of teaching]
  - What is the algebraic expression of each? [Technical skill object of teaching]
  - How can we deduce population size from the mortality rate and the number of deaths? [Technical skill object of teaching]

Step 3:
- Consultation of the interactive panel of the Ministry of Health to perform the following tasks:
  - Redo the calculations using the estimate of the Brazilian population recently published by the IBGE. [Technical skill object of teaching]
  - Calculate lethality and mortality in your region and state. Compare the results. [Technical skill object of teaching]
  - Evaluate the rates found previously compared to national rates. What can be concluded? [Learning Check]

Form of evaluation:
- Troubleshooting

Table 5: Possible dialogical model for this didactic proposal

Theoretical Dimension	Dialogical Relations	Experiential Dimension
● Statistical knowledge ○ Population and sample ○ Variability ○ Rates and indices ● Mathematical knowledge ○ Ratio and proportion ○ Percentage	● Beliefs and attitudes ○ Distinguish evidence and possible cognitive dissonances ⇜⇝⇝⇝

distribute competencies and skills required and intended for students articulating the theoretical and experiential world with specific dialogical relations, the teacher launches into a permanent informed improvement. This is the profile of the teacher-researcher in Basic Education: a teacher who does not segregate theory and practice, but integrates academic knowledge into professional practice. From the student's point of view, the dialogical model of statistical literacy can be used as a useful methodological guidance for the development of an effectively meaningful learning of topics that are so dear to Statistics and Mathematics as a whole. Therefore, it would not be a redundancy to add this aspect more in our proposed model (MAGALHÃES; NÓBREGA, 2023) and, henceforth, call it a dialogical-significant model of statistical literacy.

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SEVEN
publicações acadêmicas

The use of mobile devices - Tablets - In the pedagogical mediation of higher education students

Crossref doi
https://doi.org/10.56238/ptoketheeducati-051

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ABSTRACT
This article intended to examine the use of educational mobile devices (Tablets) as complementary mediation pedagogical agents on high education. For this matter, this study attempted to investigate the implications and potential of the use of Tablets, as educational promoting agents throughout the articulation between the players involved on the learning process.

Keywords: Mobile devices, Pedagogical mediation, Information and communication technologies.

1 INTRODUCTION

Contemporaneity is marked by the penetration of Information and Communication Technologies (ICT) in the daily life of social reality, expanding the perception of space and time, towards the construction of a new understanding of society. This scenario has led to transformations in all areas of knowledge, of course, and education cannot be left out. Through technological advancement and the insertion of digital media, numerous changes have occurred. In addition, education has become more complex, generating new ways of teaching and learning and consequently affecting educational standards and models.

For Moran (2003), "education will be more complex because it will incorporate dimensions that were previously less integrated or visible, such as intellectual, affective and ethical competences." (MORAN, 2003, p.2) These changes cited by Moran (2003) cover several areas of knowledge: from the philosophical, pedagogical, technological field, to the field of medicine, psychology and sociology. With the introduction of new educational trends, the educational process added values, modifying pre-established standards.

In recent decades, ICT has gradually increased its importance in the teaching-learning process, thus justifying the growing investments in technology applied to education (MORAN, 2000). The incorporation of ICT into the educational environment has forged the need to translate these changes, leading society to feel the need to modify the pedagogical method, making it more flexible and dynamic. ICT, now adding to the mobility of information, opens up the possibility of new social

structures. With the recent advent of small artifacts that converge telephony, Internet and database technologies in a single device, humanity is truly experiencing the first generation of ICT portability (PETERS, 2007).

Mobile telephony and the Internet are increasingly becoming affordable, which is expanding their use. Mobile technologies have enabled new forms of communication, typical of youth, a generation for which mobile communication is part of daily interaction. This generation is characterized by always being connected to networks of geographically dispersed communities organized by common interests. The possibilities of communication and data transfer created by mobile technologies (*m-technologies*) significantly reduced the limitations that fixed locations established for work and study. This acquires the potential to revolutionize the way we work and learn. However, in a mobile and connected society, new educational challenges are established, because it is expected that teaching occurs with the same speed (PETERS, 2007).

However, even though it is believed in the advantages of the use of computational devices in education, its use in the educational sphere should not be restricted to the simple insertion of equipment in the classrooms. In order to have positive results, it is necessary to identify the expectations of the actors involved, seeking to adapt them to the best teaching practices. Changes of this nature demand reflections and theoretical and practical studies, in order to identify whether they result in better learning experiences or not (ALMEIDA and AZEVEDO, 2009).

In this context, the purpose of this article was to examine the use of mobile devices, in this case tablets, as complementary agents to pedagogical mediation in Higher Education.

2 MOBILE DEVICES IN EDUCATION

In the last decade the use of mobile digital devices - Cell Phones, PDAs and *Tablets* - in education, especially in higher education, has gained space. Considering its degree of portability, mobility and resources, the *Tablet* has been pointed out as the new didactic material (VILAÇA, sd). Tablets are lightweight and practical notebooks, where interaction can be via mouse, keyboard or electronic pen. Another advantage of *the Tablet* is that, for its lightness and mobility, it can be used supported on the table or on the user's own arm. This differentiates it from the notebook, whose screen is vertical, creating discomfort between the user and his interlocutors (EMBYSK, 2010).

Studies (SCOOT et al., 2006 apud CACEFFO et al., 2011) point out that students prefer to use *Tablets* instead of traditional notebooks in the classroom. However, as with the use of any other technology, the use of *Tablets* can generate anxiety and even distraction. Other studies (Klopfer, Squire, Holland and Jenkins, 2002 apud PETERS, 2007) suggest that mobile devices make it possible to explore unique educational potentialities, such as:

a) Social Iterativeness.

b) Ability to bring together unique aspects of a certain context, environment, or moment.

c) Connectivity, relative to other mobile and network devices.

d) Individualization, through the unique ability to customize individual research trajectories.

Like many other technological advances - television, radio, cinema, CDs, DVDs, just to name a few, the *Tablet* was also not planned for educational purposes, but ended up benefiting education (VILAÇA, sd). In education, the convergence between digital and face-to-face, promoted by educational practices that combine face-to-face activities and resources with digital, has been driving the use of *Tablets.* Teachers can use mobile devices as complementary agents to pedagogical mediation, for example, by asking their students to conduct research and online activities. This hybrid teaching, called *blended learning* (TORI, 2009 and 2010), despite favoring the integration of mobile digital technology, runs into issues that deserve attention. The high cost involved in the adoption, on a large scale, of the *Tablet* as a complementary agent to pedagogical mediation, makes its adoption still an isolated initiative of a few educational institutions (VILAÇA, sd).

Thus, in order to examine the use of *Tablet by* students of higher education, with special interest in the formal use of this device, we sought to investigate the degree of satisfaction and difficulties experienced by students of an undergraduate course, as well as their perception of how much this experience added to their learning.

3 METHOD

The objective of this article was to reflect on the potential of the use of mobile devices in the classroom as complementary agents to pedagogical mediation in higher education. To verify this question, information was collected on the perception that students of a higher education institution (HEI) X had of the use of *Tablets* during an academic semester, attending the discipline Political Science, in the course of Law.

This investigative scenario is part of the efforts of a higher education institution (HEI) X to implement a new education system. As a pedagogical strategy to capture and maintain students, IES X distributed *Tablets* to all students of the courses considered most important for the institution, these being the Law and Engineering courses. The equipment was made available on *a lending basis,* so that it could be used, instead of the printed didactic material, until the end of the course.

3.1 PARTICIPANTS

The sample of this study was composed of two classes of 2nd semester, of the Law course. One of the classes consisted of 34 students, 16 of whom could request the *Tablet.* The other class had 59 students, where 32 had the option to request the equipment, totaling 48 students with *Tablet*. Of these,

only 32 participated in this study. Below you can see the demographic data of the sample (see Table 1, Table 2 and Table 3).

Table 1: Age

Less than 20 years	**2**	**6%**
20 to 25 years	4	13%
26 to 30 years	6	19%
31 to 40 years	11	34%
41 to 45 years	2	6%
46 to 50 years	4	13%
50+ years	2	6%

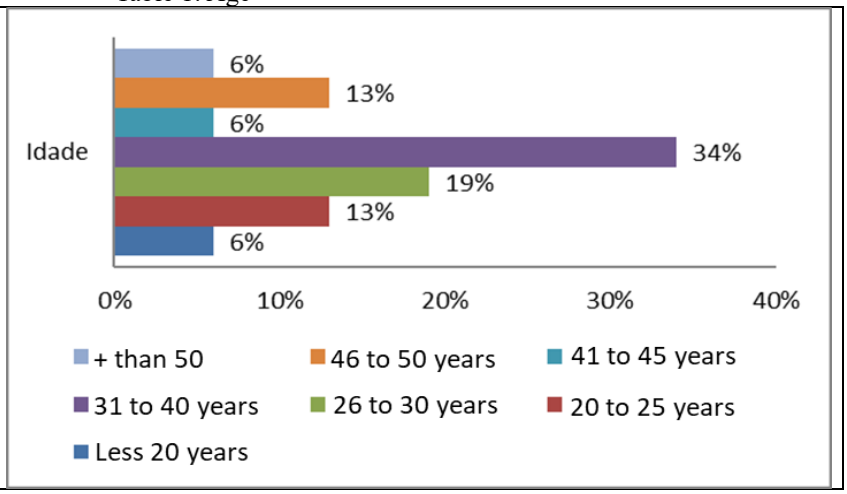


Table 2: Gender

Male	**13**	**41%**
Female	18	56%

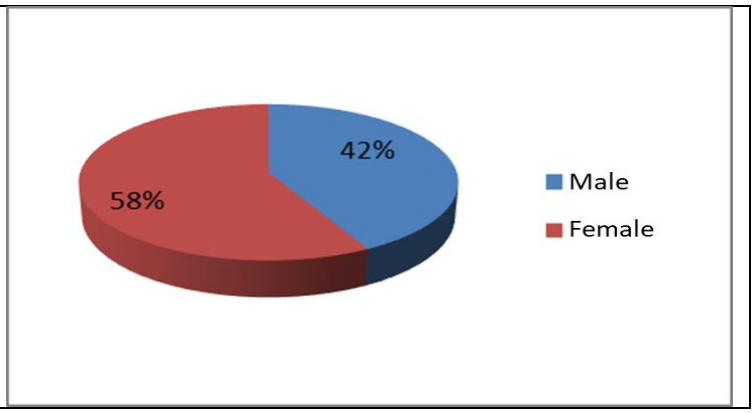
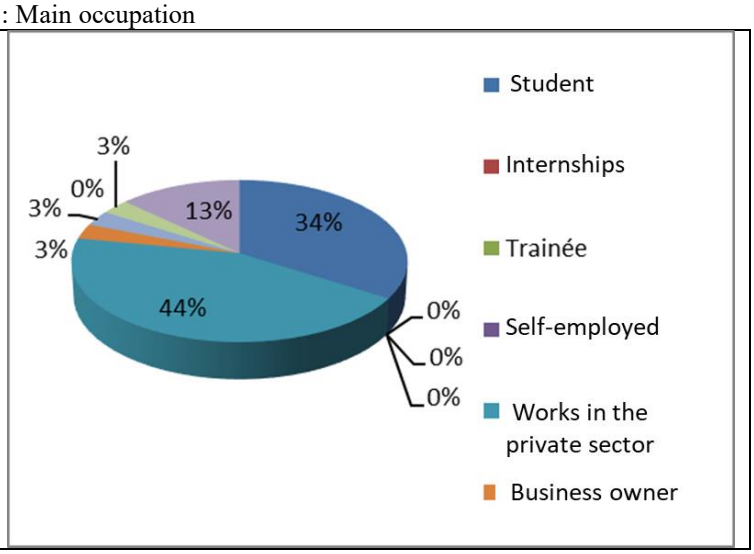


Table 3: Main occupation

Student	**11**	**34%**
Trainee	0	0%
Drag	0	0%
Self-employed	0	0%
Works in the private sector	14	44%
Business Owner	1	3%
Municipal civil servant	1	3%
State civil servant	0	0%
Federal civil servant	1	3%
Other	4	13%



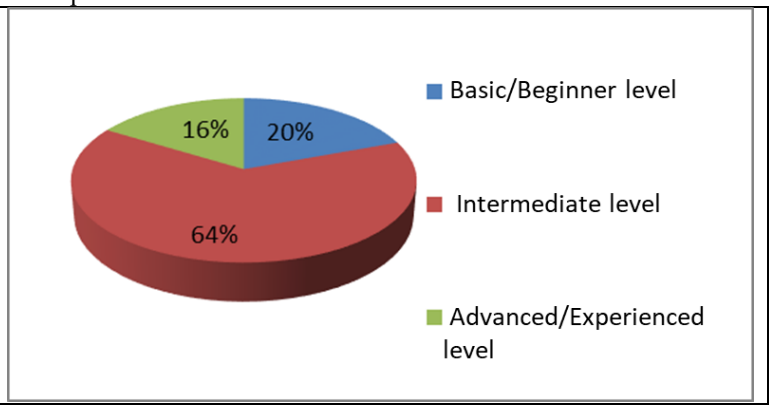
3.2 EQUIPMENT AND SUPPORT

The *Tablet* used in the study was of the Positivo brand and although all the students received the same model, the equipment provided did not contain the necessary applications for the execution of the most desired functions, such as: editing a text, a spreadsheet or any other type of document. Thus, even though the institution offered in the first week of distribution training on the use of the equipment, each student was responsible for installing the applications on their equipment, being forced to seek solutions on their own.

Although the student had been given the freedom to install the applications he wanted, due to the extensive need for customization, performing these operations required a minimum of computer knowledge. Even though more than half of the students (63%) declared to have an intermediate level of computer knowledge (see Table 4), this situation led many students to become discouraged in starting to use the equipment.

Table 4: Computer Skills

Basic/Beginner Level	**6 students**	**19%**
Intermediate Level	20 students	63%
Advanced/Experienced Level	5 students	16%



4 DATA COLLECTION AND ANALYSIS

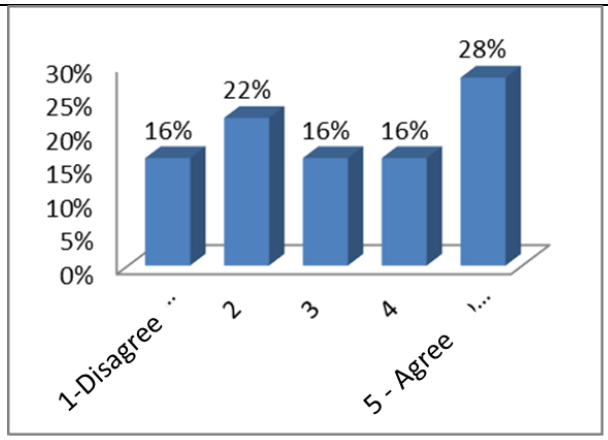
Data were collected through questionnaires applied at the end of the academic semester, as well as through observations conducted in the classroom throughout the semester. The duration of the course was 3 months and data were collected from September to November. The questions of the questionnaire sought to examine different aspects of the experience in the use of the *Tablet*, by students of a Law course. The dynamics of this use was also observed through the performance of activities, having been given the option of presenting them, both in conventional (printed) media and in the *Tablet*. In addition, throughout the academic semester, observations of situations that emerged in the classroom about the experience of using the device were conducted.

The questionnaire was designed considering four categories: satisfaction, use and intention to re-use, individual benefits and quality of the system. Each category contained questions, to be answered in Likert scale format (from 1 to 5, from 1 – Strongly Disagree to 5 – Totally Agree), whose analyses are presented below.

4.1 SATISFACTION

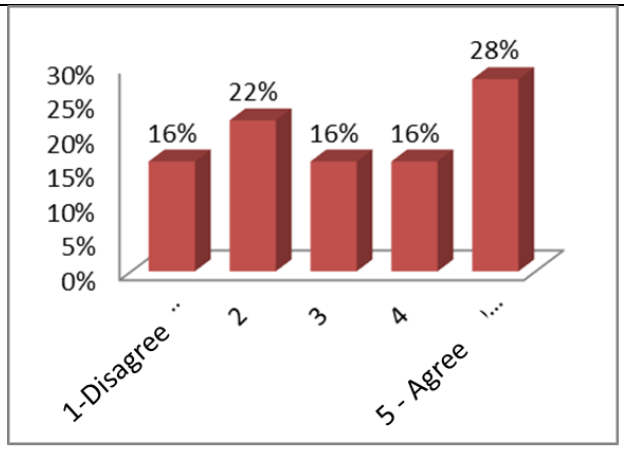
4.1.1 I feel satisfied with using the Tablet

1 -	**Strongly disagree**	**1**	**3%**
2		7	22%
3		11	34%
4		7	22%
5 -	Totally Agree	5	16%



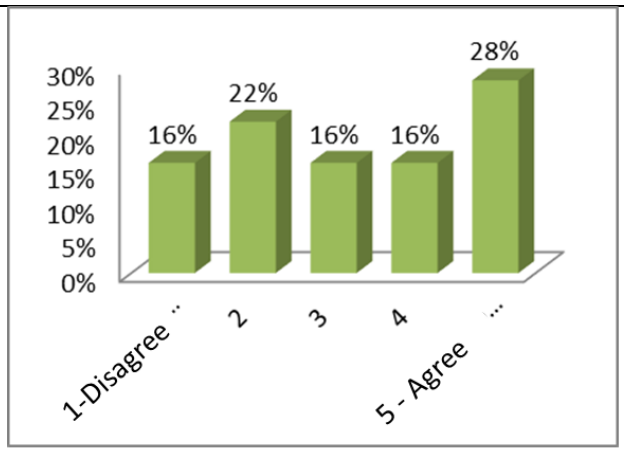
4.1.2 The Tablet provides an attractive learning environment

1 -	**Strongly disagree**	**1**	**3%**
2		5	16%
3		12	38%
4		6	19%
5 -	Totally Agree	7	22%



4.1.3 I like to use the Tablet

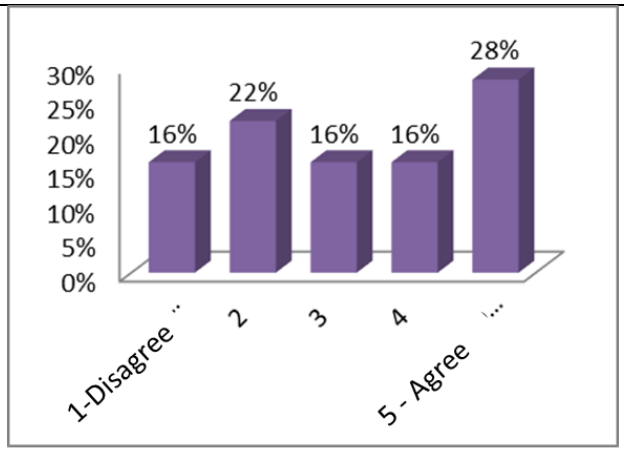
1 -	**Strongly disagree**	**3**	**9%**
2		3	9%
3		11	34%
4		4	13%
5 -	Totally Agree	10	31%



4.2 USE AND INTENT TO RE-USE

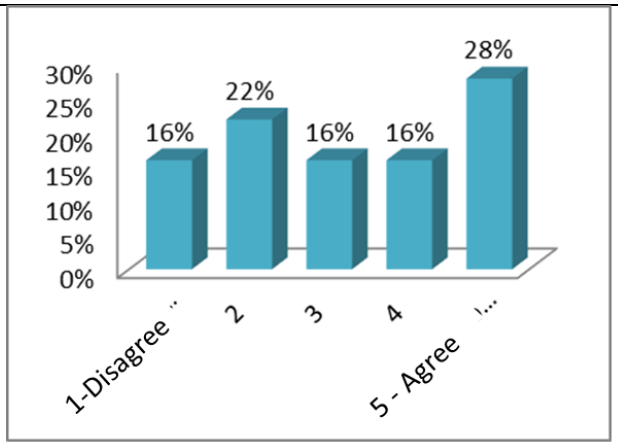
4.2.1 I frequently use the Tablet

1 -	**Strongly disagree**	**4**	**13%**
2		5	16%
3		9	28%
4		4	13%
5 -	Totally Agree	9	28%



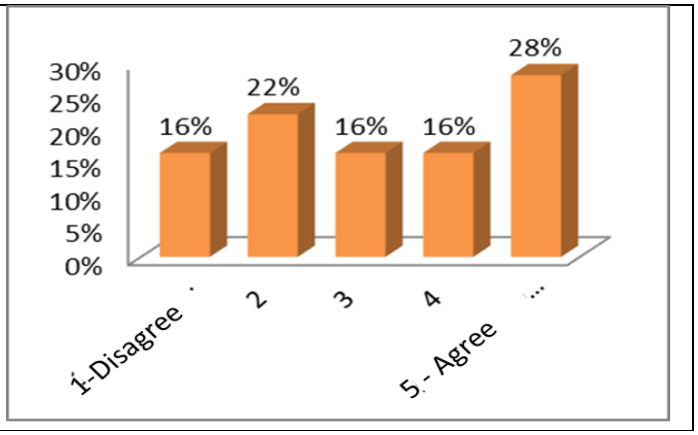
4.2.2 I intend to continue using the Tablet whenever I can

1 -	**Strongly disagree**	**3**	**9%**
2		3	9%
3		8	25%
4		2	6%
5 -	Totally Agree	15	47%



4.2.3 I intend to increase the frequency of use of the Tablet while studying at the institution

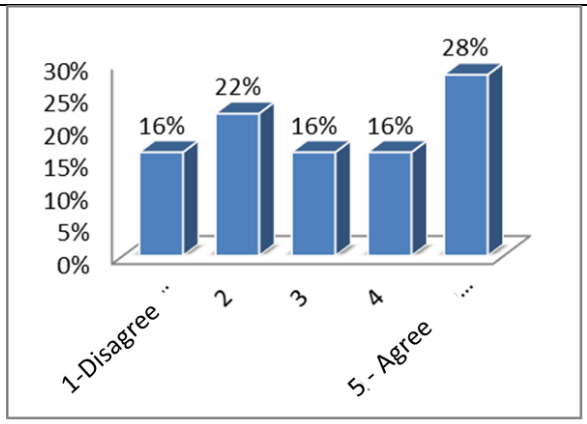
1 -	**Strongly disagree**	**2**	**6%**
2		5	16%
3		5	16%
4		5	16%
5 -	Totally Agree	14	44%



4.3 INDIVIDUAL BENEFITS

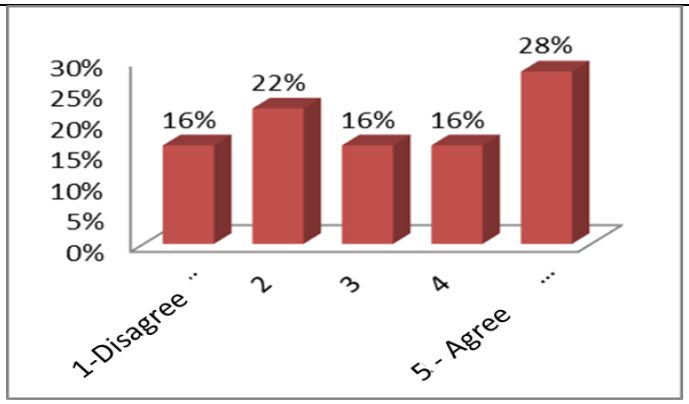
4.3.1 The use of the Tablet stimulates my interest in learning

1 -	**Strongly disagree**	**4**	**13%**
2		8	25%
3		5	16%
4		4	13%
5 -	Totally Agree	10	31%



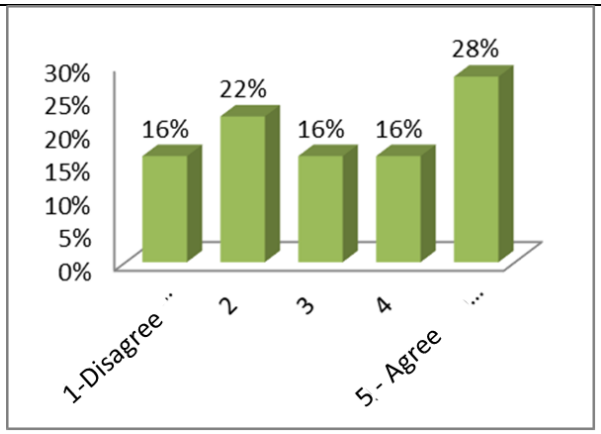
4.3.2 I put more effort into learning and focus better when I use the Tablet

1 -	**Strongly disagree**	**8**	**25%**
2		5	16%
3		7	22%
4		8	25%
5 -	Totally Agree	3	9%



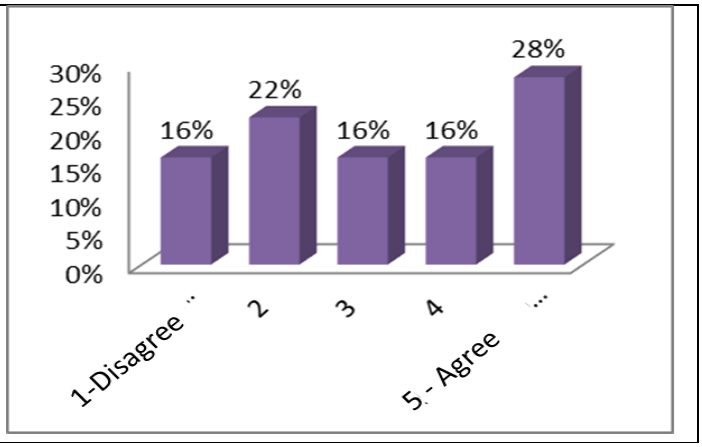
4.3.3 Using the Tablet increases my learning performance because it allows me to perform tasks faster

1 -	**Strongly disagree**	**4**	**13%**
2		9	28%
3		5	16%
4		6	19%
5 -	Totally Agree	7	22%



4.3.4 Using the Tablet facilitates the learning process by improving teaching

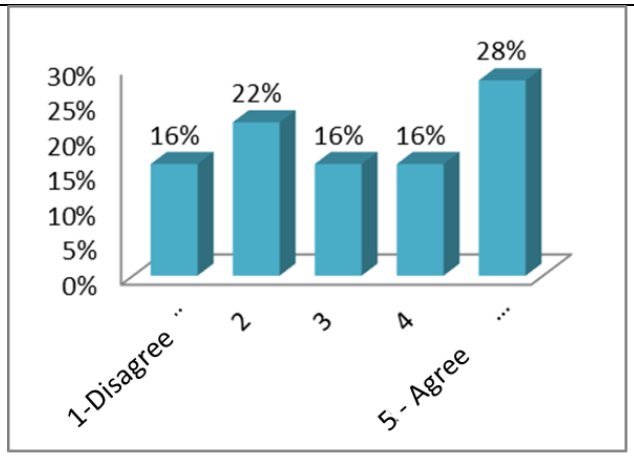
1 -	**Strongly disagree**	**6**	**19%**
2		8	25%
3		4	13%
4		8	25%
5 -	Totally Agree	5	16%



4.4 SYSTEM QUALITY

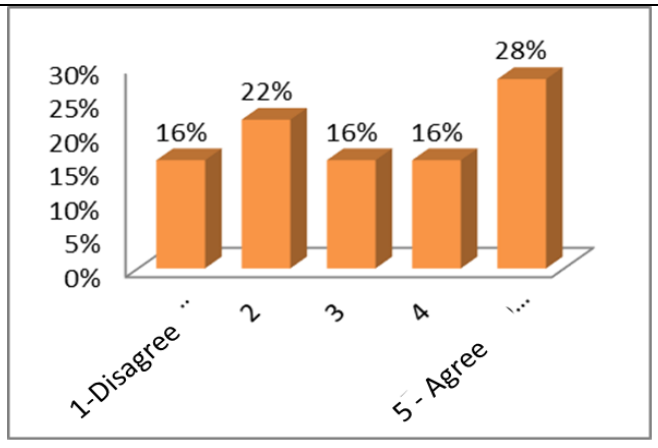
4.4.1 Learning how to operate and navigate the Tablet was easy

1 -	**Strongly disagree**	**4**	**13%**
2		5	16%
3		5	16%
4		3	9%
5 -	Totally Agree	14	44%



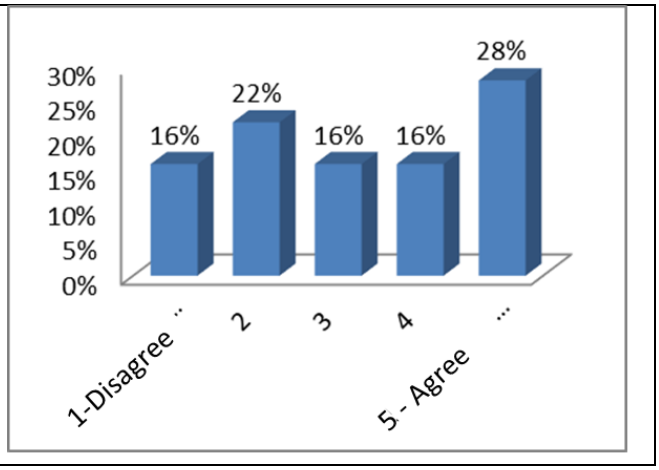
4.4.2 The Tablet interface is visually pleasing

1 -	**Strongly disagree**	**1**	**3%**
2		6	19%
3		7	22%
4		7	22%
5 -	Totally Agree	10	31%



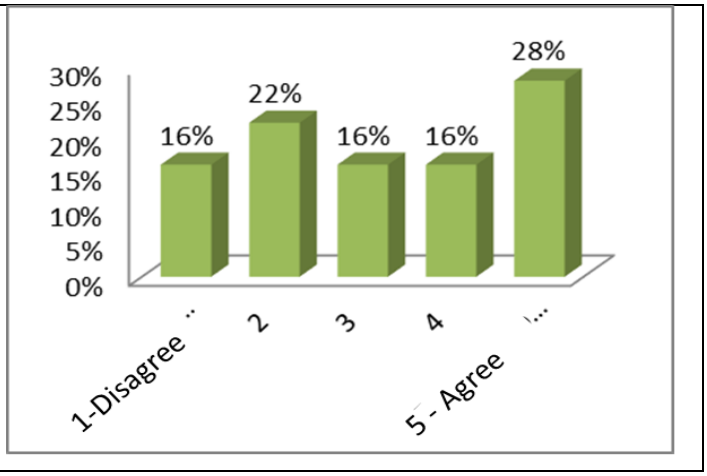
4.4.3 Tablet pages and apps load quickly

1 -	**Strongly disagree**	**6**	**19%**
2		7	22%
3		11	34%
4		5	16%
5 -	Totally Agree	2	6%



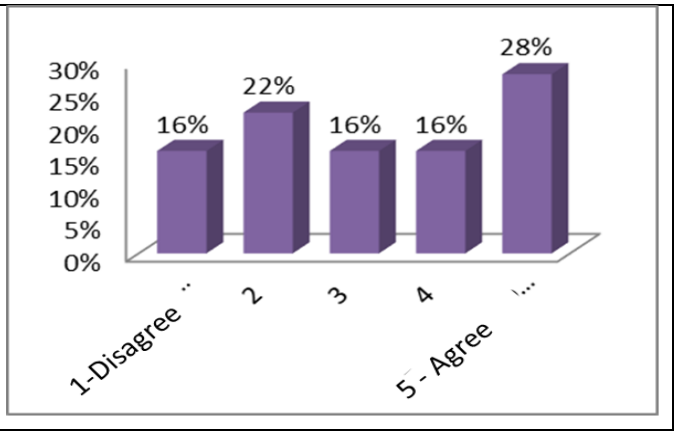
4.4.4 The Tablet has applications that helped me in the activities

1 -	**Strongly disagree**	**4**	**13%**
2		5	16%
3		8	25%
4		6	19%
5 -	Totally Agree	8	25%



4.4.5 In general, the Tablet offered by the institution has good quality

1 -	**Strongly disagree**	**5**	**16%**
2		7	22%
3		5	16%
4		5	16%
5 -	Totally Agree	9	28%



5 RESULTS

When asked to present the correction of an activity, although the students had the option of performing it both on the Tablet *and in a conventional (printed) medium, of the 48 subjects, only 5 had brought it on the* Tablet. This may be explained by the fact that the activity was requested at the

beginning of the second month of use of the equipment, without having had the time of acclimation to the device. Probably the result would have been different if the same activity had been requested at the end of the semester.

Another interesting fact is that of the 48 students who requested *the Tablet*, 6 either did not use it or practically stopped using it in the first week of the academic semester. Asked why, the subjects pointed out as justifications: lack of interest/need, preference for printed material, technical problems faced in the use of the equipment, lack of familiarity with the technology, lack of technical quality of the equipment and fear of using equipment that did not belong to them, among others.

Regarding the data collected in the questionnaire, in relation to the patterns of use, when asked about the Use and Intention of Re-Use, of the 33 students, 24 stated that they use and intend to continue using the *Tablet regularly*. The reason for this can perhaps be attributed to the fact that the student envisions possibilities of its use as a personal benefit related to increased interest in learning by allowing the accomplishment of academic tasks more quickly. However, opinions were divided when asked if its use improves their effort and their concentration on learning and if it facilitates their learning process by improving teaching.

As for System Quality, the study revealed the expected difficulties in relation to hardware and software, such as: slow performance of the equipment and lack of credibility in data security. But the main difficulty faced was the need for customization that the equipment initially required. Another limiting element in the diffusion of the use of the *Tablet was the lack of* WiFi access in the *facilities of the IES, because it was not possible to access the Internet, it could only be used in the computer function.*

As for the most popular activities performed with the *Tablet*, the following were indicated: Internet browsing, creating, reading and editing electronic files (Word, Excel and Power Point), consulting the didactic materials and studying and annotating comments during classes. The activities where *the Tablet* was less used by the students were: watching videos, listening to music, updating agenda, Facebook, Blog, Twitter and chatting. It is worth mentioning that the main activity in which the Tablet was used - Internet browsing - not necessarily an activity exclusive to the *Tablet platform*.

6 CONCLUSIONS AND COMMENTS

This study found evidence that the use of *Tablets* is a breakthrough towards transformation and, why not say, improvement of learning. Although the interface of mobile devices still presents limitations, the main observation raised in the data collected and corroborated by the feedback of the students is that the greater the use of the *Tablet* - both inside and outside the classroom - the greater the comfort and interest in its use to carry out academic activities.

However, the mobility and flexibility of a *Tablet* (on and above all other factors) is what enhances the insertion of this sociotechnical artifact in almost all aspects of the student's formal learning. This innovative aspect enables a transformative effect on learning, opening new paths for contemporary education.

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Satisfaction of users of copper intrauterine device: Analysis of patients at the family planning outpatium of a public hospital

https://doi.org/10.56238/ptoketheeducati-052

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ABSTRACT
Introduction: In Brazil, the guarantee to contraception is given through the National Family Planning Policy of 2007, which offers several free contraceptive methods, among them the copper intrauterine device (IUD), a highly effective contraceptive method. Objectives: To know the satisfaction of users with the IUD and specifically to evaluate and identify the interference of side effects in the quality of life of patients. Methods: This is a prospective, field-cross-sectional study with a quantitative approach, using a structured questionnaire applied to copper IUD users, inserted in the service and with at least 03 months of use. Results: The users were satisfied with the copper IUD (92.6%) and did not report discomfort with the method (59.5%), although 63.0%, 77.8% and 44.5% presented abdominal pain (outside the menstrual period), menstrual colic and increased menstrual flow, respectively. Conclusion: Most users were satisfied with the copper IUD, continuing its use, despite the existence of some side effects. The study demonstrated that the IUD is an excellent contraceptive alternative
for being effective, having a prolonged action, reduced cost and with good satisfaction among users.

Keywords: Copper intrauterine device (Cu), Family planning outpatient clinic, Satisfaction.

1 INTRODUCTION

Knowledge about contraceptive methods should be related to the prevention of unwanted pregnancy, induced abortion, maternal mortality and other health problems related to reproductive morbidity and mortality (VIEIRA, et al., 2012). Thus, in 1996, Law No. 9,263 was created, which obliges the Unified Health System (SUS) to guarantee assistance to conception and contraception, as part of the actions that constitute integral health care (GINECO, 2023).

In addition, family planning is ensured by the Brazilian Federal Constitution, which determines as the responsibility of the State to offer conditions for citizens to have access to information, which concerns the control of their fertility (BRASIL, 1996). Thus, the National Family Planning Policy of 2007, through the Unified Health System (SUS) offers several free contraceptive methods, among them stands out the copper IUD (Cu), a highly effective contraceptive method (MCCARTTHY, 2018). Despite the efficacy, IUD adherence in Brazil is still low, with estimated use around 1.9% (BRASIL, 2018), either due to difficulty in accessing information about the wide variety of existing contraceptive

methods, and thus, indicating a mismatch between what is proposed by the family planning program and what is effectively practiced (SOS CORPO, 2017).

There are eligibility criteria for a contraceptive method, defined by the set of characteristics presented by the candidate for the use of a certain method, and which indicate whether or not that person can use it (BEMFAM, 2003; PENTEADO, et al., 2001). In addition, some restrictive criteria such as: client safety, availability difficulties, technical capacity of the health professional and perception of side effects, are observed regarding the eligibility of women for the recommendation and insertion of the IUD (MCCARTTHY, 2018). And it should still be very clear, the effectiveness of a contraceptive method and the ability of this method to protect against unwanted pregnancy (PENTEADO et al., 2010). Therefore, ensuring access to known contraceptive methods is as important as ensuring that individuals receive adequate guidance on indications, contraindications and implications of use.

Therefore, knowledge about contraceptive methods can help women choose the most appropriate method for their sexual behavior and health conditions, as well as use the method chosen correctly. Thus, the research had as problematic: What is the level of satisfaction regarding the use of the IUD-Cu method, introduced in women with a desire for contraception attended in a family planning outpatient clinic? It is hypothesized that patients know the advantages of the Cu-IUD and that there are no serious side effects.

The present research is justified from information that in Brazil, the median age of women having their first child is 21 years according to the National Health Survey (BRASIL, 2015) and that, most of the time, pregnancies occurred unconsciously, that is, unplanned (ALMEIDA, 2016). IUD use by populations of women, such as adolescent and nulliparous women, remains low, despite clinical evidence identifying that most women are eligible candidates for IUD use (ACOG, 2015, 2018).

The research had as general objective to know the satisfaction of the users with the IUD-Cu and specifically to evaluate and identify the interference of the side effects in the quality of life of the patients.

2 METHODS

This is a prospective, field-based, cross-sectional study with a quantitative approach. Data were collected from October to November 2022 at the Family Planning Outpatient Clinic of Fundação Santa Casa de Misericórdia do Pará (FSCMP), a reference hospital for maternal and child health in the state of Pará, located at Rua Bernal do Couto, 1040 - Umarizal, Belém/Pará.

The research participants were the users of the copper IUD, inserted in the service for at least 03 months of use, attended at the Family Planning outpatient clinic during the data collection period (October and November).

The inclusion criteria of the study were women over 18 years of age, with insertion of IUD-Cu in the FSCMP for at least 3 months, after counseling on contraceptive methods and who agreed to participate in the research, signing a consent form and using the copper IUD exclusively as a contraceptive method. Exclusion criteria were users of Copper IUDs under 18 years of age, less than 3 months old, attended outside the data collection period (October and November) and who did not wish to participate. The research sample consisted of all users of the Copper IUD who met the inclusion criteria, attended during the period established for data collection.

Data collection was performed individually through a structured questionnaire (APPENDIX A), with the purpose of guiding and organizing the information collected about the patient. The variables present in this instrument were: sociodemographic data, obstetric history: number of previous pregnancies, number of living children, number of abortions, desire to become pregnant and data related to the experience of using the Cu-IUD (time of use, satisfaction with the method, complaints/discomfort after placement, change in the frequency of sexual intercourse). The information collected was used solely and exclusively for the execution of the present study.

After data extraction, they were analyzed by Excel 2013. The descriptive analysis of the results was performed by means of relative and absolute frequencies and presented in the form of tables. The association between the satisfaction of the users and the variables studied was evaluated using Pearson's chi-square test and statistical significance was considered when *p* was lower than 0.05.

The study was only initiated after the approval of the Research Ethics Committee of the Institution under CAEE number 63456822.8.8.00005171 (Annex 1) and, in accordance with Resolution 466/12 of the National Health Council involving research on human beings and subsequent acceptance of the Informed Consent Form (ICF) (APPENDIX B).

3 RESULTS

The study included 27 women treated at the Outpatient Clinic and their demographic characteristics are shown in Table 1.

Table 1. Clinical-demographic characteristics of women treated at the Family Planning Outpatient Clinic of the Santa Casa de Misericórdia do Pará Foundation (FSCMPA). Bethlehem, PA, 2023.

Variables	N*	%
Age/years		
18-24	05	18,5
25-34	15	55,5
> 34	07	25,9
Marital status		
Single	08	29,6
Married woman	17	62,9
Divorcee	01	03,7

Not informed	01	03,7
Schooling		
Incomplete fundamental	03	11,1
Medium complete	13	48,2
Incomplete high school	03	11,1
Complete Superior	04	14,8
Incomplete Superior	04	14,8
Origin		
Belém/RMB**	18	66,7
(Other) Peixe Boi, Santo Antônio do Tauá, São Miguel, Mãe do Rio, Bonito, Ipixuna do Para, Acará, Abaetetuba, São Domingos Capim	09	33,3
Race/Color		
White	02	07,4
Black	03	11,1
Pardon	21	77,8
Yellow	01	03,7
Works		
Yes	14	51,9
No	13	48,2
Household income		
Up to 1 minimum wage	11	40,7
Up to 2 minimum wages	14	51,9
More than 2 minimum wages	02	07,4

*N: number of women: 27 patients.
**Metropolitan Region of Belém (Sta Isabel, Castanhal, Marituba)

With regard to the sociodemographic variables of the users, analyzed from the study outlined in the profile, where it was found that most of them were between 25 and 34 years old, they came from the Metropolitan Region of Belém (RMB). As for marital status, married women make up the vast majority and less than half are single. The other variables were minimal in relation to these data.

In the variable schooling, less than half had completed high school. Most of them declared themselves mulatto, have paid work and live with a monthly family income of two minimum wages (Table 1).

The variables related to the tocogynecological history of the users, the data obtained, reveal that less than half had only one pregnancy, had a child and more than half did not suffer any abortion. Still, the majority answered that they did not express the desire to become pregnant again, and less than half reported using two or more contraceptive methods before choosing the IUD. (Table 2)

Table 2 – Tocogynecological data of IUD users T Cu 380A. Bethlehem, PA, 2022.

Variables N* %		
Number of pregnancies		
0	01	03,7
1	08	29,6
2	07	25,9
3	06	22,2
4 or but	05	18,5
Number of children		
0	02	07,4
1	12	44,4
2	06	22,2
3	07	25,9
Abortions		
1	10	37,0
2	02	07,4
3	01	03,7
None	14	51,9
You want to get pregnant in the future		
Yes	07	25,9
No	20	74,1
Use of another contraceptive method before the IUD		
Oral contraceptive	03	11,1
Injectable	05	18,5
Condom	04	14,8
Behavioral	01	03,7
Two or more methods	13	48,2
None	01	03,7
Total sample: 27 patients		

Regarding the experience of the users to the use of the IUD T Cu 380A, the majority answered that they were satisfied with the method (Table 3) and among these, most stated that they did not feel discomfort since the insertion of the IUD and less than half did not present increase or reduction in the duration of menstruation, and more than half denied feeling abdominal pain outside the menstrual period. Regarding menstrual colic, most of them reported experiencing colic pain. As for the menstrual flow, less than half answered that it was not altered. In more than half the number of menstruating days had no changes. It was also observed that most of them stated that there was no change in the frequency of weekly sexual intercourse (Table 3).

Table 3- Data on the experience of patients using the IUD T Cu 380A followed at the family planning outpatient clinic of FSCMPA. Bethlehem, PA, 2022.

Variables	N	%
Level of satisfaction with IUD use		
Satisfied	25	92,6
Unsatisfied	02	07,4
Annoyance with the IUD		
Yes	11	40,7
No	16	59,3
Abdominal pain (outside the menstrual period)		
Yes	10	37,0
No	17	63,0
Menstrual colic		
Yes	21	77,8
No	06	22,2
Menstrual flow		
Increase	12	44,4
Decrease	02	07,4
no change	16	48,2
Number of days menstruating		
Increase	10	37,0
Decrease	02	07,4
no change	15	55,6
Frequency of sexual intercourse after use		
Increase	02	07,4
Decrease	04	14,8
No change	21	77,8

Source: survey data (2022).

To verify the statistical significance between the variables studied and the degree of satisfaction of the users of the IUD T Cu 380A, the chi-square test was used, where it was verified that the level of satisfaction is related to six (6) variables surveyed (marital status, paid work, discomfort since the insertion of the method, increased menstrual flow, change in the duration of menstruation and variation in the frequency of sexual intercourse after use), because they obtained a p-value lower than 0.05. (Table 4)

Table 4- Relation of variables researched with significance among the users of the IUD T Cu 380A. Belém, PA, 2022.

Variables	Satisfaction		Total
	Satisfied	Unsatisfied	
Marital status			
Married woman	15 88,3%	02 11,7%	17 100%
Single	07 87,5%	01 12,5%	08 100%
Pearson chi2(2) = 7.313 P = 0,021			
Paid Work			
Yes	12 93,3%	03 06,7%	15 100%
No	10 83,3%	02 16,7%	12 100%
Pearson chi2(2) = 3.622 P = 0,043			
Nuisance			
Yes	04 57,1%	03 42,9%	07 100%
No	18 90%	02 10%	20 100%
Pearson chi2(2) = 8.2221 P = 0,004			
Increased Menstrual Flow			
Yes	10 83,3%	02 16,7	12 100%
No	02 100%	00 0%	02 100%
No change	10 76,9%	03 23,1%	13 100%
Pearson chi2(2) = 5.0929 P = 0,025			
Number of days menstruating			
Increased	10	02	12
	83,3%	16,7%	100%
Decreased	02 100%	00 0%	02 100%
No change	10 100%	00 0%	13 100%

Source: survey data (2022).

4 DISCUSSION

In view of the data obtained, the age group with the highest number of users of the IUD T Cu 380A, was in the range between 24 and 35 years or more of age, while less than half of the interviewees were in the age group above 34 years. This data differs from the study conducted by Campos et al. (2020), where the age group with the highest number of users of the IUD T Cu 380A, was 35 years of age or older.

In the study conducted by Holanda et al. (2013), the age of the users was 29 years, demonstrating that the users of the IUD are young women included in the reproductive life period.

Regarding the marital status of the interviewees showed that more than half were married, in accordance with the study published by Morais et al., (2021) which showed that 64.2% of 158 women were married or had a steady partner. This data remains one of the criteria for eligibility for the use of the IUD as a contraceptive method developed by the World Health Organization (WHO) in 2007 (VIEIRA et al., 2008; WHO, 2017).

Regarding the level of education, it was found that less than half have completed high school, similar to the data found in the study by Morais et al., (2021); Regianini (2009), where they found a similar percentage of the same schooling respectively.

The information obtained through the tocogynecological antecedents of the users showed that less than half of the patients had only one child, evidencing a reduction in the fertility rate in Brazil, as observed in studies conducted by Morais et al., (2021); Kisnisci (1985), where the average number of children per woman was six in 1950, rising to 1.6 children per woman per year in 2000. Regarding the general satisfaction of the interviewees, the majority expressed being satisfied with the IUD T Cu 380A, corroborating data found in the studies by Borges et al (2017) in which, of the 209 women interviewed, 94.7% were satisfied with the method. Several studies reinforce that the IUD is an efficient method and well accepted by users, because it has longevity in its use (GRIMES, 2019).

Regarding the complaints analyzed, the results revealed that there was no increase in menstrual flow in less than half of the patients, as well as the increase (menorrhagia) since the placement of the IUD in the patients interviewed. This data is similar to that found by De Holanda et al. (2013), who observed the same complaint in 44.7% of the participants. Several studies indicate bleeding and pelvic pain during the use of the copper IUD (CHEN et al., 2010). This fact is justified because the IUD continues as a foreign body in the endometrium, causing a more pronounced inflammatory reaction of the same.

The evaluation of the satisfaction of the users of the intrauterine device T CU 380A showed that most of the interviewees were satisfied with the IUD-Cu, evidencing what is described in the qualitative study by Silva (2011), about the importance of the integrated work carried out by several

health professionals in the clarification and assistance to the woman and the couple in the search for adequate contraception. Thus, corroborating to an increasing number of choices for this method.

In a study SCHMIDT et al., (2015) in a study of satisfaction of the IUD-Cu, found that users opted for the use of the same as a reliable contraceptive method, when asked about what motivated to choose this method, reported that they felt that it was a 100% safe method, which brought peace of mind and also the benefit of the duration of 10 years.

Other studies show several benefits of the IUD-Cu, such as: not containing hormones, symptoms such as bloating, fluid retention, nausea, headache or decreased libido that can occur with the use of hormonal methods, are rarely observed in users of the copper IUD (BORGES et al., 2017; HUBACHER et al., 2013; PEIPERT et al., 2011).

5 CONCLUSION

In this study, it was observed that most users of the IUD T Cu 380A are between the age group of 25 to 34 years, coming from the metropolitan region of Belém, are married or have a fixed partner, with a high school education, have paid work, live with a monthly family income of one minimum wage, were satisfied with the copper IUD, continuing its use, despite the existence of some discomforts such as increased flow and the days of menstruation.

The IUD is an effective alternative to reduce the number of unplanned pregnancies, thus decreasing their well-known negative repercussions. IUD insertion can be an excellent contraception option because it has a prolonged action, reduced cost and few side effects.

Brazil has high rates of unplanned pregnancies, impacting several aspects such as: individual, family, social and economic, induced abortions and their respective complications.

The findings confirm what research has pointed out: users of more effective contraceptive methods - long-lasting and reversible - such as the IUD - Cu - are satisfied, and this result may help increase the offer of this type of method by the SUS.

Finally, it is important to approach the subject, so that a greater number of women can know more about the contraceptive methods available, thus being able to choose the method that best adapts, thus reducing the rates of dissatisfaction.

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Education, pandemic and youth in Brazil

https://doi.org/10.56238/ptoketheeducati-053

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ABSTRACT
The insertion and maintenance of young Brazilians in the world of work is a great challenge and the lack of access to quality education contributes to adversities for professional qualification and labor occupation, especially in protected, decent and formal working conditions. The Covid-19 pandemic has intensified the impacts on the lives of young people with the withdrawal from face-to-face school activities, social isolation and limited access to technologies and the internet, which has made it difficult to enter the world of work and led to school dropout, unemployment and inclusion in precarious working relationships. The reflections carried out are based on the understanding of the historical process, crossed by contradictions, in which young people are inserted in the capitalist mode of production. The central objective of this study, supported by bibliographic and documentary research, is to contribute to the debate about the impacts experienced by Brazilian youth in relation to schooling and work in the post-pandemic context and the role of education policy as a democratic and transformative space.

Keywords: Youth, Education, Work, Pandemic.

1 INTRODUCTION

The current political, economic, cultural and sanitary scenario has changed the forms of organization of social life and public policies. Since 2020 the population has suffered from the impacts of the Covid-19 pandemic, which has had repercussions on the restructuring of all sectors, public and private. Brazilian youth were deeply affected, compromising the prospect of a future with better living conditions, due to the period of isolation, the increase in school dropout, unemployment, precariousness and flexibilization of labor relations.

The professional daily life of the authors is permeated by public policies and programs that seek to guarantee access to social rights, the protagonism of youth, social protection, professionalization, work, autonomy and emancipation of families, which motivated this study, whose central objective, supported by bibliographic and documentary research, based on the understanding of the historical process, is to contribute to the debate about the impacts experienced by Brazilian youth in relation to schooling and work in the post-pandemic context and the role of education policy as a democratic and transformative space.

2 THE FUTURE OF BRAZILIAN YOUTH IN THE POST-PANDEMIC

In March 2020, the World Health Organization declared the health pandemic unprecedented due to the uncontrolled spread of the Covid-19 disease in the world. This scenario exacerbated a global crisis, accentuating social inequalities. In Brazil, immersed in a context of structural crisis of capital and increased social disprotections, contradictions of a system in the process of productive restructuring, subordinated to the logic of finance, which intensified expressions of the social issue with the increase of informality and precariousness of labor relations were evidenced. (YAZBEK; BRAVE; SILVA; Martinelli, 2021). They have worsened the living conditions of the most vulnerable, while increasing the concentration of wealth of the richest. There were extreme social, political, economic and cultural impacts, such as food insecurity, unemployment, education deficits, millions of deaths, increased violence and physical and mental health illnesses.

Changes in the world of work occurred amid the processes of productive restructuring and the rise of technological innovations, with "the exponential growth of an era of digital slavery" (ANTUNES, 2020), constituting new work configurations and new professions, which demand and request new professional skills. Unemployment and informality rates have increased, especially among black and brown people and young people (IBGE, 2022). In a society historically awash by discrepancies, especially of class, race and gender, it is evident that the crisis has affected the population in a disparate way, bringing numerous consequences for the living conditions of the working class, especially for the most vulnerable groups.

Brazilian youth were one of the groups most affected by labor issues, such as rising unemployment, precariousness and flexibilization of work. Young people stayed away from face-to-face classes, suddenly needing to acquire skills and access to the tools of the digital world. They lost their jobs and submitted to low wages, precariousness and/or unstable labor relations to ensure their own and their families' livelihoods.

The International Labour Organization found that young people are the first to become unemployed in times of crisis (ILO, 2020) and the ones who have lost their jobs the most since the start of the pandemic in 2020, according to a report on global youth employment trends (ILO, 2022). The level of education reflects directly on employability, increasing or decreasing the possibility of inclusion in the world of work and insertion in jobs with better pay.

However, in May 2023, celetista employment in Brazil expanded, registering a balance of 155,270 jobs, resulting from 2,000,202 admissions and 1,844,932 dismissals, and the age group with the highest balance was 18 to 24 years, with 106,408 posts (CAGED, 2023). Even so, intersectoral articulation is necessary to monitor the maintenance of employment and working conditions, because for capital, young people are often seen as cheap labor, in search of their first job, without experience

From the Brazilian Federal Constitution of 1988 are promulgated the Social Rights, among them, education, which is presented in the first place in Article 6, accompanied by health, food, work, housing, transportation, leisure, security, social security, protection of maternity and childhood and assistance to the destitute (BRASIL, 1988). Other Articles of the Magna Carta deal with national education, its guidelines, competencies of federated entities configuring it as a right of all, aiming at the full development of the person, the possibility of exercising citizenship and qualification for work (CARA; PELLANDA, 2018). The Statute of the Child and Adolescent - ECA (BRASIL, 1990) and the Statute of Youth (BRASIL, 2013) are also legal frameworks regarding the rights of young people.

Youth is permeated by complexities of all kinds, which require intersectoral and multiprofessional attention, through Public Policies. Mostly, the actions aimed at the social protection of this public are related to education and early insertion in the world of work. The ECA and the Youth Statute have specific chapters on professionalization and protection at work. These regulations legally support state protection for young workers, but at the same time, contradictorily, the state enables disprotections, since it has a functioning mechanism that contributes to the maintenance of the reproduction of the system in the logic of capital.

Brazilian education policy, historically, has developed in a critical scenario of dismantling and ineffective investment, which has been aggravated in the pandemic context and suffers from school emptying and the increase in the illiteracy rate. Data released by the Civil Society Organization Todos pela Educação indicate that approximately 54% of public school students arrived in the last year of elementary school with reading difficulties, in addition to another 33% having completed this stage without reading fluently and with spelling difficulties (TODOS PELA EDUCAÇÃO, 2022). Another worrying factor is that the number of Brazilian children and adolescents of compulsory school age outside of school has skyrocketed compared to the period before the pandemic (UNICEF, 2021).

In addition, it is observed the fragility of actions related to ethnic-racial issues in schools and the control of a movement of exclusion of young black and brown people. The survey conducted by the Organization All for Education on ethnic-racial inequalities in enrollment and completion of high school, based on data from 2012 to 2022 from the Brazilian Institute of Geography and Statistics – IBGE, shows that the rate of young black and brown people who accessed and completed high school is equivalent to a decade of delay, in comparison with indicators of white students ((TODOS PELA EDUCAÇÃO, 2023).

The Single Registry is a system created by the Federal Government and operationalized by the municipalities, which records the information of families, especially those who are in a situation of lack of protection. It is through this registration that families have the possibility to access social programs and benefits. With reference to the month of April/2023, the population between 7 and 34 years old, which includes young Brazilians, was the largest public enrolled in this Registry, as well as

people registered in families with a total monthly income of up to 1 minimum wage, according to the following tables:

Table 1 – Enrolled Single Registry by age group

	Male	% Male	Female	% Female	Total	% Total Age
Between 0 and 4 years	4.057.025	51,02%	3.894.784	48,98%	7.951.809	8,42%
Between 5 and 6 years	1.916.858	51,12%	1.833.079	48,88%	3.749.937	3,97%
Between 7 and 15 years	8.374.618	51,05%	8.029.407	48,95%	16.404.025	17,37%
Between 16 and 17 years old	1.822.343	50,69%	1.772.416	49,31%	3.594.759	3,81%
Between 18 and 24 years	4.766.818	44,19%	6.021.268	55,81%	10.788.086	11,42%
Between 25 and 34 years	4.673.131	35,67%	8.427.681	64,33%	13.100.812	13,87%
Between 35 and 39 years	2.239.529	35,32%	4.100.629	64,68%	6.340.158	6,71%
Between 40 and 44 years	2.324.931	37,13%	3.936.764	62,87%	6.261.695	6,63%
Between 45 and 49 years	2.132.931	39,22%	3.305.851	60,78%	5.438.782	5,76%
Between 50 and 54 years	1.993.979	40,93%	2.877.504	59,07%	4.871.483	5,16%
Between 55 and 59 years	1.903.973	42,64%	2.561.700	57,36%	4.465.673	4,73%
Between 60 and 64 years	1.634.622	44,83%	2.011.369	55,17%	3.645.991	3,86%
Older than 65 years	3.460.052	44,24%	4.360.550	55,76%	7.820.602	8,28%
Total	**41.300.810**	**43,74%**	**53.133.002**	**56,26%**	**94.433.812**	**100,00%**

Source: Adapted based on data from the Secretariat of Evaluation, Information Management and Single Registry – SAGICAD, 2023

Table 2 – Number of people in households by income group

Number of people registered in families with total monthly income	
Up to 1 minimum wage	79.919.137
Between 1 and 2 minimum wages	11.152.529
Between 2 and 3 minimum wages	2.379.065
Greater than 3 minimum wages	983.810

Source: Prepared by the authors based on data from the Secretariat of Evaluation, Information Management and Single Registry – SAGICAD, 2023.

Since 2022, the country has shown an improvement in unemployment rates compared to 2020 and 2021, but despite this, the data remain worrisome and challenge public policies. Currently, there are 9.4 million unemployed, 3.9 million discouraged (IBGE, 2023a), as well as more than 38 million

informal workers. The figures also point out that the most vulnerable groups, that is, the most affected are women, young people. brown and black.

In 2021, the number of young people who were unemployed and not studying was 12.7 million, corresponding to 25.8% of people aged 15 to 29 years, with 41.9% being black or brown women, 24.3% black or brown men, 20.5% white women and 12.5% white men (IBGE, 2022). In this context, it is possible to verify that the disprotections of youth are deepened, without the possibility of school development and acquisition of qualification and professional experience, compromising or restricting future job prospects. Regional inequalities are also visible, in Maranhão and Alagoas the percentages of young people without job and study opportunities were higher than 36%, while in Santa Catarina it was approximately 12% (IBGE, 2022).

The high rate of youth unemployment also occurs in other Latin American countries. In 2020, considering eight Latin American countries, the unemployment rate among adults was 8.3%, while among young people it was 24.5%, so it is increasingly necessary to expand policies related to the productive inclusion of young people (ECLAC, 2021).

The report "The Future of the World of Work for Brazilian Youth", organized by Itaú education and work (2023) pointed out the reality of young people today through five categories, where most of them are only working or without the opportunity to study and work:

Table 3 – Categories of young people in school-work transition in relation to educational and labor insertion

Categories	%
Young people only studying	15%
Studying and working	14%
Just working	39%
Studying and unemployed	5%
No opportunity to study and work	27%

Source: Prepared by the authors based on data from Itaú: Educação e Trabalho, 2023.

In addition to the impacts related to education and work, other issues affect young people such as mental health, relational conflicts, food insecurity, urban mobility, lack of access to culture, housing, public security and given the plurality that involves this segment it is necessary to implement policies that go beyond those strictly related to the world of work and build integrated actions between policies, that include the participation of the family and the community.

The United Nations - UN established in 2015, through agreement with its Member States, an Agenda from 2016 to 2030, with seventeen objectives and their respective goals to promote economic growth, inclusive and sustainable, with decent jobs for all people. The eighth objective presents, among other goals, the opportunity for full, productive employment and decent work for women, men, young people and people with disabilities. Also, equal pay for work of equivalent value and the substantial

reduction in the proportion of young people without employment, education and training (UNICEF, 2023).

3 THE SCHOOL AS A LOCUS OF DEMOCRACY, TRANSFORMATION AND EMANCIPATION

During the period of the pandemic, the virtual methodology of teaching in Education has expanded due to the impossibility of face-to-face activities. Strategy was initiated in private educational institutions and then expanded to public ones. The effectiveness of this work method was often challenged by the unequal reality among students, because families with greater vulnerabilities did not have equipment and access to the internet.

The school in many situations has a role of reproduction of capitalist forces, being hidden its potential for social transformation. Building a democratic space in the school requires commitment from professionals, students, families and the community. It needs openness to dialogue and reflections from the reality itself, so that the veiled discourses that mask the real intentions that ground and legitimize the hegemonic interests and capital, supported by neoliberalism (MÉSZÁROS, 2008) are overcome. As Freire (1980, p. 35) states, "man becomes the subject of a reflection on his situation, on his concrete environment."

The participation of the subjects can be consolidated in several instances, such as in the school activities themselves, in the councils, meetings of parents and student union, internally and beyond the walls of the school. There is a scenario of dismantling of the financing of politics, in which there are denialist discourses in relation to science, violent attacks on teachers, the attempt to criminalize them, difficulties of the reform of high school, commodification and militarization of education.

In the process of socio-historical evolution of education in Brazil, the authoritarian political culture was preserved (ALMEIDA, 2003). It is necessary mobilization and resistance to fight for social rights, for the right to a quality education, public and free, accessible to the entire population, so that it enables the new generations to appropriate the theoretical and practical instruments that encourage their active and critical participation in the struggle for the transformation of today's society, for a real democratization, in search of putting education at the service of full human emancipation (SAVIANI, 2017).

4 FINAL CONSIDERATIONS

The world of work has been undergoing significant changes, with the emergence of new work modalities and new professions that require professionals with differentiated skills. Unemployment, lack of professional experience and access to education expel young people from the world of work,

especially those who are in greater social vulnerability, contributing to the increase in social inequalities.

The living conditions of Brazilian youth have been affected by the harmful effects of the Covid-19 pandemic, be they social, sanitary, cultural and economic. Access to education, which should have as its objective the formation and development of young protagonists, with critical thoughts, with discovered and enhanced skills, was led to an emptying of the school environment and delay in the teaching-learning process, mainly due to the long period of withdrawal from face-to-face school activities and restricted access to technological and internet tools for remote monitoring.

Recent years have been marked by scant investments in education and significant cuts in the Ministry of Education - MEC and Ministry of Science and Technology - MCT. The expectation is that the current government will adopt measures that overcome the serious consequences that the pandemic has caused and the structural chasms that accompany Brazilian education. There is the perspective of recomposition of investments and transfers, restructuring of Ministries and encouragement of social participation through councils, committees and commissions.

Brazilian youth are hopeless about their future in the face of the lack of protection experienced and need the construction and strengthening of a quality education, anti-racist, that performs intersectoral affirmative actions to reduce school dropout, has technological infrastructure that ensures access to equipment and internet for teachers and students, is a proponent of integration with professional and technological education, and assertive inclusion policies in universities. The school must be a democratic space, of welcoming, reflection, stimulating criticality, resistance and struggle in search of effective access to rights, essentially the right to education.

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SEVEN
publicações acadêmicas

Mathematics education in professional and technological education: Mathematical Learning Support Program (PSAM)

Crossref doi
https://doi.org/10.56238/ptoketheeducati-054

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ABSTRACT
This research project investigates the difficulties of students in the discipline of mathematics in everyday school life and in the learning processes, in the light of the social contexts that constitute the school, the community and society. From there it proposes the construction of an educational product entitled Mathematical Learning Support Program: in learning, with the intention of subsidizing the treatment of the issue in the scope of Integrated High School. The research will be developed within the scope of the Graduate Program in Professional and Technological Education (ProfEPT / Ifal). The present study is justified by bringing a theme that can contribute to the work of teachers of Integrated High School, recognizing that mathematics is a very important discipline, not only for the curriculum but for life, they go through the learning processes and the school that receives these students, sometimes with the existing difficulties., then through an action-research , carried out with general data of teachers who act as teachers of especially in mathematics which is the objective. The data collection instruments adopted will be questionnaires, interviews, conversation circles and observations. The analysis of the data will be qualitative-quantitative, made in the light of the theoretical framework, which will involve knowledge necessary for the reception and teaching methodology for these students who arrive at the Institute with some difficulty, now existing, to teaching in general and to ETC, in particular. The results indicate that through a learning support program, students and teachers understand their place within the EPT, until then there is no systematic action in the course to qualify teachers and to work in the EPT.

Keywords: Integrated High School, EPT, Mathematics, Learning Support Program, Teacher Education.

1 INTRODUCTION

Professional and Technological Education (EPT) is an educational modality conceived by vocational education. In the historical path of its constitution, the split in Brazilian education is evident: for the children of the elite, a propedeutic education is intended for the continuity of studies at the higher level; for work, technical education, for immediate insertion in the world of work and life in society.

Duality is a pillar of class division in the capitalist system of production, since workers retain the privileges of the elite. Thus, this duality was generated by the differentiation between manual and structural work, separating those who think (plan) from those who perform the craft.

According to Manfredi (2002), the society segmented into classes and the institutionalized school education are structured in a dual way, since, in the beginning, it was intended to prepare the people of the ruling class, that is, there was a formation aimed at those who exercised power, and another for the executors of the work, with the primary purpose of preparing "for the exercise of professions.

Considering the evolution of society and the need to form an active, critical, conscious and prepared subject for the challenges of life in society, education assumes the role of promoting the construction of these competencies, aiming at the full development of its learner. Thus, this article aims to present a program named as: Mathematical Learning Support Program, which allows us to reflect on how these students arrive at the Federal Institute of Alagoas and how this influences the learning process, considering the context of Integrated High School in Professional and Technological Education. This reflection is part of the research carried out at the Master's level in the Graduate Program in Professional and Technological Education – ProfEPT. We start from the assumption that young people arrive with some difficulties of some basic themes of elementary school, but must also take responsibility for their integral development, recognizing and setting in motion different dimensions of the human experience to which the program plans to remedy some difficulties in which these students appear. From this premise, the text is organized in order to present, at first, a contextualization that goes through the history of the Federal Institutes and their founding conceptual bases, discussing the meaning of integral and omnilateral education for different authors (Marx, Frigotto, Ramos and Ciavatta). In a second moment, it goes through works of important authors who thought about the role of mathematics in the learning process, a debate that leads us to reflect on the importance of the treatment of this human dimension when we propose the realization of integral education. We intend, therefore, to contribute so that future research can be implemented in order to deepen the studies on the theme, whose results will be used to re-signify the teaching and learning processes, with a view to the integral development of students.

2 BRIEF HISTORICAL CONTEXTUALIZATION OF PROFESSIONAL AND TECHNOLOGICAL EDUCATION IN BRAZIL

The Vocational Technical Education, in the current EPT conjuncture, is so titled by virtue of Law 9394/96 (LDB). Since then, it has undergone profound resignifications, during the twentieth century, in the 1990s and, above all, in the 2000s. There was a motion for the training of the worker in technical schools in a merely fragmented and technical way; and another education of a propaedeutic character, reserved for the children of the bourgeoisie. However, with the creation of the current LDB and the Federal Institutes of Education, there is a proposal to overcome the purely technical model.

In this legislation, there are indications of a formation in the critical and transformative perspective, with a context of integration between technical education and high school, as well as curricular reform in the other levels of this modality of education. In addition, propaedeutic education for the children of the bourgeoisie, which directed them to higher education and, after this training, to the functions of management and command; while the workers performed routine and repetitive tasks determined by this bourgeoisie.

Based on the assumption of RAMOS (2004), MOURA (2007); CIAVATA and RAMOS (2012), the current LDB, in terms of EPT, is conceived as a specific educational process, not necessarily linked to the stages of schooling, focused on the permanent development of skills for productive life" By the way, RAMOS (2004, p. 63) points out that in this same education proposal, "[...] The notion of competence has taken center stage in the curricular guidelines." Marx (1979) goes further, being interpreted by MANACORDA (2007) and discussed by Saviani (2012), when they affirm that education and work are not a natural process, disjointed from man, but is ontological, a process of humanization.

> [...] Because it has a historical character, work thus creates the material elements for the development of a rich individuality, which is both omnilateral in its production and in its consumption, and work does not appear as work but as the full development of the activity itself, in which the natural need disappears in its immediate form, because in its place a historically developed form has been placed (MANACORDA, 2007, p. 68).

In this way, in the EPT, training is concerned with work in the productive system, with the maintenance of capitalism. However, we defend that its proposal of formation can assign a fundamental role in the life of the workers, from an education that has emancipatory bases and that overcomes the fragilities of its conception.

In this context, work and education reflect human action on nature, the social relations of production, historical and social human development, in order to achieve qualitative leaps for human formation. The integral formation, promulgated by Marx, also inscribes the first stage of a whole society traced in justice, with equal opportunities, where work and education would be definitively merged in a single key of social transformation. Marx (1989) believed that the germ of the education of the future, producer of fully developed men through the elevation of social production, had an important place in the factory system.

According to Gramsci, the relationship between work and education is historical-social, since it was formed by each society until it reached the form in which it is based today. The latter, like Marx, also wanted a society in which the contexts of life were egalitarian and that there was no longer exploitation-subordination between classes. Thus, in reformulating Marx's thought, Gramsci brought up the educational question and idealized the unitary school, in which everyone, without exception,

would have the right to culture, parallel to manual labor. The school, then, would be an essential means for the construction of a society that is based on work as an educational principle.

Educating for a critical/reflective understanding of/in the world and for the construction of emancipation requires an educational process that provides individuals from their individual singularities to collective issues, the understanding of their emotional conditions, life, schooling, work and the relationships that can be built in their daily lives.

3 THE ROLE OF MATHEMATICS AND ITS IMPORTANCE IN THE LEARNING PROCESS

The importance of the study of the exact sciences is a consensus, not only in Brazil, but throughout the world, especially in the most technologically advanced nations, and mathematics is conceptualized as a general basis for practically all technologies. On the other hand, it is also evident the difficulty in developing mathematical knowledge in young people, especially in the phases that correspond, in Brazil, to elementary and secondary education.

Technical and vocational education, whether at secondary or higher level, is the basis for the technological development of a country, generating human resources, not only capable of maintaining a level of industrialization, but also of generating important technological innovations in the most diverse areas of development of a society.

Technical education is a complement to the regular, being the elementary school a prerequisite for entry, while high school is a prerequisite for its completion, there are also the so-called technological courses of higher level, for which high school becomes a prerequisite already at admission, that is, the student must have completed elementary school to be able to start the technical course, And at the end of this must have completed high school to be able to obtain the diploma of the technician, while the technological courses are of higher level, and for this it is necessary that the incoming student has already completed high school. According to the portal of the Ministry of Education (MEC), we have the following modalities planned:

> "The Technical Courses can be developed in conjunction with the High School or be subsequent to it. The articulated form can occur integrated with high school, for those students who have completed elementary school, or concomitant with it, for students who will start or are attending high school. The offer can be either in the same school or in different educational institutions. It can also be developed in a regime of intercomplementarity, that is, concomitant in form and integrated into a joint pedagogical project. The subsequent form is intended for those who have already completed high school" (BRASIL, 2018).

In his article "Why Is Mathematics Taught?" (D'AMBRÓSIO, 2000), D'Ambrósio defends the use of mathematical modeling, and that it develops as learning requires, always focusing on the problem-solving part. The modeling to which D'Ambrósio refers, has little relation to that discussed in the academy, it is about practical models of everyday life. He advocates the use, for example, of data relating to the student's journey from home to school, that the student imagine the graphical

representation of this route, measure the distance travelled, measure the time needed and even, finally, can determine its average speed.

Mathematics Education presents itself as a complex area of action, because it brings, in a structural way, in its constitutive core, Mathematics and Education with its specificities. These specificities are revealed in the practical activities based on these sciences, such as those of teaching, or application of knowledge, as well as with regard to the process of knowledge production itself.

Before entering into reflective analyses on philosophical aspects that are imposed on the didactic-pedagogical performance and the research carried out in the area of Mathematics Education, we dwell on the ontological, epistemological and axiological issues that, historically, have inhabited the regions of Mathematics and Education.

We are simplifying and talking only about this trio, not because we do not consider the sociocultural aspects important for the understanding of Mathematics Education, but because we understand that when we consider specific issues of ontological studies, which aim at the study of reality, in an appropriate way, those aspects are present.

This is the central idea of this article: to present ways of seeing Mathematics, Education and Mathematics Education and to alert to the complexity of pedagogical and investigative activities that call for a search for understanding the ontological, epistemological and axiological aspects of their practice and the knowledge they produce.

This project aims to investigate the feasibility of using a course for the permanence program and learning support as a tool to improve the teaching and learning process in the practical classes of the mathematics disciplines of the Integral High School of the Federa Institute of Alagoas.

4 METHODOLOGY (OR MATERIALS AND METHODS)

The present study is assumed to be of the action-research type, characterized by a qualitative and quantitative approach with a collaborative bias. This type of investigation is described as a type of "social research that is conceived and carried out in close association with an action or with the resolution of a collective problem and in which researchers and participants representative of the situation of the reality to be investigated are involved in a cooperative and participatory way" (THIOLLENT, 2005).

The present study is assumed to be of the action-research type, characterized by a qualitative and quantitative approach with a collaborative bias. This type of investigation is described as a type of "social research that is conceived and carried out in close association with an action or with the resolution of a collective problem and in which researchers and participants representative of the situation of the reality to be investigated are involved in a cooperative and participatory way" (THIOLLENT, 2005).

The research proposes to fulfill the following steps: i) The research is qualitative and quantitative, because it will account for the participation, that is, the quantity of participants, and will also say what are the difficulties of each participant in a real and existing way, giving quality and credits to the research in its essence; ii) statistical analysis, there will be graphs accounted for using software programs, such as Excel; iii) variables that will be analyzed and/or correlated for the appropriate organization for the course and the Learning Support Program; iv) The strategy used will be the extraction of information from each participant, not for mere data, but for didactic purposes, also during the interviews, conversation circles and dynamics, photographs will be taken with the researcher's own cell phone camera which is a smartphone Iphone model 11 we will make some records of the moments and the whole event of the research with the participants, for the purpose of remedying the difficulties, now existing, following the discourse analysis and also content analysis, grounded theory, narrative analysis, collective discourse analysis, literature review, v) Evaluation of the Educational Product made in conjunction with all those involved, in addition to the feedbacks of each stage completed, preparation of the research project and submission to the Research Ethics Committee (CEP) of IFAL; Following after approval by the CEP, interventions will begin in the class of the discipline of "mathematics" within the learning support program that will take place in the classes of the 1st years, as mentioned above, in how to emphasize the importance of the participation of the target audience in the research procedures. After this appeal, the ICF and TALE will be proposed (if there is a minor) and questionnaires will be applied to identify the awareness of students and teachers about the importance of mathematics in this new proposal, especially in the context of education, with the aim of improving proposals and seeking new ideas that add to the perspective of the research.

If there is interest on the part of the students, this course will be built with the help of the students, in a demonstration of affirmation that this research has a collaborative character, discussing the educational reality in which they are inserted and defining, together with the researcher, the implementation of changes and analysis of problems, sharing the responsibility of decision-making and its developments, Always in a perspective of continuous improvement.

It is intended to work with a sample universe with 2 teachers who teach the discipline of mathematics and 60 students, from the two classes of the first years, that is, we will work with 30 students from class A and thirty students from class B, entering in the first semester of 2023 of the Integrated Technical Course of Informatics, totaling 62 participants.

In a later phase, evaluative questionnaires will be applied to teachers and students in order to analyze the application of the practice of the use of pertinent subjects within the context of the classes.

Following Bardin (2011), this analysis will be structured in such a way that the information is gathered and grouped into themes and categories, observing its different phases, whose organization will take place in three moments: pre-analysis, exploration of the material and treatment and

interpretation of the results.

The data and materials related to the research, such as questionnaires, image and audio data, will be stored for a period of 5 years after the end of the research, ensuring the proper integrity of the information and the confidentiality of the data, being used only for the purposes of this project, after this period the researcher will destroy all the data that were obtained through this research.

As described in the execution schedule, already at the end of the activities and research, the educational product will be evaluated, by managers, teachers and students and by researchers before its execution, to better shape it according to the realistic look of all mutual parties, so that there is a collective approval and that later has the acceptance of all, from the perspective of a collaborative bias.

At the end of the research, it is intended to develop an Educational Product of the course type in the format of e-book within the Mathematical Learning Support Program. This will serve as a didactic tool for application in the classes of the discipline of mathematics, of the Integrated Technical Course of Informatics that make up the Integrated High School. The product will be evaluated by the researchers and by all participants at the end of the research phase, so it is intended together to give the approval endorsement and we will have all possible feedback from all parties involved. It is worth mentioning that some intercurrences may occur throughout the research, such as: increase or decrease in the number of participants; reformulation of questions of the questionnaires, external facts beyond the will of those involved that prevent or hinder greater participation, choice of classes among others, in this case, any change that needs to occur in the methodology used in the course of the research will be reported to the Research Ethics Committee via the Brazil Platform, according to item III of Art. 28 of Resolution CNS 510/2016.

5 RESULTS AND DISCUSSION

The results and discussions of this study are incipient, considering that it is still running, but we highlight the importance of the research, considering that at present, the need for teaching practices that aim at the intellectual development of students has been discussed, in relation not only to mathematics, but also and at an equal level of priority, strategies that promote the acquisition of knowledge that favors the condition of being human, as a complex and integral being. As a human formation, what is intended is to guarantee young people the right to a complete education for reading the world and for acting as a citizen worthily integrated into their political society (CIAVATTA, 2014, p. 85), which conceives education as a social totality, imbricated in historical mediations that are concretized in the educational processes.

Given the above, we understand education as a liberating practice, which goes beyond a formation that prepares young people for the job market. Education needs to have a more comprehensive look with those who are involved in the process, this subject should be considered in

its entirety, its life history, its knowledge, since Professional and Technological Education aims to form citizens with intellectual autonomy, having and understanding the power of decision to exercise their choices, able to create and interact with the world on which it operates. In view of the aspects mentioned, the present work, in the search to contribute to reflection, with the educational community.

6 FINAL CONSIDERATIONS

In a practical analysis, it is important to note that disregarding the teaching of mathematics and its importance in the teaching-learning process can produce frustrating interventions from the pedagogical point of view, because to disregard the individual in his concreteness and completeness is to close his eyes to the real problems that the student may face during his or her journey. Provide educational spaces-times and promote learning processes so that the subjects recognize their difficulties in relation to the discipline and are helped by some method, equalizing all aspects and contributing to an omnilateral formation.

In this context, the challenge of the educator is to incorporate these multiple perspectives on the Brazilian "youth" in the pedagogical practice of schools, paying attention to the practices that occur outside the educational institution. It is also necessary to invest in continuing education of teachers, discuss, understand and research on the practice, to enable a closer look at the school community and the adoption of new pedagogical actions.

It is in this socio-political and cultural economic context that one understands the meaning of the reflection on the function of the institute and the teacher in the education of these students that may arrive with difficulties and they need to be identified, observed and possibly remedied.

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SEVEN
publicações acadêmicas

Management skills: The importance of academic training for entrepreneurs in micro, small and medium-sized enterprises

Crossref doi
https://doi.org/10.56238/ptoketheeducati-055

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ABSTRACT
The objective of this study was to verify the correlation between academic training and the success of entrepreneurs and managers in the administration of micro, small, and medium-sized enterprises (SMEs), seeking to highlight the skills that influence the positive results of these enterprises. To theoretically support the study, bibliographical research was carried out on education and managerial skills (knowledge, skills, and attitudes) necessary for entrepreneurs and managers to manage their businesses. A survey was applied to a random sample stratified by sectors (Construction, Industry, Commerce, Services, Agriculture) and size made up of 391 companies active in the state of São Paulo, Brazil, with a confidence margin of 95%, collecting the perception of entrepreneurs or senior executives, to verify the importance they attach to academic training and managerial skills in conducting and continuing their businesses. Among the results, when analyzing the average ($p = 0.538$), it was shown that university education alone is not considered a determining factor for the success of SMEs. However, the general assessment allows us to conclude that the maintenance of micro, small, and medium-sized companies in the market, their progress and evolution are related to the level of education and development of skills of entrepreneurs and managers involved in business administration, pointing out They emphasize that adequate training and continuing education processes focused on managerial skills are factors that positively influence the success of companies. A limitation of the study is the geographical limitation to a specific region of Brazil, for which new studies are suggested in other regions of the country.

Keywords: Education, University, Company, Competence, SMEs.

1 INTRODUCTION

Education is of fundamental importance to improve the human development index of a nation and, therefore, to better understand how the process of rise and fall of companies is, a closer look at this sector is necessary. Therefore, the education that administrators have received in their university training has a direct and substantial impact on the sustainability and success of small and medium-sized businesses.

Education as a general form has a great influence on society and especially on human beings and is a way of identifying and promoting people in all social media. In this way, the University must

promote the human and professional education of its students, preparing them for their responsible and constructive role in society and further, promoting interaction with society, through scientific, technological, artistic, and cultural dissemination and community development, in tune with social demands.

A company needs people prepared with skills, abilities, and attitudes to be able to face the challenges that the contemporary world presents, with constant changes and increasingly strong globalization in all areas.

In this context, this research, whose results were statistically analyzed, aimed to study the relationship between professional development and educational training of entrepreneurs and managers of micro, small, and medium-sized companies established in the state of São Paulo, Brazil.

2 THEORETICAL REFERENCE

According to Drucker (2018), success cannot be permanent. Companies are human creations that lack real permanence, that must survive beyond the life of their founder, contributing to the economy and society. The author concludes by saying that perpetuating the company's basic task of entrepreneurship and the ability to achieve it may well be the ultimate test for its management.

The leaders, administrators, and managers of small and medium-sized companies are affected by the limitations of this type of organization in an increasingly competitive business environment. They need to overcome their resource limitations and innovate sustainably and adopt possible learning mechanisms and actions, in the reality of SMEs. Bankruptcy in these types of companies is a real risk and is not limited to business in Brazil. On the other hand, the reasons for the success of most organizations, in general, are commonly related to the ability of these companies, in the person of their administrators, to innovate in the management process, in the use of modern technologies, adding skills and new knowledge or recombining existing ones to go beyond what the market already offers (Tavares et al., 2018).

It should be noted that the training of managers within the small business has proven to acquire new skills and creates alternatives for the individual in terms of career and life. Skills acquired by the manager to facilitate the execution of their tasks enrich their understanding of life: people with the knowledge and skills developed become self-sufficient and contribute to the success of the business (Pelissari; Gonzalez; Vanalle, 2007).

Degen (2005) pointed out that lack of knowledge and management, marketing, financial and technological skills are the main reasons for business failure. These are the most important reasons: lack of business experience; insufficient knowledge of the market; the availability of capital to start the business; product quality problems; Incorrect location; management errors in business development; excessive use of fixed assets; delinquent creditors; marketing and sales inefficiency;

excessive centralization of the management of the employer; poorly planned growth; wrong business attitude to the company; Error in the evaluation of the competitive reaction; rapid obsolescence of products; incorrect sales approach; product production problems; Pick a bad time to start the project; planning errors or failure of the company, such as projected sales, costs, and cash flow.

Barringer et al. (2005) maintain that entrepreneurs with a little experience in the sector come out against others without experience. Like the authors themselves, this is because the insights gained help reduce risks, and because access to the network of relationships creates an advantage.

Motta, Pimenta, and Tavares (2006, p. 9) indicate that [...] in the world of administration the separation between academic and professional practice takes on an even more serious and paradoxical aspect. Because the administration is essentially practical and, when it is theorized, it must serve the improvement of the practice. In the context of the global crisis in which a professional is required who understands the company as a whole and is conducive to change.

Today we know more than demanding results you need to create a healthy and stimulating environment for people to produce more and better. This role goes directly through the manager's ability to establish positive relationships with his subordinates and foster team spirit. Chér (1990) attributes the mortality of small businesses to the following factors:

a) Lack of experience in the business sector: lack of information and prior knowledge leads to a lack of managerial competence, lack of strength, and inability to take risks.

b) The sandwich effect: companies buy from large suppliers and sell to large customers and, therefore, prices end up being imposed both by the supplier of the raw material and by the buyers of the final product. In this situation, the company ends up being "devoured".

c) Tax legislation.

d) The low volume of credit and financing.

e) Unqualified labor.

f) Excessive attention to personal goals.

g) Obsolete methods, team, and company spirit.

h) Lack of communication between partners, employees, suppliers, and customers.

Amatucci (2000) emphasizes that the new professional should have increased powers, encompassing interdisciplinary, leadership, technical and political skills, and understanding of the company, in addition to maintaining ethical professionalism. He takes an active role in organizations, increasingly disputed.

For Bahry and Tolfo (2004, p.42) "the word competence has given rise to different meanings in the world of work, focusing more on people (knowledge, skills, and attitudes) and others on functions (results)". Also recalling that the development of management skills seeks to align with the broader objective of making organizations better prepared to face current and future challenges,

especially small ones, which are more susceptible to change. Since competition effectively only existed at the time of adding economic value to the organization and the social value of the individual (Resende, 2000; Sveiby, 1998).

Culturally, the small company exercises the administration based on the figure of its owner-founder (Pelissari, 2007). Still, pelissari (2002) also points out that the success of a small company is strictly on the management capacity of its administrator and the creativity to establish norms and create resources to intensify the strategy and the competitive position of the company.

For Barone (1998), the search for training becomes an increasingly differentiated element of quality professionals, but the professionals who stand out are those who, in addition to the training of seeking information, that is, the learning process during all life traces.

Zabot e Silva (2002, p.89) states that "All these factors lead to the need for a change in the profile of administrators, and it is worth pointing out the fundamental role that universities play in their education." Managers must have a minimum of preparation to face the intellectual capital professional, they must be stoned for that.

For Dessler (2003, p.152) "Many organizations have offered seminars and conferences aimed at development managers (...) that are provided by universities and high schools"

Professional training in today's university: from education to self-education in terms of autonomy, we defend that it concerns a level of personality development, which supposes, first, a maturity in the intentionality of the subject in his personal formation and professional, which transcends education to self-education.

Coopers & Lybrand (1997) state that any process of change only occurs when the way of thinking and acting of the members of the organization changes.

A well-known concept of competence was developed by Boyatzis (1982), which is a prominent characteristic of a person that is coincidentally related to good or excellent performance in a specific job in a specific organization. According to Parry (1996), competence refers to the relationship between the knowledge, skills, and attitudes that affect most of a task (role or responsibility) and is directly related to performance that can be measured against well-accepted parameters and can be improved through training and development. Fandt (1994) addresses competencies that are linked to social skills, and include "Learning" and "Problem Solving".

There is also a constant debate on the impact of qualification and education in labor relations, especially when qualification and training of a professional nature become more difficult to define their concepts.

The great challenge of Manfredi (1998), is to reconstruct and define mainly concepts and meanings to the topics mentioned so far since they are of great importance for labor relations in the contemporary era.

Perrenoud, (2000, p. 15) states that competence is the ability to mobilize various cognitive resources to face different situations based on four aspects:

a) competencies are not themselves knowledge or attitudes, but they mobilize, integrate, and orchestrate these resources;

b) this mobilization is only relevant in a situation, each situation is, even if it can be treated analogously to another, they are already found;

c) the exercise of competence involves complex mental operations involving thought schemes to determine (consciously and quickly) and maintain (effectively) an action relatively adapted to the situation;

the professional skills built-in training, but also the taste of a teacher's daily navigation, one work situation to another.

Bergamini (2006) deals with the issue of competency leaders and managers and makes an interesting distinction between the role of management and the role of business leaders. According to the author, the administrator or manager is the one that is the most analytical, structured, and organized side, it is the professional that guarantees the identity of the organization over time. But the leader is a qualified professional to change the status quo of the organization and is characterized as a "creator's vision", flexible work, directly with the individual capabilities of his subordinates. "Leaders, therefore, devote much of their attention to people and not to structures or systems.

The same author points out that some people do better in administrative positions, while others feel more comfortable in positions that require their skills as leaders. "The great challenge before us for organizations today is to find out what is the main difference that identifies a person to any position." (BERGAMINI, 2006, p. 65).

Le Boterf (2003) establishes that each specific professional situation requires personal skills to be acquired and that these provisions require the ability to analyze and diagnose, a good knowledge of the procedures and information devices, playability, and decision-making. The author complements by making a distinction between worker and professional: "The worker is expected to carry out training to perform a job; he is expected to put into practice professional skills to manage a professional situation. "(Le Boterf, 2003, p.25).

Still, Robbins (2002) highlights the need to become an effective manager, so it is necessary to develop managerial skills. Those competencies within small businesses are organized into two groups: knowledge and appropriate skills. Knowledge is so comprehensive. Appropriate skills apply to understanding, and, for the most part, the knowledge base is derived from management functions: planning, organizing, leading, and controlling (Robbins, 2002).

The transition from the industrial society to the knowledge society was responsible for the discomfort that has never learned enough, so the contradictions, inconsistencies, dilemmas, and

polarities that were previously avoided, now, should be encouraged, and exploited, so from the differences, a collective, deep, and qualified position can be consolidated (Takeuchi; Nonaka, 2010).

The learning process consists of behavior change motivated by the incorporation of new habits, attitudes, knowledge, and skills (França, 2010). This process must be structured on the principle of information exchange. Senge (2010) considers that it is essential that there is a relationship of exchange of experiences so that knowledge circulates in the environment of the organization and allows group learning. Also adds Bitencourt (2004), the form and frequency of the interactions should be systematized, so that at a given moment, they happen spontaneously. The challenge of making the organization a learning center seems immense, but "people are enthusiastic about knowledge [...] and its development is a natural process [...] since management allows and encourages [...] People are curious and naturally willing to learn and improve their skills "(Argyris, 2000, p. 84).

Learning, as a complex process, requires an epistemological analysis that facilitates focusing on the matter from the integrity of its determinants.

Organizational learning is a long-term development process, a tool for the formation and development of the subsystem, warns Chiavenato (2009). But it should be noted that knowledge management is a "commitment to continuous development" and unrestricted access to a given function or difficulty (Garvin, 2000, p. 51). In addition, attention must be paid to the efficiency of the forms of communication and interaction between people, because they must be clear, accessible, and efficient (TAKEUCHI; Nonaka, 2010).

According to the ideas of Skinner (2005), it can be said that learning is a change in the probability of response, and must specify the conditions in which it occurs. It is important to point out that the same author also assures that the execution of a behavior is essential, but not what affirms the existence of learning.

Trying to clarify his idea, Skinner (1972, p.4) states that "There are three variables that make up the so-called reinforcement contingencies so that learning is generated:

(1) the time the behavior occurs,

(2) own behavior and,

(3) the consequences of behavior."

Learning for Vygotsky goes through a process of internalization of concepts. This "consists of the internal reconstruction of an external operation" (Vygotsky, 2007, p. 56). The author uses in all his work, concepts such as: cognition, mind, internal processes, higher psychological functions, and the intrapersonal process while the mental state, to explain the acquisition of learning.

Companies have been adhering to the great technological advance in all segments, and this requires qualified and competent labor.

When implemented in organizations in the last two decades of the last century, the new forms of production and the different models of work replacing the Taylorist and Fordist models raised numerous questions about the skills and qualifications of workers. Instead of a worker capable of understanding and executing standards, the new production systems began to demand initiative, flexibility, and self-management (Hirata, 1994).

In this context of the new requirements for the knowledge of workers, qualification seems to lose space in some academic and business areas for competence. These new requirements and the conceptual shift gave rise to discussions in several areas of knowledge: sociology (Ropé; Tanguy, 1997; Zarafian, 1998), education (Manfredi, 1999; Perrenoud, 1999), labor economics (Leite, 1994; Paiva, 1997).) and administration (Dutra, 2004; Fleury; Fleury, 2001; Ruas; Antonello; Boff, 2005).

For Ramos (2001), the notion of competence does not replace the concept of qualification with which it disputes space in the theoretical-empirical ordering of labor relations. This author uses the scheme offered by Schwartz (1995) to defend this thesis.

In this scheme, the qualification is presented in its three dimensions: conceptual, social, and experimental.

The conceptual dimension defines qualification as a function of registering formalized theoretical concepts and training processes, associating it with the value of diplomas and certificates. The diplomas legitimize the knowledge associated with them, guaranteeing status and remuneration to their holders.

The social dimension places qualification within the scope of the social relations that are established between the contents of the activities and their social recognition, referring them to collective classification grids. The social dimension is responsible for inserting the worker in a socio-historical context with others who share the same professional identity and category.

The relationship established between the conceptual records of activities formalized by diplomas and socially recognized titles and professional insertion made qualification a code of communication between professional categories and employers.

Rules for access and permanence in employment, career, and remuneration were historically built based on these codes.

The experimental dimension is related to the actual content of the work, to which the conceptual records and the tacit knowledge put into play in carrying out the work are related. In this dimension, the qualification of workers evolves due to the permanent accumulation of concrete work experiences and the acquisition of new knowledge and skills, through formal and informal means.

This evolution is also conditioned to the technical changes incorporated in the qualifications prescribed for the job. This incorporation is not always explicit but composes the flow of knowledge

that exists in carrying out the activities and is part of the complexity of social relations that characterize qualification as a synthesis between objective and subjective working conditions.

For Ramos (2001), competence does not replace the concept of qualification. There is a conceptual shift, as competence both reinforces and denies the existing dimensions in the concept of qualification. This displacement can cause losses of workers' historical conquests. To understand this shift, it is necessary to look at the two concepts in question. Although they are polysemic, in this work the hegemonic meanings given to the terms are considered. This operation aims to facilitate the understanding of the discussions promoted within the areas of knowledge mentioned above.

Professional qualification here is understood in two complementary approaches: the first, within the area of production and organization of work, which highlights qualification as a social relationship. Associated with the Welfare State, it emerged in response to the absence of social regulations in labor relations. Qualification, in this case, is understood in a context of conflict and negotiation between the different interests of capital and work. In this context, workers strive for their qualifications to be officially recognized within the job classification systems, to obtain social and financial recognition. The second, a quantitative approach, conceives qualification as a formal qualification, using it as an index of socioeconomic development, covering both the population's average schooling rates and the average length of time spent in school (Paiva, 1997).

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3 METHODOLOGY

The study had as its main objective the description of the characteristics of the academic formation and the competencies, skills, and attitudes of the entrepreneurs in the State of São Paulo, and to collect the information the necessary technique was used the collection of standardized data collection The data was understood through the field survey, through the application of a pre-established questionnaire, and systematic observation during the interviews that were carried out, as well as statistical data already made.

According to Gil (2017), descriptive research is the one whose main objective is the description of the characteristics of certain populations or phenomena. One of its characteristics is the use of conventional data collection techniques, such as questionnaires and systematic observation. They also stand out in the research whose objective was to describe the characteristics of the group's age, sex, origin, level of education, and state of physical and mental health, as well as the description of a process in an organization, the study of the level of entities care, survey opinions, attitudes, and beliefs of the population. Gil (2019, p.42) considers that there is a dynamic relationship between the real world and the true subject, that is, an indissoluble link between the objective world and the subject's subjectivity that cannot be translated into numbers. The interpretation of phenomena and the assignment of basic meanings are in the process of qualitative research. It does not require the use of statistical methods and techniques. The natural setting is the direct source for data collection and the researcher is the key instrument. It is descriptive. Researchers tend to analyze their data inductively. The process and its meaning are the focus points, a dynamic relationship with the real world.

In quantitative research, following the teachings of Richardson (2017), this method is characterized by using quantification both in data collection methods and in the treatment of these through statistical techniques, from the simplest to the most complex. more complex.

Qualitative variables were presented by frequencies and percentages. The quantitative variables were presented by their means, medians, standard deviation, and minimum and maximum values. The association between categorical variables was performed by Pearson's chi-square test or Fisher's exact

test according to the criteria of expected frequencies, according to Pagano and Gauvreau (2004). In the case of ordinal type variables, Kendall's tau test was performed according to Sheskin (2004).

Principal component analysis was used for the questions related to the characteristics of the administrators, using the varimax rotation method, according to Vieira and Ribas (2011). In addition, the internal consistency of the data was evaluated through Cronbach's alpha, according to Cronbach (1951). The level of significance adopted was 5% and the statistical analyzes were performed in the statistical software PASW Statistics 18 (SPSS for Windows v.18).

4 DATA ANALYSIS

The administrators responsible for the Small and Medium Enterprises (PYMES) of the State of São Paulo were invited to participate in this research. During the period from September 2015 to May 2016, the surveys were sent by e-mail to the managers of these companies. At the end of the study, 416 people sent their answers, corresponding to 371 companies. The calculated size is from 391 to 430 respondents (sample II) considering a margin of error of 5%.

The characteristics of the SMEs are presented in Table 1. With billing up to R$ 360,000, it indicates that there are 214 companies and with a participation of 58%, it is noted that the majority have low annual billing. We consider that the participation of the Services and Commerce segments are the most participative with a representation of 84.1% and in a number of companies that are 312 of a total of 371 companies represents 84%.

Table 1 - Characteristics of the SMEs in the study.

foundation period	**n. (%)**	***Economic sector***	**n. (%)**
1902-1950	7 (1,9%)	Services	226 (60,9%)
1951-1970	13 (3,5%)	Trade	86 (23,2%)
1971-1980	23 (6,2%)	Agricultural	4 (1,1%)
1981-1990	46 (12,4%)	Industry	39 (10,5%)
1991-2000	90 (24,3%)	Building	16 (4,3%)
2001-2010	102 (27,5%)	**Number of employees**	**n. (%)**
2011-2016	90 (24,3%)	1-9 employees	222 (59,8%)
Billing in the last year (R$)	**n. (%)**	10-24 employees	53 (14,3%)
R$ 10.000 – R$ 60.000	95 (25,6%)	25-50 employees	33 (8,9%)
R$ 61.000 – R$ 260.000	79 (21,3%)	More than 50 employees	63 (17,0%)
R$ 261.000 – R$ 360.000	40 (10,8%)	Average (SD)	41,2 (93,4%)
R$ 361.000 – R$ 1.000.000	55 (14,8%)	Median (min-max)	6 (1-490%)
R$ 1.000.001 – R$ 3.600.000	102 (27,5%)		

Source: Research (SD: standard deviation; min: minimum value; max.: maximum value).

About the number of employees, it is noteworthy that 59.8% of the companies employ from 1 to 9 employees, which means that the vast majority are small companies, and the average (standard deviation) points to 41.2 companies with a percentage of 93.4%.

Table 2 - Characteristics of the administrators of the SMEs in the study.

Gender	**n. (%)**	***Position/Function***	**n. (%)**
Male	255 (61,3%)	Director	77 (18,5%)
Female	161 (38,7%)	Manager	94 (22,6%)
Age group (in years)	**n. (%)**	Partner	124 (29,8%)
≤30 years	60 (14,4%)	Owner	97 (23,3%)
31-40 years	115 (27,6%)	other function	24 (5,8%)
41-50 years	88 (21,2%)	time in the company	***Years (%)***
51-60 years	92 (22,1%)	Average (SD)	10,7 (9,8%)
≥61 years	61 (14,7%)	Median (min-max)	8 (1-46%)
Time in office (in years)	**n. (%)**	Have you ever started and closed a business?	**n. (%)**
Average (SD)	10,4 (9,5%)	Never	254 (61,1%)
Median (min-max)	7 (0-41%)	One time	72 (17,3%)
Time of experience in the sector	***Years (%)***	Twice	40 (9,6%)
Average (SD)	17,8 (13,0%)	Three times	27 (6,5%)
Median (min-max)	15 (1-60%)	more than three times	23 (5,5%)

Source: Research (SD: standard deviation; min: minimum value; max.: maximum value).

The characteristics of the administrators of the SMEs of São Paulo point to a higher percentage of the Male Gender 61.3% against 38.7% of the Female Gender, and the age up to 50 years with 63.2%, which shows that they are very young to consider that up to 40 years represents 40%. As a function/position, it was revealed that 53.1% are partners or owners and since the average (standard deviation) points to almost 10 years (9.8), the time in the company, which is quite significant, and the average (standard deviation) of 9.5 years in the time in the position, which shows a certain longevity, and the average (standard deviation) of Time of experience in the sector shows that they are 13 years, which denotes a good experience, interesting observation is how much to the entrepreneurial spirit 61.1% never had the experience of being an entrepreneur, and 38.9% had several experiences in starting and closing a business.

Table 3 - Professional training of administrators of SMEs

Career	**n. (%)**	***Post-graduate course***	**n. (%)**
Management	168 (40,4%)	no course	222 (80,1%)
Accounting	20 (4,8%)	MBA	5 (1,8%)
Law	16 (3,8%)	master's degree	38 (13,7%)
Engineering	38 (9,1%)	PhD	7 (2,5%)
Psychology	14 (3,4%)	Postdoc	5 (1,8%)
Pedagogy	25 (6,0%)		
odontology	26 (6,2%)		
information technology	13 (3,1%)		
Economy	9 (2,2%)		
Technologist	32 (7,7%)		
Another university course	55 (13,2%)		

Source: Research (277 interviewees finished their university career).

The university education of administrators is a factor in professional development and success in the operation, growth, and permanence of SMEs as presented in Table 3. No significant association

was observed between the conclusion of the university course and the year of foundation of the company (p = 0.538) as a success factor.

University education is constituted as a determining factor for the operation, growth, and permanence of SMEs as presented in Table 5. A significant relationship was also not observed between the conclusion of the university course and the year of the foundation of the company (p = 0.538) as a determinant of longevity.

In Table 5, an important observation is that in the last 15 years, those who have completed a university education are 153, which represents 50.6%, versus 149, which represents 49.4%, with a complete education in the last century, and in Table 3 the percentage of 43.6% in postgraduate studies in the last 15 years.

The association between the training of SME managers and the company's operating time is presented in Table 2.

It is observed that from 1902 to 2016 there was always a growing number of administrators with a completed course (302) about those who did not complete the course (114), according to Table 4. However, it is possible to observe a higher percentage of administrators whose companies were founded in the period from 2011 to 2016 (Table 4).

Table 4 - Association between the professional training of administrators and the company's operating time.

Year of foundation	**University course**		**Total**	**Value of *p*[1]**
	Not Completed	**Completed**		
	n = 114	**n = 302**	**n = 416**	
	n (%)	**n (%)**		
Period				0,538
1902-1950	0	7 (2,3%)	7	
1951-1970	5 (4,4%)	9 (3,0%)	14	
Year of foundation	8 (7,0%)	20 (6,6%)	28	
1981-1990	18 (15,8%)	37 (12,3%)	55	
1991-2000	23 (20,2%)	76 (25,2%)	99	
2001-2010	31 (27,2%)	84 (27,8%)	115	
2011-2016	29 (25,4%)	69 (22,8%)	98	

Source: Research (1 Pearson chi-square test).

When the completion of a postgraduate course among university students was analyzed, no significant association was observed either (p = 0.810), an important observation is also made here, it is noted that in the last 15 years, those who have completed the postgraduate course are 31 who they represent 56.4% versus 24 that represent 43.6% with the postgraduate course completed in the last century (Table 5).

Table 5. Association between postgraduate completion of administrators with a university degree and the company's operating time.

Year of foundation	He completed postgraduate		Total	Value of p^1
	No	Yes		
	n = 222	n = 55	n = 277	
	n (%)	n (%)		
Period				0,810
1902-1950	5 (2,3%)	1 (1,8%)	6	
1951-1970	7 (3,2%)	1 (1,8%)	8	
1971-1980	15 (6,8%)	3 (5,5%)	18	
1981-1990	32 (14,4%)	5 (9,1%)	37	
1991-2000	57 (25,7%)	14 (25,5%)	71	24 43,6%
2001-2010	60 (27,0%)	14 (25,5%)	74	
2011-2016	46 20,7%)	17 (30,9%)	63	31 56,4%

Source: Research ([1]Fisher's exact test).

The professional career of the administrators of the SMEs according to the condition of having completed the course or not is found in Table 6. The most frequent careers were administration courses (40.4%), followed by engineering (9.1%), Dentistry (6.2%), and Pedagogy (6.0%). The association between the chosen career and the completion of the course was statistically significant ($p < 0.001$).

Table 6 - Association between the professional career of administrators according to the condition of completion of the course

Professional Career	Course		Total	Value of p^1
	Not Completed	Completed		
	n = 114	n = 302	n = 416	
	n (%)	n (%)		
Career				<0,001
Management	70 (61,4%)	98 (32,5%)	168 (40,4%)	
Accounting	1 (0,9%)	19 (6,3%)	20 (4,8%)	
Law	1 (0,9%)	15 (5,0%)	16 (3,8%)	
Engineering	6 (5,3%)	32 (10,6%)	38 (9,1%)	
Psychology	1 (0,9%)	13 (4,3%)	14 (3,4%)	
Pedagogy	9 (7,9%)	16 (5,3%)	25 (6,0%)	
odontology	0	26 (8,6%)	26 (6,2%)	
information technology	2 (1,8%)	11 (3,6%)	13 (3,1%)	
Economy	0	9 (3,0%)	9 (2,2%)	
Technologist	16 (14,0%)	16 (5,3%)	32 (7,7%)	
Other university courses	8 (7,0%)	47 (15,6%)	55 (13,2%)	

Source: Research ([1]Pearson chi-square test).

To evaluate the training requirements of administrators, they were asked about a set of items (questions Q24.1 to Q24.29) to find out the factors that could be related to competencies, skills, and attitudes. Cronbach's alpha was first calculated to verify the internal consistency of the 29 questions. Cronbach's alpha value was 0.941, indicating excellent consistency.

The questions were then analyzed by principal component analysis. The results are presented in Table 7. Five factors were formed that represent 55.83% of the accumulated variation of the data: Group 1- Incentive for teamwork, Group 2 - Objectives within the workgroup, Group 3- Attention to

the external activities of the company, Group 4- Development and delegation to the work teams and, Group 5- Interrelation with the work teams.

Regarding the managerial characteristics of administrators, the participants answered 21 questions grouped into "Technical characteristics", "Human characteristics", "Concept characteristics" and "General characteristics". The internal reliability of all questions was high (Cronbach's alpha = 0.937), indicating that the data have internal validity.

Table 7 - Factors related to the skills of managers of SMEs.

Question	**Factor**				
% Accumulated variation= 55,83%	**1**	**2**	**3**	**4**	**5**
Group 1- Incentive for teamwork					
Q24.15 Convey messages and ideas clearly and make sure your orders and directions are understood by the team	0,747	0,173	0,059	0,056	0,199
Q24.14 Generate human, material, and financial resources for your company	0,724	0,300	0,087	0,079	0,013
Q24.13 Update yourself on the latest methodologies and practices in your business sector	0,658	0,299	0,075	0,243	0,017
Q24.23 Encourage your team and give suggestions for improvement in the company's processes	0,652	0,193	0,303	0,206	0,107
Q24.25 Manages the time to give attention to the whole team in the conduct of processes and projects	0,618	0,147	0,321	0,230	0,165
Q24.19 Invest in the task and project planning	0,617	0,270	0,367	0,046	0,070
Q24.24 Value and reward important team contributions	0,616	0,186	0,328	0,271	0,082
Q24.16 Offer conditions so that the team obtains the expected results	0,612	0,140	0,043	0,058	0,490
Q24.17 Invest in team training	0,542	0,196	0,215	0,247	0,319
Q24.12 Make reports on the development of your team	0,500	0,327	0,381	0,282	0,104
Group 2 - Objectives within the working group					
Q24.5 Use your customers' perceptions of the quality of your products/services	0,125	0,626	-0,017	0,203	0,168
Q24.3 Set realistic and challenging team goals	0,164	0,588	0,275	0,142	0,080
Q24.4 Evaluate the performance of your team	0,271	0,582	0,281	0,105	0,202
Q24.9 Define which group of customers should be the focus of commercial actions	0,357	0,553	0,250	0,126	-0,048
Q24.1 Clearly define your business	0,301	0,553	0,160	-0,232	0,326
Q24.7 Stimulate innovation, updating, and absorption of new knowledge in your team	0,423	0,546	0,041	0,212	0,173
Q24.11 Actively participate in the goals of each area	0,410	0,537	0,151	0,104	0,010
Q24.2 Sharing knowledge and information with the team	0,113	0,531	0,227	0,173	0,271
Q24.6 Adapt to changes	0,286	0,516	0,059	0,288	0,307
Group 3- Attention to external activities of the company					
Q26.27 Seek professional advice and guidance	0,295	-0,014	0,631	0,169	0,165
Q24.20 Systematically monitor the performance of the competition	0,266	0,246	0,631	0,182	-0,013
Q24.8 Dominate the operational activities of your company	-0,058	0,428	0,605	-0,114	0,144
Q24.22 Maintain exchange with suppliers and collaborators	0,333	0,202	0,460	0,242	0,039
Group 4 - Development and delegation to work teams					
Q24.29 Accept your team's mistakes when looking for creativity	0,193	0,144	0,168	0,707	0,075
Q24.28 Encourage a critical attitude in your team	0,314	0,199	0,308	0,560	0,207
Q24.10 Decentralize the decision process	0,367	0,400	0,103	0,486	-0,027
Group 5- Interrelation with work teams					
Q24.21 Treat your team with respect	0,055	0,168	0,132	-0,030	0,749
Q24.26 Meet deadlines with your customers	0,079	0,198	-0,016	0,445	0,552
Q24.18 Encourage cooperation between your team	0,414	0,299	0,096	0,251	0,482

Source: research.

The results of the factors are presented in Table 8. 3 factors were formed using all the questions on managerial characteristics, which represent 56.68% of the accumulated variation of the data: Group 1- Understanding of the organization, Group 2- Development of business, Group 3- The business relationship.

Table 8. Factors related to the managerial skills of administrators of SMEs

Question	Factor		
% variation = 56,68%	**1**	**2**	**3**
Group 1- Understanding of the organization			
Q25.1.4 Ability to identify and solve problems	0,751	0,140	0,187
Q25.1.5 Orientation for costs and results	0,738	0,071	0,234
Q25.3.3 Ability to understand the concepts and transfer them to your business	0,608	0,436	0,219
Q25.3.1 Total vision of the business	0,595	0,502	0,101
Q25.1.2 Ability to innovate technologically	0,568	0,285	0,261
Q25.1.3 Attitude of continuous research of the competitors (benchmarking)	0,551	0,310	0,311
Q25.3.6 Vision of the Future	0,544	0,492	0,253
Group 2- Business Development			
Q25.4.4 Learning from Experience	0,167	0,724	0,132
Q25.4.2 Negotiate, mobilize for change, cultural sensitivity, teamwork	0,162	0,659	0,398
Q25.4.3 Responsible and human ethics towards the group that works	0,081	0,643	0,299
Q25.3.2 Ability to integrate your contribution with the business	0,394	0,581	0,233
Q25.4.1 Characteristics of the business: understand its objectives, customers, and competition, as well as the political and social environment	0,446	0,570	0,173
Q25.3.5 Critical distance for evaluation of actual data	0,354	0,548	0,370
Q25.3.4 Ability to interrelate to external reality	0,502	0,512	0,289
Group 3- The business relationship			
Q25.2.3 Quality of relating at all levels	0,117	0,195	0,787
Q25.2.6 Positive reinforcement practice	0,115	0,319	0,709
Q25.2.2 Ability to motivate and engage	0,382	0,152	0,682
Q25.2.4 Openness to adapt to changes	0,314	0,233	0,672
Q25.2.5 Practice of social competence	0,276	0,310	0,628
Q25.2.1 Ability to lead and participate in teams to achieve goals	0,520	0,175	0,574
Q25.1.1 Technical mastery of processes	0,195	0,285	0,287

Source: research.

To investigate whether there is an association between the good functioning of SMEs and the management and direction of the company, we used the time of foundation of the company. The results are presented in Tables 9 and 10. Most of the interviewees indicated that management and direction are important or very important regardless of the year the company was founded.

Table 9 - Capacity to add economic value to the organization according to the year of foundation of the SMEs

Year of foundation	management				Value of p[1]
	Not at all important	More or less important	Important	Very important	
	n = 1	n = 9	n = 117	n = 289	
	n (%)	n (%)	n (%)	n (%)	
Período					0,720
1902-1950	0	0	2 (1,7%)	5 (1,7%)	
1951-1970	0	0	5 (4,3%)	9 (3,1%)	
1971-1980	0	1 (11,1%)	8 (6,8%)	19 (6,6%)	
1981-1990	0	1 (11,1%)	13 (11,1%)	41 (14,2%)	
1991-2000	0	1 (11,1%)	30 (25,6%)	68 (23,5%)	
2001-2010	0	4 (44,4%)	31 (26,5%)	80 (27,7%)	
2011-2016	1 (100%)	2 (22,2%)	28 (23,9%)	67 (23,2%)	215 (74,4)

Source: Research (1 Kendall's tau – τ test for ordinal variables).

The perception of the Ability to add economic value to the organization on the importance of Management, the Very important, was very strong in the last 25 years with 74.4%.

Table 10. Capacity to establish norms and create resources to intensify the strategy and the competitive position of the organization according to the year of foundation of the SMEs.

Year of foundation	management				Value of p[1]
	Not at all important	More or less important	Important	Very important	
	n = 1	n = 13	n = 101	n = 301	
	n (%)	n (%)	n (%)	n (%)	
Período					0,537
1902-1950	0	0	1 (1,0%)	6 (2,0%)	
1951-1970	0	0	4 (4,0%)	10 (3,3%)	
1971-1980	0	2 (15,4%)	7 (6,9%)	19 (6,3%)	
1981-1990	0	2 (15,4%)	12 (11,9%)	41 (13,6%)	
1991-2000	0	3 (23,1%)	22 (21,8%)	74 (24,6%)	
2001-2010	0	4 (30,8%)	28 (27,7%)	83 (27,6%)	
2011-2016	1 (100%)	2 (15,4%)	27 (26,7%)	68 (22,6%)	74,8

Source: Research ([1]Kendall's tau - τ test for ordinal variables).

The opinion of administrators on the importance of professional training and their participation in events (congresses, seminars, updates) was analyzed. The results are presented in Table 11.

The evidence from the sample allows us to say that there is a significant association between participation in events and the academic training of administrators ($p < 0.001$). Regarding academic training, the data suggest an association, despite not having a statistically significant result ($p = 0.054$).

Table 11 - Association between the professional training of administrators and the importance of professional training and participation in events.

Characteristic	University course		Total	Value of p[1]
	Not Completed	Completed		
	n = 114	n = 302	n = 416	
	n (%)	n (%)		
Professional training				0,054[1]
Nothing important	2 (1,8%)	1 (0,3%)	3	
a little bit important	4 (3,5%)	1 (0,3%)	5	
There's no difference	10 (8,8%)	26 (8,6%)	36	
Important	36 (31,6%)	95 (31,5%)	131	
Very important	62 (54,4%)	179 (59,3%)	241	90,8
Participation in events				<0,001[2]
Never	17 (14,9%)	9 (3,0%)	26	
Rarely	31 (27,2)	56 (18,5)	87	
Eventually	43 (37,7)	111 (36,8)	154	
Almost always	16 (14,0)	79 (26,2)	95	
Always	7 (6,1)	47 (15,6)	54	41,8

Source: Research ([1] Fisher's exact test; 2 Pearson's chi-square test).

As an objective the training of professionals, the organization that works in the management and development of products and service organizations.

5 CONCLUSIONS

The professional in administration must be able to act in management and coordination functions at different administrative levels, developing new technologies to control the speed of innovation, and trying to meet the real needs in the field in which they operate. The good performance of an administrator also depends on his training, which allows him to function in various sectors of the economy. The topic is important for the development of a reflection on the cultural and academic training of entrepreneurs to better develop their activities given the constant challenges of the globalized world. The fundamental concern of large companies is and must be their survival

The survey with the administrators points out that changes and transformation in the requirements of the university education of the administrators of SMEs, overcoming the current structure and proposing a new one: curricular redesign, theoretical framework, training, skills, and practice.

With the growing globalization and changes in the labor market, companies feel the need to have a team of employee leaders capable of meeting the needs of the organization and be prepared for the challenges in learning and improvement, and when the survey asked about the factors that are related to skills, abilities, and attitudes, the result that is shown in five blocks was excellent with an average of 55.8%, showing that administrators have these requirements.

Competence is not only a sum of knowledge, not only knowing how to select, within a repertoire of resources such as knowledge, skills, qualities, experiences, and emotions, among others, the relevant factors to solve problems.

The survey tried to identify if SMEs can only function well if they have good management or direction. And the information collected in the survey has shown that most managers (74.4%) pointed out that the management and direction of companies are very important.

To identify yourself, you can establish a relationship between the training or education of SME administrators and their training or university preparation, they were asked about professional training and their participation in events (conferences, seminars, updates) the result of the survey was that 90, 8% point out professional training as important or very important and 41.8% almost always or always update it.

More than 78.0% of entrepreneurs consider starting a business to be a desirable career option; successful entrepreneurs gain status and respect in society and the media with stories often about successful start-ups.

These concepts show the prestige that entrepreneurship has achieved among the population. It was sought to know that the university education that administrators have received in the Administrators Career are factors of professional development and success in the operation, growth, and permanence of SMEs and the result of the statistical data shows in terms of the level of education. college administrators.

In the period of the years 2001-2016, that is, in this century the level of administrators with university education is 50.6%, where we can notice a slight positive percentage variation of 1.2 percentage points, which indicates that raising awareness of university education is important in business management, where a trend of this percentage can be predicted to be higher in the coming years due to high competitiveness and global globalization.

However, when analyzing the average, which is ($p = 0.538$), it shows that the university education of administrators is not a determining factor for the operation, growth, and permanence of SMEs in the State of São Paulo.

With all this, and although considering such observations and notes, it is undeniable that the University has become an important teaching space, in the development of skills for the world of work that provides learning based on solid and universal conceptual training. , the transmission of the universal beliefs and values of society and the development of the academic culture to train competent managers to generate the success of the institutions and the community, the university, which belongs to the management system of the company, to develop skills for the business world; develops learning based on business practice, the transmission of the beliefs and values of the company and its business environment and on the development.

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Teachers' digital competences: Concepts, models and challenges for the educational integration of technologies

https://doi.org/10.56238/ptoketheeducati-056

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ABSTRACT
Digital technologies have caused numerous transformations in educational contexts, revolutionizing pedagogical practices, inviting new organizations of school spaces, redesigning curricula and reinventing models of communication between teachers and students.

1 INTRODUCTION

Digital technologies have caused numerous transformations in educational contexts, revolutionizing pedagogical practices, inviting new organizations of school spaces, redesigning curricula and reinventing models of communication between teachers and students.

Classrooms have come to welcome digital devices, interactive applications and instant access to a vast world of online knowledge. In this broad and unpredictable stage of change, teachers find themselves. By their central role as transforming agents of education, teachers reinforce their role, now more mediator than transmitter, where digital skills are fundamental to know, understand, select, evaluate and integrate the numerous digital resources that are available in the teaching and learning processes.

The preparation of teachers goes beyond the acquisition of digital skills to the simple mastery of the use of equipment and applications. It's about knowing how to incorporate digital tools into the curriculum in a meaningful and innovative way, creating interactive and engaging learning experiences, fostering creativity and collaboration through digital resources, preparing students to become critical, responsible and ethical digital citizens.

In this text, we will analyze the concept and relevance of teachers' digital competencies so that they can impact on teaching and learning processes, contributing to the formation of a new generation of students.

2 TEACHERS' SKILLS

The presence of digital technologies in the educational context impacts on the ways of knowing, learning, organizing, informing and relating to knowledge (MELLO; NETO; PETRILLO, 2021), becoming an increasingly necessary and challenging reality. Necessary because technological transformations determine and characterize the ways we live, relate, produce, access knowledge and develop. This social impact caused by successive technological advances significantly reaches the school, however the exploration of the potential of these resources in education still needs to be developed and demonstrated (ESTEVE; ADELL; LINDA CASTAÑEDA, 2018). On the other hand, this is a challenging reality, "since technological complexity has led to the emergence of different needs." (SILVA; BEHAR, 2019, p. 1), to demand new knowledge, new skills and a new way of doing for the educational system, especially for teachers.

It is the teachers who perform the essential task in the mediation of the teaching and learning process (PERRENOUD, 2002), considering that they are responsible for planning, putting into practice and evaluating this whole process. The use of digital technologies in pedagogical practices places teachers with new tasks and functions (CAMARGO; DAROS, 2021), requiring specific competencies (MOURA, 2017), a crucial aspect to ensure the integration of new methodologies and strategies of teaching and learning mediated by technologies (OTA; DIAS, TRINDADE 2021) that meet the social demands of the new generation (FIGUEIREDO, 2019).

For teachers to converge their practices with the possibilities that digital technologies offer to teaching it is necessary not only the technical mastery of the resource, but the development of digital skills that allow the critical integration of these resources, recognizing benefits and limitations that their use offers to the educational process (RABELLO; Tavares, 2022), underpinning a teaching that builds in students a critical and innovative reflective posture capable of solving problems to generate knowledge that responds to global challenges (UNESCO, 2019, 2022).

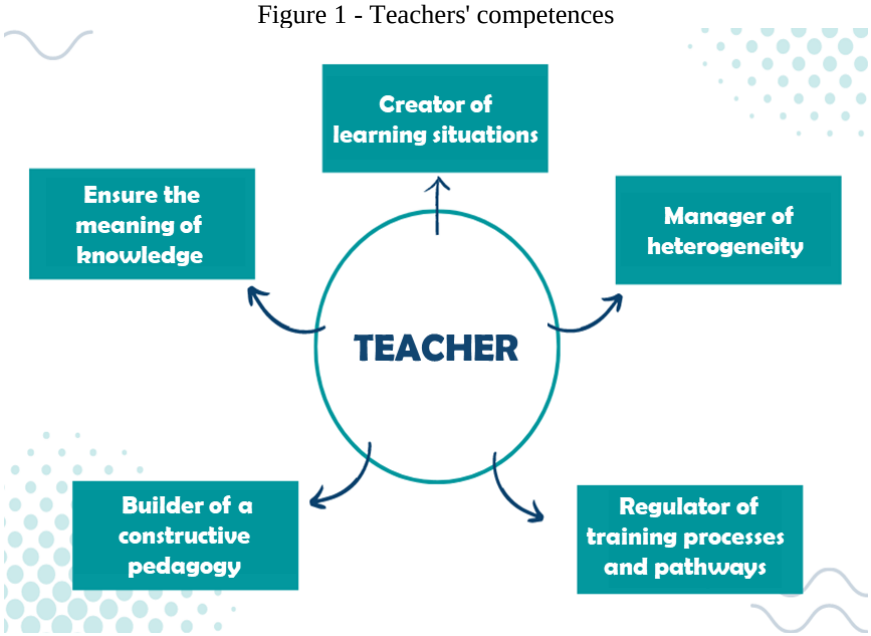
But after all, what are digital skills? To point out this conceptualization, it is first necessary to understand that its definition is marked by a diversity of concepts (FIGUEIREDO, 2019); second, the term digital skills can carry a diversity of nomenclatures (SILVA; BEHAR, 2019).

Starting from a more general conceptualization, Perrenoud (2002) defends the idea that the purposes of the educational system cannot be dissociated from the competencies of teachers, conceptualizing them as the "aptitude to face a family of analogous situations, mobilizing in a correct, fast, pertinent and creative way, multiple cognitive resources: knowledge, capacities, microcompetences, information, values, attitudes, perception schemes, of evaluation and reasoning" (PERRENOUD, 2002, p. 19).

Perrenoud (2002) visualizes the figure of the "ideal teacher" as one who constructs knowledge and competencies, such as being able to create learning situations, knowing how to manage

heterogeneity, regulating training processes and paths, being a builder of constructivist pedagogy and ensuring the meaning of knowledge (Figure 1).

Figure 1 - Teachers' competences



Source: Adapted from Perrenoud (2002)

For the author, the recognition of these competencies is beyond the identification of situations to be managed, problems to be solved and decisions to be made, emphatically pervades the clarity of knowledge, capacities, thoughts and ethical posture, many of these characteristics being built through the course of practice and considered knowledge of experiences.

3 ELEMENTS FOR THE CONSTRUCTION OF DIGITAL COMPETENCE

With regard to digital competence in the educational context, there is a diversity of user terms to refer to it. A research conducted by Silva and Behar (2019), presents some of these different terms linked to digital competencies: Computer Literacy, Information Literacy, Media Literacy, Digital Literacy, Digital Fluency.

The authors traced a history of the variations of terms and concepts of Digital Competence treated so far, indicating that, in the 1980s, the term used was Computer Literacy (Computational Literacy) aggregating variations such as ICT Literacy (ICT Literacy), IT Literacy (IT Literacy) and Technology Literacy (Technology Literacy), and these variations are associated with the level of experience and mastery with the computer/computer applications. In the 1990s, the term Information Literacy emerged, with requirements beyond the use of the computer, covering the identification, location and evaluation of information.

In the same decade, 1997, there were discussions about the terms related to Media Education and Media Literacy. The concept of Media Education was seen as a subcategory of Information

Literacy, which focuses on how information is accessed, evaluated, defined, constructed, and interpreted. On the other hand, Media Literacy emphasizes the ability to deal with different formats of information, such as print and audiovisual media (radio and television). In the case of Brazil, the concept of Digital Literacy, presents different translations such as: Digital Literacy, Digital Literacy, Digital Fluency and even Digital Competence (SILVA; BEHAR, 2019). The understanding of digital competence is also permeated by various terminologies, being referred to as "audiovisual, media, literacy or digital literacy competence" (PAZ; PONTAROLO; PELOSO, 2022, p. 10).

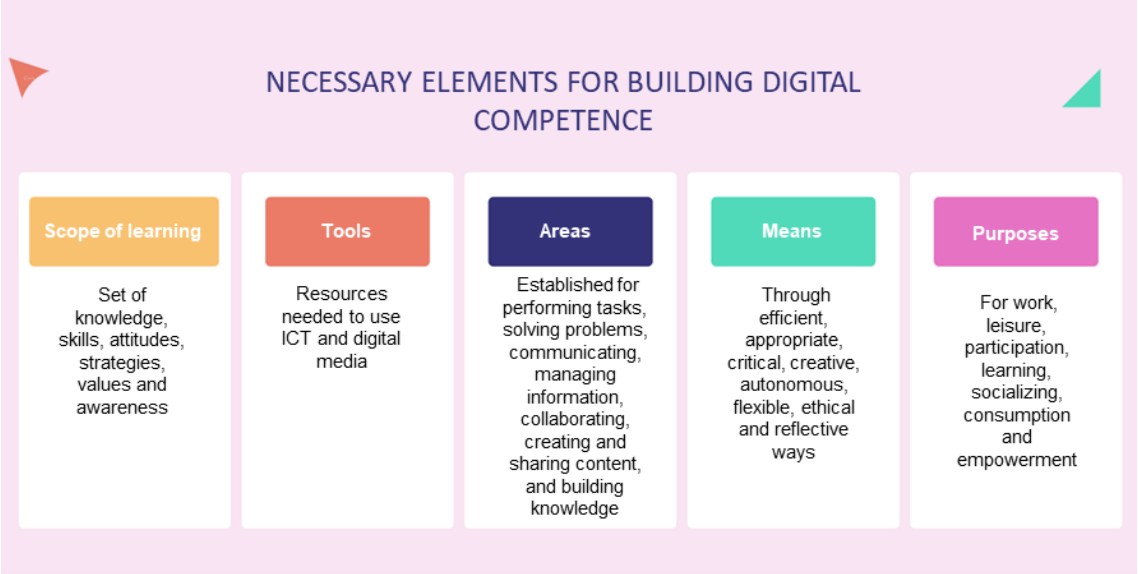
When we present the variables of the terms associated with digital competencies, it is evident that digital technologies have dictated a change in the processes of socialization and culture, impacting people's relationships with knowledge. Thus, the concept of digital competence comprises a breadth beyond digital literacy, being composed of a complex set of skills, knowledge and attitudes necessary to participate and act in digital culture. In this aspect, it is worth emphasizing: the concept of competence is marked by alternations due to the evolutionary and transitory profile of digital technology.

In 2006, the European Commission (2007) presented a report with a reference framework of key competences for lifelong learning, highlighting as one of the eight core competences digital competence, defining it as a junction of knowledge, skills and attitudes, for the safe and critical use of technology in the information society for work, leisure and communication, sustaining the use of the computer to "obtain, evaluate, store, produce, exchange information, communicate and to participate in cooperation networks via the Internet" (COMISIÓN EUROPEA, 2007, p. 7). Corroborating this definition, Gisbert and Esteve (2011) In addition, in addition to the combination of skills, knowledge and attitudes related to technological aspects, digital competence also involves informational, multimedia and communication aspects, giving rise to a complex of multiple literacy.

Pérez-Rodríguez and Ponce (2012) They define digital competence as the ability to seek, process, communicate, create and disseminate information through technologies, enabling an educational approach based on critical thinking, cooperation, dialogue, management and production of new knowledge, learning functionality, tolerance and appreciation of diversity. In line with this conceptualization, Adell et al. (2018) indicate that the most recent trends indicate that the digital competence of the teacher should be expanded beyond mere digital literacy, focusing on the development of competencies to explore specific pedagogical resources that can be transferred to the classroom, promoting authentic learning through an environment enriched by technology.

The European Commission (FERRARI, 2012) published in 2012 a study called "Digital Competence in Practice: An Analysis of Frameworks" that defines five elements necessary for the construction of digital competence (Figure 2).

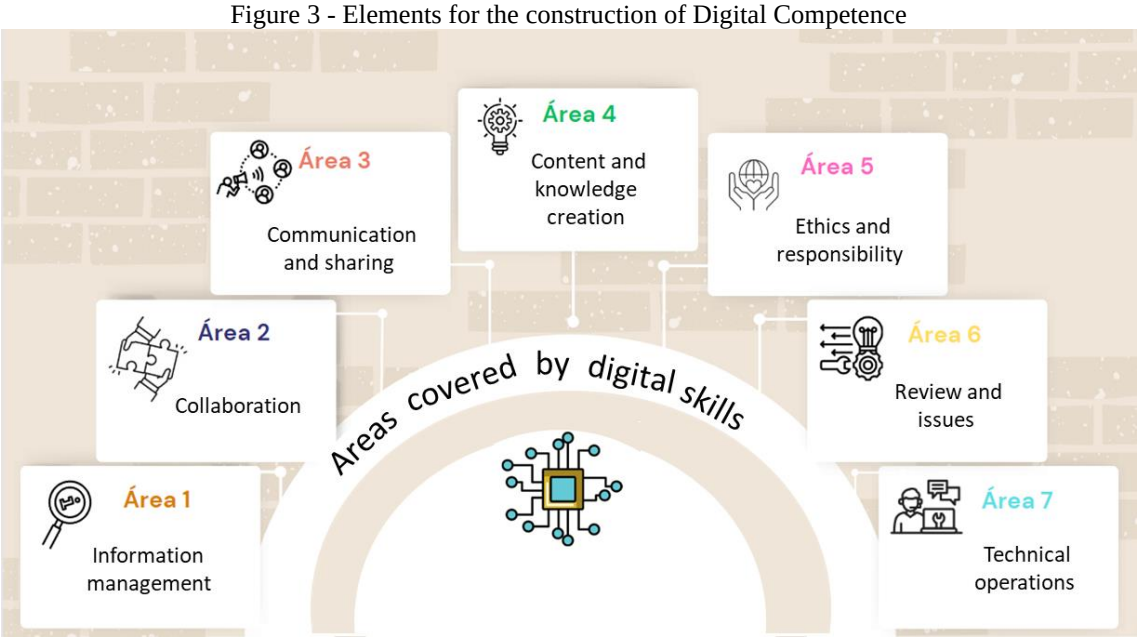
Figure 2 - Representation of the elements for the construction of Digital Competence



Source: Adapted from Ferrari (2012)

The study presents the need for digital competencies to encompass much more than technical skills, proposing seven prominent areas that need to be considered in a perspective more adapted to current needs, such as managing information, collaboration, communication and sharing, content and knowledge creation, ethics and responsibility, review and problem, technical operations (Figure 3).

Figure 3 - Elements for the construction of Digital Competence



Source: Adapted from Ferrari (2012)

For each of the areas of coverage of the digital competencies presented in the figure above, definitions considered essential for the development of the learning objectives are established: (1) Information management: refers to the knowledge, skills and attitudes necessary to identify, locate, access, retrieve, store and organize information; (2) Collaboration: refers to the competence to link

with other users, participate in online networks and communities, and interact constructively and with a sense of responsibility; (3) Communication and sharing: refers to communication through online tools, taking into account privacy, security and netiquette; (4) Content and knowledge creation: refers to the expression of creativity and the construction of new knowledge through technology and media, also to the integration and re-elaboration of previous knowledge and content and its dissemination through online means; (5) Ethics and Responsibility: refers to the knowledge, attitudes and skills necessary to behave in an ethical, responsible and aware of the legal frameworks; (6) Review and Problem: refers to identifying the right technology and/or media to solve the identified problem or to complete a task, as well as evaluating information; and (7) Technical operations: refers to the competence necessary for the effective, efficient, safe and correct use of the technology.

Based on the analysis of several studies and various understandings of Digital Competence, the European Commission's report proposes the following definition:

> Digital competence is the set of knowledge, skills, attitudes (including skills, strategies, values and awareness) that are required when using ICT and digital media to accomplish tasks; solve problems; communicate; manage information; collaborate; create and share content; and build knowledge in an effective, efficient, appropriate, critical, creative, autonomous, flexible, ethical, reflective way for work, leisure, participation, learning, socialization, consumption and empowerment (FERRARI, 2012, p. 43).

The author presents a balanced approach to digital competence, in which each area of competence is developed equally, without emphasizing only the "technical operations" of the tools, but also highlighting the importance of the didactic component. She argues that most of the frameworks analyzed do not present an organized structure to interconnect the competencies, limiting their development to a mere accessibility and technical domain. Thus, the author presents a broad definition of digital competence as a structured and interconnected concept.

4 DIGITAL COMPETENCE REFERENCE FRAMEWORKS

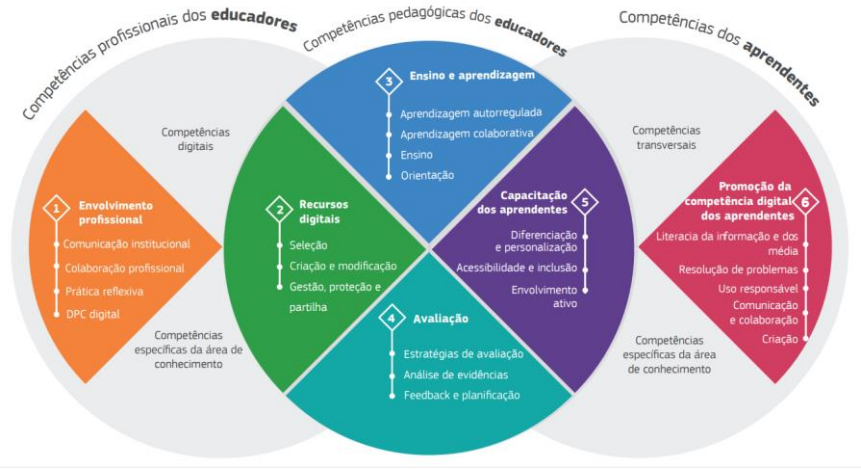
DigCompEdu: European Digital Competence Framework for Educators, was developed by the European Commission and presents a common frame of reference on the digital competences needed for educators[1] can effectively integrate digital technologies into their pedagogical practice. In the document, digital competence is defined generically as "the safe, critical and creative use of digital technologies to achieve objectives related to work, employability, learning, leisure, inclusion and/or participation in society" (LUCAS; Moreira, 2018, p. 91).

The Digital Competence Framework for Educators has been developed to address the awareness in many European countries that teachers need specific digital skills to enable them to

[1] In the DigCompEdu document, the term "educator" is used to refer to anyone involved in the process of teaching or promoting access to knowledge.

harness the potential of digital technologies to improve education through innovation, presenting three dimensions of competences: (1) Professional competences of educators; (2) Pedagogical competencies of educators and (3) Competencies of learners, and their respective areas (Figure 4).

Figure 4 - DigCompEdu Competence Framework



Source: Lucas and Moreira (2018, p. 15)

The DigCompEdu Competency Framework is composed of 22 competencies organized into six areas: (1) Professional Involvement: refers to the use of digital technologies by educators in their professional interactions with colleagues, aiming at their own professional development and the collective benefit of the institution; (2) Digital Resources: refers to the fundamental skills to use, create and share digital resources that best suit the abjects of learning, in an effective and responsible manner; (3) Teaching and Learning: refers to the management and adaptation of the use of digital technologies in the different phases and configurations of the teaching and learning process; (4) Evaluation: refers to the use of digital strategies to improve evaluation; (5) Learner Empowering: refers to the potential of digital technologies to support student-centered pedagogical teaching and learning strategies and drive the active involvement of learners in this process; and (6) Promotion of learners' digital competences: refers to the specific pedagogical competences essential to promote pupils' digital competence. The goal of DigCompEdu is to provide guidance to educators, educational institutions and policy makers regarding the development of teachers' digital skills for the digital age.

In addition to this European experience, we highlight the result of a mapping of articles published in the CAPES Periodicals Portal carried out by Wheel and Morgado (2019) on international productions related to teachers' digital competencies. In this study, multiple interpretations were identified about the understanding of what digital competence is, as well as indications of the use of various terminologies to refer to these competencies. By compiling the analyzed texts, the authors propose a definition for teachers' digital competencies as a set of knowledge, skills and attitudes necessary for the efficient use of technologies during the teaching-learning process, emphasizing that

this definition evidences the complexity and comprehensiveness of the concept, suggesting that the digital competence of the teacher requires more than simple technical skills and proficiency in the use of tools specific, these being just some of the various aspects of digital teaching competence.

Another fact that the study reveals is the fact that research on teachers' digital competencies stands out in institutions in countries such as Norway, Spain, Mexico, the United States, Brazil and Chile, with universities in Norway (Norwegian University, Nordic Institute for Studies in Innovation and University of Bergen) at the forefront. This prominence of Norway is related to its global pioneering in the inclusion of technologies in the national curricula of compulsory education, established since 2006.

The study points out that the researchers focus mainly on the digital competencies of teachers, exploring topics such as the training of teachers for the development of these competencies, the challenges and opportunities related to the use of technology in the teaching and learning process and how the development of these competencies can improve methodological aspects of this process (RODA; MORGADO, 2019).

To compile what the studies and reports presented in this subchapter point out about the definition of digital competence, we present in Chart 1 the main concepts and their authors:

Frame 1 - Digital Competency Concepts

Reference	Concept
Comissão Europeia (2007)	Combination of knowledge, skills and attitudes for the safe and critical use of technology for work, leisure and communication to "obtain, evaluate, store, produce, exchange information, communicate and participate in cooperation networks via the Internet.
Gisbert e Esteve (2011)	Combination of skills, knowledge and attitudes related to technological aspects, as well as informational, multimedia and communication, originating a complex of multiple literacy.
Pérez-Rodríguez e Ponce (2012)	Skills to seek, process, communicate, create and disseminate information through technologies
Ferrari (2012)	Set of knowledge, attitudinal skills (including skills, strategies, values and awareness) to accomplish tasks, solve problems, communicate, manage information, collaborate, create and share content and build knowledge effectively, efficiently, appropriately, critically, creatively, autonomously, flexible, ethical and reflexive for work, leisure, participation, learning, socialization, consumption and empowerment
Lucas e Moreira (2018)	Safe, critical and creative use of digital technologies to achieve goals related to work, employability, learning, leisure, inclusion and/or participation in society
Adell et al. (2018)	In addition to mere digital literacy, it focuses on developing skills to explore specific pedagogical resources that can be transferred to the classroom, promoting authentic learning through an environment enriched by technology.

Source: Prepared by the Author (2023)

The concepts of Digital Competence presented here are aligned primarily by the relationship of knowledge, skills and attitudes (COMISIÓN EUROPEA, 2007; GISBERT; ESTEVE, 201;

FERRARI, 2012), for safe and critical use of technology, going beyond the mere functional knowledge and domain of the resource obtaining the recognition and pedagogical exploration in the classroom (ADELL et al., 2018; LUKE; Moreira, 2018). Although there are some different emphases among the authors, there is a consensus that digital competence is a concept that has distinct dimensions and that requires the complex integration of technical, cognitive, socio-emotional and ethical skills.

There are some limitations in the digital competence reference frameworks with regard to the overemphasis on technical views when approaching the digital as an essentially instrumental reality, seconding the human and social dimensions (FIGUEIREDO, 2019). They are also limited to fulfilling descriptive functions, not giving clues or instruments that promote the development of these skills. In addition, a study conducted by Paz, Pontarolo and Peloso (2022) on the digital competencies of teachers highlights the lack of a pedagogical approach that can serve as a theoretical basis for the theme. The authors point out the need for specific training to promote the development of digital teaching skills, both in the initial phase of training and in continuing education programs. This highlights the importance of educational policies in relation to this subject.

Another parameter presented by Figueiredo (2019) It is the classification of five essential aspects of digital skills that do not receive due attention in the literature: (1) the importance of differentiating skills from digital knowledge, since both are necessary in different situations. The current emphasis of training in digital skills does not diminish the importance of training in digital knowledge, on the contrary, both complement each other; (2) digital competences cannot be separated from non-digital competences, on the contrary, they must be built on them, mutually reinforcing; (3) digital competencies are not reduced to instrumental skills to achieve specific goals, but encompass complex, multidimensional and transversal cultural competencies, indispensable to ensure mature, active, critical and emancipated participation in the digital age; (4) the acquisition of digital skills is not acquired through the frequency of disciplines, as in the case of knowledge development, but through involvement in complex social practices that make it possible to emerge and consolidate these competences; and (5) the identification and selection of practices for the development of digital competencies requires awareness of the dialectical relationship between pedagogies, learning models and social practices.

These aspects call attention mainly to the need to organize formative references for the development of digital competencies of teachers that privilege the use of technology not as a specific knowledge to be learned, but as a didactic approach applicable in various teaching and learning situations (ILOMÄKI et al., 2016).

Given the conceptual approaches presented, we can infer that the conception of digital competence is closely related to the ability to mobilize knowledge (technical and pedagogical) to

safely, critically and ethically explore, make decisions, collaborate, solve problems and build learning situations in the face of multiple circumstances with the use of technology.

5 FINAL CONSIDERATIONS

We understand that, in education, it is indispensable nowadays professionals prepared to explore technologies and their numerous pedagogical possibilities for teaching and learning. For this, the training of digital skills of teachers is crucial for success in this process. We could feel recently, during the remote emergency teaching established by the COVID-19 pandemic, how much the absence of these skills can lead to constraints and difficulties in adapting to new forms of teaching that demand pedagogical and methodological assumptions different from the usual, as well as in the effectiveness of the transmission of knowledge through digital means, highlighting the gaps in the digital skills of teachers, making urgent the need to overcome these limitations to ensure an education accessible to all.

The reality experienced by education and, especially by teachers, has accelerated the need for training for the development of digital skills that help them overcome the challenges of the contemporary world and education of the twenty-first century, allowing a pedagogical and methodological practice connected to the demands of the students of this time lived.

However, we still face some limitations in this regard, such as the lack of investment in initial and continuing education for the development of teachers' digital skills, the lack of resources and infrastructure in schools, as well as greater investment in policies and strategies that value teacher training in digital skills, recognizing its importance for the pedagogical exploitation of technological resources in the classroom, for the enrichment of the teaching and learning process and for the formation of critical and active students in an increasingly digitized world.

In this perspective, we consider it necessary to review and strengthen public policies for the initial training of teachers, reformulating the pedagogical projects of the courses through the insertion of more and distinct formative moments that prepare teachers for the acquisition of digital skills, based on innovative pedagogical practices and promoters of active learning. In addition, continuing education also plays an important role in preparing teachers for the challenge of educational technologies, requiring training plans that meet the demands of schools and teachers.

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The mission of the psychopedagogue

https://doi.org/10.56238/ptoketheeducati-057

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ABSTRACT

The genetic content of a person determines his characteristics and his process of evolution. However, in addition to the hereditary factor, it is verified that there is influence of the cultural environment and the level of harmonious integration of the child with the world in its surroundings on the development of the same, which is the object of study of Psychopedagogy. It is a discipline of the Human Sciences, whose beginning took place in the nineteenth century, with the demographic expansion of the post-war period, but its importance is extremely high for the present day, in which there is the search for a better orientation of knowledge and a deeper maturation of human learning. Psychopedagogy is a systematic study, closely linked to psychoanalysis and medicine, on the conditioning factors of behavior and lifestyle and their influence on human development in its most varied aspects, from cognitive functios to social interactions. The work of the psychopedagogue is to contribute to the optimized school formation of students through methods developed for each specific case. Through the interventions of the psychopedagogue in the educational process, it is possible to reverse learning deficits, help the inclusion of children with special needs and improve the social integration of the student in the environment in which he is inserted. The objective of the bibliographic research is to analyze the true contributions of psychopedagogy to education and to enumerate the main challenges experienced by the professional in the school institution. The bibliographies used are scientific and review articles, monographs and dissertations that report the performance of the psychopedagogue in the educational field. In this way, the work emphasizes the mission of the psychopedagogue, which is to contribute so that all individuals can assimilate contents and learn efficiently and effectively, promoting means of obtaining a healthier and more complete environment. human development, in addition to affirming the constant need for this professional in the educational environment.

Keywords: Psychopedagogue, Inclusion, Apprenticeship, Human development, Educational process.

LIST OF ABBREVIATIONS OR ACRONYMS

ABNT Brazilian Association of Technical Standards
ABPP Brazilian Association of Psychopedagogy
CF Federal Constitution
EAD Distance Education
HEIs Higher Education Institution
LDBE Law of Guidelines and Bases of National Education
MEC Ministry of Education
NBR Brazilian Standard
NEE Special Educational Needs
PUC Pontifical Catholic University
RS Rio Grande do Sul
SP São Paulo
UNIFEO University Center of the Teaching Institute Foundation of Osasco

1 INTRODUCTION

Psychopedagogy is a relatively new science, with an interdisciplinary proposal, adding diverse knowledge of related sciences such as Medicine, Psychology, Psychoanalysis and Biology, which aims to study the processes of development of the human being and its variables (SCALZER; Smith, 2011).

Psychopedagogy can also be divided into Institutional Psychopedagogy, whose professional works in schools in partnership with teachers and other members of an educational institution, constituting a preventive science, and Clinical Psychopedagogy, whose work occurs in hospitals and clinics, and can count on the help of other professionals such as pediatricians, therapists and neurologists, for casesof need for patient enclosure (CAZELLA; MOLINA, 2010).

In general, the work of the institutional psychopedagogue, object of study of this work, is to assist students with learning difficulties in a certain area and proposes the treatment of the problem from its origin, using specific methods. That is, the psychopedagogue analyzes the various factors involved in the development of the student and applies his methodology to optimize thelearning process (TANZAWA; MARTINS; BRENZAN, 2010).

Every educator must ensure that all his learners learn and assimilate learning in the way that best suits the individual. Therefore, the importance of Psychopedagogy is unquestionable in school education, as it allows the student to learn better, develop their intelligence and potential, have a more complete growth and be more integrated into society.

Because it is a recent discipline, there is still some confusion of the public as to the real work of the professional in this area.Therefore, the relevance of the research is high, as it provides a demystification of Psychopedagogy, presenting a broad approach to its history, its main concepts and branches of action and the results caused in student learning.

Therefore, the objective of the research is to elucidate the true work of the psychopedagogue in the field of Early Childhood Education. The specific objectives are to clarify how the role of this professional is given and what his level of importance in the school is , in addition to reporting the most common challenges faced in his daily life and his impact on school society.

The research problem is to study, succinctly and clearly, the performance of the psychopedagogue in the school environment and reveal the main attributions of the professional in his area of expertise, in addition to reporting an example of the performance of this work in a school of early childhood education, aiming at the inclusion of students with special needs in regular classrooms.

The theoretical framework used in the research is a bibliographic research of qualitative approach that comprises scientific articles and dissertations on the performance of the psychopedagogue in educational institutions, focusing on early childhood education schools, that is, that have students from zero to six years. Articles whose publication date is between 2000 and 2018 were used. The search tools used are the databases available on the Internet, such as Google Scholar

and Scielo.

The chapters were organized as follows: ChapterI brings an ahistorical approach to Psychopedagogy, explaining its creation, its branches of action and how the maturation of this science took place over the years.Chapter II deals with the performance of the professional in Early Childhood Education and its importance; Chapter III talks about the importance of early childhood education; Chapter IV exemplifies the work of thepsychopedist dagogue in school, revealing the improvements achieved with his methods.

Finally, the work leads to reflect on the constant need of this professional in the educational environment so that there is an increase in the level of learning of students with difficulties.

It is still good to add that, like all science, there must be reinventions and readaptations of methods, that is, to make studies, tests, trials and reformulations, so that Psychopedagogy is not outdated, but that it always has a renewed and optimized methodology according to the needs of the students and with the passing of the years of study.

2 PSYCHOPEDAGOGY: A BRIEF HISTORICAL APPROACH

Initially, it is important to present a definition of Psychopedagogy. According to the most up-to-date version of the Aurélio Dictionary (2017), Psychopedagogy is "Pedagogy based on scientific psychology, especially of the child".

This science has an interdisciplinary proposal, aiming at the study of human development. It deals with the learning process and its normal or pathological patterns, considering the constant influences of the environment – school, family and society – in the formation of man and applying own and characteristic procedures of analysis (NASCIMENTO, 2006).

It is related to Pedagogy, about the study of human life itself, considering social and individual aspects, and with Psychology, about the dualistic character between psyche (consciousness, mentalization) and physical (concreteness, observation). However, its branch of activity goes beyond what only these two disciplines can offer, with contributions from other sciences, such as Medicine, Psychoanalysis, Biology, Speech-Language Pathology and Audiology and Neurology, which collaborate to provide a well-structured theoretical body and an in-depth and critical analysis of the forms of human learning, increasing the development processes (TANZAWA; MARTINS; BRENZAN, 2010).

History states that Psychopedagogy was born in the nineteenth century in Europe, due to the learning problems that occurred among children in the post-war period and at the time of the Industrial Revolution, in which there were rural migrations, growth of cities, overcrowding, spread of infectious diseases and poor infrastructure in the area of Health and Education. Therefore, initially it was a clinical Psychopedagogy, that is, worked in hospitals and medical clinics, together with health

professionals such as doctors, psychologists, therapists, speech therapists and neurologists. The first educational centers were created in France tohelp children with behavioral and/or school difficulties. It was important, at the time, to differentiate students with learning problems and students with physical or mental disabilities, so that the psychopedagogical process, of knowing the child and his environment and proposing solutions to the root of the problem, was applied separately to all. (SAINTS, 2009)

Over the years, teaching and psychopedagogical practice have become popular and widespread in France, encouraging several universities to institute Psychopedagogy as a discipline in their curricular matrices or even to create training and specialization courses, such as the Sorbonne University in Paris, considered as one of the main points in the history of Psychopedagogy in the country for the high level of research developed in the area, and the Institut Catholique-Paris, which trains a good number of psychopedagogues every four years of course (PERES, 2007).

The ideas of Psychopedagogy were growing and expanding, until they reached South America, around the 60s and 70s, and in Buenos Aires, Argentina, Psychopedagogy was inserted as a discipline of the curricular matrix of the Psychology course, at the Faculty of Psychology of the Universidad del Salvador (ANDRADE, 2004) and the first Mental Health Centers were opened, where professionals made diagnosis and treatment of patients (SAMPAIO, 2004). Argentine psychopedagogy was greatly influenced by French authors such as Fraçoise Dolto, Maud Mannoni and Montessori.

Also in Argentina, in 1956, Psychopedagogy was constituted as a three-year undergraduate course to train teachers with training in school psychology, using pedagogy and psychology as supporting sciences. However, currently, the fixed course is five years, with the arrival of graduation and for reasons of economic organization and human resources. And there is also the possibility of the student to attend master's and/or doctoral degrees, following lines of research determined by the Higher Education Institution – IES. The object of study of this science is the individual in the teaching-learning process, that is, the ability of the subject to be the agent and receiver of his learning (GONÇALVES, 2007).

It is important to state that, both inEurope and Argentina, learning problems were mainly seen as resulting from biological factors of the individual, related to neurological dysfunctions. That is, from the nineteenth century to the mid-70s, the work of the psychopedagogue was simply to solve the causes of the patient's learning problems, in an essentially medical way (SILVA; LUPERINI; PAUL, 2014).

In Brazil, Psychopedagogy arises in a historical context of repression of freedom of expression and military dictatorship. This science gains space in the Brazilian scenario through the Argentines, amid a climate of clandestinity (ANDRADE, 2004). It was also common for the idea of the learning

problem to originate from organic factors. However, at the end of the 70s, scholars pointed out other causes for the failures in gem learning, such as the deficiency of the educational system itself, the unpreparedness of teachers and the lack of infrastructure necessary to serve the most diverse students, in addition to family issues . All these environmental and cultural circumstances are related to those of a physical and genetic order, implying in the impediment of the subject's learning (SILVA; LUPERINI; PAUL, 2014).

Initially, Psychopedagogy was instituted in Brazil from medical models of action, that is, focused on the clinical branch. But from the 70s, due to the context of learning problems, it was also analyzed institutionally. At the same time, the specialization course in Psychopedagogy was created at the Medical-Pedagogical Clinic of Porto Alegre (SAMPAIO, 2004).

In 1979, Sedes Sapientae was created in São Paulo, an institute for teaching health sciences, education and philosophy, which became the main means of boosting the growth of Psychopedagogy in the country. This institution, despite having been created under a military regime, excelled in the exercise of freedom of thought, multidisciplinary expression and the training of professionals whose ethics were not based on simple formality, but who were committed to the rights of the human person (ANDRADE, 2004).

To further consolidate the profession and organize knowledge, the Associação Paulista de Psicopedagogia was created in 1980, which in 1988 was renamed Associação Brasileira de Psicopedagogia – ABPP. The organization aims to bring together psychopedagogues and other professionals who are involved with psychopedagogical issues. It presents, as one of its main objectives, the proposal for the dissemination and development of Psychopedagogy, through meetings, debates, courses and other related means, as well as the publication of articles related to the area. (PERES, 2007)

In the early 2000s, the Ministry of Education – MEC authorized and regulated the training of the psychopedagogue, at the *Lato Sensu* graduate level, in several Brazilian cities, and the distribution of the class hours is 75% theoretical and 25% practical, through supervised internship. As for the distance education courses, the MEC recommends at least 20% of the face-to-face activities for the Psychopedagogy course (GRAÇA; SILVA; BIRTH, 2013).

In addition to the specializations, there are currently some undergraduate courses offered in some states, such as São Paulo and Rio Grande do Sul. Higher education institutions such as the Pontifical Catholic University of Rio Grande do Sul (PUC-RS) and the University Center of the Osasco Teaching Institute Foundation (UNIFEO-SP) opened in 2003 and 2006, respectively, undergraduate courses with an average duration of four years.

Another important point to be highlighted is the performance of the psychopedagogue in the current context of Brazilian education, which occurs through the insertion of somepeople with Special

Educational Needs – SEN in regular education, characterizing the so-called school inclusion. In this context, the psychopedagogue collaborates so that the student obtains a high levelof school success, performing follow-ups and specific evaluative strategies (NASCIMENTO, 2006).

It is noticed, therefore, that although Psychopedagogy originated from a single factor - the improvement of the levels of school failure -, it took different directions in each country presented. In Europe and Argentina, there is a whole career focused on the work of the psychopedagogue, through undergraduate and graduate courses *Lato* Sensu and *Stricto Sensu*. In Brazil, professionals in the area of Education and / or related go through aspecialization in Psychopedagogy to become psychopedagogues, that is, there is no continuing education of sciences, with few exceptions. This fact is a differential about the other locations presented, because it indicates a combination of diverse knowledge from other sciences to the knowledge of the profession of psychopedagogue, which was regulated only recently, in 2014, through the draft Law PLC 31/2010. It is expected that, with the regulation of the profession, there will be improvements in the area and increments in the educational development of the country.

3 THE WORK OF THE PSYCHOPEDAGOGUE IN EARLY CHILDHOOD EDUCATION

According to Bossa (2000), Psychopedagogy was born from a demand for learning difficulties and has evolved over the years by the improvement of resources and the evolution of studies and research, becoming a practice to aid the optimization of teaching.

The psychopedagogue has the task of studying, diagnosing and treating the causes of the educational pathologies of the students. As well said Golbert (1985), the work of the professional of Psychopedagogy should:

> It is understood from two approaches: predictiveand therapeutic. The preventive approach considers as the object of study of Psychopedagogy the human being in development, while educable. Its object of study is the person to be educated, his processes of development and the alterations of such processes. It focuses on the possibilities of learning in a broad sense. It should not be restricted to a single body such as the school, but also go to the family and the community. It can clarify, in a more or less systematic way, teachers, parents and managers about the characteristics of the different stages of development, about the progress in the learning processes, about the psychodynamic conditions of learning , about the determinant conditions of learning difficulties. The therapeutic approach considers as the object of study of Psychopedagogy the identification, analysis, elaboration of a methodology of diagnosis and treatment oflearning difficulties (1985, p.13).

As an institutional category, the development of Psychopedagogy occurs through the study of the school environment, considering that this is the place where the didactic-methodological processes and the dynamics of teaching-learning occur. The objectives of the professional is to assist the institution in its role of teaching and knowledge and the student in his role of learning, in addition to providing a harmonious and interactive place between people from various social spheres and distinct

multicultures and provide the strengthening of the construction of the concept of collectivity (CAZELLA; MOLINA, 2010).

In this way, the psychopedagogue should act providing a collaboration between teachers and parents, promoting conditions for a more in-depth analysis of the conditions of the school, providing means for the different education systems to be evaluated and applied according toeach specific case and according to the diagnosis and assist the teaching team as to the evaluation methodology, to the intended objectives and the teaching plans outlined (GRAÇA; SILVA; BIRTH, 2016).

Nascimento (2006) lists some aspects of development to be analyzed in the diagnosis of the learner: cognitive and intellectual factors, which deal directly with cognition and potential age; emotional factors, which are related to affection and sensitivity; social factors, which are linked to the social environment, to the neighborhood that surrounds the student; and pedagogical factors, which deal with didactics, teaching methodology and evaluation, content, number of students in the classroom , among other elements related to the teaching-learning process. Each specific area needs its methods and analyses, so that the situation of weakness is remedied and/or prevented in the best way.

Often, the professional of Psychopedagogy uses the method of phenomenology, that is, observes the fact, is concerned with describing it directly and, from this, makes its interpretation. In this method, the data are said to be absolute achieved by intuition, to investigate the structuring of the act and verify the objectives corresponding to the actions (SOUSA, 2014). Through this methodology, the psychopedagogue can discern the most effective form of action for the student, becausea systematized check was made on the environment and the individual himself.

In addition, the professional must work with conflicts, misunderstandings and losses in the learning process, guide knowledge through reflection and promote autonomy and cooperation, that is, the ability of the student to have a progressive educational independence and obtain effective interaction with their colleagues. The psychopedagogue is also an educator, therefore, he must act to give children the necessary conditions for them to build their cognitive, emotional and social identity.

It is also the work of the Psychopedagogue to favor the necessary construction of ethical identity, so that the student becomes a person governed by values and whose character is integral. Thus, it strengthens the practice of the virtues above all, because education, first of all, must be based on a level of ethics (LINS, 2010).

As it turns out, however, there are some difficulties to overcome. According to Masini (2006), there is a need for a constant remodeling, that is, it is necessary to develop new studies for the field of action of the psychopedagogue, through research programs in universities and graduate courses, which collaborate for a better improvement of the methods of this science. It is also necessary to continue the issue of psychopedagogical evaluation, together with the teacher. For this, it would be necessary

an in-depth study of the teaching-learning methodology, taking into account the cases of each student, to provide the best school, occupational and social development for the same.

According to Peres (2007), the main challenges to be faced, from physical issues, such as the number of students, to social issues, such as the valorization of the professional, are listed in the following table.

Table 1 – Challenges pointed out in the area of Psychopedagogy

Desafios indicados na área de psicopedagogia
• Realização do trabalho psicopedagógico em função do alto número de alunos em sala de aula
• Ausência de supervisão que acompanhe o trabalho psicopedagógico
• Existência de trabalho psicopedagógico na escola
• Psicopedagogia na rede pública de ensino
• Ampliação do número de professores – psicopedagogos
• Ampliação dos atendimentos psicopedagógicos nas escolas
• Auxiliar na superação das dificuldades de aprendizagem, promovendo a aprendizagem
• Realização de um trabalho integrado
• Conscientização sobre a teoria implícita que influencia a pesquisa e a experimentação piagetiana na área da educação
• Reconhecimento profissional e científico

Source: PERES (2007, p.144)

On the other hand, there are suggestions for improvements that couldbe made concerning the work of the professional, which would lead to the optimization of the results, such as the increase in the number of professionals in the school, the collaborative action between parents and teachers to optimize the results, the decrease in the number of students in the classroom, the realization of psychopedagogical diagnoses and the continuity of the studies in the training of the professional. In this way, the psychopedagogical workwould havenew perspectives and achieve greater impact on school society.

4 THE IMPORTANCE OF EARLY CHILDHOOD EDUCATION FOR HUMAN DEVELOPMENT

First of all, it is necessary to define childhood. More objectively, childhood is the period of life that extends from birth to puberty, in which there is character and personality formation, contraction of rules, values, family customs , beliefs and social behaviors.

For a long time, the child was seen as a "coming to be" and was only considered a human being when he reached rational age, and was therefore not valued as human life. Currently, it is already noticeable and indisputable the importance that the child has for the community. It represents the result of multiple variables already existing and the future of the nation (EIBEL, 2005).

According to Silva (2010):

> Childhood is the continuity of our expectations and goals, this causes the child to often be surrounded by affirmations, which adults project. But this later is also threatened by contemporaneity, by globalization, it is the adult world that arrived long before their lives, they no longer want to play make-believe, the digital age makes them hostages of an unreal and often dangerous life , which leaves them mutilated without fantasies to create and recreate a more colorful world in their image. Without recognizing our childhood we feel threatened in our desire for perpetuity and deprived of the future (SILVA, 2010, p. 19).

Therefore, adults must promote a good construction of this childhood, because future humanity depends on the care given to children. The child is an integral being and all aspects of his development must be taken into account in psychopedagogical projects.

The importance of early childhood education and care for this public are dimensions that are mentioned in article 227 of the Federal Constitution – CF (BRAZIL, 1988):

> It is the duty of the family, society and the State to assure children and adolescents, with absolute priority, the right to life, health, food, education, leisure, professionalization, culture, dignity, respect, freedom and family and community coexistence, in addition to keeping them safe from all forms of neglect, discrimination, exploitation, violence and oppression (BRASIL, 1988, art. 227, p. 132).

The family, because it is the first contact of the subject with other people, has a primordial role for the formation of the same, through support, affection and encouragement to personal growth. It is also necessary a joint effort of all sectors of society to guarantee the rights that belong to it, such as education, health and leisure (SILVA, 2010).

Early childhood education is a unique experience for life, because it is through it that it becomes possible to form character, cognition, motor coordination, social interaction and, consequently, the generation of responsible and healthy adults.

The Law of Guidelines and Bases of National Education – LDBE, in its article 29, states that early childhood education, the first stage of basic education, aims at the integral development of the child until the age of six, in its physical, psychological, intellectual and social aspects, complementing the action of the family and the community.

According to Vygotsky (1987, *apud* DANTAS, 2003), the child's learning occurs from birth and is essential for the development and improvement of mental functions, and school learning produces something innovative in this process, because it transmits to the child the awareness of his processes that occur in his mind. In addition, it can bring the potential closer to the real, that is, the child has greater aptitude to flourish and develop as a human being.

The school has the function of being the bridge between the child and the world outside the home. As an intermediary, your function is not only to transmit content, as the traditional method of education requires. The educator must keep in mind that his task is to contribute so that the student

learns, interacts, develops his mind and body and can debate, reflect, opine, discuss and teach, in a relationship of double exchange. Both, student and teacher, are builders of knowledge, because it is through the collaboration between the parties that the teaching and learning of the human is formed (PULINO, 2017).

Thus, the educator needs to meet the particularities/specific characteristics of the development of the students, since it is in the school that the children receive greater support from specialized professionals to assist them in their school trajectory (FREITAS; CORSO, 2016).

Antunes (2004) shows that the age group of 0 to 6 years of life is the fundamental stage for the organization of information that will reflect on competencies and potentialities. Therefore, the education that takes place during this phase is essential for good human development.

In early childhood education, the objectives of the educator's work are organized in such a way as to promote the proper development of the student in the various areas. It is important to ensure self-knowledge of the child's body, through games and activities that stimulate the exploration of body characteristics (such as flexibility, stretching, balance, among others), the development of the imaginary, creativity and critical sense, through stories, readings, drawings and arts, cooperation with the other, through interaction with colleagues of similar ages, and respect and friendship with older people. In this sense, school education collaborates with the knowledge of body, affective, emotional, social, cognitive and moral capacities and potentialities, forming children in a perfect state of development (COSTA, 2004).

Research conducted in the Federal District – DF reveals that most adults who have cognitive, motor and emotional disabilities did not attend Early Childhood Education, unlike adults who developed skills and built significant learning relationships, who were schooled from an early age (GOULART, 2008). Development is compromised when there are no stimuli necessary for this, such as in a school environment with trained professionals.

Unfortunately, there is still prejudice on the part of parents and family members, because it is common to hear from them constant complaints about school education, suggesting that their children spend the day playing and are not learning from it. However, as described by Freitas and Corso (2016), games and other activities, apparently useless, promote learning and bring numerous intellectual benefits to the child. Playing, for example, is one of the most effective pedagogical means in early childhood education, as they meet the objectives defined by pedagogues, developing in students reading , concentration and body control skills .

Thus, the relationship between education and children must take place through methods, techniques, languages, instruments, among other means, that are capable of building concepts of solidarity, respect, justice, leadership, in addition to allowing the luno to have adequate means to form their identity and develop the potential to shape their future.

In this sense, the role of the psychopedagogue is to contribute to the pedagogical management and promote communication with the student and the group and individualized support, if necessary, helping students to obtain the best school, social, affective and cognitive performance. The psychopedagogue is the most suitable professional to advise and assist the school in the various aspects of the teaching-learning process. It is worth remembering that each person is unique, therefore, the professional of Psychopedagogy must, firstly, identify the difficulties, analyze the factors involved in the formation and elaborate the necessary intervention plans (OLIVEIRA, 2009).

To close the chapter, a quote from Fulghum (2004) sums up the level of importance of early childhood education for human development: "Ireally needed to know ... I learned it in kindergarten. Wisdom was not at the top of the highest mountain, in the last year of a higher education, but in the sand tank of the mother's school yard" (FULGHUM, 2004, p. 16).

5 AN EXAMPLE OF THE PERFORMANCE OF THE PSYCHOPEDAGOGUE IN SCHOOL EDUCATION

In this chapter, a proposal was suggested for how the psychopedagogue could act in a given situation of the school environment.

In the context of the Brazilian reality of the twenty-first century, it is increasingly common the birth of children who have some physical or mental disability. At the same time, it is increasingly common to include students with disabilities in regular schools, and not in exclusive schools. This is the result of several factors, such as public policies, legislation and gradual changes of awareness in society, which have generated a whole conjuncture of promotion of the ideals of social and educational inclusion.

According to data from INEP (Anísio Teixeira National Institute of Educational Studies and Research), between 2005 and 2015, the number of students with disabilities in regular classrooms increased 6.5 times. In absolute numbers, it grew from 114834 to 770983 special students living with other students (TENENTE, G1, 2016).

According to Mendes (2006), according to the practices of integration and inclusion, the benefits for students with disabilities would be the chance to enter more challenging learning environments, observe and learn with more competent students, be able to experience more realistic social contexts to promote meaningful learning. The positive results for the other students would be the possibility of teaching them to accept the differences between human beings and promote attitudes of acceptance of their potentialities and limitations.

Therefore, the work of the psychopedagogue in this context is to develop an interactive approach among students to promote development in the school environment. The psychopedagogue must unite parents, teachers and colleagues for the promotion of a healthy context of learning and

development.

As for parents and relatives of children with disabilities, it is suggested to the professional to reassure them about the work developed in the classroom and encourage them to raise their children so that they have life experiences like other children. It is not healthy to deprive the child of living, of relating, of smelling, of playing and of trying new things. On the contrary, parents can motivate their child to develop skills, potentials and languages, to play with neighborhood classmates so that he gets used to being around people who are outside of his relatives, discourage repetitive or meaningless movements, stimulate the physical senses, experiment with various flavors, textures and temperatures, and help form a positive self-image of the child, so that she feels confident and able to face the world around her. The family must be a place of affection, affection, support and stimulation to the development of the child.

As for the teachers, it is interesting that the psychopedagogue develops a joint work in the classroom, assisting in the evaluation and the teaching method. It is important that the planning of classes, meetings and other pedagogical events are carried out with the presence of the psychopedagogue to better direct the work. It is also necessary that educators enjoy being with children, identify with them, have an interesting and efficient didactics, encourage the inclusion of students with disabilities, promote awareness among children and transmit good values of respect, equality, tolerance of differences, friendship and collegiality.

As for students with disabilities, the psychopedagogue must make the diagnosis and perform the monitoring of performance, which can be done alone or together with other students. The detection of learning difficulties and changes in child growth are essential, as they ensure the correct application of the solution. It is important, in this phase, the use of the necessary assessment instruments to better understand the life situation in its emotional, physical, social, family, moral and cultural aspects, to propose the alternative intervention for each case.

The realization of games, games, activities, drawings and other pedagogical resources should be the main means of stimulating the imagination, creativity and freedom of children in school. They are educational opportunities that favor the development and learning of the student and cannot be underestimated by the educational procedure.

In addition, in early childhood education it is paramount that the school infrastructure is adequate. The facilities, the space available for games and activities, the number of students per room, the availability of teachers and psychopedagogues, among other factors, should be sufficient to serve the students.

All the procedures mentioned in the chapter compose the proposal of the psychopedagogue's performance in the context of educational inclusion.

6 FINAL CONSIDERATIONS

The goal of psychopedagogy is to promote learning and effective integration of the student. It studies how humans process and assimilate information to develop understanding. In the classroom, the psychopedagogue recognizes problems, employs corrective and preventive methodologies, evaluates student behavior and suggests solutions to improve academic performance. Over the years, psychopedagogy has evolved and improved, reaching more people and seeking to promote human growth. Challenges such as serving a large number of students in a class and integrating parents and teachers can be overcome with more professionals and teamwork. The goal of psychopedagogy is to ensure healthy development and support quality education, allowing the potential of each individual to be fully realized for the benefit of society.

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Specialized educational care in the public system: Intervention strategy in a case of double exceptionality

https://doi.org/10.56238/ptoketheeducati-058

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ABSTRACT

Among the diversity of students in the school context, there are those who still have little identification in the regular classroom, including Double Exceptionality (DE), that is, Asperger's Syndrome (SA) and High Skills (AH). Due to gaps in the initial and continuing training of teachers that enable them to recognize the characteristics of specific human talents, the biggest loser in this situation is the student. Qualitative research where the object researched is the trajectory of the student XD (fictitious name) in the school environment. The type of study is the single case study, which places the case as the focus of the research. The Medical Evaluation showed a clearly above average position in intellectual capacity and an average above expected for age and schooling, with percentile equal to or higher than 40% for a group of the same age group; his cognitive development presented some distortions with delays, his academic performance being impaired due to limitations in social interactions, in addition to severe blockages in relation to the environment, with reactions to pressure, anxiety, inadequate feelings, which made him highly attached to his imagination and fantasy, bringing the feeling of a dangerous, uncertain, rigid, inflexible world. In this case, communication increased as trust was established and it was possible to perceive the set of experiences of the subject of the report from the stimulus of a game, since playfulness had a positive role in this process linked to difficulties. The oral communication skill was stimulated with gamification and graphic representation, stimulated by the interest in the English language. The partnership with an institution with a gamification and robotics project greatly facilitated the development of XD as an individual in society, strengthening ties, affirming trust and opening new

professional horizons. A particular actor, the Teacher Coordinator of the Pedagogical Center, and the collaboration of the entire school community leveraged and sustained XD's educational inclusion.

Keywords: Teaching and learning, Special education, Specialized educational care, Intervention strategies, Double exceptionality, High skills / Gifted.

1 INTRODUCTION

In the diversity of students present in the school context, there are those who still have little identification in the regular classroom, among them, the Double Exceptionality (DE), that is, Asperger Syndrome (SA) and High Skills (AH). Due to gaps in the initial and continuing training of teachers that enable them to recognize the characteristics of specific human talents, the biggest loser is the student. In this sense, losses such as deficits in social interactions and communication that are already typical of this student population increase, resulting in a mismatch between intellectual, social and emotional development. However, it is possible to alleviate their suffering by enabling interventions in the follow-up with teamwork composed of professionals focused on support and with individualized interventions coming from different strands that will contribute with support supports for improvements in social adjustment, favoring the performance of this student in the classroom.

2 REVIEW OF RELATED LITERATURE

2.1 SPECIALIZED EDUCATIONAL ASSISTANCE IN THE PUBLIC EDUCATION NETWORK

The right and the guarantee of access to free education are established in the Federal Constitution of 1988, in article 208 [1]. In this perspective, the National Policy of Special Education in the Perspective of Inclusive Education (PNEEPEI), of 2008 [2], emerges with a new milestone for education, this time, a new look at special education that was previously substitutive to common education.

In 2009 [3], Brazil ratifies what was provided by the Committee on the Rights of Persons with Disabilities (CRPD), of the United Nations (UN), in the International Convention on the Rights of Persons with Disabilities (CRPD), establishing that students with disabilities, global development disorders and high skills, are offered education in the regular classroom and in Specialized Educational Assistance (AEE), in a complementary and supplementary way. This issue is then recognized as a matter of justice, human rights and promotion of equality. From Law No. 9,394 of December 1996, Chapter V [4], special education became a transversal teaching modality at all levels, stages and modalities.

Thus, the PNEEPEI guides the systems regarding the organization of this teaching, in this context, Law No. 13,146/2015 (Statute of the Person with Disabilities) [5] is established, bringing the inclusive school model with the requirement of adopting new pedagogical practices. Thus, the training of teachers is necessary to break with conceptions of homogeneous patterns of students. The other

education professionals, as well as the participation of the family and the community, become part of this organizational system for the realization of an inclusive look in urban, architectural accessibility, furniture and equipment, transport, communication and information, in the intersectoral articulation of the implementation of public policies [6].

As a response to families who cannot always identify what the school lacks so that students can gain in their singularities related to school inclusion, Law No. 9,394 of December 20, 1996, the Law of Guidelines and Bases (LDB) [7], establishes the mediation of the specialized teacher in the AEE, according to article 58:

> § 2º: Educational assistance will be provided in specialized classes, schools or services, whenever, due to the specific conditions of the students, it is not possible for them to be integrated into ordinary regular education classes.

Under the law, the AEE is carried out in the multifunctional resource rooms of basic education schools. These are spaces with furniture, teaching and pedagogical materials, accessibility resources and specific equipment for the care of students targeted by special education, in a shift contrary to their schooling, as established in PNEEPEI [2] and Decree No. 6,571/2008 [8].

Resolution No. 4, of October 2, 2009 [3], makes it clear that the AEE will be carried out in the reverse shift of schooling (counter shift). Aimed at students with disabilities, global development disorders and high skills, it brings the guarantee of a specialized teacher in a specific area, within the school itself, whose function is to guide regular classroom teachers, families and classmates regarding the use of materials, their applicability and functionality, in addition to adequately supporting the student in his educational need with content of the Brazilian Sign Language (Libras) and tactile Libras; Digital alphabet; Tadoma; Portuguese language in written form; Braille system; Orientation and mobility; Accessible computing; Sorobã (abacus); Visual stimulation; Alternative and Augmentative Communication (CAA); Development of educational processes that favor cognitive activity. As resources, accessible didactic and pedagogical materials (books, drawings, maps, graphics and tactile games, in Libras, in Braille, in enlarged character, with visual contrast, imagery, digital, among others); Accessible Information and Communication Technologies (ICTs) (mice and actuators, keyboards with hives, voice synthesizers, Braille line, among others); and Optical resources; AAC boards, pencil thickeners, equipment tip, head, inclined plane, accessible scissors, magnetic board with magnetized letters, among others. In conjunction with other professionals, the work of this specialized teacher collaborates with the development of the autonomy of this student in care.

2.2 AUTISM SPECTRUM DISORDERS (ASD) AND THE LEARNING PROCESS

Autism Spectrum Disorder (ASD) in Early Childhood Education (EI) has been a much discussed topic today, as it is observed that children have been diagnosed early, due to the advancement

of studies related to this area of special education [10], as pointed out by the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) [11].

Children with ASD face several challenges in their daily lives, whether they are social interaction, communication or in their motor and cognitive development. Through observation, carried out during the EI period, it is found that although the child with ASD has limited language and has resistance to physical touch, this child has feelings and, therefore, the teacher needs to nurture the relationship of affection and stimulate his emotional sensitivity. Another factor of difficulty is the way in which information is understood by the child with ASD. The child needs to be told in detail at school what is going to be done that day. It is also necessary that the activities are done one at a time, because too many stimuli can cause an overload, which makes it difficult to assimilate what is being taught. [10]

Psychopedagogy is also of paramount importance for the development of children with ASD since the psychopedagogue studies the learning process of these children, thus identifying the difficulties that interfere in the assimilation of content [12].

2.3 THE DOUBLE EXCEPTIONALITY

Rezende, Fleith and Alencar [13], mention that Double Exceptionality (DE) is an asynchrony of human development and cite as an example, Asperger Syndrome (AS), Attention Deficit Hyperactivity Disorder (ADHD), Learning Disorders (LD), among others. In these conditions, it can be added to High Abilities/Gifted (AH/SD).

Renzulli [14], defines AH/SD, being it, in his definition, represented in the "[...] Three Rings Conception of Giftedness: creativity and commitment to the task. [...] above-average ability [...]".

Still in this conformity, in agreement with this definition, Resolution CNE/No. 4, of October 2, 2009 [15], considers in its Art. 4-III, some traits for the identification of students with AH/SD, defining them as "[...] those who have a high potential and great involvement with the areas of human knowledge, isolated or combined: intellectual, leadership, psychomotor, arts and creativity".

2.4 THE CONTRIBUTION OF OTHER AREAS TO ESA

The specificity of each ESA student can benefit from the participation of other professionals supporting the development of children.

For example, autistic people, because they present significant deficits in behavior, suffer a great impact on education, requiring stimuli for a better quality of life. The participation of other professionals in the multidisciplinary team can lead to the achievement of new skills, such as the practice of physical activity that improves not only the motor part, but also the cognitive with benefits

in the physiological, psychological, cognitive and social spheres, working the individual as a whole in his integral formation.

According to Oliveira, Santos and Santos [16], in the case of the autistic, due to different dysfunctions, the development of new skills brings progress in the physiological aspect with maintenance and increase of the range of movements, developing coordination with improvement of balance and body posture. In the psychological area, success in the execution of activities results in increased self-esteem. In the cognitive area, it is observed that through body movement, students tend to know themselves better, and in the area of socialization, it enables better inclusion, since the child needs to have contact with others of the same age group, in addition to approaching adults.

According to Teixeira and Hernandes [17], music therapy, through the musical language that is universal, overcomes cultural, cognitive and emotional barriers, opening paths in the communication of all human beings through creation, interpretation, listening and musical improvisation.

In this context, it is perceived that music becomes something organized and essential, integrated with sports practices, becomes favorable for the learning of autistic students served in the AEE, however, the service does not have the support of the multidisciplinary team through state resources, and families must bear the costs for the benefits of children in care.

2.5 GAMES AS A COMMUNICATION CHANNEL

Although it is clear that autism is a very broad disorder, Sá et al [18] mention that intervention with educational games brings the perception of daily progress that is being achieved, according to reports from parents, specialists and researchers, so that it collaborates with a cognitive, social and emotional growth in children. In this context, depending on the autistic child, the games are possibilities found through technological tools, thus creating a productive process.

An approach that has been gaining adherents and being widely experimented involves the application of digital games, which aim, in a playful way, to improve the deficient skills resulting from ASD, which are present in the emotional, communication and social interaction, cognitive, motor and concentration areas [19]. Digital games, as educational tools, allow the student to assimilate concepts, assisting in the learning process and in the development of skills and abilities essential for their training. With the use of digital games, the individual develops his cognitive skills, mainly pattern recognition, information processing, creativity and critical thinking [20].

The use of digital games as assistive technology for people with ASD has been shown to be effective in a considerable number of studies. There is a strong trend towards the growth of the area of development of digital games with assistive characteristics focused on mobile devices, which should increasingly integrate into the daily activities of people with special needs and abilities, in particular, people with ASD. [21]

2.6 THE INSTALLED CONTEXT

The emergence on December 31, 2019, in the city of Wuhan, Hubei province, People's Republic of China, of the SARS-CoV-2 virus, known as Coronavirus, which leads to acute respiratory syndrome, hospitalization and death led from March 12, 2020, the pandemic declared by WHO, the global outbreak of SARS-CoV-2 [22].

This fact, initiates the new conditions of the educational scenario in the pandemic, forcing decision-making with emerging measures by the National Council of Education (CNE) approving Opinion No. 5/2020 [23], which reorganizes school calendars, as well as the performance of pedagogical activities.

In this sense, the State Department of Education (SEDUC), through Decree No. 64,862, of March 13, 2020, amended by Decree No. 64,864, of March 16, 2020 [24], suspends classes within the scope of the Department of Education, to prevent contagion by Covid-19. Thus, the service in the AEE that was previously in person becomes remote and the pedagogical process gains a new modeling in teaching.

As a result, there is a paradigmatic change in the school, as technology becomes part of the school context as never experienced.

Technology becomes the main means of communication between school, family and students, with the cell phone being the most used means of communication through the Whatsapp application, with the creation of groups or with individualized video calls.

School activities were offered in such a way that students did not lose contact with school and did not experience setbacks in their development.

The Law of Guidelines and Bases of Education (LDB) [7], in its Article 62, in items 2 and 3 provides for teacher training to "use distance education resources and technologies", however, the scenario brought to the educational process much suffering.

The decentralized bodies, such as the Teaching Directorates, through the Teacher Coordinator of the Pedagogical Center, also supported teacher training in accordance with what is established in the LDB.

In the meantime, support to schools was based on the elaboration of weekly and biweekly scripts with suggestions of didactic materials made available in Whatsapp groups through exercise lists, videos, pedagogical guidelines, among other notes such as feedback to families, students and monitoring of managers.

In line with this, State Decree No. 64,982 of 15-05-2020 [25], establishes the São Paulo Education Media Center, aiming at the implementation of new methodologies and educational tools complementary to face-to-face teaching. A great advance for the education of São Paulo with moments

of training in real time for all the teams of the teaching directorate and schools, as well as online classes for students.

In this context, the AEE is also inserted, however, the obstacles have emerged in a punctual way, since not all students have tools such as cell phones or computers to perform the activities, requiring the sending of printed materials.

Given this reality, the students served end up being segregated because they do not have the necessary support for their development. This impact ends up being reflected in the activities of the regular classroom, bringing the need for active monitoring by the school team.

3 RESEARCH METHOD

Research of a qualitative nature where the object researched is the trajectory of the student XD (fictitious name) in the school environment. The type of study is a single case study that places the case as the focus of research. The research was conducted at the State School "Jardim Encantado" (EEJE), in the city of Votuporanga, State of São Paulo, Brazil, from May 2019 to March 2020. The research data source included: 1) Pedagogical Core Coordinator Teacher (PCNP) responsible for the special education teaching modality, 2) EEJE Coordinator, 3) English Teacher. The data collection of the case study was through direct observation. The data analysis technique used in this research was the non-statistical technical analysis that applies to qualitative data.

4 SURVEY RESULTS

4.1 IDENTIFYING THE CASE

Attending a routine visit the PCNP is faced with the student XD, fictitious name, whose performance in relation to other students of Specialized Educational Assistance (AEE) caused him a certain strangeness and discomfort. XD had oriental characteristics, was 13 years old and was regularly enrolled in the 7th grade of Elementary School, in the afternoon, at "EE Jardim Encantado". The EEJE is a school considered outstanding, as the location is privileged in this city in the northwest of São Paulo, under the jurisdiction of the Teaching Directorate (DE), in addition to having a faculty almost entirely effective, without turnover, reason for dispute for vacancies for children by their families. Precisely on the day of the visit, XD was in care for students with Intellectual Disability (ID), having been referred by his regular school, with the justification of being a student without participation in classes, not having friends, despite being very nice. Already, the argument of the teacher responsible for the SEA, as to the presence of the student in the service, was to be in evaluation. Well, on that day of the visit, XD crossed his gaze with that of the PCNP and there was established a first interaction. Smart, bright and captivating look, with a synchronized swing of the legs as if he wanted to say something, and said, without sounds of words, but in written form "My name is XD.". Another sign

that attracted the attention of the PCNP who asked him: "Do you like English?"; and the answer: "Yes!". This aroused the curiosity of the PCNP who wondered: "What is hidden in this being? A student with intellectual disabilities, writing in English is not natural ... ". The link was created and the PCNP, delighted, proposed to investigate XD more closely. Back in the ED, and in conversation with the teaching supervisor (SE) about the case found in the SEA room and the strangeness felt with the clues given, the PCNP was surprised by the fact that the SE had also perceived something different, mysterious in this student.

4.2 PEDAGOGICAL CASE FINDING

In the second half of May 2019, the PCNP began the pedagogical survey with XD to get to know him more, interacting with his life story. The first contact was with the school coordinator, who had taken over the function a month ago, however she knew the student in the classroom for having taught him mathematics, which would favor the collection of information. However, the PCNP realized that the work would require a little more patience in this school itinerary, considering that the school still had traces of very conservative conceptions, when it came to the process of inclusion of the target audience of students with ASD, and rightly so, because this audience was hidden, being more visualized in the Special Care Institutions. "EE Jardim Encantado was a school extremely careful with the health of students, so much so that it had an employee of the secretariat to administer medication at scheduled times for students, with due authorization by parents for this purpose.

Thus began the investigative interaction with the school coordinator as a survey of the student's school life: "XD comes from another school network, has been studying at this school for two years, however, he never opened his mouth to talk to teachers, he has no friends, sometimes the appearance is that of a deaf student, because he does not interact with anyone, among teachers the discourse is permeated in a dubious way, whether he hears well or not, because they never heard his voice in the classroom during class time. A curious fact, among us at school, is that this student comes every day with sunglasses and a glove on one hand, other times he comes with a sweatshirt, hiding his head in the hood. The family is oriental, extremely reserved, speaks little of XD's life, and what we know is that the student is autistic, has psychological, neurological monitoring and does swimming activities in the after-school hours. Also, the family order is that he has no contact with one of his classmates because of a past disaffection, when they were in the other network. He comes to school accompanied by his mother to the gate and at the end of classes, she picks him up."

In this way, the first information about XD was obtained. In the Collective Pedagogical Work Activity (ATPC) of the school unit, teachers were informed that the PCNP would participate in the classes for student observation.

The following week the PCNP entered the classroom, sat down at the last desk and began to observe him. He remembers well: math class, XD barely raised his head, his legs continued in that synchronized swing as if a musical echo sounded just for him, the movements did not stop. The teacher began to explain the subject, went through the activities with the participation of the students. The class came to an end, the teacher said goodbye, and the teacher of the next class entered. XD continued with the same posture as in the previous class, so he followed the subsequent classes, until the break time, when the PCNP also left for the survey in another environment outside the classroom. His gaze ran through the courtyard spaces in search of XD, the buzz of the kids were noticed, because the moment was recreation, rest and lots of laughter, however there was also XD in its own way. Interaction with the kids? No! We could see his enormous desire to get in the boys' circle, because he was walking around, but something did not let him interact, thus signaling one of the characteristics of ASD.

The next day the PCNP talked to the English teacher about the interest in the communication of this language by the student, narrating to her what she had witnessed in the communication at the time of the visit in the AEE, when the teacher shared the same thought as the PCNP: "he likes English very much, but has no participation in classes. The activities are seen, corrected, the interest in the language is well perceived." That day, in conversation with the school coordinator, she was informed about the student's poor performance in the math test, a fact that had left her worried, as the student had good grades.

4.3 BREAKING THE SILENCE

Then the PCNP invited XD to a private conversation, since his close and frequent presence no longer caused him strangeness. He readily accepted the invitation, now, the challenge of the PCNP was to expand that interaction initiated in the look of the AEE room, maintaining that it evidenced possibilities of subjectivations in the reception and hidden potentialities, not yet revealed, since the school, being plural in its diversity of students, could have let this monitoring pass. In one of the school rooms, reserved for coordination, XD and the PCNP started the mathematics assessment again as a pretext for a better understanding of what was happening, and, in the midst of the questions, the PCNP asked XD if she was managing to perform the proposed tasks, but she did not get answers and at these times her silence bothered her. "Why did you write in English to me in the AEE room? No answer! Do you like English?" The silence continued, but her eyes were on the PCNP. "I'm terrible in English, I don't know anything about this language", the PCNP said to XD, to see her reaction. The math questions were there to be solved. The PCNP knew she was hindering him in his calculations, but the goal was to open a channel of communication.

Another question was asked: "Do you like to play with your friends? Do you play on the computer or on your cell phone?" At that moment, XD opens the communication channel and reports

in writing in a corner of the test sheet. The PCNP quickly handed him a blank sheet of paper so he could write. "I like Kick the Buddy, a torture game. We torture the doll, it's an anti-stress game, but my mom thinks this cell phone app can get you in jail, she's wrong." The PCNP, although very frightened by what she read, continued with her inquiries, because the channel was opening and could not be missed. Then XD writes: "This one is dead", referring to himself, "I poisoned his soul, only a clone of me can help me". Drawings of knives, saws began to appear in the midst of his creation. The PCNP realized that the student was literate, but wondered how she would act with socio-emotional skills. All the more reason to continue the investigative probe. The clock was ticking and the hours were advancing, they interrupted the task with an agreement to continue the next day. The next day, in the same room, they continued the math tasks. After a while, XD was involved in the calculations and silence again hung in the air, an idea came to the PCNP's mind: to try the Kick the Buddy game, mentioned in the previous class. And so, with the cell phone in hand, the PCNP started, out loud, the wrong pronunciation in English about the words of the mentioned game, and to his surprise, XD gets up from his desk, whispering in his ears "that's not how you read it", correcting his pronunciation of the words of the game. The sounds of the words began to break the silence that had existed until then. Unforgettable human being, different, unique.

In the meantime, the PCNP discovered in this communication that XD was invisible, that is, in his imaginative conception his presence in the school was hidden, so he did not speak, did not interact with anyone and from that moment on the PCNP also became invisible. However, she could not be rude or insensitive, but welcoming in that speech that seemed so distressing and suffocated, kept to herself; but, how to be an invisible friend? the PCNP asked herself, and thought: "there are ways to go so that we can also lead others". She told XD that she was not from the school, but she would be his invisible friend, however he needed another invisible friend who was from the school, he resisted, but accepted the proposal. She presented him with the idea that the school coordinator might be the friend he needed, and with a little resistance he accepted her.

The PCNP left the room in search of the other invisible friend in XD's imagination, who from now on, was also part of this arrangement. This fact surprised the school management team, because until then, they had never heard the student's voice. The coordinator, now the new invisible member, entered the room, whose door was closed, XD's voice echoed for the first time in the environment sharing ideas, even if they were narratives that seemed strange.

It was perceived in the student a possible impairment in this intellectual aspect, as well as adaptive skills, however, knowing the family environmental conditions of an extremely rigid and conservative family, the look at this aspect in the interactions was sharpened.

From that day on, XD started talking to the invisible friends she had just gained at school, telling them what happened to her in the school and family environment. The bond was established

with welcome, otherness, empathy and affection. Also, in order not to miss these precious moments, the PCNP sought XD at the EEJE school, whose building was right next to the ED where she worked.

XD attended the ED every day for about 1h30min, and at these times the use of the computer with the *Kick the Buddy* game was guaranteed. Support was also provided in English conversation stimuli with the coordinating teacher responsible for the foreign language, since with the other teachers of the ED and the school, the retraction in social interaction and communication continued.

4.4 THE DIAGNOSIS AND MEDICAL ASSESSMENT OF XD

But what about XD's family? It was at this point that the mother was called, and was informed of what was happening with her son. Very solicitous, the mother answered the call of the ED and with the participation of the school team, all the monitoring done to the student was narrated. Surprisingly in this conversation, the reports were presented by the mother, since the student was already being evaluated by the multidisciplinary team of a medical school in the northwest of São Paulo, diagnosed as having Asperger's Syndrome.

From there, a greater relationship was established with the mother to better understand XD, such as preferences, routines, autonomy and independence, mobility, family relationships and other environments frequented by the student. The first information was emerging from the partnership established with the mother, reporting games as her favorite activity.

The test results showed a definite above-average position in intellectual ability and an average higher than expected for his age and schooling, his percentile being equal to or better than 40% for a group of the same age group; in his cognitive development, he presented some distortions with delays, and his academic performance was impaired due to limitations in social interactions, in addition to severe blockages in relation to the environment, with reactions to pressures, anxiety, inadequate feelings, which made him highly attached to his imaginations and fantasy, bringing the feeling of a dangerous, uncertain, rigid, inflexible world. Such analysis brought to PCND the feeling of responsibility in initial and continuing education to education professionals, because there are hidden treasures in each human being that can only be discovered, explored if touched with affection, understanding and passion for educational practice.

4.5 EXPANDING THE POSSIBILITIES OF CARE

Thus, the circle of people increased so as not to make the same (or worse) mistakes, was widening, not only in the ED space, but also in the EEJE school that now has in its space the place for the care of students with ASD.

In agreement with the family, XD was transferred from this school in the second semester of 2019, to the State School "Castelo Forte" (EECF), in order to facilitate care for his spectrum. Inserted

in the appropriate AEE and created for this type of student, XD was accompanied by the teacher specialized in ASD who worked different aspects for his advancement. As it was found that the student had High Abilities / Giftedness in some areas, partnerships were initiated with the Universidade Estadual Paulista (UNESP), particularly the campus of the Institute of Biocências, Letras e Ciências Exatas de São José do Rio Preto (IBILCE) and the Federal Institute of Science and Technology of São Paulo (IFSP), Votuporanga campus, through the insertion and monitoring in activities, whose themes would address their areas of interest, such as gamification and programming, with the assumption that learning was centered on the student, using the methodology based on projects and problems.

In the EEA of ASD, the service took place twice a week with activities advised by the researcher responsible for the area of High Skills of UNESP, planned jointly between the PCNP and the specialized teacher of the EEA, with an individualized service plan for XD, aimed at the development of the potentialities presented in their area of interest as skills in games, foreign language, creation, still, seeking to intensify social interaction, communication, with activities and tasks that minimize existing environmental phobias.

The fact is that, the positive side of the student evidenced in the evaluation period by observation in the classroom, was addressed in the care of the AEE TEA, through creations that stimulated his interaction with the specialized teacher. Thus, tasks were planned to be performed by the student. Being a follower of famous *youtubers*, XD had expressed the desire to also be a *Youtuber*, and such a tip was the hook to ensure communication stimulation. Research on the routines developed by *youtubers* was also carried out, seeking to know the values and earnings of these people, advertisements on the channels and video recordings by cell phone were also guaranteed for XD to stimulate speech. Still, valuing the creation side, several activities with *STOP Motion* were done so that the student activated his imagination, putting the scripts and characters into action with the support of digital technology, later transposed to other materials such as sulfite sheet, cardboards.

As for the student's day of attendance, the activation of other spaces that contemplated support was also considered, demystifying the environmental phobias detected by the evaluation of the multidisciplinary team. Classes were held weekly at the IFSP, with the participation of a group formed by approximately 10 students who had a high level of school performance, including participants in the Brazilian Olympics of Mathematics in Public Schools (OBMEP), in addition to a great interest in games, a reason that facilitated personal interaction with peers in moments of creation, bringing motivation in the execution of tasks shared in groups, in addition to the obligation in communication.

The classes took place on Thursdays at the IFSP and were taught by the researcher in technologies and programming, lasting 1h30min. This time was divided between explaining the problem to be solved, indicating the appropriate programming and then applying the concepts by the students, always counting on the final challenge. Thus, the first tool presented was *Scratch,* the second

tool, *Construct 2,* both free and available on the internet. In the *Scratch* environment it was only possible to program using blocks, in the case of the games created by XD the challenge was to make the well-known character "Mario" pass through the pipe, enter an underground world in which he should capture the largest number of coins within the time of 60 seconds. Then the student had to do the Coin Programming. The classes respected the pace of the student, and also of the other participants of the project, in this way it was possible to notice that other students of the same class, also developed different games, using the same mechanics, some use time, others do not, also the uses of lives and points were varied, considering that the scripts and characters had different rules for each student.

A great advance was observed in the tasks performed with the development of XD skills from these stimuli during the school year in the regular school and in the care and partnerships.

The student's care was also continued in the 2020 school year, with great expectations, as his development was clear.

5 CURRENT SITUATION

However, obstacles and barriers arose: the ESA teacher was unable to continue the service because she taught classes at another educational institution, and there was no other teacher with the same training in the list of teachers enrolled at DE level who could teach classes to XD and another negative and impacting factor was that from March onwards, an unusual situation arose, the COVID-19 pandemic, which directly affected health and education. With social distancing, regular classes and assistance became remote with online activities, leaving that routine that until then, one was used to in person. And then the school that used to be the space for inclusion, support and reception, also started to need to be welcomed. In the face of so many events that have led entire families to death, affectivity, empathy and otherness gain space in the integral formation of education, articulated to the knowledge historically instituted in the school space.

5.1 ENGAGEMENT ACTIVITIES AND ACTIVE SEARCHES BY LEARNERS BECAME PART OF PEDAGOGICAL PRACTICE

The faces hidden behind the masks obscured communication, however, alternative activities to guarantee the teaching-learning process were carried out, preventing students from dispersing from school life. Barriers were inevitable in school spaces, so XD care suffered from mediation, even if online, because fear, insecurity, social distance, were present in all families and in all spaces and environments. Time went by, the school year ended, however, the pandemic is increasingly worrying waiting for the vaccine. At school, students have the option of flexible attendance, but is learning the same?

New horizons appear with the threshold of the year 2021, the arrival of the vaccine, and hope is reborn. We are in the new normal, but ending the first semester, but where is it XD? As for the services, even if remotely, they were tried, but without success, with the distance the condition of the spectrum was accentuated again, requiring a resumption, as soon as everything normalizes with school life.

Your family was contaminated with COVID 19. I believe that the suffering experienced with the disease helped to silence the voice, however, the flame can be lit again, just make it possible.

6 DISCUSSION

As trust was established, communication increased. It was essential to take advantage of this moment, as it collaborated with the expansion of the vision in the evaluation of the student. Pragmatic theories consider the context extremely important for communication since the pre-verbal period; that is, even before issuing the first words the child is able to respond to social initiatives, with the emergence of skills that underlie conversational exchanges [27], which is in line with the findings of research [28,29] that demonstrated that the context, attentive and responsive parental behaviors, predict subsequent language gains in children with ASD. Rolim and Antero [26] state that for there to be significant changes in the development of the ASD patient, it is necessary to have bonds, affection, meanings and affections. In this process the sensitivity to perceive words said and even those that were not heard, be perceived, felt and thus obtain a better use in learning. This is what happened in the reported case where the PCNP was lovingly unveiled in the attention and monitoring of XD.

It was possible to perceive the set of their experiences from the stimulus of a game, after all the playfulness had a positive part in this process linked to difficulties. Indirectly, games and language have established communication since the time of Piaget and Vygotsky [30]. Virtual games benefit their patients through health, entertainment, training and education, for example [31]. The game *Kick The Buddy* has a somewhat strange and controversial classification category since it falls under violence, torture and action games. There are those who stand against this classification saying that the purpose of the game is just for people to get rid of stress, a somewhat curious form of therapy. *Kick The Buddy* means "kick the friend", and is like a punching bag to relieve tension. All means of torture can be applied, as the dummy feels no pain and suffers nothing. *Kick the Buddy* features simple gameplay and to play you simply select the desired weapon or power from the menu on the left side of the screen, and then just tap the screen to use the selected object. You can find hundreds of objects, and even extranatural aids, all divided into categories. It is offered by *Playgendary, it* was released on May 22, 2018 (*Android* App *Kick Buddy - Buddyman Kick Game, Zoldyck Developer*) and last updated on July 5, 2018, because a while after that *Kick The Buddy: Forever* was released. The game is free to

play, but offers in-app purchases of some items, as well as constantly displaying ads. It is compatible with *iPhone*, *iPod touch*, *iPad* with IOS 4.0 or higher and all *Android* devices [32].

In a recent review, Albuquerque et al. [33] state that there is a connection between conventional intervention and the use of technologies as a complement to traditional professional practices by showing that the public involved in the reviewed works showed positive results between the associated therapies and thus, being able to say that there is success in the interventions, improving the communication and interaction of those involved; and that the development of more *serious games in* this area will provide greater gain for patients.

The oral communication capacity was stimulated by providing knowledge about cognitive knowledge such as logical sequence of facts, organization of ideas, perception of the cause and consequence relationship, in addition to the observation of their emotions. These learning elements are of great importance in the lives of autistic people since they have many difficulties in interpreting and constructing narratives, due to characteristics, such as the difficulty of understanding some expressions, ironies and feelings, facing language in the literal sense [34]. *Games* allow the experience of various narratives, in different contexts and virtual environments, which help subjects to, among other skills, develop logical thinking [35].

The use of drawings frequently used in their upbringing were an integral part of the communication process established, initially orally, then written with the mixture of graphic representations. Communication by figures is the most effective communication methodology used with autistic people, something observed since the first years of age [36]. Based on the assumption of the effectiveness of focused interventions [37], *quizzes* with a proposed tool that seeks to assist in the development of the understanding of the linearity of events of ASD patients, with graphic design, where images are shown and the child has the mission to order them sequentially, according to a children's story presented, have been developed with the purpose of evaluating the usability of the game when applying it to individuals with ASD [38].

Among the specificities of people with ASD is the deficit in socialization, communication and behavior so that they commonly encounter difficulties that reflect on social participation [39] and, according to Buemo et al. [40], in the school context the deficits in communication and social interaction of people with ASD cause losses in their socio-educational development. The isolation and eventuality of segregated activities are pointed out as a negative factor in self-reports of people with ASD [41]. Herein lies XD's "invisibility", his imaginative conception that his presence at school was hidden. According to Daniels [42], the social voice becomes the inner voice as it internalizes meanings and transforms them into its subjectivity.

The diagnosis of Asperger's Syndrome given to XD does not exclude the condition of a junction of HS/G and some disability and/or disorder that is revealed in a unique population in the area of HS/G,

where students tend to fail to demonstrate high academic performance or to reveal some specific disability and/or disorder, since their potentialities can be masked by some disability and/or disorder or, the opposite, the disability and/or disorder can mask HS/G [43]. Vilarinho-Rezende, Fleith and Alencar [44] also state that distinguishing between giftedness and double exceptionality is not only a challenge for professionals working in the field of Special Education (SE), but it is also a difficult task due to the similar characteristics between HS/G and AS [45] and this, in fact, promotes difficulties in the evaluation process of the two specificities. This reinforces the need for the topic to be studied, especially when it comes to the scarce production of knowledge on the condition of dual exceptionality in Brazil [46].

The logic of the partnership with IBILCE and IFSP is based on research that revealed that when programming, children learn to solve problems, communicate their ideas and plan and structure projects, and these skills are useful not only for those who intend to enter the job market in the area of information technology, but for anyone, regardless of age, experience, interest or chosen profession. The concepts of programming logic also help in the learning of subjects such as Portuguese, mathematics and physics, arousing greater interest of the child in school.

The fact that the IFSP on this campus has a gamification and robotics project with children and adolescents within the autistic spectrum and / or with high skills, greatly facilitated the attendance of XD. This project has a flexible lesson plan, as it is based not only on the transmission of content, but also on the student's view of the proposed theme and their development as an individual in society, strengthening ties, affirming confidence and opening new professional horizons. Johnson, already in 2010 [47], working with a gifted American adult with Asperger's disorder, showed that early identification and the adoption of differentiated teaching strategies proved to be important educational intervention tools to promote the success of these individuals. Students with dual exceptionality need educational interventions that present interconnectivity between both conditions, in addition to adequately qualified teachers, because failure to meet their needs can cause losses that prevent the development of their talent [48].

The location of the course is also stimulating, as elementary and high school students who do not belong to the IFSP become part of the daily context of the school, being treated as regular students, having the same responsibilities and rules, living during breaks with technical and higher education students, giving those involved familiarity with people, environments and projects developed there and stimulating a future entry into careers in the engineering area. Promising future for XD, with talent and potential in this area, since the development of potential of individuals like XD is possible in school institutions at all levels, from elementary to higher [49].

The project teacher takes into account that today's careers linked to information and communication technology open up a wide range of employment and career development possibilities

for young people, both outside and within the autistic spectrum. What is measured is the ability to solve problems and develop medium to long-term projects, and this professional can work remotely or allocated in any physical space allocated by companies. It is noted that some of the important characteristics for professionals in this area are concentration, logical reasoning, self-taught ability, ease of repetitive and methodical work, verbal and written fluency in other languages, in addition to digital fluency, both in the handling of tools and in the construction of software and hardware prototypes, skills shown by XD in the multidisciplinary evaluation. The cognitive functioning of children like XD presents characteristics of cognitive activity that can be explained by greater plasticity and efficiency and that assist in extensive attentional processes that facilitate the management of cognitive performance through working memory, flexibility and inhibition [50]. In addition, they exhibit rapid learning; greater speed in understanding large, complex and abstract problems; good verbal skills; good problem-solving skills; significant capacity to store and manage information; a good level of understanding; varied interests and a high level of curiosity towards the environment [51].

The educational inclusion of XD, leveraged by the PCNP, was based on the collaboration of the entire school community (manager, teachers, support professionals and family members), since, in general, the various actors involved were committed to enabling actions aimed at promoting their school success, developing their talent and reducing their limitations. According to the literature, it is essential that all institutional segments are truly engaged in proposing and increasing collective attitudes in favor of reducing discriminatory attitudes and consequently increasing respect for diversity [52-54].

7 CONCLUSION

In the case reported, communication increased as trust was established and it was possible to perceive the set of experiences of the subject of the report from the stimulus of a game, since playfulness had a positive part in this process linked to difficulties. Oral communication skills were stimulated with gamification and graphic representation, stimulated by interest in the English language. The partnership with an institution with a gamification and robotics project greatly facilitated XD's development as an individual in society, strengthening ties, affirming confidence and opening new professional horizons. A particular actor (PCNP) and the collaboration of the entire school community leveraged and grounded XD's educational inclusion.

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The impact of the brazilian college admissions exam on the perceived stress of young adult

https://doi.org/10.56238/ptoketheeducati-059

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ABSTRACT

The first standardized selection instrument for university admission in Brazil was defined by Decree 8.659 on October 5, 1911. It approved the Organic Law of Higher and Fundamental Education - also known as the Rivadávia Corrêa Reform - establishing: "To be granted enrollment, the candidate will undergo an examination that enables an overall assessment of their intellectual development and capacity to effectively undertake the study of the subjects that constitute the college curriculum." (RIBEIRO NETO, 1985, p. 41). It consisted of an oral examination of languages and sciences, as well as a written section in Portuguese that covered specific content.

1 INTRODUCTION

1.1 THE COLLEGE ADMISSIONS EXAM

The first standardized selection instrument for university admission in Brazil was defined by Decree 8.659 on October 5, 1911. It approved the Organic Law of Higher and Fundamental Education - also known as the Rivadávia Corrêa Reform - establishing: "To be granted enrollment, the candidate will undergo an examination that enables an overall assessment of their intellectual development and capacity to effectively undertake the study of the subjects that constitute the college curriculum." (RIBEIRO NETO, 1985, p. 41). It consisted of an oral examination of languages and sciences, as well as a written section in Portuguese that covered specific content.

However, it was only with the Rocha Vaz Reform, consolidated in 1925, that the college entrance exam approached the model known today. With this reform, the selection instrument became even more complex, including not only passing the exam but also ranking among the number of available slots established by each institution (VALLE; BARRICHELLO; TOMASI, 2010). Initially conceived as an assessment and guidance instrument for schools, with individual and confidential results, "the exam aimed to achieve four basic competencies, combining everyday life content and conceptual content from different disciplines, such as language proficiency, understanding of phenomena, problem-solving, argumentation, and proposing interventions in reality" (SILVA and ZANINI, 2011, p. 3). The objectives for the ENEM exam were announced as follows:

1. To provide a reference for each citizen to self-assess themselves because of their future choices, both regarding the job market and further studies;
2. To structure an evaluation at the end of basic education that serves as an alternative or complementary modality to the selection processes in different sectors of the job market;
3. To structure an evaluation at the end of basic education that serves as an alternative or complementary modality to entrance exams for post-high school vocational courses and higher education.

Nonetheless, adherence to the exam was extremely low, as students had no incentive to undergo it. It is reported that in the first exam, only 10% of the total high school graduates of that year registered for it. According to Maria Helena Guimarães de Castro, President of INEP during Fernando Henrique Cardoso's government, "the participation of higher education institutions was essential to strengthen the credibility of the exam and decisively contributed to transforming it into a new reference in the search for alternatives to traditional selection processes" (BRASIL, 2000, p.25). From that point on, the college entrance exam morphed into a regulator of teaching plans, leading to the neglect of individuality, creativity, and personal interests of each student. The number of applicants increased exponentially, and the exam became the main criterion for admission to universities. If before the entrance exam was created for the school, now the school was molded for the entrance exam.

The main ideological justification associated with the implementation of the entrance exam, especially the Unified Selection System (Sisu) and the National High School Exam (Enem), was the possibility of democratic choice of public universities by students. Moreover, a burden was placed on the students who, while still in high school, are pushed to make immediate decisions about their career options and whether or not to continue their academic careers. Thus, an ideology of social mobility was produced, propagated by the current capitalist economic system, suggesting that "the only way to succeed in a meritocracy is to achieve the highest level of education possible" (CARNOY, 1986, p. 77). Once again, the burden on the students is evident, as they are shaped to perform well in the exam by studying subjects that have little relation to their culture and daily interests, which can lead to stress and anxiety.

1.2 MOOD CHANGES AND ANXIETY

In their studies, Peluso et al. (2010) demonstrated that mood changes experienced by adolescents, although starting before the college entrance exam, lasted for months after the event. Similarly, Calais et al. (2003) postulated that socio-emotional skills, such as the ability to cope with stressful and anxiety-provoking events, can be differential factors for exam performance - even more important than academic ability or subject knowledge.

In conducting a longitudinal study to investigate mood changes in young college aspirants, Peluso et al. demonstrated that the changes intensified as the exam approached. They experienced an increase in negative effects, while positive effects remained consistently low. Among the seven scales that showed a significant correlation with the time spent studying, all criteria (except attentiveness) pointed in the same direction: mood worsens as study time increases (PELUSO, 2010).

Another study conducted by Lacey et al. found that while changes in cortisol levels in the blood of young individuals typically occur just before the administration of an important exam, changes in the immune system occur just before the exam is scheduled (usually 6 to 8 weeks in advance). This demonstrates that psychological stress begins many weeks before the actual exam (LACEY, 2000).

1.3 MENTAL HEALTH OF YOUNG ADULTS

It is known that adolescence is a fragile period for individuals, as they are exposed to hormonal changes, mood fluctuations, are more susceptible to crises, and undergo psychological, physical, social, and cultural changes (WAGNER, FALCKE, SILVEIRA, & MOSMANN, 2002). It is precisely during this time that young people are exposed to tremendous academic pressures, whether they are students in public or private schools.

According to Perrenoud (2003, p. 14), teenagers are immersed in the concept of school excellence, which is built upon a socially situated evaluation process, involving complex transactions according to the forms and norms of school excellence anchored in the current curriculum and the cultural perspective to which the evaluation belongs. Along the same lines, Bourdieu (1998) argues that the culture produced by schools is the same as that of the dominant class - highlighting that disparities in educational outcomes are not based on differences in abilities but on the level of similarity between school culture and the students' family culture.

Insofar as we can observe the discrepancy in the results of college entrance exams between public and private schools. The college-oriented school culture aligns with the interests of the dominant classes, which see maximum education as the only instrument of success and directs the education system toward this single goal. In this manner, technical and vocational courses, among other viable career options, are neglected. Both groups, students from public and private schools, experience excessive pressure: either to continue the family's history of excellence or to break the cycle of low education and poverty.

The similarity between students from both school networks lies in the way the college entrance exam intensifies family expectations, thereby guiding young people to operate at constantly high levels of stress, greatly affecting their self-esteem. Specifically for students from public schools, who do not have specialized preparation for the exam, it is common for them to lack interest in taking the exam due to a belief that they will not be able to compete with students from other schools (BARROS, 2014).

According to Mozart Neves Ramos, a member of the Governance Council of Todos Pela Educação, "it is natural for them to distrust their ability to reach higher education" (BORGES, 2011). It is theorized that this stems from the lack of confidence that students have in the educational system they are part of. Most public school students do not have the opportunity to study the necessary content, due to factors such as curriculum disorganization within the school. On that account, we can see that all college aspirants - in one way or another - attribute tremendous importance to the exam as a means of social mobility, making it even more anxiety-provoking, classifying, and exclusionary (SILVESTRE, 2004). For low-income youth, it is an opportunity for change. For upper-class youth, it is a condition for maintaining family status.

2 RESEARCH PROBLEM

Is there an impact of the educational system oriented toward the *vestibular* exam on the stress levels of 16 to 19-year-old candidates in the city of São Paulo, Brazil? What is the magnitude in which the effects of stress are felt and reproduced?

Based on previous research studies, it is hypothesized that the impact of the vestibular exam on the mental health of young individuals is significant, and it is a stressor that affects various aspects of the student's life, including self-esteem, self-confidence, and socio-emotional skills. This research also aims to reflect on possible coping mechanisms that can be used to alleviate these negative effects on the mental, social, emotional, and physical health of students, evaluating strategies and techniques that can be implemented in schools to promote student well-being.

3 OBJECTIVES

3.1 GENERAL OBJECTIVE

To evaluate whether there is an impact of the educational system oriented toward the vestibular exam on the perceived stress levels of candidates in the city of São Paulo, Brazil.

3.2 SPECIFIC OBJECTIVES

Through this research, three specific objectives are intended to be achieved. These are: to identify the effects of the vestibular exam on the development of student's self-esteem and self-confidence, to define coping strategies and mechanisms that can help maintain the mental health of candidates, and to propose a methodology for the preparation for the vestibular exam.

4 JUSTIFICATION

The reflection on the current educational system in public and private schools in Brazil is urgent and of utmost importance in the current scenario. Mental health is one of the most important

components for determining the quality of life and directly influences the biopsychosocial experience of individuals. Therefore, it is necessary to contribute research that investigates possible sources of psychological distress for young adults, as they will be the next leaders and professionals in the country. Intending to draw attention to this issue and propose instruments to address the problem, this work seeks to understand the effects of the educational system and, at the same time, assess the possible impacts on the psychological lives of students within it. In this context, the research can prove to be a valuable tool for studying the gaps in the vestibular exam system and encouraging critical thinking about it.

5 THEORETICAL FRAMEWORK

Educational Psychology has developed relevant discussions in recent decades regarding the role of psychologists in the field of education and the creation of public policies aimed at educating Brazilian youth. Questions arise about the social role of interventions in this field, seeking perspectives that go beyond subjective models of understanding the educational phenomenon (PATTO, 1990). Patto argues that the role of psychologists in the construction of a democratic and quality public school should be guided by the purposes that guide the development of educational public policies. They must materialize in practices that determine the school's daily life (Souza, 2010) and reveal the social demands that support the presence of these professionals in the area. It is precisely in the combination of School and Educational Psychology with Cognitive Neuropsychology that the necessary tools can be acquired to address the issue of excessive stress experienced by young individuals preparing for the vestibular exam.

The manifestation of stress typically goes through three phases: alarm, resistance, and exhaustion. The alarm phase occurs when the organism experiences stressors, activating reactions of the sympathetic nervous system. Second, there is the resistance phase, which occurs when the stressor persists for prolonged periods or is of great magnitude. Finally, there is exhaustion when stress exceeds the individual's capacity to cope with it, leading to long-term health problems (such as ulcers, gingivitis, psoriasis, hypertension, depression, and anxiety). Each of the phases listed above has its symptomatology, accompanied by hormonal changes (SELYE, 1956).

D'Avila and Soares (2003) state that the vestibular exam generates conflicts, doubts, fear, anxiety, and stress for adolescents. These effects, on a large scale, stem from the fear of failing, facing the expectations of family and society, as well as the possibility of failure and uncertainties associated with career choice (LEVENFUS, 1993). Choosing a profession is a delicate process, especially when it is associated with crises and conflicts typical of adolescence. Bianchetti (1996) states that "young people do not possess the necessary self-awareness or sufficient maturity for the actual career choice.

Henceforth, adolescents undergoing the *vestibular* exam are subjected to both family and social pressures, as well as personal ones. This high level of psychological pressure can trigger a state of anxiety and stress that impairs academic performance and the psychosocial skills of the student. According to Oliveira and Duarte (2004), this tension fosters a sense of apprehension about the future, which is a key component of anxiety that interferes with learning. These authors theorize about the role of the grading system in this phenomenon, which can lead students to compete for personal achievement. Coelho (2002) also suggests that the conflicts and problems to which adolescents are subjected involve significant emotions and multiple situations marked by strong emotional implications among them.

Considering that stress is elevated during the preparation period for the vestibular exam, it is evident that this test is a stressor of great magnitude for most young people - a fact that may raise questions about the adequacy of a competitive system to which young people are subjected to continue their education. In his writings, Campos (1996) emphasizes the relevance of implementing support programs for research on stress experienced by students at all levels. According to the author, it is of paramount importance to monitor the academic community and provide support to all its members.

As attested by the texts of Lassance, Grocks, and Francisco (1993), the act of entering a university has assumed an "evolutionary task character in itself, as if entering higher education was a natural continuation to be assumed by those who finish high school and the only alternative available for entering the job market." The overemphasis on higher education, especially in more traditional courses, has a significantly negative influence on the guidelines that guide high school education. As a result, it neglects its role in preparing young people for the adult world in general and transforms itself into a vehicle for preparing for the vestibular exam.

In light of this, the need for a change in the conception of what comprises a quality education must be emphasized. When the sole criterion for evaluating education is approval in the university admissions exam, it hinders the proper development and biopsychosocial adaptation of adolescents. It creates an education that is disconnected from life and everyday reality, guided by formulas and content that, for the most part, become unnecessary after the exam. Rubem Alves theorizes on the subject, noting that "it is the vestibular exams that determine the direction of schools. The teachers who prepare the exam questions do so in ignorance that their choices will determine the course of schools in the Brazilian educational system and the destiny of children and adolescents. That is why "strong" schools dedicate themselves to training their students with previous vestibular exam questions" (ALVES, 2013).

In a study conducted with 960 individuals on psychological well-being in adolescents, carried out by Silva, Horta, Pontes, Faria, Souza, Cruzeiro, and Pinheiro (2007), it was found that there is a tendency for well-being to decrease with age. The identified trajectories showed that younger

adolescents (12 to 13 and a half years old - early adolescence) have values that indicate greater well-being. From this age onward, these values change, with a decrease observed in the group of 16 to 17 and a half years old (late adolescence). "Based on the results, it is possible to identify an ageing period in which young people can be considered more vulnerable to changes in psychological well-being and, consequently, at greater risk" (SILVA, HORTA, PONTES, FARIA, SOUZA, CRUZEIRO, 2007, p. 1117).

Considering the history of several children in a primary public school in the city of São Paulo, Maria Helena Patto studied the construction of power strategies that sought to erase the roots of the problem. Ideologically, the author cites, students and their families were convinced that the problem of failure was exclusively their fault. The theories about school failure fail to take into account the school mechanisms that produce these learning difficulties, resulting in an educational system that creates obstacles to the achievement of its objectives. Thus, it becomes necessary to study this system in-depth, which emphasizes only one specific intelligence (PATTO, 2015).

A critical examination of school failure and its subsequent exams (such as the ENEM) leads to a review of the prejudices that guide professional practices in schools. We are reminded of the words of Paulo Freire, who emphasized the need to denounce and announce - that is, to think about alternative work and dialogue with teachers. Thus, the causes of failure in schools can be reconsidered, and practices that contribute to improving the quality of the schooling process can be proposed. In line with this idea, we emphasize the words of Patto (1990), who characterizes the school as a social institution that must be understood within the social relations of production and, thus, within the social structure that includes it.

Rocha et al. investigated students in the second and third year of high school, as well as students in pre-university courses who had already completed high school. The participants were evaluated using the Self Reporting Questionnaire (SRQ), which allows for the screening of mood disorders. The presence of indicators of depressive disorder was reported in 45.7% of the students. "Pre-university course students showed indicators of depression in 59.4% of cases, third-year students in 51.4%, while second-year students in 35.8%" (ROCHA et al., 2006, p.101). These authors found a correlated increase in these symptoms with age and the progress of academic advancement, demonstrating that the older and closer to the vestibular exam a subject is, the more depressive symptoms they present (GUZINSKI; PELISOLI, 2008).

Research in the field is extensive. Calais et al. (2003), investigating perceived stress in young adults with varying levels of education, found higher stress scores in pre-university course students compared to first and third-year high school students. The feeling of unpreparedness for the exam influences the process of anxiety, leading to difficulties in concentration, restlessness, headaches, muscle aches, and dizziness. An important factor that contributes to the worsening of the situation is

that young people, even when realizing that something is not right with their mental health, hesitate to seek help or psychological preparation for the exam (D'AVILA and SOARES, 2003).

In a study derived from Calais et al.'s research (2003), Guzinski Rodrigues and Pelisoli (2008) found that 90% of participants reported having their lifestyle habits altered during exam preparation. The changes occur in all areas of life, from relationships to simple activities and basic needs such as eating and sleeping. The life of Young people goes through a process of change, and many priorities become secondary to the exam (GUZINSKI; PELISOLI, 2008).

The resurgence of the political nature present in psychological practice should lead to an uncompromising commitment to the search for instruments for the consolidation of a quality democratic school. Thus, as Souza (2010) asserts, it is necessary to break with adaptationist conceptions and build a psychological praxis in the face of school complaints.

6 METHODOLOGICAL PROCEDURES

The main methodological procedure used for this research was the Perceived Stress Scale, developed by Cohen et al. (1983). The scale is one of the main instruments cited in the literature for estimating stress (Lee, 2012). The advantage of the instrument, according to its creators, is the estimation of the "degree to which individuals believe that their life has been unpredictable, uncontrollable, and overloaded during the month before the assessment" (COHEN et al., 1983). Thus, the evaluation occurs from three perspectives: the presence of specific stress-causing agents, physical and psychological symptoms of stress, and overall perception of stress. This evaluation occurs regardless of the causal agent. The Perceived Stress Scale (PSS-14) is presented in Table 1.

Table 1 Perceived Stress Scale (PSS-14)

Item	Question
1	In the past month, how often have you been upset because of something that happened unexpectedly?
2	In the past month, how often have you felt unable to control the important things in your life?
3	In the past month, how often have you felt nervous or stressed?
4	In the past month, how often have you coped successfully with the problems and hassles of everyday life?
5	In the past month, how often have you felt that you were effectively dealing with the significant changes happening in your life?
6	In the past month, how often have you felt confident in your ability to handle your problems?
7	In the past month, how often have you felt that things were going your way?
8	In the past month, how often have you realized that you couldn't handle all the things you needed to do?
9	In the past month, how often have you been able to control the irritations in your life

10	In the past month, how often have you felt that you were in control of things?
11	In the past month, how often have you gotten upset over things that happened that were beyond your control?
12	In the past month, how often have you found yourself thinking about the things you have to do?
13	In the past month, how often have you been able to control how you spend your time?
14	In the past month, how often have you felt that difficulties were piling up so high that you could not overcome them?

The application was conducted with 63 students of both sexes, aged between 16 and 19, residing in the city of São Paulo, who were preparing to take the college entrance exam. The test was administered through the Google Forms platform. Fourteen items were used to assess how unpredictable, uncontrollable, and overwhelmed respondents perceive their lives. The interpretation of the results is divided into two factors: 1) negative perception and 2) positive perception. The 14 questions have response options ranging from 0 to 4, corresponding to:

0 = never

1 = rarely

2 = sometimes

3 = almost always

4 = always

Questions 4, 5, 6, 7, 9, 10, and 14 have a positive connotation - therefore, their scores are inversely summed, as follows:

0 = 4

1 = 3

2 = 2

3 = 1

4 = 0

The remaining questions are negative and directly summed. The total scale score is the sum of the scores of the 14 questions, ranging from zero to fifty-six. In addition to the stress scale, a structured questionnaire composed of 5 questions will be distributed to investigate more specifically the role of the college entrance exam as a stressor for the evaluated youth. The form will follow the Likert Scale and will be administered through the Google Forms platform, targeting young college applicants between 16-18 years in the city of São Paulo, SP. Before administering the tests, the presented criteria were submitted to the Ethics Committee of Universidade Presbiteriana Mackenzie, as well as to the Plataforma Brasil for prior approval.

Regarding the qualitative aspect of the research, the content analysis method formulated by Laurence Bardin will be used. According to the author, content analysis is "a set of techniques for

analyzing communications aimed at obtaining, through systematic and objective procedures for describing the content of messages, indicators (quantitative or not) that allow inferences about the production and reception conditions of these messages" (Bardin, 2009, p. 44). The exploration of the material is the longest stage of the process. It involves the coding and categorization of the entire corpus selected for the project, as well as the construction of indicators that allow for inferences. The categorization of the material is done in two stages: inventory and classification. This classification can be done a priori or a posteriori. Finally, in the last stage, the treatment of the results, inference, and interpretation takes place. Simple and more complex statistical operations are used, such as percentages, diagrams, tables, and models that condense and highlight the information provided during the analysis.

7 RESULTS

Table 1: General Sample Data

Gender	**Institution**		**Total Participants**
	Public	Private	
Female	10	31	41
Male	3	19	22
Total	20.6%	79.4%	63

Table 2: Average Perceived Stress of Sample

Gender	**Institution**	**Average total score**	**Average perceived stress score**
Female	Public	37.9	High
	Private	38.3	High
Male	Public	37.0	High
	Private	38.2	High

The average scores appear to be higher in private institutions compared to public institutions, regardless of gender. However, all participants fall into the "High" classification on the average perceived stress scale, indicating that there is no significant difference in perceived stress between the institutions. It can be inferred, therefore, that the young individuals involved in the context of preparing for the college entrance exam are experiencing a state of chronic high stress, regardless of other variables such as gender and previous type of educational institution.

Table 3: Utilization of Coping Resources and Exam Impact on Perceived Stress

Gender	Institution	Feels that stress will lower after the exam			Utilizes coping resources to deal with stress	
		Yes	No	Maybe	Yes	No
Female	Public	40%	0%	60%	70%	30%
	Private	71%	3.2%	25.8%	100%	0%
Male	Public	66%	0%	33%	100%	0%
	Private	84.2%	5.3%	10.5%	100%	0%

Among women in public institutions, 40% strongly believe that stress can decrease after the college entrance exam. In private institutions, the majority (71%) hold this belief. Among men in public institutions, 66% are convinced of this decrease, while 84.2% of men in private institutions believe that stress will decrease after the exam.

Regarding the use of coping mechanisms to deal with stress, only females from public institutions reported not using any mechanisms, while 100% of the other participants reported using stress management tools.

Table 4: Average Perceived Stress and Performance Pressure on the Exam on a 0-5 Scale

Gender	Institution	The average impact of the exam in other areas of life	Average pressure felt to perform well in the exam
Female	Public	4.8	4.0
	Private	4.7	3.2
Male	Public	4.0	1.3
	Private	4.42	2.6

For both genders, the average impact of the college entrance exam on other areas of life is relatively high, with values close to 4.0 or above. However, there is no significant difference in the perceived impact between students from public and private institutions. Regarding the average pressure felt to perform well in the exam, we observed higher numbers for females in public institutions. Among male participants, there is a similar trend where the average pressure felt is higher in public institutions compared to private institutions.

Table 5: Reported Coping Mechanisms

Coping mechanism	Frequency
Physical activity	63,3%
Music	76,2%
Video games/Computer	20,6%
Social and group activities	14,3%
Does not use coping resources	4,8%

Physical activity and music are the most commonly used coping mechanisms, with usage frequencies of 63.3% and 76.2%, respectively. Video games and computers are used as a coping mechanism by 20.6% of the participants. Social and group activities are the least used coping mechanisms, accounting for approximately 14.3% only. A small percentage of participants reported not using any specific resources to cope with stress, and they were all females from public institutions.

8 DISCUSSION

Given the presented data, interesting trends can be observed. Notably, the average scores are higher in private institutions compared to public institutions, except regarding the pressure felt by the students from their families to perform well on the exam. It is worth discussing this finding by referring to Carnoy's writings (1986), which discuss the production of an ideology of social mobility that suggests "the only way to succeed in a meritocracy is to achieve the highest level of education possible" (p. 77).

Despite the score differences, all participants fall into the "High" classification on the Perceived Stress Scale (PSS-14), indicating that there is no significant difference in perceived stress between students from different institutions. It seems that young individuals involved in the context of college entrance exam preparation face a situation of chronic high stress, regardless of other variables such as gender and previous type of educational institution.

Regarding the belief in stress reduction after the college entrance exam, differences are observed between genders and educational institutions. Both males and females in private institutions are more likely to believe in stress reduction after the exam compared to their peers in public institutions. It is theorized that this phenomenon arises from other psychosocial factors that young individuals from lower social classes need to deal with beyond the context of the college entrance exam in their daily lives. It may also be related to factors such as the perception of higher academic pressure in public institutions or greater confidence in the ability to cope with stress in private institutions.

Another interesting aspect is the use of coping mechanisms to deal with stress. The majority of participants reported using instruments for stress management, especially physical activity and music. However, it is important to note that only females in public institutions reported not using any coping mechanisms. This may indicate a need for greater support or awareness of effective stress-coping strategies for this specific group.

When it comes to the impact of the exam on other areas of students' lives, there is a significant and widespread impact, with very high average values. There is no significant difference between public and private institutions, suggesting that the college entrance exam equally affects students from all institutions, highlighting the importance of adequate support for students during this challenging period.

Finally, it is noteworthy that the pressure felt to perform well on the exam also shows some differences between genders and educational institutions. Women in public institutions report higher average pressure compared to women in private institutions. This trend is also observed among male participants, although to a lesser extent. These results may reflect sociocultural expectations and individual perceptions of academic performance and competition within each educational context.

9 CONCLUSION

The study aimed to answer the research question: Does the college entrance exam impact students' perceived stress? In summary, it can be concluded that students experience a high level of chronic stress during college entrance exam preparation and perceive it as a significant factor contributing to their everyday stress, regardless of gender and the type of educational institution they attended.

A widespread belief that perceived stress will decrease after the college entrance exam was observed, with a higher proportion of students in private institutions expressing this conviction. Additionally, gender differences were identified, where women, both in public and private institutions, have a higher perception of pressure and lower utilization of coping mechanisms compared to men.

While physical activity and music are the most commonly used coping mechanisms, it is important to highlight the need for support and adequate coping strategies for women in public institutions who reported not using any specific mechanisms. Psychological support interventions, such as coping skills training programs, family support, and career guidance, can help students cope with stress effectively during college entrance exam preparation. These practices involve teaching specific techniques such as relaxation, problem-solving, cognitive restructuring, and communication skills, empowering students to deal more effectively with the emotional and academic challenges they face. This enables students to develop a more adaptive and constructive mindset in the face of stress, improving their emotional well-being and academic performance.

It is also important to emphasize that family support plays a crucial role in reducing students' stress during exam preparation. Providing emotional support and understanding from family members can help alleviate perceived pressure and create an environment that promotes balance between studies and other daily activities.

While there is preliminary evidence suggesting the effectiveness of coping strategies, it should be noted that each individual is unique and support needs vary. Therefore, it is essential to adapt interventions to better meet the specific needs of each student.

Despite the robust discussion provided by the data and theoretical framework of the research, it is important to mention some limitations that may affect the generalization and interpretation of the results. The sample used (63 participants) was not equally distributed among genders and educational institutions, which may not be representative of the target population, reducing the external validity of the findings. Additionally, the self-report nature of the research relies on subjective measures, which may be subject to memory or interpretation biases of the participants. Finally, the data does not consider other variables that may influence stress and participants' perceptions, such as family support, social expectations, or study load. The lack of control over these variables may limit the comprehensive understanding of factors related to stress during college entrance exam preparation.

Further research is suggested to follow participants longitudinally, measuring perceived stress from the beginning of preparation until the exam time. This would allow for comparisons within individuals' stress patterns, capturing changes and fluctuations in participants' perceptions and coping strategies used. By addressing these recommendations, future research will provide a deeper understanding of factors related to stress during the college entrance exam preparation process, contributing to the development of more effective support strategies for college entrance exam candidates.

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Academics' link with the university and the relevance of the spirituality and dentistry project during the covid-19 pandemic

https://doi.org/10.56238/ptoketheeducati-060

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ABSTRACT
Abstract: The teaching project "Spirituality and Dentistry: A more humanized care", proposes to the students a broad and more humanized view of the patient as an integral being, as well as demonstrating the role of spirituality in the health-disease process. With the COVID-19 pandemic, the project needed to reformulate its methodology in the face of the reality of remote teaching and thus maintain the link between academics and the university. Thus, this study aimed to verify - through the application of an online questionnaire - whether the methodology employed was satisfactory for the students and whether it had a positive impact on their education and on their bond with the university. The result of the research showed that most students consider that participating in the project activities influenced them in a positive way, both in the personal sphere and in the student/patient relationship at the university. In addition, most students expressed the desire for these teaching activities to continue to take place. It is concluded that the project participants perceived positive differences both in the personal sphere and in the student/patient relationship during the pandemic, because they were involved in the Spirituality and Dentistry teaching project.

Keywords: Dentistry, spirituality, humanized care.

1 INTRODUCTION

Spirituality is understood by one of the divisions of the human being, a human constitutive dimension, subtlety of the transcendent and his personal experiences. There are several presentations and studies regarding the associations between spirituality and its benefits to the treatment of the patient. In the scientific and technical environment of Dentistry, the field of spirituality is little covered and fostered in studies (ASTROW, 2001).

A project based on spirituality and, consequently, related to social interrelations allied to Dentistry is established as a break of paradigms in what is proposed as a teaching project, which is routinely founded with the focus of technical knowledge, thus configuring an important tool for prospecting important knowledge that should form the professional profile (LEVIN, 1997).

Considering the holistic proposal of understanding the health-disease process, the biopsychosocial and spiritual model contradicts the mechanistic and technicist conception. In this sense, dental treatment should also cover the human being in its entirety and not only perform procedures that are minimal to specific techniques (ROCHA, 2018).

The present investigation is justified by the importance of verifying whether the methodology used by the project, remotely, was satisfactory for its listeners. In order to verify if it had a positive impact on their education and on their bond with the university. In addition, feedback from students about possible failures of the current format of the project "Spirituality and Dentistry: A more humanized care" is fundamental to improve the work of the project in the future. Therefore, because it is a topic little explored in scientific research, this study aimed to evaluate and elucidate the influence of the Spirituality and Dentistry project on the link of academics with the university in a remote way during the COVID-19 pandemic.

Thus, the objective of this study was to evaluate the importance of the teaching project "Spirituality and Dentistry: A more humanized care" in the lives of dental students remotely.

2 METHODOLOGIES

2.1 MATERIALS AND METHODS

This is a cross-sectional study with a qualitative approach, which was carried out after the approval of the Research Ethics Committee of the School of Dentistry of the Federal University of Pelotas, under registration CAAE: 50203221.9.0000.5318, located in the city of Pelotas, extreme south of the state of Rio Grande do Sul, Brazil.

The study was conducted in a virtual environment, by filling out an online questionnaire, and the School of Dentistry of the Federal University of Pelotas was the institution of origin of the research. The means chosen for the application of the form was the WhatsApp application, in which the group "Spirituality and Dentistry" was used with the participants of the project "Spirituality and Dentistry: A more humanized service".

This study included those listeners who were attending the remote seminars of the project "Spirituality and Dentistry: A more humanized service" and who participated in the WhatsApp group during the application of the questionnaire. Those who did not attend any of the remote seminars of the project and were not participating in the WhatsApp group entitled "Spirituality and Dentistry" during the application of the questionnaire were excluded.

The research took place through a virtual questionnaire made on the Google Forms platform. For data collection, a virtual questionnaire prepared by the researchers themselves was used, containing questions that qualitatively evaluated the personal experience of each participant of the project.

Attached to the questionnaire was the Free and Informed Consent Form - ICF. The individual's participation in the research only continued if he signed the option to accept his participation.

The virtual questionnaire was made available by the researchers through the WhatsApp group of the teaching project, with the objective that the participants of the project activities could answer the research questions.

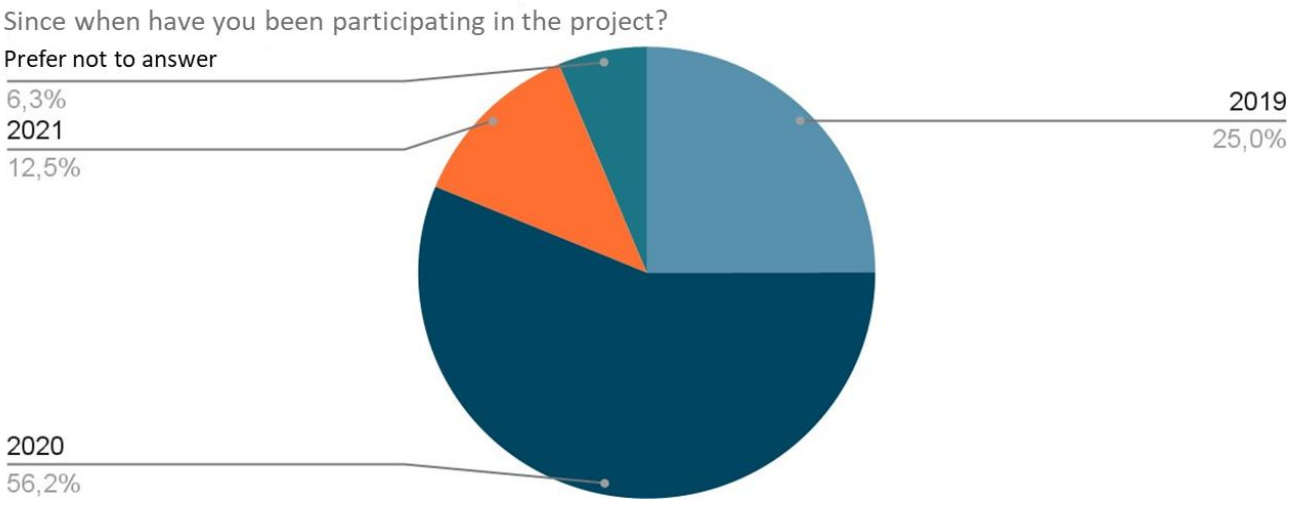
The answers were sent to the electronic address of a researcher, who included the answers in an electronic database and was responsible for the confidentiality of the information. After data collection, they were entered into an Excel spreadsheet, where each participant was identified with a number for control.

A descriptive analysis of the data found was performed with tabulation in an Excel spreadsheet. The data were presented in the form of figures and tables.

3 RESULTS FOUND

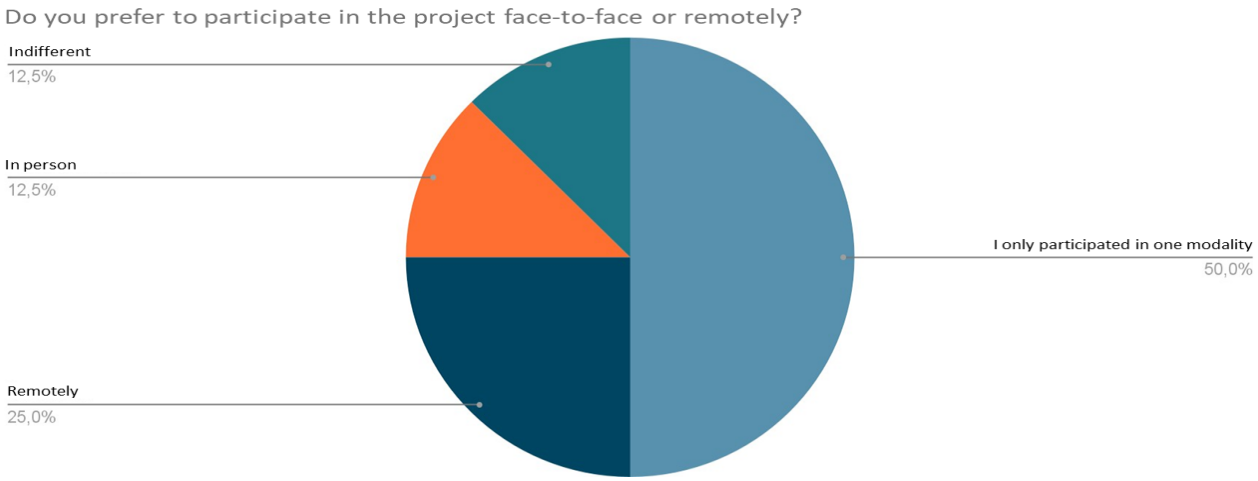
Of a total of 63 students enrolled in the WhatsApp groups of Spirituality and Dentistry: A more humanized service, 16 (25.4%) answered the evaluation form of remote activities. Of these 16, all participants stated that they agreed with the use of their answers for didactic and scientific purposes. Thus, the sample represented in this research is composed of 16 forms filled out properly. Regarding the year in which they started participating in the project, 25% (4) of the participants started participating in 2019, 56.3% (9) started in 2020, 12.5%(2) started in 2021 and only 6.3% (1) preferred not to answer (Graph 1).

Figure 1. Questioning about the moment of beginning of participation in the project.



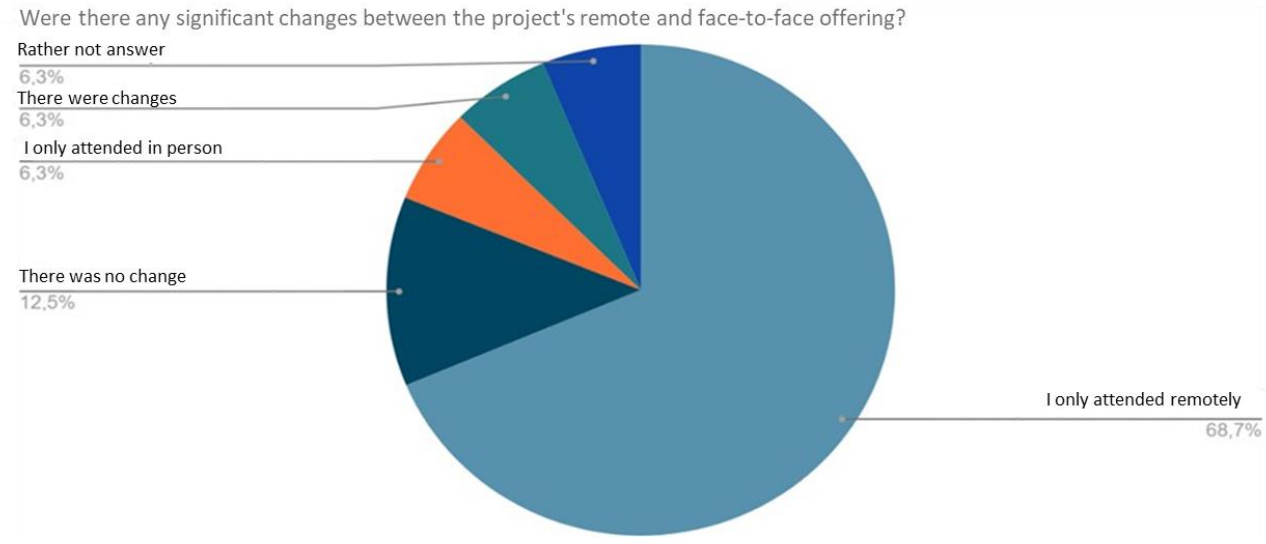
As for whether they prefer the project offered in person or at a distance, 50% (8) participated in the project only in one modality, 25% (4) prefer the distance, 12.5% (2) prefer face-to-face and 12.5% (2) were indifferent (Graph 2).

Figure 2. Preference as to the modality of offer of the project.



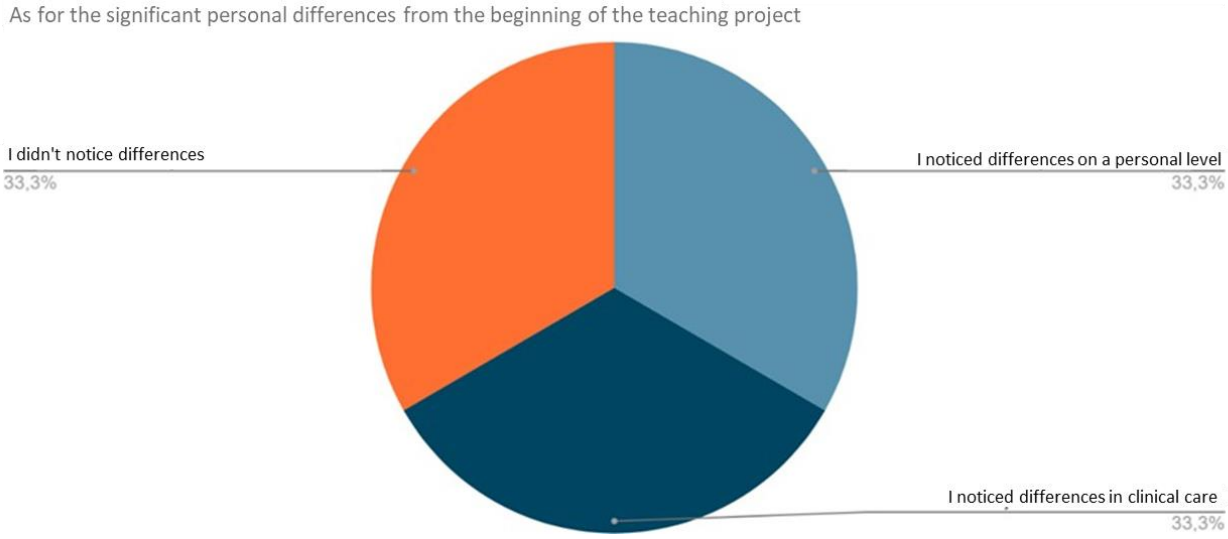
In addition, 68.8% (11) of the sample answered that they participated only remotely when asked if there was any significant change between the project offered in person and remotely, 12.5% (2) answered that there was no change, 6.3% (1) answered that they participated only in person, 6.3% (1) answered that there were changes yes, but they do not compromise the learning with the project and 6.3% (1) preferred not to answer (Graph 3).

Figure 3. Changes regarding the remote and face-to-face offer of the project.



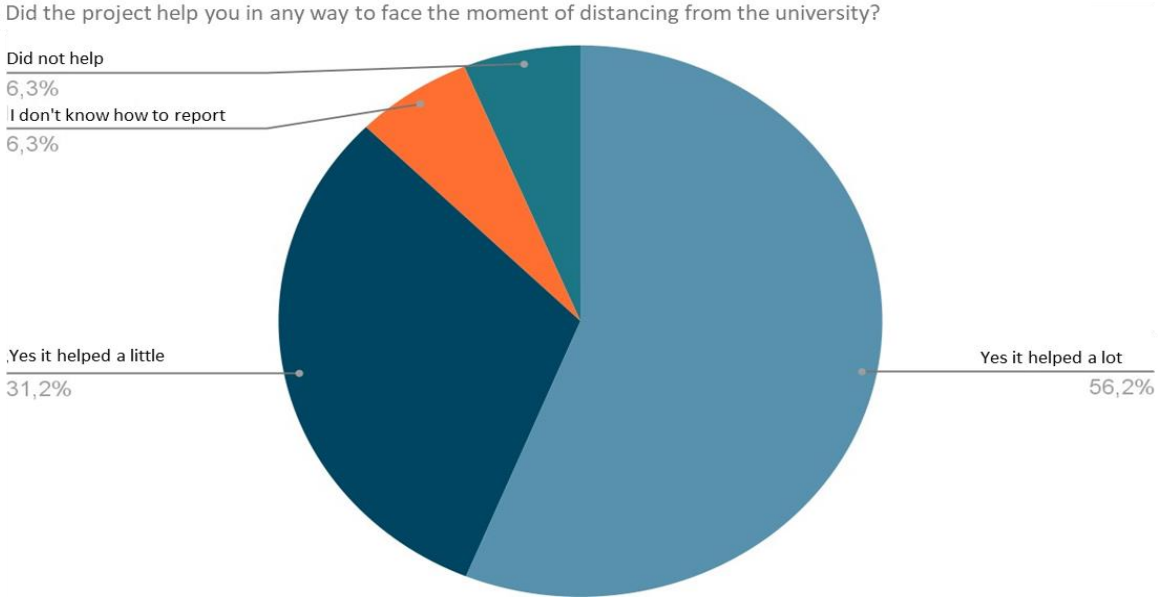
Regarding the significant personal differences from the entry into the project Spirituality and Dentistry: A more humanized care, the majority 75% (12) answered yes, who perceived differences both in the personal sphere and in the student/patient relationship, 12.3% (2) answered yes, they perceived differences only in the personal scope, 6.3% (1) answered yes, they perceived differences only during clinical care and 6.3% (1) answered that they did not perceive differences (Graph 4).

Figure 4. Differences in the personal scope due to the project.



As for whether, in any way, the project helped to face the moment of distancing from the university, 56.3% (9) of the participants reported that yes, it helped a lot, 31.3%(5) of them reported that yes, it helped a little, 6.3%(1) of them do not know how to report and 6.3% (1), reported that it did not help (Graph 5).

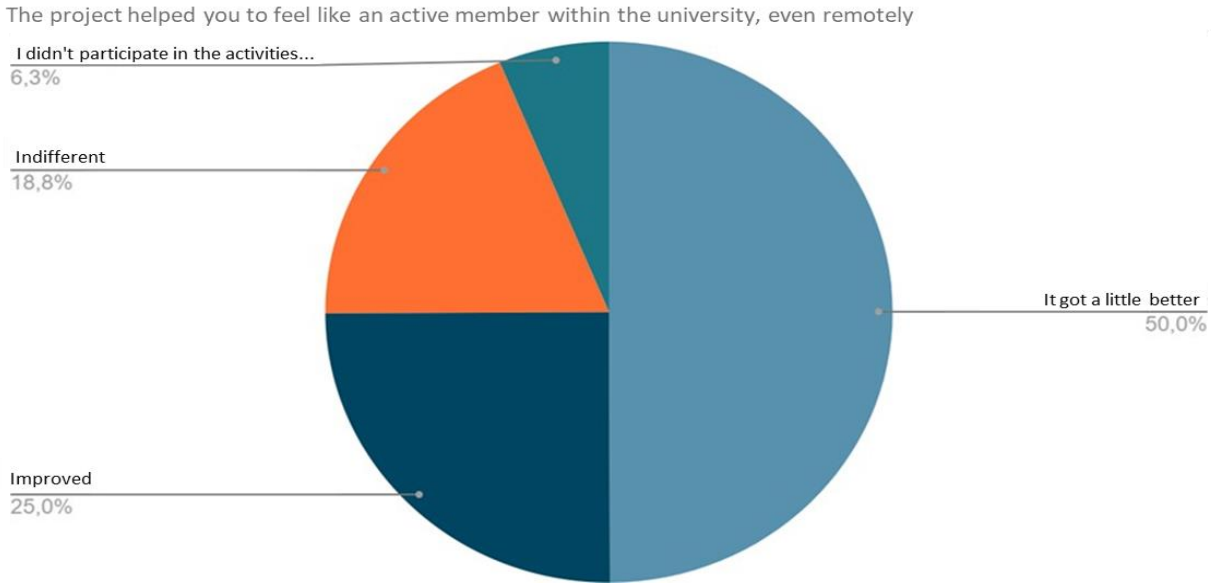
Figure 5. Question related to the project's help at a time of pandemic distancing.



In addition, 100% (16) of the participants considered that participating in the project activities positively influenced them. Regarding the participation in the project to influence the clinical care to patients, 50% (8) of the participants reported that yes, it helped a lot, 31.3% (5) of them reported that yes, it helped a little, 6.3% (1) of them prefer not to report and 12.5% (2) reported that it did not help.

When the participants were asked if the project helped them to feel like an active member within the university even when it was remotely, 50% (8) felt that the bond with the university improved somewhat, 25% (4) felt that the bond with the university improved, 18.8% (3) felt that it was indifferent and 6.3% (1) did not participate in the remote activities of the project, only of face-to-face activities. Regarding the continuation of the project activities, 93.8% (15) of the participants reported that yes, they would like the activities to continue and 6.3% (1) preferred not to respond (Graph 6).

Figure 6. Project collaboration for the feeling of activity at the university during the pandemic.



Thus, it was asked if the activities continue, in what way they would like them to be and 43.8% (7) would like the activities to be only remote, 43.8% (7) would like them to be face-to-face and remote and 12.5% (2) of the participants would like them to be only face-to-face. The suggestions for the project were: more lectures (either in remote or face-to-face format), maintain remote activities, continue to seek innovations and that more meetings were held.

7 statements were received, 100% (7) of them were extremely positive, demonstrating how the project can influence professional and personal career (chart 1):

Table 1. Student testimonials about the project.

Testimonials of the students participating in the Teaching Project Spirituality and Dentistry: A humanized care
1. "With Welcoming, Humanization and Psychosocial Care to Patients."
2. "Humanizing dental care and hospitality, based on in-depth multifaceted knowledge."
3. "Look at the patient in a more human way, with delicacy and empathy ... differentiate themselves from professionals who only see the mouth and not the human being in the chair."
4. "Understand that every human being needs care and attention"
5. "Make the professional more sensitive to understand the patient."
6. "Reflecting on issues beyond common sense."
7. "Helping Yourself and Others"

In view of the above, many listeners reported influencing the welcoming, humanization, care and psychosocial attention, thus making the professional more sensitive to understand the patient, reflecting on the issues beyond common sense. There have been reports that the project can influence the help of oneself and others, in a more human way, with delicacy and empathy. Thus, through these reports, it is evident that there was relevance of the project in the bond of the academics with the university, since the students did not have more face-to-face meetings during this period and thus, they could continue to follow and show their ideas through the online meetings.

4 DISCUSSIONS

In addition to the teaching project "Spirituality and Dentistry: a more humanized care" has a pioneering theme in the dental environment, it also contributes to the understanding of the space that exists between humanized treatment and spirituality in the academic environment. Thus, it provides students with a better understanding of these subjects, to be able to treat them with due importance, in the search for the promotion of knowledge in different areas of health, since the lack of evidence-based scientific proof of the correlation between spirituality and dentistry is notorious (CRUZ et al., 2020).

In this sense, the teaching project Spirituality and Dentistry: A more humanized service, exercises its teaching activities since 2018. However, in 2020, the project had to change, moving from the in-person to the remote model, due to the COVID-19 pandemic. Therefore, even in the face of limitations, the projects offered remotely establish between students and university institution a form of bond and brings students closer to extracurricular activities that are of paramount importance for academic training (PINTO et al., 2020).

In this way, the use of technologies contributes effectively to the improvement of students. Since distance education has been growing in Brazilian education and in the world, connecting people from different places and promoting opportunities for access to knowledge for many individuals (ALVES, 2011). In this perspective, technology was fundamental in the development of teaching actions, so that the project Spirituality and Dentistry: A more humanized care maintained its activities remotely in the midst of the COVID-19 pandemic.

During the pandemic period, the Teaching Spirituality and Dentistry Project provided the academic community with 8 remote seminars, with the following themes: "Dynamics of Friend's Day"; "Emotion, Health and Pandemic"; "Fear of dentist: Understand and learn to deal with it"; "Mindfulness: being present, here and now"; "I-you: Developing healthier relationships in the different contexts of life"; "From fear to laughter: humanization and comfort in surgical procedures"; "Self-Care: Focusing on Self" and "Far Living and Spirituality."

In addition, the remote activities of the project "Spirituality and Dentistry: A more humanized service", were considered excellent in the training of the students who accompanied it and can still be watched by the YouTube channel from any location and at the time of the listener's choice, without the need for financial investments or displacement. Therefore, it is important to emphasize that this study was based on the answers given by the participants and each answer is a personal interpretation, where one's own individuality can interfere in the understanding and interpretation of each question.

In addition, the projects offered remotely establish between students and the university institution a form of bond and bring students closer to extracurricular activities that are of paramount importance for academic training (PINTO et al., 2020). Thus, despite health courses encountering difficulties in the period of social isolation due to COVID-19 (HASSAN, M.; HASSAN, R., 2021), the project continued working through teaching and research actions so that in the future we have more studies addressing the impacts that spirituality can bring in clinical practice and in professional and academic performance in Dentistry (CRUZ et al., 2020).

In view of the above, distance education has been growing in Brazilian education and in the world, connecting people from different places and promoting opportunities for access to knowledge for many individuals (ALVES, 2011). Therefore, the remote activities of the project "Spirituality and Dentistry: A more humanized service", were considered excellent in the training of the students who accompanied it and can still be watched by the YouTube channel from any location and at the time of the listener's choice, without the need for financial investments or displacement.

5 CONCLUSIONS

It was noticed that most participants considered that participating in the project activities influenced them in a positive way and was important at the time of social distancing, demonstrated by the reports and positive responses in the questionnaire. In addition, the vast majority of listeners reported that they would like the activities to continue. The students also suggested several themes for the activities of the next semester, whether in person or remotely. Therefore, it could be concluded that the participants of Spirituality and Dentistry: A more humanized care were interested in the continuation of the project, because they perceived positive differences both in the personal sphere and in the student/patient relationship.

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Behavioral nutrition applied to the treatment of obesity

https://doi.org/10.56238/ptoketheeducati-061

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ABSTRACT
Obesity is a chronic disease, difficult to control. Even with traditional treatments, such as diet prescription, physical exercise, psychological and drug therapy, the obesity prevalence still continues to increase in worldwide. Thus, behavioral nutrition emerges as a possibility in the control of this disease. This study aimed to understand the role of behavioral nutrition in the treatment of obesity. This is a literature review, conducted through online research in Pubmed, Scielo and Lilacs. Publications from the last ten years in Portuguese and English were included. Reference books in the area were also consulted. The keywords used in the search were: obesity, feeding behavior, mildfulness eating, and intuitive eating. The Boolean AND and OR techniques were used to combine the keywords. Behavioral nutrition is a psychological method, which aims to understand food as a whole, and its main objective is to change negative relationships with food. Thus, the application of behavioral nutrition in obesity treatment can favor the individual to see food as a source of both nutrition and pleasure, but not as an "enemy". It is known that obesity is directly associated with eating-related behavior patterns and changes of satiety recognition. In this sense, behavioral nutrition techniques broaden the range of interventionist possibilities to rescue the recognition of the hunger and satiety cycle and the factors that interferes in this process. Strategies of behavioral nutrition applied in the treatment of obesity include nutritional counseling, intuitive eating, cognitive-behavioral therapy, motivational interviewing, and mindful eating tactics. It is concluded that the application of behavioral nutrition promotes recognition of hunger and satiety signals, and may generate even greater benefits in the treatment of obesity.

Keywords: Obesity, Eating behavior, Mindfulness, Intuitive eating.

1 INTRODUCTION

According to the WHO, obesity is defined as an accumulation of abnormal fat that can harm health. Obesity has numerous causes, being considered a disease of multifactorial origin, dependent on the interaction of genetic, metabolic, social, behavioral and cultural factors, causing a strong impact both on physical health and psychological well-being and, mainly, on quality of life (NISSEN; SCALLOP; BOZZA, 2012).

In recent decades, with the increasing prevalence of obesity worldwide, it has become a public health problem, constituting an epidemic responsible for the substantial increase in morbidity and mortality. The increase in body mass index (BMI), especially in severely obese patients (BMI >40.0 kg/m2), causes serious health problems, such as increased risk factors for cardiovascular, metabolic, neoplastic and orthopedic diseases. Chronic non-communicable diseases, associated with obesity, entail high costs to health systems and the national economy, through mortality and early retirement (SILVA et al., 2020).

Obesity also causes infertility, cholelithiasis, non-alcoholic fatty liver disease, gastroesophageal reflux, depressive symptoms, psychosocial disorders, systemic arterial hypertension and breathing difficulties, such as chronic hypoventilation and obstructive sleep apnea (BRASIL, 2020).

Overweight and obesity are closely linked to eating behavior, and these are affected by several factors, the so-called food determinants that are categorized into three types: those related to food, such as taste, appearance and nutritional value; those related to the eater: anthropological, psychological and socioeconomic biological; and factors related to the environment: physical and sociocultural; these affect food choice through effects on individual thoughts and feelings (NUNES; GARRIDO, 2018).

Emotions are directly related to the principle and individual behavioral aspects, which can cause risks for emotional disorders such as depression, anxiety, eating disorders, and image distortion body and low self-esteem, which are intrinsically linked to inappropriate food behavior and consumption (LIMA; OLIVEIRA, 2016; MOURA; NAVA, 2020).

The incorporation of behavioral nutrition in the context of eating behaviors in the face of obesity has become an extremely important approach, since it values the relationship of human beings with food and all behavioral aspects related to food. This new concept disassociates the negative aspects attributed to food, in addition to worrying about the emotional, physiological and social factors involved in eating behavior, also relating pleasure to the act of eating without guilt and the change in the vision of food from enemy to ally (CARVALHO, 2012).

The present work is justified by the growing epidemic of obesity and consequently the need to study and apply new approaches that will combat the problem more effectively. There is an increase in the prevalence of obesity, making it a major public health problem. In addition, obesity is a risk factor for other serious diseases, which compromise quality of life and cause an increase in the use of health resources. For this reason, intervention studies for the treatment of obesity (NISSEN; LEONARDO, 2012).

Our motivation came from the fact that there is an increasing need to value and rescue the bonds with eating without guilt, to share a good meal with natural foods in its majority, and to emphasize that by taking such attitudes the body system self-regulates itself naturally, both physically and

psychologically, since healthy eating favors the proper functioning of the various body systems. We hope to contribute in this work, to demonstrate that the human being is unique and must be treated in an integral way and not only under the biological approach, but also human.

2 GOALS

2.1 GENERAL OBJECTIVE

Understand how behavioral nutrition can contribute to the treatment of obesity.

2.2 SPECIFIC OBJECTIVES

1. Analyze the fundamentals of behavioral nutrition;
2. Review the behavioral determinants related to the etiology of obesity;
3. To associate the applicability of behavioral nutrition in the treatment of obesity.

3 MATERIALS AND METHODS

A bibliographic review was carried out by consulting scientific articles published in the databases Scielo, PubMed and Lilacs in the last ten years, as well as specific academic books in the area. We conducted research through the combination of keywords registered in the Health Sciences Descriptors (DECS): Obesity, Obesity Management, Mindfulness, Eating Behavior and Eating Habits. The English terms used were: Obesity, Obesity Management, Mindfulness Feeding behavior, Mindful eating and Comfort food. The Boolean technique AND and OR were applied to combine the keywords.

4 DEVELOPMENTS

4.1 OBESITY

4.1.1 Definition and prevalence

Obesity, according to the WHO, is a chronic condition of excess body fat in amounts that determines damage to health, categorized in the 10th revision of the International Classification of Diseases (ICD-10), being considered a manifestation of food and nutritional insecurity and risk for the development of other chronic non-communicable diseases (DIAS et al., 2017).

It is diagnosed through body mass index (BMI), which is calculated by the ratio of weight to height squared (BMI = weight (kg) / height (m)2) (SBEM, 2020). BMI does not measure body composition; however, it has high specificity and low sensitivity, suitable for its use as a criterion to identify overweight/obesity as a risk factor for chronic non-communicable diseases (NCDs) in population groups, but not to make nutritional diagnosis (ABESO, 2016; DIAS et al., 2017).

Combining BMI with measures of body fat distribution can help solve some problems of using BMI alone. The cutoff point for adults is based on the association between BMI and chronic disease

or mortality. Those with BMI between 30 and 34.9 kg/m2 are classified as Obesity I and at high risk for diseases; BMI between 30 and 39.9 kg/m2 is classified as Obesity II and very high risk for diseases; and BMI ≥40.0 kg/m2 is classified as severe obesity III and very high risk for diseases (ABESO, 2016).

In the human body there are two types of adipose tissue, the white adipose tissue that stores fat in a large drop, mostly in the form of triglycerides. It is considered the most comprehensive and is located mainly in the visceral and subcutaneous compartments, with functions of energy storage, mechanical protection against shocks and traumas, adequate sliding between viscera and muscle bundles. It is considered thermal insulator and maintains body temperature, still provides raw material for the synthesis of some vitamins, lipoproteins and hormones (BONFANTE et al, 2015).

It is the white adipose tissue that produces and secretes a large amount of adipokines, which are stimulated by monocytes, macrophages and infiltrated lymphocytes, and which influence appetite regulation, energy balance, insulin sensitivity and angiogenesis. Its excess causes hypoxia, cell death and remodeling of adipose tissue, causing greater secretion of adipokines and induction of a chronic low-grade inflammatory state, which will influence the emergence of NCDs (BONFANTE et al, 2015).

On the other hand, brown adipose tissue has a greater number of mitochondria and the ability to metabolize energy substrates to produce heat and consequently burns a large number of calories (BONFANTE et al, 2015; SBD, 2019).

Obesity considered exogenous results from external factors, such as the imbalance between caloric expenditure and food intake. Endogenous obesity is characterized by weight gain as a result of hormonal imbalance factors resulting from changes in thyroid, gonadal, hypothalamic-pituitary metabolism, tumors and genetic syndromes (GOIS; BAGNARA, 2011).

Obesity can still be classified into four types according to the distribution of fat deposits: type I, characterized by excess total body fat mass without particular concentration; type II, excess subcutaneous fat in the abdominal region and trunk, also known as android-type or "apple" type obesity; type III, excess abdominal visceral fat, associated with cardiovascular problems and resistance to the action of insulin; type IV, excess gluteofemoral fat, also known as gynoid type or "pear" type obesity (GOIS; BAGNARA, 2011).

To store more fat in the adipose tissue, it is necessary that it increases its storage capacity, increasing the size of the adipocyte by the process of hypertrophy, which has a more pathological character due to the inadequate and disproportionate increase in vascularization. The process of hyperplasia is characterized by the increase in the number of adipocytes, and occurs by adipogenesis, in which there is the recruitment of more cells of the stromal vascular fraction and increase in vascularization proportionally (MOURA et al., 2019).

There is also the possibility of accumulation of ectopic fat, characterized by the deposition of triglycerides in other non-adipose tissues, such as the liver, brain, heart and skeletal muscle, either by

an inability of cells to hydrolyze triglycerides, or by increased uptake of triglycerides by non-adipose tissues. These phenomena cause the reduction of energy expenditure in brown adipose tissue, impairment of bone marrow stem cells, decrease in muscle strength, appearance of chronic diseases, in addition to contributing to systemic inflammation, due to increased secretion of pro-inflammatory cytokines. Already in the process of weight loss, these cells decrease in size, but not in number, in this sense, obesity is considered a disease that has no cure, but rather control (MOURA et al., 2019).

Obesity rates have almost tripled since 1975, affecting people of all ages, social groups in developed and developing countries, reaching 650 million people worldwide (BRAZIL, 2020). By 2025, an estimated 700 million adults will be obese. Currently, 55.7% of Brazil's adult population is overweight and 19.8% is obese, according to the Surveillance Survey of Risk and Protective Factors for Chronic Diseases by Telephone Survey (BRASIL, 2019). Between 2015 and 2017, the country had the highest growth rate of obesity among adults aged 25 to 34 years (84.2%) and 35 to 44 years (81.1%) (ABESO, 2020). The National Health Survey (PNS), of 2013, indicates that, among adults with diabetes mellitus, 75.2% are overweight and, among adults with hypertension, 74.4%, which demonstrates the relationship between overweight and comorbidities (BRASIL, 2020).

4.1.2 Etiology and consequences

Obesity is considered a multifactorial disease, in which several biopsychosocial factors are involved in its development. In this way, the political, economic, social and cultural environment assumes a strategic place, as well as biological and environmental determinants (SBEM, 2020).

As an etiology for obesity, one should consider the historical and ecological influences of the nutritional transition, where there was a reduction in the prevalence of diseases attributed to underdevelopment and the increase in diseases linked to modernity, correlating with economic, social and demographic changes. In this scenario, it was observed the adoption of a diet rich infats, sugars and refined foods, and reduction in the consumption of fiber and complex carbohydrates, accompanied by reduced physical activity and adherence to a sedentary lifestyle (DIAS et al., 2017).

Leptin, a hormone secreted by adipose tissue in response to fat storage or excess food intake is considered the most important hormone for homeostasis of energy balance. It acts on the hypothalamus decreasing energy consumption and carrying signals from energy stores in the body for the brain to be able to balance energy expenditure and consumption (MACHADO; MARTIN; PINTO, 2015; MANCINI et al., 2015).

Food intake generates responses to reduce food consumption, and stimulates the secretion of leptin, which acts on the central nervous system and potentiates the effect of reducing food consumption, from the inhibition of the synthesis of neuropeptides related to appetite, along with

increased expression of anorectic neuropeptides, such as α-melanocyte stimulating hormone and corticotropin-releasing hormone (MACHADO; MARTIN; PINTO, 2015).

When there is central activation of leptin receptors, there is an increase in the activity of the sympathetic nervous system, which stimulates energy expenditure in adipose tissue. In addition, it acts in the control of glucose and lipid metabolism (MACHADO; MARTIN; PINTO, 2015).

Leptin has already been observed in other organs and tissues, with direct action on the regulation of immune cells, pancreatic beta cells, adipocytes, muscle and blood cells. It acts as an endocrine and paracrine factor, in the regulation of puberty and reproduction, modifying insulin sensitivity in muscle and liver, preventing ectopic lipid deposition, in the association of endocrine and immune systems, skin repair and glucose metabolism (SILVA; CASTRO, 2019).

It is observed that serum leptin concentrations in obese individuals are higher compared to lean individuals, directly correlating to body fat percentage. However, when it occurs in high plasma concentrations, leptin resistance may occur, which is usually associated with a hypercaloric diet for a long period, and this becomes unable to act effectively in the control of the energy balance, leading to excessive weight gain and the difficulty of treating obesity (SALDANHA, 2019).

The hormone ghrelin, in turn, is secreted mainly in the mucosa of the stomach, and stimulates food intake and reduces energy expenditure. It has potent properties of release and effect of growth hormone, is an important regulator of food intake and satiety, which is reduced in obese individuals and in response to high food intakes (VILANDRE JUNIOR et al., 2012).

The feeding impulse induced by ghrelin is partly mediated by the hypothalamic arcuate nucleus, implying the secretion of neuropeptide Y (NPY) and agouti-related peptide (AgRP). The alteration of leptin and ghrelin levels is capable of altering the pattern of food intake and leading to nutritional maladjustments, and the synchronism in the secretion of these hormones is important for the daily pattern of meals, and there is a reciprocal rhythmic pattern between the secretion of leptin and ghrelin. Ghrelin also inhibits the expression of adiponectin, a hormone that modulates the regulation of glycemia and the catabolism of fatty acids, where its reduction implies insulin resistance and obesity (VILANDE JÚNIOR, 2012).

Adiponectin also has potent anti-inflammatory properties, being able to influence the proliferation and balance of anti- and pro-inflammatory cells and molecules, such as Tumor Necrosis Factor (TNF-α), IL-10, macrophages, T cells and NK cells (SILVA; CASTRO, 2019). Such adipokine has the potential to activate the expression of molecules that increase the oxidation of fatty acids in skeletal muscle, reduce insulin resistance in this tissue, and may activate the enzyme adenine monophosphate kinase (AMPK), which results in decreased hepatic glucose production (PENNA; HERMSDORFF; SARON, 2020).

Interleukin-6 (IL-6) has inflammatory functions, and the greater the amount of adipose tissue, the greater the secretion of it and adipokines with immune function, such as TNF-α (SIPPEL et al., 2014).

TNF-α, a pro-inflammatory cytokine, synthesized as a transmembrane protein, causes decreased expression on the cell surface of glucose transporters (GLUT-4), phosphorylation of the substrate of the insulin (IRS-1) and specific phosphorylation of the insulin receptor, also reduces the oxidation of fatty acids in hepatocytes and skeletal muscle, implying accumulation of bioactive lipids, such as triacylglycerols (SPERETTA; MILK; Duarte, 2014).

Obesity today is characterized by a state of chronic inflammation, characterized by increased concentration of pro-inflammatory adipokines, which have a great impact on various bodily functions that are strongly correlated with cardiovascular diseases (SIPPEL et al, 2014).

Still as determinants of obesity, we have the influence of sleep and melatonin production, where the number of hours of sleep per night is inversely related to BMI and obesity. Sleep deprivation causes decreased leptin and TSH secretion, increased ghrelin levels, decreased glucose tolerance, increased hunger and appetite. Melatonin secreted in the pineal gland functions as a chronobiotic hormone, regulating circadian temporal order, GLUT4 expression, insulin receptor phosphorylation, and intracellular substrates of the insulin signaling pathway. The reduction in its production induces insulin resistance, glucose intolerance, sleep disturbances, and metabolic circadian disorganization, characterizes a state that leads to obesity (ABESO, 2016).

Serotonin is the neurotransmitter responsible for regulating functions such as mood, sleep, and appetite. Its reduced production is related to depression, associated with increased desire to consume sweets and refined carbohydrates, as well as lower satiety, which is potentially related to excessive weight gain and development of obesity (AZEVEDO; BRITO, 2012).

Exposure to chronic stress influences the temporal pattern of peripheral biomarkers that can have behavioral impacts and metabolic repercussions, leading to obesity. The neurobiological mechanisms of stress affect reward pathways to enhance motivation and consumption of highly palatable foods. The stress response is characterized by: acute behavioral and physical adaptations, such as gluconeogenesis, lipolysis, and reproduction inhibition (BITTENCOURT; VAZ; ZANIN, 2015).

The Hypothalamic-Pituitary-Adrenal (HPA) axis is one of the two main neuroendocrine systems associated with stress. Activation of the HPA axis occurs when the hypothalamus secretes a corticotropin-releasing factor (FLC) hormone, which stimulates the pituitary to release adrenocorticotropic hormone (ACTH) into the bloodstream, which acts on the cortex of the adrenal gland, stimulating the release of glucocorticoids (cortisol), with bodily effects of stress response. Constant activation of the HPA axis is associated with eating disorders such as binge eating, as well

as alters glucose metabolism and promotes insulin resistance, with changes in appetite hormones and feeding neuropeptides (e.g., Neuropeptide Y). Cortisol helps in the control of biorhythm, acts in the process of controlling inflammation, allergic reactions, stress, immune responses, emotional stability and also stimulates the increase of glucose in the blood. When their levels are high, weight gain, learning disability, low growth, decreased testosterone and memory lapses occur (TOFOLI, 2012).

When there is exposure to environments characterized by chronic psychosocial stressors, this chronic stress overloads the mechanisms of body homeostasis, causing the release of glucocorticoids, which causes an anomalous distribution of fat, especially in the abdominal region, associated with insulin resistance, hypertriglyceridemia and systemic arterial hypertension. Situations considered as desynchronizing biological rhythms, which induce the release of glucocorticoids, are associated with eating disorders that can lead to obesity (BITTENCOURT; VAZ; ZANIN, 2015).

Stress can modify eating behavior, as the hormone cortisol stimulates food intake. Compulsive behavior facilitates obesity, just as the severity of binge eating may be related to the degree of obesity. Thus, compulsive individuals may represent a subcategory of the obese population, who present high levels of psychopathology, and greater severity of obesity (LIMA; OLIVEIRA, 2016).

There are psychological variables involved in the development and maintenance of obesity, which are related to some type of psychological suffering, such as anxiety, anger, sadness, guilt, worry, experience of psychosocial stressors, as well as a loss of self-image and self-esteem (STAR; MENDES, 2017).

Emotional problems are a serious risk for these patients, as they tend to present an increase in emotional symptoms when dieting, in addition to being constantly exposed to intrinsic psychological suffering, resulting from social prejudice regarding their obesity in conjunction with the eating behavior presented (CUNHA et al., 2020).

There is also the influence of pharmaceutical iatrogeny on the development of obesity, where many drugs used to treat other conditions contribute to weight gain or exacerbation of weight gain in susceptible individuals (ABESO, 2016).

Endocrine disruptors are environmentally stable and industrially produced lipophilic substances, which include dichlorodiphenyltrichloroethane, some polychlorinated biphenols and alkylphenols, and can affect endocrine function, disrupting endogenous hormone regulation, promoting weight gain through multiple pathways (GORE et al., 2019).

Obesity would also have a cause compatible with the infectious origin, since it was found that the human adenovirus, adenovirus (Ad)-36, Ad-37 and Ad-5 directly affect adipocytes, stimulating enzymes and transcription factors that cause triglyceride accumulation and the differentiation of pre-adipocytes into mature adipocytes. The data reveal that Ad-36 is present in 30% of obese humans and 11% of non-obese humans (ABESO, 2016).

In addition, it is believed that the altered intestinal microbial composition can lead to obesity, increasing energy uptake in both the large and small intestines. The gut microbiota is made up of approximately 100 trillion bacteria, and they are also responsible for converting food into nutrients and energy. Its composition interferes with gene expression, immune system, risk of chronic and serious diseases, immunological, metabolic and structural function. The imbalance of this microbiota, or gut dysbiosis, generates bacterial overgrowth, toxin production and increased intestinal permeability, causing immunological and hormonal changes. In addition, microbial signals regulate the release of fasting-induced adipose factor (Fiaf) from epithelial cells of the intestine, inhibiting lipoprotein lipase (LPL) that regulates peripheral fat storage (ANDRADE et al., 2015).

In a study, consequences were found in the health status of obese individuals, and a positive association was found between self-rated health and diagnoses of hypertension, diabetes mellitus, angina and depression, related to obesity (FERREIRA; SZWARCWALD; DAMACEN, 2019).

According to the Brazilian Society of Bariatric and Metabolic Surgery (SBCBM, 2016), comorbidity is the pathological state caused, aggravated or hindered by the presence of excess weight or that presents control or cure with weight loss, such as metabolic diseases, some respiratory diseases, joint diseases, arterial diseases, liver diseases, male and female infertility.

At the present time, SARS-CoV-2 has shown worse outcomes for obese people regardless of age. This is due to the cardiac overload and immune dysregulation presented in obese individuals, being proportional to the increase in BMI, so obesity is an important comorbidity for the severity in cases of COVID 19 (BRANDÃO et al., 2020).

A sedentary lifestyle emerges as a major public health problem and there is evidence to support the detrimental effects on health and well-being in individuals of all ages in the long term, associated with increased risk for a range of health problems, including, obesity, cardiovascular disease, mood disorders and mortality. It is defined as "any waking behavior." It is different from physical inactivity, which is defined as physical activity at a level insufficient to meet current recommendations (150 min of moderate or vigorous physical activity per week) (RAWLINGS et al., 2019).

A sedentary lifestyle is a risk factor for obesity and comorbidities that is easily circumvented. It is worth emphasizing that the practice of physical exercises in conjunction with healthy eating, are factors that produce important improvements in the general health status, including prevention and treatment of obesity (PORTO et al., 2019).

The reasons for remaining in a sedentary lifestyle come from childhood, where the parenteral environment, interests and capacities of the individual, social and physical, influence the levels of sedentary lifestyle. In adulthood, social roles, family, employment and economy, can act as facilitators or barriers to sedentary lifestyle. By ceasing to be sedentary, the individual experiences various benefits such as increased stamina, balance, weight loss, psychological and physical well-being,

improved mood, better sleep quality, cognitive benefits, quality of life and mental health (RAWLINGS et al., 2019).

The relationship between eating habits and NCDs, such as obesity, has been extensively investigated. Data from the Global Burden of Disease Study, conducted in 195 countries between 1990 and 2017, indicated that global consumption of healthy foods and key nutrients were suboptimal, with the largest differences between recommendation and consumption for nuts and seeds, milk, and whole grains. In parallel, it was noted that the daily consumption of unhealthy foods, such as sugar-sweetened beverages, was much higher than the optimal intake, as was processed meat that exceeded 90% of the ideal amount and sodium per day, and red meat exceeded the ideal intake by 18% (GBD, 2017 DIET COLLABORATORS, 2019).

This analysis provides a comprehensive picture of the effects of poor eating habits on health at the population level. It is believed that improved diet could potentially prevent one in five deaths globally. This study showed that the main dietary risk factors for mortality are diets high in sodium and low in whole grains, fruits, nuts and seeds, vegetables, and omega-3s (GBD 2017 DIET COLLABORATORS, 2019).

Body weight tends to increase from 20 to 50 years of age, worsening with the reduction in the levels of physical activity, resulting in an increase of 600g in average weight per year and reducing 200g of muscles. After menopause, there is a frequent increase in body weight, as well as changes in the distribution of body fat. The weight gain from the fourth decade onwards is due to the reduction of the basal metabolism, positive caloric balance and accumulation of body fat, being observed that there is a progressive increase in the waist-hip ratio with advancing age, which is due to elevation of abdominal fat of menopausal women (DIAS et al., 2017).

4.1.3 Obesity and eating behavior

Obesity presents as one of the main causes the food consumption above the daily needs. In this sense, it is necessary to elucidate the behavioral factors related to diet and overweight. Eating behavior involves methods, reactions, and ways of proceeding with food and is directly related to the control of food intake. It is configured as the system that conducts the choices, requiring specialized mechanisms to balance physiological information from the internal environment, affected by psychosocial factors, with nutritional information from the external environment (ARAÚJO; MAYNARD, 2019).

According to the literature, there are three types of determinants of eating behavior (ARAÚJO; MAYNARD, 2019):

1. Food-related: such as taste, appearance, nutritional value;

2. Related to the eater: biological, anthropological, psychological and socioeconomic;

3. Environmentally-related: physical and sociocultural, reflecting interactions between the physiological state, the psychological state, and the environmental conditions of the individual.

Although not considered a mental disorder, obesity involves behavioral and emotional disturbances related to eating and there may be comorbidities with psychological disorders such as depression, anxiety, eating disorders, as well as body image distortion and low self-esteem. These emotional and psychological changes are intrinsically related to the behavior and food consumption that can lead to excess weight (LIMA; OLIVEIRA, 2016).

Individuals with obesity who seek specialized treatment for weight loss may have a higher prevalence of symptoms of anxiety, depression, impulsivity traits, and eating behavior disorders (BIAGIO; MOREIRA; AMARAL, 2020)

Depression alters the eating and social behavior of individuals, and they may present difficulties in relating, and anxious symptoms may arise, increased sense of social inadequacy and decreased sense of well-being and, as a consequence, decreased interpersonal relationships (STAR; MENDES, 2017).

Chronic stress is associated with metabolic disorders and changes in energy homeostasis that can induce pleasurable and compulsive behaviors such as eating sweet and fatty foods. There seems to be a bidirectional relationship between psychiatric disorders, overweight and obesity, which is a predictor of depression, which has a bidirectional association with obesity (STAR; MENDES, 2017).

Studies state that the quality of the diet is related to mood disorders, and that some nutrients can contribute to depression and other pathologies associated with mood. Weight gain distorts body self-image, which can lead to a devaluation of self-concept, decreasing self-esteem and potentiating depressive symptoms, decreased sense of well-being and feeling of social inadequacy (CUNHA et al., 2020).

Several patterns of eating behaviors have been identified and they include: Eating Uncontrollability (AD), Emotional Eating (EA), and Cognitive Restriction (CR). Cognitive Restriction consists of adopting a mental position in relation to food in order to reduce caloric intake. Emotional Eating is characterized by the impulse to eat in response to emotions, and changes in mood are triggers for the disinhibition of food control. And finally, food uncontrol is the loss of self-control and excessive consumption of food, with or without the presence of hunger. Therefore, it is important to understand the patterns of eating behaviors for the proper management of obesity, and to build a nutritional approach multidimensional that may result in greater adherence to treatment (BIAGIO; MOREIRA; AMARAL, 2020).

Binge Eating Disorder (BED) falls among eating disorders. Its diagnostic criteria are recurrent binge eating episodes, such as eating alone out of shame about how much one is eating; feeling disgusted with yourself, depressed, or very guilty afterwards; and having marked suffering due to binge

eating. These episodes are accompanied by feelings of subjective distress, involving shame, disgust and/or guilt (LIMA; OLIVEIRA, 2016).

Patients who have concomitant eating disorders such as Binge Eating Disorder and do not treat with obesity, tend in the long term, remain with a high rate of caloric intake, usually have a higher BMI, more severe levels of depression and obsessive-compulsive symptoms. Thus, it is essential to carry out nutritional and/or behavioral interventions that simultaneously address weight control and the reduction of eating disorder behaviors in individuals with obesity, in order to improve treatment adherence and promote greater benefits to physical and mental health, than treatments focused on only one or another condition (FLORIDO et al., 2019).

In a study by França et al. (2012), the psychoeducational techniques applied in two focus groups were described, in order to contribute to the change of eating behavior:

1) Psychological factors, which address the perception of the group about interferences of psychological aspects in the maintenance of adequate eating habits, making it possible to identify feelings such as: sadness, anger, depression, anxiety, difficulties in family relationships, low self-esteem, negative evaluation of body image, motivation and joy, with prevalence of depression and anxiety;
2) Intervention strategies, in order to investigate how participants behave in the face of psychological symptoms that negatively influence the change in eating habits. From this angle, the principles of cognitive behavioral therapy helped in the construction of this category, through the technique of distraction, which works by shifting attention from the internal world (thoughts, bodily sensations) to the external world. Thus, participants learn how to change their inaccurate and dysfunctional thoughts so that they feel better emotionally and behave more productively in the pursuit of their goals; and the modification of dysfunctional beliefs, such as going to church, reading, working, using the computer, meditating, performing physical activity, going to the mall, and doing manual labor. These strategies help them to control psychological problems and deal with impulses regarding food cravings;
3) Effectiveness of the psychoeducational group in changing eating behavior, which provided improved self-esteem, changing habits, performing physical activity more frequently, changing thinking, valuing food, weight loss, improving biochemical indicators such as cholesterol, triglycerides and blood glucose and healthy food choice. Finally, feelings evaluated by the group as negative allowed a lower adherence to the diet and the practice of healthy habits, as well as positive feelings were evaluated, as a driving force to change eating behavior and the practice of healthy habits, being paramount for adherence to changes in lifestyle.

There is a trend in the relationship between emotional eating and eating disorders, associated with obesity in conjunction with depression, comfort food consumption, inflammatory markers, menstrual cycle, neurotransmitters, violence and neglect. Regarding depression, it is suggested that emotional eating is a mediator between obesity and depression, in the subtype that generates increased appetite (FRANCE et al., 2012).

Both emotional eating and routine restriction are associated with differential neural activity in regions of the brain related to self-control, impulse, and reward. Emotional eating was positively associated with general eating psychopathology and binge eating, and negatively with body image flexibility and mindfulness. Body image flexibility moderated the association between emotional eating and binge eating. In women, emotional eating may be related to hormonal changes arising from the menstrual cycle, higher levels are found in the luteal phase (BETTIN, 2017).

4.2 BEHAVIORAL NUTRITION

4.2.1 Eating behavior

Behavior and habit are confused in their uses and definitions, where the term behavior is linked to behavioral theories. In food and nutrition, the terms "eating behavior" and "eating habits" are empirical categories that express a reality. Elements such as objectivity, permanence, individual and collectivity can contribute to the understanding of eating habits, because when inserted in the culture, the individual is significantly influenced (KLOTZ-SILVA; MEADOW; SEIXAS, 2016).

Several authors have definitions of Eating Behavior and all converge on the following factors: the way of behaving and living with food, involving eating practices, the meaning given to food and sociocultural factors. They are the actions of the individual based on the information received and from these, the changes or reactions in the way he deals with food. In addition to being associated with sociocultural factors, it is also related to intrinsic factors of the individual and the collectivity in which he lives at the time of the act of eating, and with the food itself. They are all forms of conviviality with food from the values or meanings, to the preparation and choice of consuming or not what is being arranged at the table (VAZ; BENNEMANN, 2014).

The term behavior has as a synonym the action or act of eating, so the term eating behavior is everything that refers to the coexistence with food, related to the social and cultural food actions of an individual or in a group, from the food choice to the swallowing of food (CAVALCANTI, 2019).

Food is multifaceted, so there are several determinants, such as nutritional, demographic, social, cultural, environmental and psychological determinants. The search for identity, with the role of social integration, satisfaction of desires and sensory pleasure present a different symbolic meaning for each individual, and for the construction of a meaning to the act of eating. Thus, the need to better understand the determinants of eating behavior, of the individual or the group, is reinforced, in order

to increase the effectiveness of interventions nutritional and promotion of healthy eating practices, especially in conditions of obesity (NASCIMENTO, 2016).

Usually food choices occur distractedly, or automatically, but the act of eating is determined by thoughts and emotions, and can represent the power to calm, reward, numb, distract, procrastinate, entertain, seduce and even punish (RODRIGUES, 2019).

Hunger is related to different elements, nine types of hunger can be mentioned, as listed in chart 1. In the performance of behavioral nutrition in the treatment of obesity, it is essential to understand the types of hunger determinants in each individual, because there are deep hungers that have nothing to do with food and that have the ability to mask several other more complex and obscure "hungers" (RODRIGUES, 2019).

Table 1 - Types of hunger and related sensations.

Type of hunger	Related sensation
Hunger of the eyes	An organized meal
Hunger for smell and Hunger for the mouth	Are the flavors, textures and temperatures in our mouth
Hunger for touch	Feel food with our hands
Ear hunger	The spoon stirring in the pan
Stomach hunger	Stomach noises
Cellular or body hunger	Our intuition, one of the most difficult to be perceiving because it requires greater self-perception of internal signals
Hunger of the mind	Influenced by our racing thoughts and concerns
Hunger of the heart	The taste of memory, Confort Food, is that food that often represents a caress hat we need at the moment

4.2.2 Definition of Behavioral Nutrition

The science of nutrition is a new science, and scientific results have shown that it can be articulated with several areas of knowledge and in different forms. Behavioral nutrition should be seen as a science that considers beyond nutrients and bioactive compounds, it integrates psychology to assist in the process of understanding the individual about the external and internal influences in relation to the pattern of food and nutritional consumption. It is constituted as a strategy to glimpse the human being from other perspectives from the relationships it establishes with food (FERNANDES; FERNANDES; BARBOSA, 2019).

Psychology and the field of food and nutrition have interests regarding the treatment of obesity, considering the multicausality and emotional aspects involved in this disease (KLOTZ-SILVA; MEADOW; SEIXAS, 2016).

In this sense, behavioral nutrition aims to present an innovative approach, without the practice of restrictive diets, focusing on stimulating the individual to feel pleasure when eating (CAVALCANTI, 2019).

The behavioral nutrition approach uses the focus of cognitive-behavioral theory, which is based on theories and principles of learning to explain the emergence, maintenance and elimination of

symptoms, with a focus on problem solving, merging assessment and intervention to generate progress (TRAJANO; ALVARENGA, 2019).

Based on the statement that there is a relationship between eating disorders and psychological conflicts, the nutritionist who works the behavioral approach is called a nutritional therapist (TN). The purpose of this approach is to help the individual in relation to the structure and what he should consume, in the understanding of how emotions influence behavior and eating attitudes. It is responsible for helping the patient to build a gradual course, making feasible the execution of food planning (FERNANDES; FERNANDES; BARBOSA, 2019).

4.2.3 Approaches and Techniques of Behavioral Nutrition

Behavioral nutrition encourages, through different initiatives, to understand why and how one eats, through various tools to motivate the patient during the process of changing eating behavior. Through messages that bring back the pleasure in eating, using responsible and positive communication to induce and provide the individual to adopt a healthy eating behavior. Behavioral nutrition believes that all foods can have a place in a healthy diet, respecting the laws of food, social and emotional aspects that involve eating. In this concept, a communication and nutritional guidance that is not based exclusively on diets and nutrients is advocated (ALVARENGA et al., 2019; CATO; Tavares, 2017).

Behavioral nutrition approaches are considered, recognizing the context of each individual, validating emotions related to the act of eating, understanding beliefs, to establish the positive relationship between food, respecting their subjectivities, with long-term interventions recognized by both actors (FAUSTINO-SILVA; JUNG; LA PORTA, 2019).

4.2.3.1 Cognitive-Behavioral Therapy

The Cognitive-Behavioral Therapy (CBT) presents itself as the main cognitive approach of today, is the integration of different cognitive-behavioral concepts and techniques. It is a system of psychotherapy based on the way each human being structures their experiences and the way they feel and behave (REYES; FERMANN, 2017).

It argues that feelings are determined by the way people interpret situations, where psychological disorders proceed in a distorted way from the perception of events, influencing affects and behaviors (REYES; FERMANN, 2017).

The objective is the construction of different hypotheses, for the different areas of life, attributing meanings to situations; in addition to describing the results of cognitive processes characterized as maladaptive or dysfunctional (CONCEIÇÃO; BUENO, 2020).

Nutritional treatment, applied in conjunction with cognitive behavioral therapy (CBT), is one of the auxiliary therapeutic techniques for weight control. It is based on the analysis and modification of behavioral disorders associated with the patient's lifestyle, avoiding relapse and consequent weight regain. One of the objectives of the use of behavioral techniques is the possibility of the patient to identify the stimuli that precede the compulsive behavior, as well as the situations that facilitate non-adherence to treatment (ABESO, 2016).

Among the principles of Cognitive Behavioral Therapy are evidenced (ALVARENGA; Trajan, 2019):

1. Respondent conditioning (Pavlov's), where neutral stimuli, paired with an unconditioned stimulus, provoke the same response;
2. Operant conditioning (Skinner's), in which the effects of a behavior can determine the increase or decrease of its frequency;
3. Social learning or social cognitive theory, where behavior can be learned and acquired by observation (or imitation)
4. Habituation, a natural phenomenon in which sensations such as anxiety and discomfort decrease according to the time spent in contact with the stimulus;

Therefore, current CBT is a combination of action procedures by multidimensional techniques and methods to modify dysfunctional behaviors and/or thoughts (ALVARENGA; Trajan, 2019).

4.2.3.2 Motivational Interviewing

Motivational interviewing (MI) is a patient-centered communication style that uses specific strategies and principles, such as reflective listening, that bring up questions about behavior, autonomy, shared decision-making, and proposes to help people in their conflicts (CATÃO; Tavares, 2017).

Its purpose is to help people identify their problems and consolidate the importance of change. Used in an initial stage of treatment, focused on the problem and has a brief duration. Its application should be based on five principles (BAZZI, 2019):

1. express empathy: through listening, understanding and accepting the patient's feelings and beliefs;
2. develop discrepancy: assess the current situation and finish line of the patient, showing discrepancies in behavior, through their personal goals and values;
3. avoid argumentation: which can generate defensive attitudes;
4. accompany resistance: act in conjunction with the client's priorities, through guiding reflections;
5. Promotion of self-efficacy: develop confidence in the patient, so that he is able to make changes.

Motivational interviewing is currently described in four processes in the form of steps:

1. engagement: it is the construction of a positive therapeutic alliance with the patient, resulting in more engagement and adherence;
2. focus: it is the development and maintenance of the specific direction of conversation for change, which helps in the elaboration of meaning, and in the process of building a direction for change;
3. evocation: it is the extraction of the patient's feelings concerning the purpose of change;
4. Planning: define when and how to change, have a specific action plan. The 4 steps are represented in Figure 1 (FIGLIE; GUIMARAES, 2014).

Figure 1. Motivational coaching in the company. Source: GARRIDO, 2017.



The first step in this approach is to talk about change, about the desire to change, and then about the patient's ability to do so. The reasons and the need to modify some behavior can be addressed. It is necessary to ask open-ended questions in order to let the patient express himself freely, understanding, supporting and giving praise. A summary of the conversation, punctuating the patient's reports, allows him to listen again to his conflicts and positive affirmations, which can have a motivating effect. It is this motivation that probably causes the person to start, continue and stay on a specific change plan, it is intrinsic, but it can be influenced by external factors (BAZZI, 2019).

There are guiding principles of the conversation to stimulate behavioral changes (SANTINI, 2019):

1. Capacity: these are the easy attitudes, which are within the reach of the patient to be fulfilled. An example would be the elaboration of a strategy capable of being executed,

such as buying fewer sweets throughout the week, and that can be suggested by the patient himself, thus having greater chances of success and adherence;

2. Reasons: may be the purposes for initiating the change and vary according to the patient's expectation. It is usually expressed in the form of desires, thoughts such as "practicing physical exercises would make me more willing";
3. Needs: something urgent and fundamental, here there is a higher level of commitment, for example, make use of words such as "need or must", or words of commitments such as "I will organize my schedules".
4. Commitment: the patient already demonstrates that he has started the process of change.

4.2.3.3 Transtheoretical Model

The motivation for behavior change can be identified through the Transtheoretical Model of Motivation for Behavioral Change (MTT) (CATÃO; Tavares, 2017). The transtheoretical model was initially proposed by James Prochaska and Carlo DiClemente, American researchers. It is considered an approach that advocates that behavior change occurs in five stages plus relapse:

1. Pre-contemplation: where the individual still has no intention of change;
2. Contemplation: the individual begins to consider the change, but does not yet have a deadline to begin;
3. Decision or preparation: foresees a change in behavior for the near future;
4. Action: corresponds to the change of behavior, requiring dedication on the part of the individual to avoid relapses;
5 Maintenance: in which the individual changed the behavior and was able to maintain it for more than six months;
6. Relapse: there is a resumption of the previous behavior, a failure in maintenance, and the individual can regress to any of the stages of change. Many need to start the whole process again, however the reason for understanding the process must be identified (SANTINI, 2019).

It is believed that people modify their behaviors intentionally, assuming commitment and collaboration of the subject. By going through these stages of the change process, individuals understand the different patterns involved in each stage, in addition to experiencing each moment, generating modifications or ceasing certain behavioral patterns. It is a process with different levels of motivation and readiness for change (BAZZI, 2019).

For the analysis of the options and elaboration of an action plan for the stages of change, it is necessary to follow some steps, such as:

1. Goal setting: it is necessary to define clear, acceptable and feasible goals, which should come from the patient himself, through key questions;
2. Analysis of options: it is the analysis of how to achieve them, which may be the first choice or not, it is important to prepare the patient for the possibility of changes or adaptations;
3. elaboration of a change plan: it can be a summary form with the change plan or a question such as, "is this what you want?", and it can be disclosed to someone important to him (FIGLIE; GUIMARAES, 2014).

Another component, in addition to the stages of change, are the processes of conduct modifications, which allow the understanding of the modification of recurrent conducts that occurs between the stages. From the moment the individual changes his behavior, it is possible to identify ten steps applied most frequently in treatment adherence, they are (SOUSA; NUNES, 2014):

1. increase awareness and information about adherence;
2. dramatic relief associated with non-adherence;
3. environmental reassessment, which consists of the perception of the effectiveness of the treatment in other people;
4. emotional and cognitive self-reassessment related to adherence;
5. self-liberation, which makes a commitment to the individual for adherence;
6. reinforcement management, with the application of intrinsic and extrinsic rewards for treatment;
7. help in relationships, through incentives and social support;
8. "counterconditioning," which is the replacement of the old behavior by the new behavior;
9. stimulus control, presenting suggestions and reminders for adherence;
10. social liberation, showing that society is changing to support you in joining

4.2.3.4 Comer Intuitivo ou Intuitive Eating

Intuitive Eating (IC) or Intuitive Eating (IE) is an approach that is based on evidence, teaching people to have a good relationship with food, knowing their own body, so that the individual gets in tune with food, mind and body through three pillars: unconditional permission to eat; eating to understand physiological and non-emotional needs and lean on internal hunger and satiety signals to determine what, how much, and when to eat. Intuitive eaters have greater intuitive awareness, perceive the physical sensations that arise from within the body, mediated directly by the brain, its internal hunger signals and eat what it chooses, without feeling guilt, without judgments and without living an ethical problem (ALVARENGA et al., 2019).

Eating intuitively is associated with high levels of psychological well-being and happens gradually, while internalized beliefs about food, nutrition and food are unleashed and replaced by new ideas (NOGUEIRA, 2019).

The Intuitive Eating technique is composed of ten principles (ALVARENGA et al., 2019).

1. Reject the diet mentality, excluding everything that contains information about diet and measures that promise rapid weight loss;
2. Honor hunger, being necessary to perceive signs of hunger and standardize schedules;
3. Making peace with food, through questions such as "do I really want to eat this?", "do I need to eat this now?";
4. Challenge the food policeman: the sensations of stealing or lying about the diet generate a feeling of guilt, and it is necessary to change this thought, and give space to other inner voices that do not judge;
5. Feeling satiety: to feel satiated, it is necessary to learn to listen and understand the internal signals, through self-assessment exercises that can help in this process of better understanding the body;
6. Discover the satisfaction factor, know how to identify when you are satisfied and eat less;
7. Dealing with emotions without using food: cognitive behavioral therapy exercises can be quite helpful in dealing with these emotions without using food;
8. Respect one's own body: encourage the patient to perceive his body with compassion, without evidencing the dissatisfactions;
9. Exercise: so that one feels the positive impacts on health, it should be daily practice and with activities in which one feels pleasure when performing it;
10. Honoring health: Practicing "gentle nutrition" consists of making people feel good about eating, but respecting nutritional guidelines.

There is an Intuitive Eating Scale (IES2), which can be applied during the consultation. The original American version consists of 23 items, adapted for the Portuguese, and has four dimensions (DA SILVA et al, 2018):

1. "Unconditional permission to eat": is the permission to eat food, without classifications and restrictions;
2. "Eating for physical rather than emotional reasons": investigates how much choices are tied to tuning in to internal hunger and satiety signals;
3. "Trust in hunger and satiety signals": investigates the level of trust the individual has with internal signals to guide their choices.

4. "Food choices made in congruence with the state of the body": evaluates the tendency of the individual to make choices according to the functioning and state of the body (BARBOSA; PENAFORTE; Smith, 2020).

4.2.3.5 Mindfulness

Mindfulness has been practiced for centuries, and it is a time of concentration, without making judgments. It means not being involved with memories, and rationalizations are suspended. It is an interaction between nature and the mind, releasing potential emotions or feelings. Through systematic training, aspects of the mind and heart are cultivated through mindfulness, which has no correlation with religious activities (MARTINS et al., 2018).

The practice is multimodal, presenting itself as a psychological state, acting in the self-regulation of attention and attitude of openness and curiosity towards the experience; as a psychological trait; as a practice and as an intervention program (MARTINS et al., 2018).

In general, mindfulness programs are applied to groups for eight weeks, with one face-to-face session per week lasting 2 hours. In addition to preventive or therapeutic applications, mindfulness programs have an impact on all aspects of health promotion, developing autonomy, self-efficacy and empowerment of people (DEMARZO; GARCIA-CAMPAYO, 2017).

The effectiveness of mindfulness-based interventions has been highlighted in the management of chronic stress, anxiety disorders, depressive disorders; in chronic clinical conditions (physical symptoms), treatment of arterial hypertension, diabetes mellitus and multimorbidity. A mindfulness-based technique used in behavioral nutrition is mindful eating (DEMARZO; GARCIA-CAMPAYO, 2017).

4.2.3.6 Comer Consciente ou Mindful Eating

The mindful eating technique engages all parts of the body, mind and heart in the choice and preparation of food, as well as in the act of eating it, involving all the senses. It involves the systematic formation of a focused state of awareness through repeated participation in sensory experiences, thoughts, and emotions, as well as the development of a non-judgmental attitude. It allows the individual to focus on the present moment without the interference of aspects of the past, It must be directed by the individual's internal experience, which is unique. This technique is much broader than simply eating slowly, paying attention to what you are eating (SILVA; Martins, 2017).

Thus, individuals are able to make positive criticisms about their food, without judgments or criticism of the sensations during the act of eating. Mindfulness is an innate ability, but it can also be developed through meditation, sharpening attention and focus (FAUSTINO-SILVA; JUNG; LA PORTA, 2019).

Meditation consists of the ability to focus attention on something, when based on mindfulness, it can be performed by anyone, it only needs a quiet environment where one can remain seated comfortably for the release of thoughts, and one must remain in this state of mindfulness for a minute. Its frequent practice is positive for health, by bringing greater recognition of feelings, and boosting positive feelings (FAUSTINO- SILVA; JUNG; LA PORTA, 2019).

In the state of mindfulness, the individual should focus only on the facts perceived by the five senses or the mind, without criticism about it. It should be behaved as an external observer, and accept what goes on in your body, remembering that the thoughts or feelings observed by the individual himself represents something momentary, not necessarily what the person is (RODRIGUES, 2018).

The definition of Mindfulness, basically part of four components (RODRIGUES, 2018):

1. uncentered consciousness;
2. sustaining action, allowing attention to rest through difficult cognitive situations or situations that generate suffering;
3. acceptance of difficult thoughts and images;
4. possibility that cognitive aspects of difficult management pass without reaction on the part of the person.

Thus, in food, mindful eating involves (NOGUEIRA, 2019):

- The slowing of the rhythm when eating: take breaks during each bite, chew more slowly, take breaks to breathe and feel the moment;
- Eating away from distractions: television or computer;
- Become aware of the hunger and satiety signals that the body provides, and decide whether or not to continue eating;
- Recognize responses to food without judgment: (liking, disliking, indifference), rather than following a strict diet;
- Choose to eat pleasant and nutritious foods, using all the senses while eating;
- Be aware: reflect on the effects of eating unconsciously, out of boredom, sadness, or eating until you feel uncomfortable.

There are no restrictions on what is ingested, adopting an intuitive diet is a process that is acquired over time. For people with a history of dieting, dietary restrictions, or body image concerns, it may be difficult to abandon old habits and attitudes, and try new ways of relating to food (NOGUEIRA, 2019).

Among the suggested practices of mindful eating are (RODRIGUES, 2018):

- Hunger Odometer: stimulates the person to "honor their hunger" by understanding the differences between hunger and satiety. On a scale from 0 (zero) to 10 (ten), when one is 0 (zero) from hunger to satiety it is 10 (ten). The application of this instrument can

be used as training to perceive the best time to feed, understanding the proper functioning of the body; according to the hunger scale represented by Figure 2.

Figure 1. Learn to use the hunger scale.



Source: NUTRITOTAL, 2019.

Some examples below of how to apply the mindful eating technique:

- Practice of raisins: by directing the mind to something it is possible to prevent thoughts from oscillating from one to another;
- Practice of chocolate and feelings: with the aim of changing the focus of attention in a conscious way. It can be performed with any food, preferably with those considered "forbidden". It is intended to make the person pay attention to some roles that food plays in our lives. Bring to mind some stressful event and assign a score from 0 to 10, corresponding to the intensity of stress. It proposes the attempt to understand why a particular food is eaten and its quantity;
- Practice of satiety: exercises respect for the body and satiety. If you fill the stomach with water, you score the size of the hunger and how much you can feel the full stomach, from 0 to 10;
- Food awareness questionnaire, investigates mindful eating. It is divided into 28 items with 5 subscales. Each item has a score from 1 to 4, the higher the score, the higher the awareness in the act of eating, which favors weight maintenance (RODRIGUES, 2018). The subscales are:

1. Awareness (awareness of what food looks like, and aware of its taste)
2. Distraction (when not focusing attention on food);
3. Disinhibition (eats even when full);
4. Emotional response (eating in response to sadness or stress)
5. External influences (eats in response to external suggestions, such as advertisements).

Some tips applied to eating mindfully include (RODRIGUES, 2018):

- To improve the eating experience, one should eat in a relaxing environment;
- Recognize and express emotions instead of eating at emotional times
- Try eating all colors of food, red, orange, yellow, green and purple, to ensure the consumption of important phytochemicals beneficial to health;
- Eating is a social occasion, it can help to focus more on people and not on the need to eat large quantities;
- Experiment with various flavors in a meal, salty, sweet, bitter, astringent, obtaining small amounts of all flavors of the food;
- Chewing a lot, because the act of eating allows you to be conscious and in the present moment, in addition to making you realize the exchange of energy with food.

4.2.3.7 Self-monitoring

Self-monitoring is part of a broader, multifaceted construct called metacognition, which comprises beliefs, processes, and strategies that identify, monitor, or control cognitions. It is the process of identifying and observing oneself in relation to one's own cognitions. There are two aspects of metacognition, metacognitive knowledge, which is the information that the individual has of his own cognition; and metacognitive regulation, through which information is monitored and controlled (MELO et al., 2014).

The individual perceives his actions and the effect caused, from there, seeks to change behaviors and thoughts. It allows the recognition of cognitive tendencies and emotional reactions to self-correction. The most used form is to fill out a checklist with date, time, situations, triggered behaviors and responses. Thus, it is possible to map dysfunctional thoughts, emotions and behaviors (CONCEIÇÃO; BUENO, 2020).

Self-monitoring is the process of identifying and observing one's own cognitions and monitoring them with a specific therapeutic goal. It involves, for its proper functioning, resources of executive functioning capable of allocating attention, monitoring, checking, planning and detecting performance dysfunctions (MELO et. al., 2014)

It is performed by the patient himself, through records of food intake, binge eating episodes and triggering events. These diaries are useful in order to assist in the elaboration of planning and therapeutic adjustments (ABESO, 2016).

Combined with cognitive techniques, self-monitoring can document misguided thoughts regarding eating, weight, and appearance bodily.

In problem solving, therapist and patient identify problems related to excess weight, and seek possible solutions and strategies, applying them, testing them and rediscussing them in order to select those that are definitely effective in modifying individual behavior, helping the patient to lose and maintain weight. In cognitive restructuring, there is the modification of the belief system, alteration of the patients' thoughts, proposing a cognitive restructuring in relation to selective abstraction, which consists of paying attention and giving more value to information that confirms their negative assumptions; such as "all or nothing" thinking, permitted foods and forbidden foods; superstitious thinking, which consists of believing that there is a relationship of cause and effect (ABESO, 2016).

There are several self-monitoring techniques for various purposes. Among the techniques that can be useful in nutritional care are (MELO et al., 2014):

- Recording of Dysfunctional Thoughts (DPR): There must be the assumption that there is the election of thought over emotion. It is based on the principles of conventional cognitive therapy, and establishes a sequential relationship between activating situations, beliefs and emotional, physiological and behavioral consequences. It is the process of realizing your thoughts and associated emotional, physiological, and behavioral reactions;
- Intrapersonal Thought Record: relates to emotional, physiological and behavioral response;
- Daily Record of Food Intake: adapted from the conventional Record of Dysfunctional Thoughts, for the work with other specific disorders related to eating behavior;
- Coping Cards: simple technique of cognitive therapy, consists of writing on a card reminders or motivational elements, which can be photos, phrases or words, which serve as an external monitor to help the patient remember the topics addressed in session, functioning as triggers that provoke metacognition, increasing the level of control;
- Techniques for decision making: The Decision Scale is a very simple and useful tool for working with many of the problems faced in clinical practice in cognitive therapy. Used when the issue is decision-making in situations of impasse, caused by the uncertainty between advantages and disadvantages, wanting and not wanting. In a form are placed two exactly opposite situations and below each of them are placed the advantages and disadvantages of the decision for each situation;
- Consensual Emotive Rational: another technique for decision making. It systematizes the decision-making process in seven stages, where a consensus between reason and emotion is sought. 1) establishes the desired or feared action; 2) it separates how much reason and emotion each of the extremities presents, so as to clearly visualize the impasse; 3) point and counterpoint, the individual performs a dialogue aloud,

representing the roles of emotion and reason at different times; 4) the therapist asks the patient to make an evaluation of their decision-making process, giving feedback in relation to the work done so far; 5) then, the patient can assess how ready he is to make his decision at that moment; 6) one should not pressure the patient, so that he does not feel compelled to decide without being prepared, or frustrated by not being totally sure of what he will do at the end of the technique; 7) action plan, the last stage of the technique, establishes a step by step consistent with the decision made by the patient throughout the consultation, so that the resolution of the problem can be implemented (MELO et. al, 2014).

4.2.3.8 Food Autobiography

Autobiography is one of the techniques that are based on narratives, it constitutes a personal narrative not limited to the individual perspective, relating the individual with the collective in the construction of its history. A characteristic of autobiography is the concern with the temporal sequence (OLIVEIRA; SILVA; PEREIRA-CASTRO, 2020).

In the food autobiography it is the narrator who decides what to narrate, it can be life itself, or fragments of it, in person, and in the present moment as well in virtual environments, such as in digital social media, in timelines or in closed groups, texts in blogs, or even in videos. Configuring the characteristic of a public food diary, with records of their feelings, relationships, events and opinions around eating practices (OLIVEIRA; SILVA; PEREIRA-CASTRO, 2020).

The food history is a great source of data during the service, but it is subject to some difficulties either by the time of data collection, or the need of the client to talk about the current moment, not finding relevant the relationship of some information of the past with the now. The client is asked to write about his story, from a pre-established script, addressing aspects from birth to the present, highlighting striking facts, his way of reacting to them and the people involved in the situations reported. In addition to these fields, the client should mention what emotion was felt at the time and what emotion was experienced when recalling the situation in the preparation of the autobiography. This information is important because it signals the relationship with current issues, because it is from the past that the future is understood and possible dysfunctional connections are found today and that were lived long ago (NEURACI, 2017).

4.2.3.9 Competency Model

The Food Competence Model is defined as a relationship between eating attitude and behavior, which is based on biopsychosocial processes, such as hunger and the will to survive; the appetite and the need for reward; the ability to stay satiated and the maintenance of body weight. It addresses aspects

related to the behavior and attitudes of food acceptance, such as eating in variable and adequate amounts. Food competence consists of four basic components (SOUSA; NUNES, 2014):

1. the attitude about food and food;
2. the ability to accept food;
3. the competence of internal regulation related to food; the positive attitudes supported by the acceptance of food;
4. management capacity in the context of eating, including the family meal

The eating attitude can be reinforced by creating bonds with food, through experiences in preparation and through tasting. Effective behaviors in regulating food is able to control the signals of hunger and satiety. The food competence model works on the changes, favoring the adoption of good eating habits (SOUSA; NUNES, 2014).

4.2.3.10 Food Education and Nutritional Counseling

Food and Nutrition Education (NEC) is defined as a set of learned experiences that facilitate the voluntary action of eating and other eating behaviors that are favorable to the health and well-being of the individual. Its goal, as well as nutritional counseling, is to provide support and guidance to individuals on how to make appropriate food choices that meet their needs (SOUSA; NUNES, 2014)

In the educational and pedagogical approaches of Food and Nutrition Education, attention should be paid to active processes, integration between theory and practice, using strategies to develop the autonomy of the individual and stimulate critical thinking about food choices (SELMY, 2018).

Food and Nutrition Education must turn to the formation of values, to pleasure, to responsibility, but also to the playful and freedom. Interdisciplinary approaches emerge as options that can offer alternative paths to this practice. Among the strategies used in food and nutrition education, nutritional counseling has been gaining prominence, since it is characterized by being centered on the patient and not only in the collection of information and strict protocols (SELMY, 2018).

The main objective of Nutritional Counseling is to promote healthy eating and lifestyle, aiming to meet nutritional needs, in order to develop strategies that solve the problems that prevent change. The initial proposal is to encourage the individual to expose their problems, from this, to develop appropriate techniques for each case (SOUSA; NUNES, 2014).

Nutritional Counseling is recommended in the proposal of the expanded clinic and the singular therapeutic project (PTS), of the National Humanization Policy. It is a process of help, which has psychology as a pillar of support. The counselor transmits the necessary information for the process of changing eating behavior, passes positively the knowledge about healthy eating, and appropriate ways to add them to the diet and more appropriate forms of preparation (BRAZIL, 2007).

The nutritional counseling was structured based on some approaches of psychology; it is an educational tactic that resizes the performance of the nutritionist before the patient. The goal is to make the patient able to master situations in their life in order to achieve growth and effective decision-making. Nutritional counseling is structured in three stages (SELMY, 2018):

1. Initial discovery: bonding with the patient, understanding their needs, and their emotional state through their verbal and non-verbal interaction;
2. Exploration in depth: makes the patient understand their problems and know how to discuss them;
3. Preparation for action: tries to minimize the patient's anxiety, as he is not used to making his own choices and solving his own problems. This process takes time, discipline and patience, and positive feedback from the nutritionist is key.

The nutritionist is responsible for promoting, preserving and recovering human health, and must follow the parameters of Food and Nutrition Education and know behavioral tools to create a bond with his patient. Should have frequent meetings with the patient, for mutual evaluation on the strategies chosen for treatment (SELMY, 2018).

We can cite as Nutritional Counseling Strategies:

1. Action of listening: acts as an efficient guide in solving problems, is a prerequisite of other competencies. The result of listening carefully, capturing the message, will promote more effective interventions;
2. Openness: it is the availability to receive the information, both the nutritionist and the patient, and allow others to influence you in your perception of the world. It includes both physical and psychological openness, it is letting oneself be influenced by what comes from outside, it is opening oneself to receive messages, even if they come at odds with established beliefs and habits;
3. Concentration: is the ability to concentrate energy on the situation of the moment, the here and now, without letting the internal dialogue interfere with this concentration. It is the acceptance of feelings at the same time that the conversation is taking place;
4. Comprehension: is the ability to attain the meaning of communication. Some factors in understanding are interpretation tools such as a large vocabulary and attention to the meanings of the client's nonverbal behavior.
5. Language: it is an important tool of interpretation. A vast vocabulary helps the listener understand what is being said;
6. Nonverbal signals: they are more difficult to understand, because they can be related to subliminal messages that bring the truth into the dialogue that the one who speaks, consciously or unconsciously, prefers to hide.

Nutritional Education strategies should be used by both the patient and the nutritionist at the time of the consultation. Knowledge contributes to sustaining or developing new attitudes, being the rational component necessary to motivate a desired action, but providing information and educational materials does not necessarily lead to changes in behavior. The main thing is to learn to meet the patient and his problems, to the point of knowing the obstacles he faces when he tries to achieve his goals in the eating plan (SILVA et al., 2020).

4.2.3.11 Health at All Sizes or Healthy at Every Size (HAES) ®

Another approach that also includes strategies for changes in eating behavior is the HAES® – Healthy at Every Size approach, which deals with a multidisciplinary approach and focuses on promoting health behaviors for people of all sizes, without using body weight as a mediator or indicator of health improvements (TORRES, 2016).

A person can have health regardless of their weight, eating normally and practicing pleasurable physical activity. The HAES® technique is defined by 5 principles:

1. respect the different types and sizes of existing bodies;
2. understand health and well-being from a multidimensional perspective, considering physical, social, spiritual, occupational, emotional and intellectual aspects;
3. promote all aspects of health and well-being for people of all sizes;
4. promote eating in a way that balances individual nutritional needs, as well as promote society, appetite and pleasure;
5. stimulate pleasurable individual physical activity, and improve the quality of life, without the goal of weight loss.

This form of approach is still controversial, requiring discussions regarding fatphobia and stigmatization in relation to obesity. It is not complacent with obesity, nor against weight loss. This model of approach treats health in a global way, involving food, physical activity, mental health, spirituality and interpersonal relationships. In fact, it focuses on behavioral changes, without the excessive pursuit of weight loss at any cost, approaching weight in an inclusive way, focusing on improving health, caring with respect; in eating for well-being; and in promoting the movement to improve the quality of life (ALVARENGA, 2019).

It is considered an alternative to work on issues related to weight and eating, based on self-acceptance and stimulation of healthy behaviors that can be maintained in the long term, regardless of body weight. It includes the acceptance of the diversity of body shapes and sizes, highlights the importance of a relaxed eating environment that respects the sensations of hunger and satiety and seeks

to collaborate for research on the social, emotional, spiritual and physical factors that contribute to a happy and healthy life (TORRES, 2016).

4.3 BENEFITS OF BEHAVIORAL NUTRITION

In the view of Behavioral Nutrition, the individual has the power to alter their behavior when they are ready for it. Lifestyle and dietary change will only occur if it is compatible with personal values and desires. The process of change should be composed of simple steps, which should be valued. It is also emphasized the need for changes in environmental issues for advances to be achieved (ALVARENGA et al., 2019).

In a systematic review study coordinated by the American Dietetic Association (ADA), the combination of different theories of behavior change, such as Cognitive Behavioral Theory, Social Cognitive Theory and the Transtheoretical Model, applied in clinical practice in the area of nutrition is effective in interrupting undesirable eating patterns and replacing contemporary habits with healthier ones, with consequent weight reduction and reduction of the risks of chronic non-communicable diseases (RODRIGUES, 2019).

Behavioral nutrition comes to act in this intangible universe of choices in relation to the lifestyle that one is ready to live at that moment, in order to improve the adherence of individuals to health treatments, so that they empower themselves and achieve an active posture towards self-care. Table 2 lists the techniques already mentioned and their benefits ((RODRIGUES, 2019).

Table 2. Benefits of behavioral nutrition approaches.

Approach or Technique	Benefits
Cognitive Behavioral Therapy	- reduction of symptoms and recurrence rates in psychiatric disorders (FERMANN; REIS, 2017); - improves the effectiveness of therapy (CONCEPTION; BUENO, 2020); - Identifi,reestruturaecorrigepensamentos dysfunctional (CONCEPTION; BUENO, 2020); - effective in the treatment of hypertriglyceridemia (MARTINS et al., 2018).
Motivational Interviewing	- reinforces the importance of detecting incongruities in individuals - effective for behavior change; - helps professionals to improve their clinical approach (OLIVEIRA; WEDGE; FERREIRA, 2021).
Transtheoretical Model	- useful in changing eating behavior (NUNES; SOUSA, 2014); - melhor adodiálogoentreopacienteeoprofissional (MAGALHÃES, 2019).
Intuitive Eating	- harmonizes the patient's relationship with food; - intervenes on the stigma of the body in a positive way; - promotes physical, mental and emotional well-being; - the perception of the signs of hunger and satiety surfaces; - favors the control of emotional eating; - improves the relationship with physical exercise; - leads to pleasure in eating, and reduces negative feelings related to food (ALVARENGA et al., 2019).
Mindfulness	- effective in the management of chronic stress, anxiety and depressive disorders, chronic clinical conditions (DEMARZO; GARCIA-CAMPAYO, 2017); - decreased perception of pain and the ability to tolerate it; reduction of stress, anxiety or depression, reduction of consumption and adverse effect of drugs;

4.4 APPLICATION OF BEHAVIORAL NUTRITION IN THE TREATMENT OF OBESITY

Due to overweight and obesity being a public health problem that increasingly affects the world population, new means of treatment are being sought and researched to control and treat this disease. Thus, behavioral nutrition has been studied as one of the non-conventional methods. This strategy is becoming increasingly relevant, as it involves the analysis of the individual's behavior and the why or what led him to binge eat and adopt sedentary lifestyle (ABESO, 2016).

Behavioral nutrition explores in the background all the socioeconomic and sociocultural factors that circulate the daily life of the patient, understanding their feelings about food. The Brazilian Association for the Study of Obesity and Metabolic Syndrome (ABESO) itself recognizes the need to know the person and encourage their own self-reflection, as something fundamental to achieve success in the treatment of obesity (ABESO, 2016).

In any case, it can significantly reinforce the maintenance of lifestyle changes (diet therapy and physical activity) after a one-year follow-up. Controlled studies of up to six months and between

one and three years, obtained results of significant improvement in psychological well-being and quality of life, even associated with a small reduction in body weight (ABESO, 2016).

Below are some positive results found in scientific research regarding the applications of some behavioral nutrition techniques already mentioned, in the treatment of obesity.

A randomized clinical trial was conducted with 117 adults diagnosed with moderate to morbid obesity, binge eating disorder (CPAT), and subclinical eating problems. Participants were assessed in a number of areas, including issues related to eating and weight, emotional regulation, state of consciousness, and spiritual well-being. A food awareness training based on the mindfulness technique was proposed during 12 sessions, with 10 of these weekly group sessions lasting 2 hours and 2 reinforcement sessions of 2 hours. The techniques applied were sitting breathing, mindfulness at meals, body scanning and forgiveness practice. As results obtained, the factors of peace and faith increased significantly in the group of individuals who underwent the intervention, with decreased anxiety and depression (KRISTELLER; JORDAN, 2018).

In another randomized clinical study, in which individuals were divided into control and intervention groups, the target audience investigated was 152 adults, 65 women and 87 obese men, with a mean age of 22.9 years. Mindfulness-related meditation interventions were proposed for 6 weeks, testing the hypothesis that the group environment helps more than the individual environment. The sessions lasted about 20 minutes through sitting breathing practice. Then the meditators were encouraged to perceive and accept thoughts and experiences, without judgment. The results indicated that participants in the group environment lost more weight and reduced their levels of cognitive-behavioral avoidance, while impulsivity and attention remained stable. On the other hand, participants in the individual condition lost less weight, while there was an increase in cognitive-behavioral avoidance and attention scores full, but a decrease in impulsivity, but it was concluded that mindfulness meditation in individual settings should be used with caution (MANTZIONS; GIANNOU, 2014).

In a study conducted with 194 adults with obesity, BMI between 30 and 45.9 kg/m2, aged over 18 years, participants were randomized to a 5.5-month program with diet and exercise protocol, with or without mindfulness training. The effects observed after 12 months in the group receiving mindfulness training compared to the control group were weight loss by -1.9 kg, decreased fasting glucose, and decreased triglyceride ratio / HDL (DAUBENMIER et al., 2016).

In the study by Daubenmier et al (2011), the effects of mindfulness intervention under eating under stress were studied in overweight and obese women, without chronic diseases or who used medications, and aged over 40 years. An intervention was developed based on components of Mindfulness-Based Stress Reduction, Mindfulness-Based Cognitive Therapy, and Mindfulness-Based Food Awareness Training. The intervention program consisted of nine 2h30m classes and a quiet 7-hour day of guided meditation practice. The interventions were body scanning, mindful yoga stretches,

sitting meditation, introduction of mindful eating practices to the physical sensations of hunger, stomach fullness, taste satisfaction, identification of emotional and food triggers, self-acceptance and inner wisdom. The results in the intervention group were successful in increasing mindfulness and responsiveness to bodily sensations, reducing anxiety and eating in response to external food stimuli, as well as reducing eating in response to emotions. (DAUBENMIER et al., 2011).

In the randomized study conducted by Mason et al. (2016), the target audience investigated was 194 individuals who had a history of obesity, with a mean age of 47 years and mean BMI of 35.5 Kg/m2. The intervention was based on the principles of mindifulness in a group format in a medical center, lasting 5.5 months, through 12 weekly sessions lasting from 2h00 to 2h30m, being held 3 fortnightly sessions and 1 session 4 weeks later, in addition of a weekend session lasting 6h30m. The training involved guided meditations and discussion of mindful eating practices. As observed results, the group that received the mindfulness training showed an increase in conscious eating associated with a decrease in the intake of sweets and maintenance of fasting glucose up to 12 months after (MASON et al., 2016).

In the work of Albuquerque and Freitas (2019), a cross-sectional study with a quantitative approach, 26 women who had a history of restrictive diets for weight loss, aged 20 to 40 years, were investigated. The present study applied four distinct types of questionnaires to assess the interrelationships of intuitive eating. The scales were: the scale of intuitive feeding (IES-2), body appreciation (BAS-2), Flexible Control and Rigid Control. The study had as positive results the relationship between intuitive eating and greater body appreciation, BMI and greater confidence in hunger and satiety signals. It was also observed that flexible control was positively related to the construction of body-food compatibility, pointing to the fact that as a relationship of respect and love for the body is maintained, a greater body connection develops (ALBUQUERQUE; FREITAS, 2019).

In the study by Oliveira, Silva and Pereira-Castro (2020), workshops were held with undergraduate students from various courses, in which they were invited to write a narrative letter, describing a food autobiography addressed to themselves. In a second moment, they wrote the key words on cards and fixed them on posters, which were arranged so as to represent a timeline. In the workshops, the participants were divided into groups, and each group discussed one of the life phases (childhood, adolescence, adulthood). The use of autobiography as a pedagogical approach in groups provided the exchange and collective construction, allowing the discussion of elements and perceptions that permeate the food. Overweight and obesity carry strong social stigmas, fat or obese bodies are judged and socially, associated with the image of lack of control, thus, there is an exclusion of oneself, and an intense social guilt in relation to their prognoses. By narrating one's own history, a field of elaboration, resignification and reinvention of identity is established where.

The narrators see themselves from the cultural significance, and it is in the singularity that the fragilities and particularities of people who seek health care to treat obesity can feel more human and visible. The food autobiography seems to be a way to reveal multiple meanings of eating in society that, traditionally are little evidenced in the processes of health formation, the body is not separated from someone who counts it (OLIVEIRA; SILVA; PEREIRA-CASTRO, 2020).

In a cohort study conducted with patients treated at Basic Health Units in the city of São Luís, 523 individuals over 20 years of age were included, most of whom were female (88.52%), who were overweight. Participants underwent two sessions of nutritional counseling for weight loss. The results were positive in relation to weight loss for the vast majority (75.7%) (ALMEIDA, 2016).

In a prospective, quasi-experimental clinical trial lasting one year, 30 women participated in the intervention "Health and well-being in obesity", based on nutritional counseling, with the objective of enhancing their personal resources through individualized strategies that stimulated responsibility for self-care, without the prescription of diets. Conducted by a multidisciplinary group, the participants performed physical activity three times a week, individual nutritional care biweekly and five philosophical workshops. After the intervention, participants reported feeling more empowered to deal with expectations about their bodies and more comfortable with their current body condition. They also reported transitioning from negative experiences associated with body movement to positive experiences with them, motivating them to insert more physical activities into their routines (ULIAN, 2015).

In a prospective randomized controlled trial conducted with 58 obese women, it aimed to understand the effects of a Healty at Every Size (HAES)®-based approach. The intervention group consisted of receiving an approach based on HAES®, through the practice of physical activity three times a week, biweekly individual nutritional care and five philosophical workshops. The control group had a traditional intervention based on this approach through bimonthly lectures. The two groups did biochemical tests and body composition tests. The results showed that the intervention group showed more expressive improvements in food quality, related to greater engagement in culinary experiences and increased food planning. They also had a positive impact on food choices, eating mindfully, in adequate time and according to hunger and satiety signals. There were reports, by a large part of the intervention group, that despite the expectation of weight loss, they were satisfied with other gains and no longer placed weight loss as a central focus for their happiness and understood that the changes would occur in the long term (ULIAN, 2018).

5 FINAL CONSIDERATIONS

The techniques used in nutritional care with a focus on behavioral nutrition value the history of the individual and their relationships with food, in order to improve the entire process and the relationships that involve food.

The process of changing eating habits and beliefs is long and requires the individual and the nutritionist to get on the same page, so that everything occurs naturally and without guilt or judgment. The self-acceptance resulting from the treatment implies weight loss, but also in improved self-esteem, social relationships and relationships with food.

Behavioral nutrition has several techniques that can be applied to different audiences at different stages of life. Techniques that range from the most basic such as food education, to those that lead the individual to a deep reflection on themselves and their state of health, such as cognitive behavioral therapy. It can be seen in this work that considering other aspects of human life besides body weight brings benefits and helps in the treatment of obesity.

It is up to the nutritionist, at the time of nutritional treatment, to identify the best approach for each individual to relate in the best way with their body and mind, in order to maintain the balance between the two and their long-term state of health.

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https://doi.org/10.56238/ptoketheeducati-062

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ABSTRACT
Urinary incontinence is one of the most important syndromes of psychological and psychological quality, which interfere with the quality of life of the elderly, as they cause low self-esteem, limiting the individual's autonomy. Objective: To describe the role of nurses in the management of patients with urinary incontinence, promoting an improvement in the quality of life. Method: It's about a literature review, integrative type, composed of 09 studies, whose data collection was carried out through the following data base: Base de Dados de Enfermagem (BDENF), Índice Bibliográfico Español en Ciencias de la Salud (IBECS), Literatura Latino-Americana e do Caribe em Ciências da Saúde (LILACS), Biblioteca Regional de Medicina (MEDLINE) and U.S. National Library of Medicine (PUBMED). Results: The importance of training nursing professionals in care, planning and interventions aimed at the elderly affected by UI is highlighted, in which the management of the geriatric syndrome is stimulated. Final considerations: It is noted the importance of the nurse's role as an agent to promote quality of life in geriatric patients affected by urinary incontinence.

Keywords: Aged, Nursing, Urinary Incontinence.

1 INTRODUCTION

Aging is an individual process and inevitable to all living beings, expressed by the ability of the individual to adapt to the environment and the decrease in functionality. To understand aging is to know that biological, psychological and social changes occur and that these changes affect the quality of life in old age when not conducted in a preventive way. With aging, geriatric syndromes arise, which are a group of clinical changes that can lead to disabling situations, affecting the autonomy, functionality and well-being of the elderly, making them vulnerable and fragile [1-2].

Urinary incontinence is considered one of the most important and recurrent geriatric syndromes, because it produces numerous socioeconomic and psychological problems, and physical and biological changes that establish difficulties for the routine of daily life, negatively interfering in

the QoL of the elderly, as it causes social isolation in the face of the fear of involuntarily urinating in public places, in addition to embarrassment and activity restrictions, generating feelings of low self-esteem and interfering in personal relationships and household chores, limiting the autonomy of the individual. UI is defined as any involuntary loss of urine, and should not be interpreted as a natural part of aging [1-3].

The main agent of intervention and promotion of continence for the hospitalized patient or in treatment is the nurse and the nursing team. Therefore, the nurse's evaluation must understand the patient in all areas, from the social to the psychological, always based on theoretical references to define a nursing intervention that is consistent with the patient's reality. It should also aim at the implementation of the prevention of urinary incontinence and the need for hospitalization, as this leads to distancing from the family and social life and may cause isolation of the elderly [4-5].

In this context, knowing the importance of health education for the recovery of autonomy and reestablishment of the social life of the elderly, as well as the role of the nurse in the intervention of the geriatric syndrome urinary incontinence, this study aimed to identify studies that exert on the role of the nurse in the management of patients with urinary incontinence, aiming at the promotion and improvement of quality of life, the following guiding question was defined for this question: "What is the role of the nurse in the management of patients affected with urinary incontinence, to promote the improvement of quality of life?".

2 METHOD

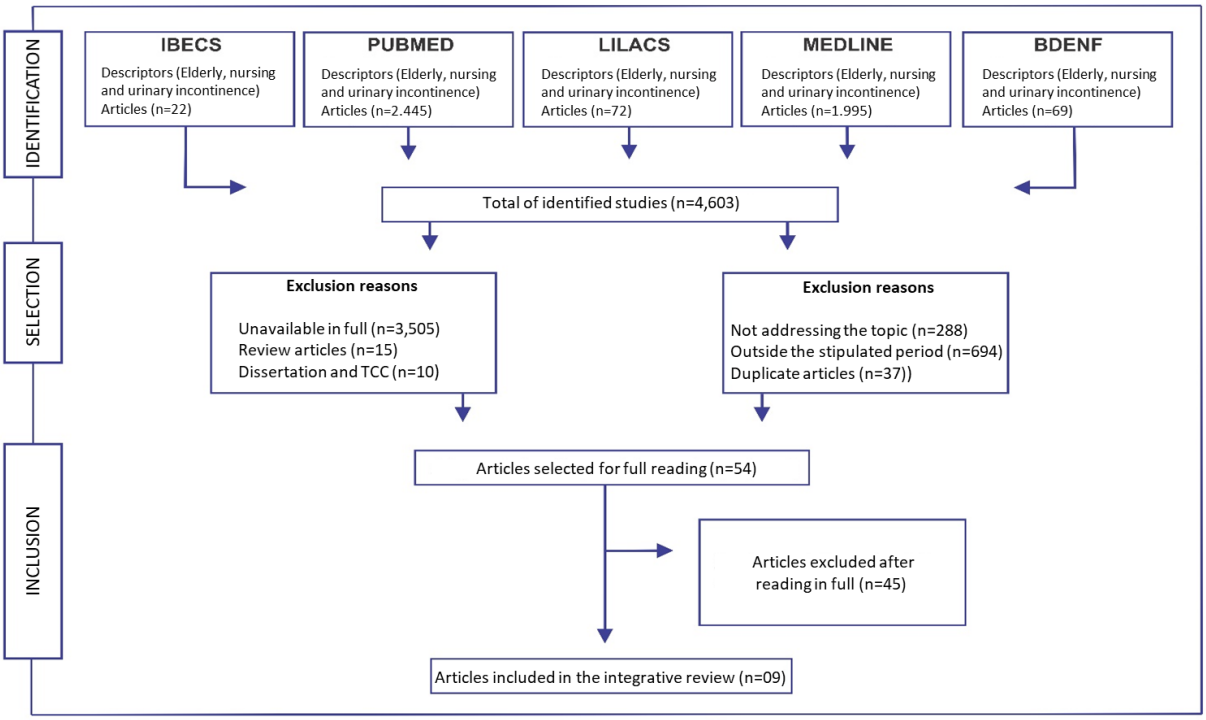
It consists of an integrative literature review, whose data collection was carried out through the following databases: Nursing Database (BDENF), Spanish Bibliographic Index in Health Sciences (IBECS), Latin American and Caribbean Literature in Health Sciences (LILACS), MEDLINE (Medical Literature Analysis And Retrievel Online), from the Descriptors in Health Sciences (DeCS): "Elderly", "Nursing" and "Urinary Incontinence" that were combined with the Boolean operator "AND", the descriptors in the English language referred to as: "Aged", "Nursing" and "Urinary Incontinence" were also used. The selection of articles followed the following inclusion criteria: original indexed articles published in Portuguese and English, freely available in full, from 2018 to 2023.

As exclusion criteria, dissertations, monographs, theses, course conclusion papers (TCC), articles that did not meet the objective of the study, literature reviews, articles that did not answer the guiding question of the study, duplicate articles in the databases and incomplete articles, other syndromes were disregarded.

After separately exploring each database by crossing the descriptors, 4,603 articles were found, organized in a flowchart through the PRISMA flow diagram, adapted according to the

recommendations of Galvão TF (2015). Thus, 54 articles were selected for full reading, and only 09 were included to compose the integrative review (Figure 1).

Figure 1 - Flowchart of crossings, search results in the databases and the reasons for exclusion, adapted in the flow diagram PRISMA, DF – 2023.



Source: Own elaboration, based on PRISMA.

3 FINDINGS

As a final sample, we obtained 09 studies that fit the inclusion criteria of the research, met the guiding question and the determined objective, in which it was possible to establish the information grouped in (Chart 1).

Table 1- Distribution of articles included in the review according to title, author, year of publication, objective, type of study and results.

Author / Year of publication	Goal	Type of study	Findings
Lenardt et al. (2020)[1]	To analyze the association of markers and the condition of physical frailty with urinary incontinence in outpatient geriatric and gerontology care.	Cross-sectional study	The presence of urinary incontinence is associated with frail elderly, related to muscle strength. Gerontological nursing needs to ensure the recurrent assessment of physical frailty in the elderly with UI.
Matos et al. (2019) [2]	To analyze the repercussions caused by urinary incontinence on the quality of life of the elderly.	Descriptive and exploratory research	The testimonies originated negative feelings of the elderly with UI and social aspects that interfere in the quality of life of the elderly with urinary incontinence.
Felisberto et al. (2021)[3]	To develop a nursing consultation instrument for	Methodologic al study	An instrument was constructed aimed at nursing consultation with elderly women with UI for an

	elderly women with urinary incontinence.		outpatient service to be performed by the nurse.
Góes et al. (2021)[4]	To learn the factors related to the onset and worsening of urinary incontinence in hospitalized elderly patients.	Qualitative, exploratory and descriptive research	The factors related to the onset or worsening of UI in the elderly were most reported were interconnected to structure, with emphasis on human resources, followed by material resources and physical structure.
Percival et al. (2021)[5]	Identify the factors that help promote continence in elderly patients aged 65 years and older.	Qualitative research	There are still barriers to providing good quality care to patients aged 65 years and older with UI. The promotion of continence in hospitals would require evaluation and planning, open communication and regular continence care.
Yuan et al. (2019)[6]	Implement a psychological intervention program and explore the effects on anxiety and depression in patients with urinary incontinence.	Randomized controlled pilot study	Psychological nursing intervention improved symptoms of anxiety and depression, which resulted in improved quality of life in older adults with UI.
Geissbuehler et al. (2020)[7]	Present the main activities of a urotherapist, an advanced nursing professional, in the care of patients with pelvic floor disorders and to assess satisfaction with the service that urotherapists provide.	Observational study	Management by a urotherapist was greatly appreciated. The role of the urotherapist as care coordinator, their level of autonomy, and barriers to implementation in primary care require further exploration.
Martín-Losada et al. (2021)[8]	To evaluate the efficacy of an immediate urination program to restore continence at discharge in hospitalized elderly who had UI on admission to a functional recovery unit.	Exploratory research	Nurses need to be aware of the importance of UI in the elderly, detecting factors that influence and contribute to its appearance and the need to develop care plans for effective management.
Schlögl et al. (2022)[9]	Evaluate the factors that can help promote continence in the elderly.	Descriptive and exploratory research	Patients should be informed about continence, especially in elderly people with frailty. Careful evaluation and establishment of etiological factors require multidisciplinary evaluation.

Source: Prepared by the authors, 2023.

4 DISCUSSION

Urinary incontinence affects not only the physiological factors of the individual, but also has the potential to harm the patient socially and psychologically. The elderly affected by UI tend to feel ashamed and limited, because the fear of episodes of incontinence in front of loved ones or public places is developed, which leads them to isolate themselves. Thus, this geriatric syndrome brings limitations to the daily activities of the elderly, preventing the development of the patient's autonomy and affecting their quality of life 6,8.

Since the nursing team is the main agent in the intervention and promotion of patient care, it is of paramount importance that nurses have a scientific basis to provide support to the elderly as a whole, from continuing education in health, care with personal hygiene and skin integrity, to care for their mental well-being in the reacquisition of their autonomy and self-esteem9. For this, it is necessary the

presence of nurses specialized in mental health, as well as nurses trained in the management of geriatric patients10.

Nursing has an important role in deciding whether or not to place urinary control devices, such as geriatric diapers, in elderly people with mobility restriction or not, because the lack of stimulation in the control of eliminations and sphincter control can lead to the aggravation of incontinence by causing a vicious cycle. Therefore, nursing interventions have significant weight in the improvement or worsening of UI, evidencing once again the importance of investing in the qualification of the team focused on this care, both of elderly patients and their relatives/caregivers, also providing a safe transition to the home [2,11].

With regard to strategies for the treatment of UI performed by nurses, studies address treatments that include physical exercise, behavioral therapy and lifestyle modifications that aim to reduce the risk factors associated with the development of UI in the elderly. The stimulation of fluid intake is controversial, as there are studies that suggest that it increases urine production and losses5. On the other hand, some authors agree that it should be performed, since many elderly people restrict water intake in order to reduce urine production and consequently UI. However, its reduction makes the urine more concentrated, which may contribute to urinary tract infection (UTI) and constipation, important risk factors for UI in the elderly [12-13.]

The orientation of the elderly regarding the reduction of the intake of foods considered bladder irritants, such as caffeine, carbonated drinks, pepper, and acidic foods and beverages is another relevant factor to be considered in the management of the syndrome, because the bladder irritation caused by these foods increases the instability of the detrusor muscle (smooth muscle of the urinary bladder wall that contracts to expel urine from the bladder) and favors urge urinary incontinence14-15. Weight reduction is another strategy to reduce episodes, since its excess leads to a chronic increase in intra-abdominal pressure and, consequently, intravesical pressure, which may compromise the function of the lower urinary tract[2].

In the studies by Geissbühler and Góes, the consensus among authors that the practice of physical exercises helps in the maintenance of good mobility is also remarkable, which favors the access of the elderly to the bathroom and, thus, contributes to the reduction of involuntary urine loss[17]. Another extremely important measure is highlighted, which refers to the strengthening of the pelvic floor muscles, based on two functions of the musculature, which are, to offer support to the pelvic organs and to assist in the urethral closure mechanism. The program to strengthen this musculature includes the identification of the muscles by the elderly and strength training through contraction, with the objective of promoting a reduction in episodes of urinary loss16.

Nursing also has the greatest participation of multidisciplinary teams in the care of hospitalized geriatric patients due to several factors that may contribute to the emergence of UI. Thus, it is

considered that, from the moment in which the UI of the hospitalized elderly person is not recognized as a nursing problem, but as a normal consequence of aging, interventions that can reverse the situation are not planned, executed and evaluated. Thus, the use of diapers is established without proper prior evaluation and determined criteria, discouraging patient autonomy [1,18].

Thus, the importance of training nursing professionals in the care, planning and interventions aimed at the elderly affected by UI is evidenced, in which the management of geriatric syndrome, the promotion of continence, and nursing care in psychological and social aspects are encouraged, providing self-esteem and patient safety. Nursing should promote health in all life processes, so it is necessary to see all aspects of life that are affected in the emergence of UI, seeking to improve the QoL of these elderly.

5 FINAL CONSIDERATIONS

This study showed how the onset of urinary incontinence can affect several areas of the life of the elderly, causing physical, social and psychological suffering. Incontinence, when not approached in the correct way, can also lead to hospitalization of the patient, increasing his frailty and enabling the development of other problems, such as the impairment of skin integrity and the risk of falls.

It is also noted the importance of the nurse's role as an agent to promote quality of life in geriatric patients affected by urinary incontinence. It was also verified the various interventions that can be put into practice by the nursing team in favor of the maintenance of self-esteem, autonomy and continence, in order to reduce or delay the process of fragility of the elderly, since the presence of incontinence is associated with the syndrome of the frail elderly.

Although there is a growth of the elderly population in the current century and studies point out the great occurrence of urinary incontinence in this population, there are few studies that mention the work of nurses, despite the proven impact on the lives of the elderly and their families. Given this situation, it is necessary to develop clinical research on the treatment of urinary incontinence by nurses, aiming to provide scientific evidence to support this practice, since this is a promising area of nursing activity.

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SEVEN
publicações acadêmicas

Remote teaching in brazilian basic education: A bibliometric review

https://doi.org/10.56238/ptoketheeducati-063

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ABSTRACT
This study presents a quantitative bibliometric analysis of scientific articles published in high-impact journals, using the metrics of the Web of Science (WoS) database, on the theme of remote teaching in Brazilian basic education. The objective was to identify trends and research gaps in this area. The results indicate that, although there are several scientific publications on the subject, there is a scarcity of more robust studies that can be published in more prestigious journals, such as those included in this research. In addition, the graphs and illustrations generated by VosViewer and MS Excel, based on the data collected in the WoS database, revealed that there are few research clusters on the subject in Brazil, with little interaction between them, although they share similar theoretical foundations. Finally, research possibilities were identified based on the gaps identified through the bibliometric analysis of the articles.

Keywords: Remote teaching, Basic education, Bibliometric analysis, Bibliometrics.

1 INTRODUCTION

Although often treated as synonyms, Distance Education (EAD) and Remote Learning have different conceptions. Distance education is a consolidated and expanding teaching modality in Brazil, whose effectiveness has been proven through several scientific studies. In this modality, teachers and students may be geographically separated, but are connected through Information and Communications Technology (ICTs). In addition, distance education stands out for the active role of the student in the teaching-learning process, thanks to the active methodologies adopted.

On the other hand, Remote Teaching consists of synchronous classroom classes, following the principles of traditional teaching. In this context, the student is a spectator who absorbs the teacher's content passively, with little interaction between the two. While distance learning is a permanent teaching modality, Remote Learning is a temporary solution, adopted in crisis situations when face-to-face classes are not feasible, as occurred during the period of social isolation imposed by the COVID-19 pandemic.

During the pandemic, Remote Learning was the emergency alternative found to maintain Basic Education activities in Brazil. However, due to its hasty implementation, several barriers were faced in the school environment between the years 2020 and 2022. Therefore, understanding the functioning, implications and challenges of remote teaching in Brazilian Basic Education becomes a relevant issue.

In view of the above, this paper presents a bibliometric analysis of scientific articles published between 2013 and 2023, which address the theme of 'Remote Teaching in Brazilian Basic Education'. The goal is to analyze trends and identify research gaps in this field of study. For this, the study is structured in four sections: introduction, contextualizing and highlighting the importance of the research; theoretical framework, which discusses the limits and trends of remote teaching and the use of ICTs in face-to-face teaching; methodology, which describes the approach adopted in the research; results and discussion, which reflect on the relationships between the concepts addressed; and final considerations.

2 THEORETICAL FRAMEWORK

The period between 2020 and 2021 was marked by the occurrence of the COVID-19 pandemic, which resulted in a significant number of deaths in Brazil, estimated at more than 700,000 lives lost (BRASIL, 2023). In order to contain the increase in contamination and avoid overloading the Unified Health System, the country's health authorities have implemented social isolation measures, known as lockdown. As a result, schools were prevented from holding in-person activities. In 2020, to enable the continuity of the school year, the National Education Council (CNE), linked to the Ministry of Education (MEC), authorized the transition to Emergency Remote Teaching (ERE), recommending the return to face-to-face classes at the end of the second semester of 2021 (BRASIL, 2021).

Given this, public and private educational institutions needed to adapt their classes to the remote teaching format, facing several challenges throughout this process. According to De Oliveira Lima and Nasser (2020), some of the obstacles faced included poor access to Information and Communication Technologies (ICTs), both by students and by institutions and teachers; the lack of motivation of the students; the difficulties of adaptation of students and teachers to the new educational reality, among others. Similarly, Macedo (2020) notes that the negative impacts of remote learning on basic education were largely derived from digital inequality, especially among public school students.

On the other hand, Alves et al. (2021, p.61) argue that, although the pandemic scenario is temporary, the use of technologies by teachers and students tends to continue, promoting greater interconnection and integration with the reality that surrounds them. Therefore, understanding the limits and possibilities of this approach becomes fundamental for the future of teaching practices.

3 METHODOLOGICAL PATH

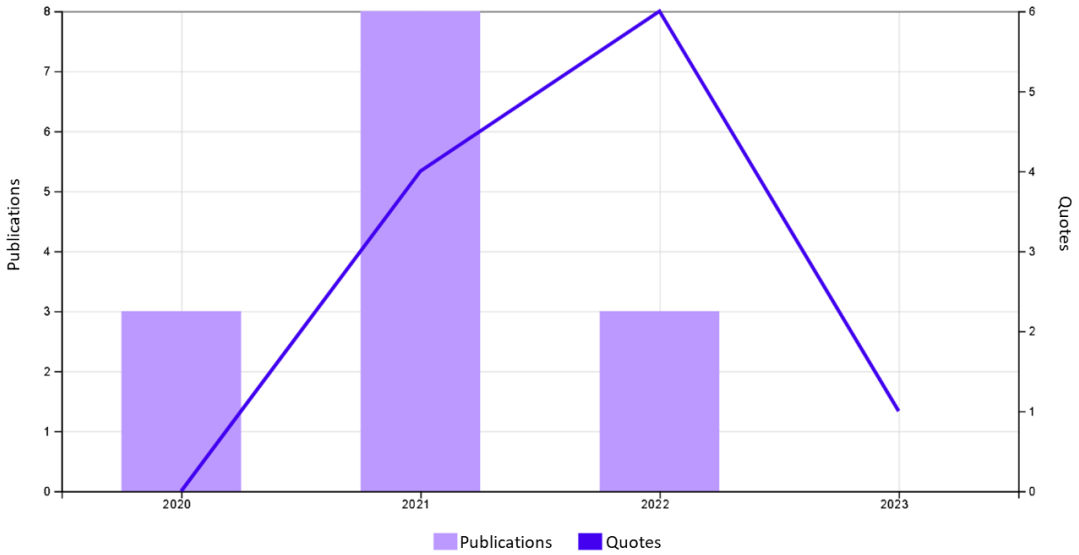
The present study adopts a methodological approach based on quantitative bibliometric analysis to evaluate the trends and perspectives of scientific productions on remote teaching in the context of Brazilian basic education. This approach follows the methodological proposal presented by Jia, Dai and Guo (2014). To perform this analysis, a search was performed in scientific articles indexed in the *Web of Science* (WoS) database, using the following search criteria: *TS = (("remote" OR "hybrid") AND ("education" OR "teaching" OR "*learning")) AND (("basic" OR "primary" OR "elementary") AND ("education" OR "school")) OR ("school*" AND ("middle" OR "high"))) AND "Bra$il*"*. The choice of this database was motivated by its high standard of selection for the inclusion of journals, as well as by being widely recognized and used by Brazilian and foreign researchers.

Then, the following filters were applied to the results obtained: type of documents - articles, review articles and early access; year of publication - from 2013 to 2023; type of access - open access; language - Portuguese. After applying these filters, a preliminary reading of the titles, abstracts and keywords of each selected article was performed in order to verify their relevance to the scope of the research in question. Finally, the results obtained from the research in the WoS database, which are listed in the annex of this work, were exported to the VosViewer *and* MS Excel applications, in which graphs and maps were generated using impact metrics.

4 RESULTS AND DISCUSSION

The mining of articles in the WoS database, using the criteria mentioned in the previous section, resulted in a total of 14 papers published in the period from 2020 to 2022, which constituted the corpus of this bibliometric study (Figure 1). It was observed that no papers published before the pandemic period were found and that the year 2021, which corresponds to the peak of the pandemic, concentrated the largest number of publications. This fact indicates that there has been a significant increase in interest in conducting research on remote teaching in the context of Brazilian basic education, driven by the implementation of Emergency Remote Teaching (ERE) due to the Covid-19 pandemic.

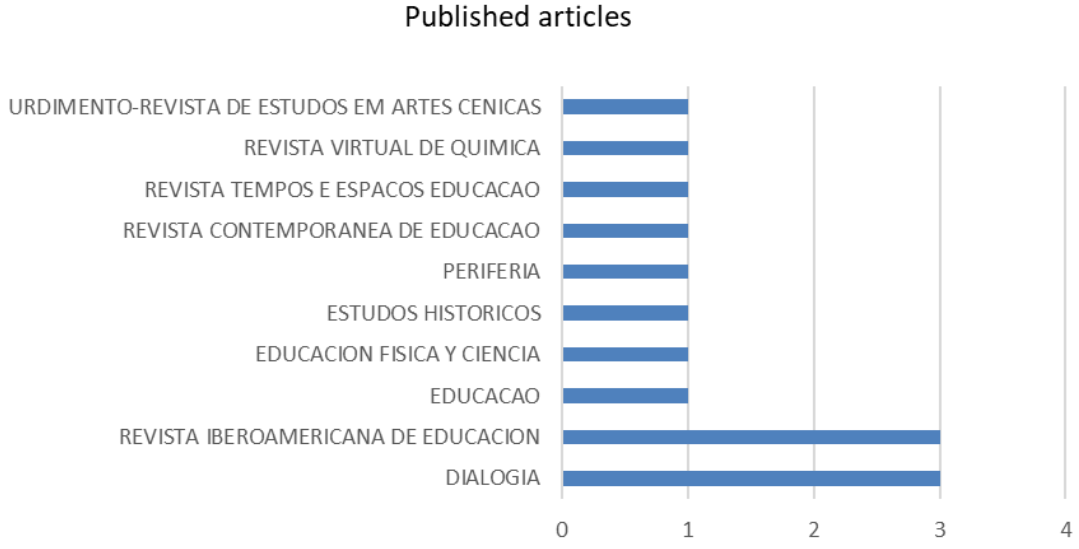
Figure 1: Chart of Publications and Citations by Year (2020 to 2023)



Source: Prepared by the author, research data in the WoS database (2023)

Regarding the distribution of articles, it was found that they were published in ten different journals, and the Dialogia Journal (e-ISSN 1983-9294) and the Iberoamerican Journal of Education *(e-ISSN 1681-5653) had the largest number of publications*, with three papers each (Figure 2). This indicator points to the interest of the journals that publish the most on the subject.

Figure 2: Graph of articles published by journal (2020 to 2023)

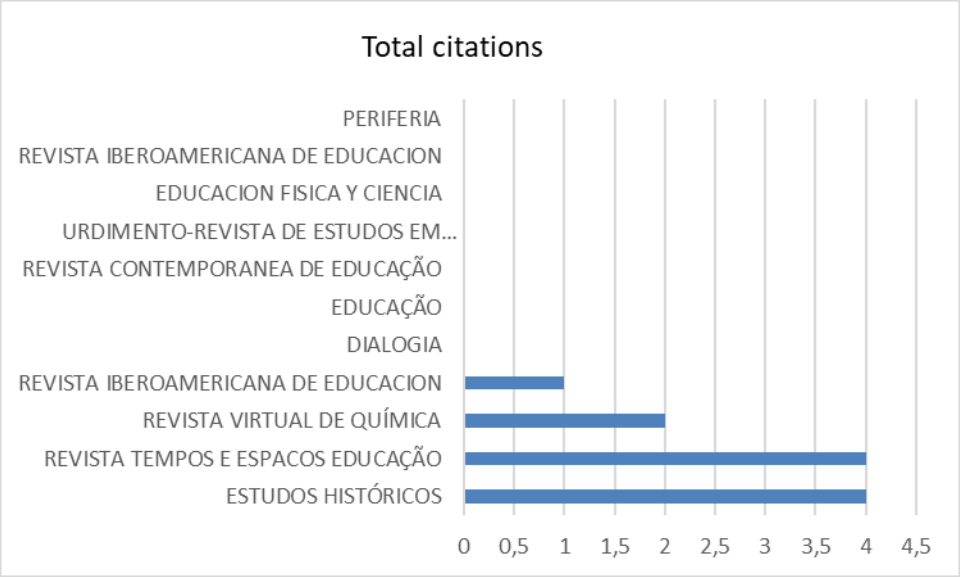


Source: Prepared by the author, research data in the WoS database (2023)

However, it is important to note that, despite having fewer publications on the subject, the articles published in the Revista Tempos e Espaços Educação (e-ISSN 2358-1425) and in the Revista Estudos Históricos (e-ISSN 2178-1494) received a higher number of citations. This fact indicates a significant recognition by the scientific community in relation to these journals, highlighting their

relevance and impact in the field of studies on remote teaching in the context of Brazilian basic education.

Figure 3: Graph of articles published by journal (2020 to 2023)



Source: Prepared by the author, research data in the WoS database (2023)

Regarding the evaluation of journals by the Coordination for the Improvement of Higher Education Personnel (CAPES), it was found that only two journals are classified in stratum B2, while the others have higher concepts and are classified in stratum A* (Table 1). This indicates that most of these journals have a high impact factor and are recognized as a reference in their respective research areas.

Table 1: CAPES Qualis Stratum of research journals (2017/2020)

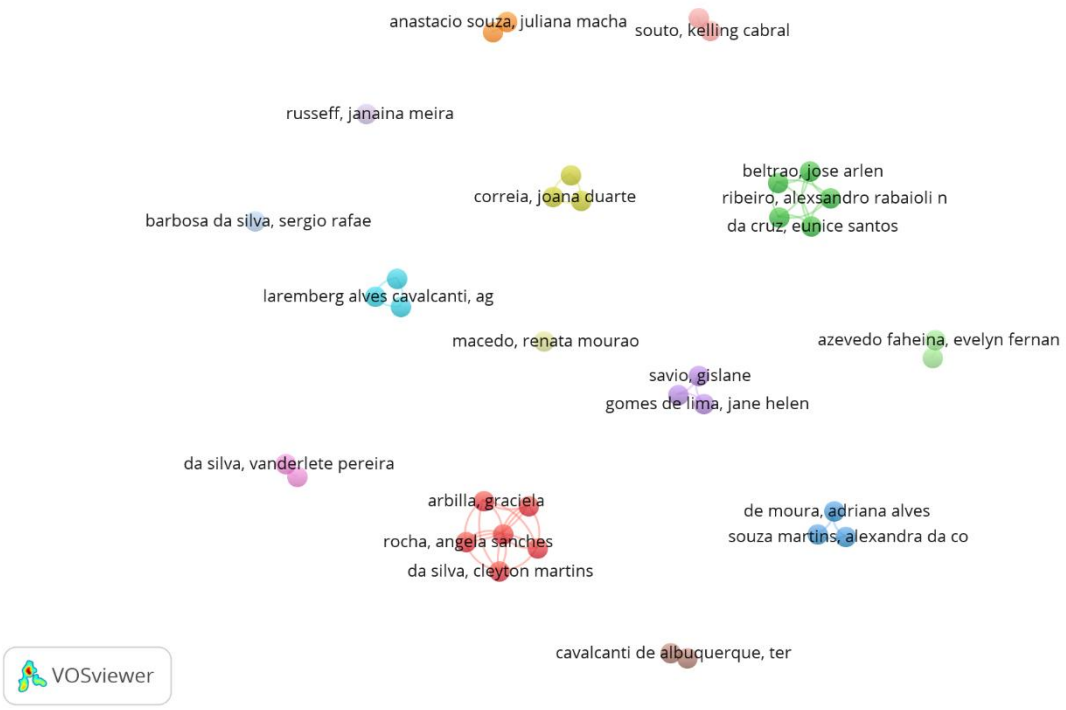
PERIODIC	**ISSN E-ISSN**	**QUALIS CAPES (2017 – 2020)**
Historical Studies	2178-1494	A1
Warp-Journal of Studies in the Performing Arts	2358-6958	A1
Ibero-American Journal of Education	1681-5653	A2
Education	1984-6444	A2
Magazine Times and Spaces Education	2358-1425	A3
Dialogue	1983-9294	A4
Outskirts	1984-9540	A4
Rev Contemp Educ	1809-5747	A4
Virtual Journal of Chemistry	1984-6835	B2
Physical Education and Science	2314-2561	B2

Source: Prepared by the author, research data in the WoS database (2023)

The co-authorship map (Figure 4) was generated considering the minimum inclusion of one article per author, revealing the existence of fourteen well-defined and sectorized research clusters. Although these clusters act independently, it is possible to identify that they share similar reference sources, as evidenced by the co-citation map. The latter was generated from references that were cited

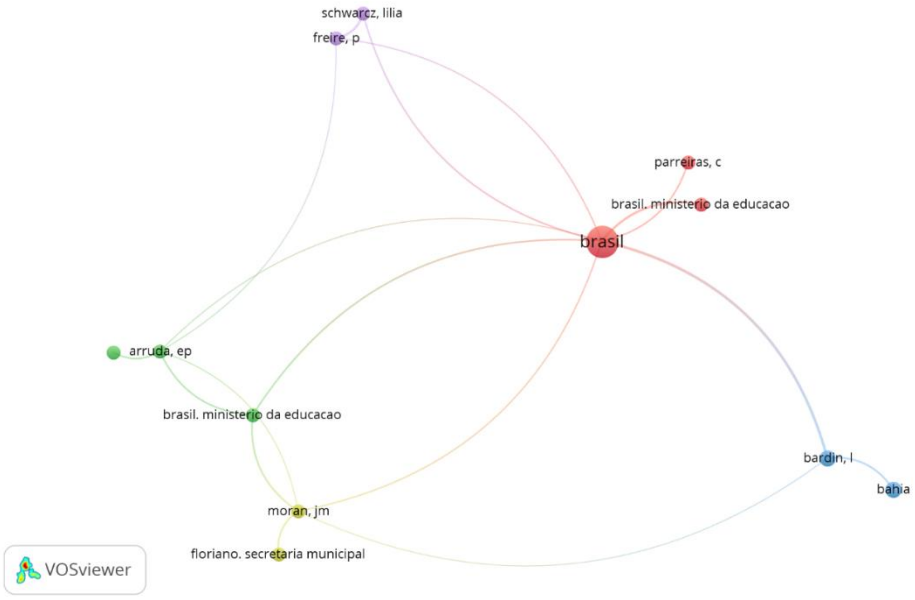
at least four times by the articles that make up the research corpus (Figure 5). These results indicate that, although the research areas are distinct, there is a substrate of knowledge shared among the different clusters.

Figure 4: Bibliographic coupling map



Source: Prepared by the author, research data in the WoS database (2023)

Figure 5: Author co-citation map



Source: Prepared by the author, research data in the WoS database (2023)

In fact, although all the articles address remote teaching in the context of Brazilian basic education, each of them adopts a different perspective. While some focus on the perception of teachers, others seek to understand the phenomenon from the perspective of students. In addition, there are articles that are dedicated to explaining or finding ways to make more effective the management decisions involved in the remote learning process. This variety of approaches contributes to a more comprehensive and in-depth understanding of the topic, considering multiple aspects and actors involved in the educational context.

5 FINAL CONSIDERATIONS

In conclusion, it is evident that there is a need to expand the amount of research on remote teaching in the context of Brazilian basic education, especially in high-impact journals, such as those indexed in the WoS database. This finding is based on the importance of the use of Information and Communication Technologies (ICTs) in the teaching-learning process, which is not limited only to periods of health crisis.

In this way, there are several contexts that can be explored and investigated more deeply. For example, it is possible to analyze regions that have had a more successful experience with Emergency Remote Teaching (ERE), identify the specific barriers faced in remote teaching in public and private institutions, examine the perception of teaching quality by students and teachers, evaluate learning in different contexts of remote and face-to-face teaching, among other research possibilities.

The expansion of this field of study will provide a more comprehensive understanding of the challenges, opportunities and best practices related to remote teaching, contributing to the improvement of educational policies and to the improvement of the quality of basic education in Brazil.

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JIA, Xiaofeng; DAI, Tao; GUO, Xinbiao. Comprehensive exploration of urban health by bibliometric analysis: 35 years and 11,299 articles. Scientometrics, v. 99, p. 881-894, 2014. Available in: https://link.springer.com/article/10.1007/s11192-013-1220-4. Accessed: 20 Apr. 2023.

MACEDO, Renata Mourão. Right or privilege? Digital inequalities, the pandemic and the challenges of a public school.Historical Studies (Rio de Janeiro), v. 34, p. 262-280, 2021. Available in: https://www.scielo.br/j/eh/a/SGqJ6b5C4m44vh8R5hPV78m/abstract/?lang=pt. Accessed: 20 Apr. 2023.

ATTACHMENT

Table 1. Corpus of bibliometric research

14 Publications	Quotes						
	2019	2020	2021	2022	2023	Average per year	Total
Total	0	0	4	6	1	3.67	11
1 **Right or privilege? Digital inequalities, the pandemic, and the challenges of a public school** Macedo, RM May-aug 2021 | HISTORICAL STUDIES 34 (73) , pp.262-280	0	0	0	3	1	1.33	4
2 **EMERGENCY REMOTE EDUCATION IN BRAZILIAN AND PORTUGUESE SECONDARY EDUCATION: TEACHERS' PERSPECTIVE** Days-Trinity, S; Belt, JD and Henriques, S 2020 | MAGAZINE TIMES AND SPACES EDUCATION 13 (32)	0	0	4	0	0	1	4
3 **Evaluation of Pedagogical Strategies used in the State of Rio de Janeiro for Teaching Chemistry, Physics and Biology in High School During the First Year of the COVID-19 Pandemic** Smith, R; de Mello, MCS; (...); Arbilla, G Nov-dec 2021 | VIRTUAL JOURNAL OF CHEMISTRY 13 (6) , pp.1404-1413	0	0	0	2	0	0.67	2
4 **Challenges and learning from remote teaching by basic education teachers** Alves, LAD; Martins, ADS and de Moura, AA May-aug 2021 | REVISTA IBEROAMERICANA DE EDUCACION 86 (1) , pp.61-78	0	0	0	1	0	0.33	1
5 **Education in Covid-19 times and the emergencial remote teaching: what do teachears of Escola Municipal Jose Ribeiro Bessa say?** Faheina, EFA and da Silva, ACV Jan-Apr 2022 | DIALOGUES (40)	0	0	0	0	0	0	0
6 **"God bless our Brazil" - Recommendations for the comeback of the return of presential classes to the**	0	0	0	0	0	0	0

children: the transition from biopolitics to necropolitics Ratusniak, C and da Silva, VP 2022 | EDUCATION 47							
7 **Remote teaching experienced by gifted students from Rio de Janeiro** Souto, KC and Delou, CMC Jan-Mar 2022 | CONTEMPORARY JOURNAL OF EDUCATION 17 (38) , pp.40-63	0	0	0	0	0	0	0
8 **What happened? An artistic-pedagogical inventory of drama teaching in Rio de Janeiro in times of pandemic** Russeff, JM Dec 2021 | WARP-JOURNAL OF STUDIES IN PERFORMING ARTS 3 (42)	0	0	0	0	0	0	0
9 **Physical Education School in the Covid-19 Pandemic: Experiences in High School Class in Northeast Brazil** Teixeira, DR; dos Santos, VBJJC; (...); Beltrão, JA Oct-dec 2021 | PHYSICAL EDUCATION AND SCIENCE 23 (4)	0	0	0	0	0	0	0
10 **We are being invaded: discussing scientific concepts related to COVID-19 pandemic through the development of memes** Costa, JS and de Albuquerque, TCC Sep-Dec 2021 | REVISTA IBEROAMERICANA DE EDUCACION 87 (1) , pp.115-134	0	0	0	0	0	0	0
11 **DEPENDENT MODERNIZATION AND THE COVID-19 PANDEMIC: reflections on face-to-face and off-site teaching** da Silva, SRB May-aug 2021 | SUBURBS 13 (2) , pp.49-69	0	0	0	0	0	0	0
12 **Actions implemented in the remote system offered by a school in the municipal education system of Brumadinho/MG to guarantee the continuity of education in response to the pandemic** Dutra, GS and Souza, JMA May-aug 2021 | REVISTA IBEROAMERICANA DE EDUCACION 86 (2) , pp.95-112	0	0	0	0	0	0	0
13 **English as a Lingua Franca (ELF) and the teaching-learning of the English language in a municipal**	0	0	0	0	0	0	0

elementary school in pandemic times: a report on English teaching-learning practices de Lima, JHG; Savio, G and Rosso, GPP Sep-Dec 2020 | DIALOGUES (36) , pp.269-282							
14 **Education in uncertain times: the implementation of remote education in the Municipal Department of Education of the city of Floriano - Piaui** Martins, A; Cavalcanti, ALLA and Golden, ACS Sep-Dec 2020 | DIALOGUE (36) , pp.73-85	0	0	0	0	0	0	0

Source: Database *Web Of Science* (2023)

The new high school as a producer of inequalities: A literature review

https://doi.org/10.56238/ptoketheeducati-064

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ABSTRACT
In 2017, Law No. 13,415 was sanctioned, which brings in its text the reform of High School, which in Brazil corresponds to the last three years of basic education and is characterized by the completion of the school cycle. The modification of the guidelines for this stage of education raised controversies and debates. Therefore, this article aims to analyze the main changes proposed by the New High School and how they are affecting students' education. The adopted methodology was a narrative literature review, and for this, 8 articles were selected as the main sample, using inclusion and exclusion criteria. Based on the results, the reform was pointed out as a possible producer of inequalities that deepen the division between students from public and private schools, increasing the disparity in access to relevant content for the education of young people through elective subjects. Thus, for an effective High School, it is necessary to create public policies that guarantee equity in education, such as the offer of extracurricular courses and investments in technology and teacher training.

Keywords: Education, School, New High School, Inequalities.

1 INTRODUCTION

Basic education in Brazil is mandatory and of fundamental importance for the formation of the individual, it is a right guaranteed by the State, which offers in a public and free way to all citizens, and aims at educational development in order to ensure common training, which is indispensable for the maintenance of citizenship and provide subsidies for further studies and / or continue with the insertion in the labor market (RIBEIRO, 2019). It is divided into three levels, namely: Early Childhood Education, Elementary School and High School.

High School corresponds to the last three years of basic education and is characterized by the completion of the school cycle, this being the moment to deepen the knowledge of the disciplines and prepare the student for the stage of his adult life, marked by his insertion in the labor market, continuation of studies in Higher Education and for human formation, in order to understand the fundamentals of society and exercise its citizenship. Thus, according to Ribeiro (2019, p. 8) "High School is a crucial level of education in the formation of Brazilian youth."

Currently, High School has become the center of debates due to a reform approved in 2017, by Law No. 13,415, but initiated through Provisional Measure No. 746, in September 2016, which brought

in its scope changes in the curricular structure and the form of teaching that was being practiced (HERNANDES, 2019). Among the main changes, we highlight the flexibilization of the curriculum, the extension of the workload, the valorization of technical and vocational training and the emphasis on training aimed at the insertion of students in the labor market.

The New High School (NEM), as it is popularly known, was approved as a response by the Federal Government to the problems encountered at this level of basic education, which cannot reflect a level of use of youth in school (BRANDÃO, 2021). For Vale (2022) the NEM aims to provide students with a series of competencies and high skills, such as critical thinking, multiple learning strategies, analysis, presentation and problem solving, as well as the valorization of the professionalizing aspect.

The reform of the national curriculum in Brazil, especially in relation to High School, is seen as an important step for the modernization of education in basic education (JEFFREYS; PAIM, 2018). Silva and Soares (2020) point out that the curriculum used in schools are partially responsible for the consequences of the success or failure of the teaching-learning process. Thus, the competencies included in the new curriculum approved by Law No. 13,415 meet the methodologies adopted in developed countries such as the United States, Japan, Canada and the entire European Union (VALE, 2022).

However, some questions are raised by society about the effectiveness of these changes, especially about educational equity, when the social origin and experiential contexts of each student are analyzed. Since, in a context of marked socioeconomic inequalities in the country, it is necessary to evaluate how these transformations can impact the provision of educational opportunities for different segments of the population.

Vale (2022) points out that for the implementation of a new competency-based model as proposed by the NEM, which generates a pedagogical change that involves the school in a collaborative and constructive teaching-learning approach, it is necessary to pay attention to the challenge that are the social, educational and regional inequalities present in Brazilian society. That is, changes in education can and should happen, but they must be geared towards social inclusion and cohesion as a whole of society in order to strengthen students' sociocognitive and psychosocial approaches.

Therefore, the questioning of whether this recent reform is capable of producing practical and effective results in the preparation of high school students, understanding the reality and demands of society or if it is just a modification of a curriculum that was developed still in the twentieth century comprehensive, embracing the intellectual, the social and the ethical, so that they are no longer harmed by inequality in public school education.

The flexibilization of the curriculum and the possibility of choice of formative itineraries by the students can result in a natural selection of the most qualified and motivated for the areas most valued by the market, leaving the most vulnerable with fewer opportunities. Thus, this article aims to analyze the New High School as a producer of inequalities, considering the following aspects: curricular flexibility, the valorization of technical and vocational training and the offer of opportunities for the most disadvantaged students, through a narrative literature review with a qualitative approach.

The relevance of this study lies in the fact that the public school, which serves the majority of students in the country, may suffer even more with the flexibilization of the curriculum, since it does not have the same offer of formative itineraries and resources as the private school. This In the sense of discussing the implications of the new curricular organization of High School is fundamental for the debate on the quality and equity of Brazilian education, as well as for the formulation of educational policies aimed at reducing social and educational inequalities.

2 METHODOLOGY

It consists of a qualitative bibliographic research, through a narrative literature review that sought to analyze the different views, theories and studies already carried out on the approval of the New High School and its role as a producer of inequalities in Brazilian education. It is worth mentioning that "the bibliographic research has as its main characteristic the fact that the field where the data collection will be made is the bibliography itself on the theme or object that is intended to be investigated" (TOZONI-REIS, 2009, p. 36). Already, the qualitative approach assists in new discoveries and evaluation of alternatives of what is already known (LÜDKE; Andrew, 1986).

Thus, for the development of this review, six stages were considered, namely: elaboration of the objective, development of the inclusion and exclusion criteria, search in the databases, categorization of the information, analysis and presentation of the results. Data collection will be carried out through the survey of relevant and reliable sources of information, such as scientific articles, books and technical reports present in the literature grouped in electronic databases, such as ScientificElectronic Library Online (SciELO), Google Scholar and journals indexed in the Sucupira platform (CAPES) that address the theme under study.

The inclusion criteria adopted were papers published in the Portuguese language, which addressed the New Brazilian High School, established by Law No. 13,415/2017, available online and free of charge, published in the last 8 years, between 2015 and 2023, excluding duplicate works that diverge from the objective, as well as abstracts published in congress proceedings and incomplete articles. The literature selection process occurred in two phases, the first consisted of reading the title and abstract and in the second phase analysis of the results and conclusion, and the works were chosen or eliminated according to the theme.

The categorization of the information followed the technique of content analysis, which allows a deeper understanding of the texts, identifying keywords, categories, concepts and recurring themes in the selected literature. Detailed readings were carried out and systematic organization of data in order to identify patterns and connections between different theoretical approaches. Thus, the information obtained was presented descriptively, allowing the exposure of knowledge on the subject and providing the reader with the evaluation of the applicability of the review.

3 RESULTS AND DISCUSSIONS

With the application of the inclusion/exclusion criteria and analyses, 8 articles were selected, thus constituting the main sample of this review. Of the eight articles, one was published in 2017, one in 2018, two in 2019, one in 2020, one in 2021, and two in 2022. Regarding the type of study, the sample consists of literature reviews, through qualitative research, in which opinion articles and reflective analysis on the text of Law No. 13,415/2017 are expressed.

Table 1 - Articles used in this review.

Article	Author	Title	Year
A1	FERREIRA, E. B.	The counter-reform of high school in the context of the new order and progress	2017
A2	FERRETTI, C. J.	The reform of secondary education and its questionable conception of the quality of education	2018
A3	ALPARONE, R. B.; MORALES, L. F.	From the reform of high school to the possibilities of popular education: Paths to a counterproposal to the New High School	2019
A4	HERNANDES, P. R.	The reform of high school and the production of inequalities in school education	2019
A5	LIMA, W. S.; SOUZA Mr. C. M.; PINHEIRO, B. B.	High School and its role today: The conception of the students of CIEP Padre Salésio Schimid de Vassouras – RJ	2020
A6	CODES, A. L. M. et al.	High school: context and reform. After all, what is it about?	2021
A7	SEGAL, R. L.	"New High School" as a persistence of educational inequalities?	2022
A8	VALE, N. P.	The new high school and its importance for the young student of the XXI century: considerations and reflections	2022

Source: OWN AUTHORSHIP, 2023.

The NEM, Law No. 13,415/2017, brought significant changes in the curricular structure of the level of education that most forms citizens for adult life. The main proposal was the flexibilization of the curriculum, with the expansion of the workload to 3,000 hours throughout High School, and the division of the disciplines into two large groups: the National Common Curricular Base (BNCC), composed of a minimum set of essential knowledge for the formation of the student, and the formative itinerary, which would allow students to choose between different areas of study, with specific content and methodologies.

Thus, for a better understanding, the discussion was divided into three topics, namely: The Brazilian High School, the Reform of High School and the Perspectives of this Reform.

3.1 THE BRAZILIAN HIGH SCHOOL

The Brazilian Federal Constitution (1988) expresses, in its article 205, that:

> education, the right of all and the duty of the State and the family, will be promoted and encouraged with the collaboration of society, aiming at the full development of the person, his preparation for the exercise of citizenship and his qualification for work (BRASIL, 1988, p. 123).

Thus, every citizen has the right to basic education, which is divided into three stages: Early Childhood Education, Elementary School and High School. These stages add up to a duration of at least twelve years of education, where students receive in the school environment the transmission of the knowledge produced by humanity throughout its history (LIMA; SOUZA; PINE, 2020).

Ferretti (2018) points out that High School, in Brazil, is the responsibility of each state of the federation, but the definition of its structure and curricular organization is carried out broadly at the national level, through the Law of Guidelines and Bases of National Education (LDBEN), the National Curriculum Guidelines (DCN) and the National Education Plans (PNE). However, "the policies referred to High School, as, moreover, government policies in general, meet and mobilize interests of a diverse nature, not necessarily congruent, around education for young people" (FERRETTI, 2018, p. 25).

It is worth mentioning that from the beginning, the LDBEN guides the organization of the Brazilian educational process, being cited for the first time in the Federal Constitution of 1934 and sanctioned in 1961 through Law No. 4,024/1961, undergoing a reform ten years later, through Law No. 5,692/1971, which was in force until 1996, replaced by Law No. 9,394/1996, which recently underwent amendment through Law No. 13,415/2017, popularly known as "High School Reform Law" or "New High School". LDBEN deals with the purpose of education, its organization, establishing which are the administrative bodies, the modalities and levels of education, as well as other aspects

that regulate and define education in Brazil (ALPARONE; MORALES, 2019; CODES et al., 2021; VALE, 2022).

High School, in Brazil, has an ambitious goal, which consists in the achievement of studies or professional competence by the largest possible number of people, where education should provide the balance of social differences, but over 200 years of independence, this stage was practically only carried out by the children of the most privileged classes, According to Codes et al (2021), needy young people, from the age of 15, need to work to help with family income, so until recently, high school was not even considered as a path to be followed by this portion of the population.

When it comes to analyzing and reflecting on the Brazilian educational system, it is perceived that there is a consensus that High School is the stage that most provokes debates, either by the problems of access and permanence, or by the quality of the education offered (FERREIRA, 2017). Another point is the low attractiveness that this phase of education exerts on students, since it coincides with the period of adolescence, between 15 and 17 years, and transition from childhood to adulthood. According to Codes et al (2021) it is the moment, commonly, marked by the emotional load arising from the responsibility of making choices that will influence their future lives.

In addition to the challenges of this phase of life, students have to deal with a teaching-learning process full of programmatic contents, which has a significant influence on their academic performance. For Codes et al (2021), High School has an excessive number of compulsory subjects, totaling twelve subjects, namely: Portuguese, History, Foreign Language, Philosophy, Mathematics, Geography, Arts, Sociology, Chemistry, Physical Education, Biology and Physics. Linked to this, traditional teaching lasting 50 minutes per class may be insufficient to arouse and maintain the interest of the student, being necessary to offer more than the current model (FERREIRA, 2017; CODES et al., 2021).

In a simplified way, the model used in the current High School carries characteristics that are due to its long history of implementation, not suffering major changes and currently, due to the saturated project, it needs a transformation, either through its structure or teaching-learning dynamics. The school it must be in tune with contemporary society, this is one of its great challenges. Due to its fragility, the model is constantly questioned, as it does not have a clear purpose, moving between being a door to university entry or professional training (FERREIRA, 2017; FILE; SOUZA; PINE, 2020).

High School for Ferreira (2017, p. 297),

> [...] it was constituted in a field of political disputes, and a reform can meet antagonistic objectives, which can both be committed to a critical and reflective formation and reinforce a lightened and/or reductionist formation. The educational policies of the twentieth century were fertile in this second perspective.

With the lack of definition of its concept and the dispute that occurs, it reflects in the conception some difficulties such as the definition of its curriculum, teacher training, quality of teaching, dropout, resources for its maintenance and expansion and levels of approval. These factors hinder the development and learning of students while attending this phase of Basic Education, reproducing the social inequality among young people (LIMA; SOUZA; PINE, 2020).

The debate on the quality of high school implies expanding its offer in order to meet the needs of students so that they remain in school in a situation of equality, understanding youth and their context in order to favor their potential. With this, it is noted that it is necessary to change in High School so that it can contribute to the formation of students in cultural, social, economic, environmental, political, philosophical and human aspects, preparing them for the performance of their role as citizens. Thus, "quality education is closely linked to the transformation of reality in the full construction of citizenship and the guarantee of human rights" (FERREIRA, 2017, p. 297).

3.2 HIGH SCHOOL REFORM

In Brazil, the reform of High School was edited through Provisional Measure No. 746/2016 and sanctioned by Law No. 13,415/2017, involving the restructuring of several points, among them the expansion of the workload, the flexibility of the curriculum, as well as the implementation of vocational education (CODES et al., 2021). But Vale (2022) points out that the "New High School" is not really new, since it was already being discussed for some time, since the early 2000s, through the Lula administrations (2003–2010), Dilma Rousseff (2011–2016), sanctioned in the Michel Temer government (2016-2018) and initiated by the Jair Bolsonaro government (2019-2022).

The reform of High School was centered on arguments about the need for flexibility in the training of students and the importance of extending their time in school, in order to bring more attractiveness to this period of basic education and with the objective of providing improved student performance, since according to the evaluation of the Ministry of Education (MEC), Brazil is far below compared to other countries (FERREIRA, 2017). The MEC also argued that the little attractiveness of high school, exists

> [...] as a result of an extensive, superficial and fragmented curriculum, which does not dialogue with the youth, with the productive sector, nor with the demands of the twenty-first century, deserving to give young people the freedom to make their own choices of which path to follow, taking into account their own interests (SEGAL, 2022, p. 2).

Given this, undoubtedly, in the literature there are information, research and data that prove the problems related to the attractiveness of high school among young people, who go through the enthusiasm in the first year to the dilemmas of the following years, pondering on the need for the school diploma for professional life, but, on the other hand, there are needs to support the family and

oneself, which causes school to take a back seat, pushing them into the labor market early (CODES et al., 2021; SEGAL, 2022).

High School, by the previous law, No. 9,394/1996, works with 12 disciplines, divided into Portuguese, Mathematics, Geography, History, Chemistry, Physics, Biology, Philosophy, Sociology, Physical Education, Arts and Foreign Language. In this modality, the student studies each discipline independently, not necessarily making a relationship between them, since they do not have a prerequisite to see the content of another discipline. Each teacher worked within their perspective and content, organizing their teaching methodology (VALE, 2022).

In addition, he had a workload of 2,400 hours, divided into 800 hours per year, during the 200 school days. However, with the New High School, the total workload was increased to a minimum of 3,000 hours, being 1,000 hours per year, and the workload will no longer be distributed equally among the areas of knowledge. The NEM adopts that 1,800 hours will be allocated in the equivalent general training and 1,200 in the formative itineraries, where the student will choose his areas of knowledge to compose his curriculum. This makes that schools have to offer full-time classes, about 7 hours a day, to achieve the required workload (CODES et al., 2021; VALE, 2022).

About the formative itineraries, Codes et al. (2021) explains that, they are the flexible part of the curriculum in which the student has the opportunity to choose the disciplines, that is, what he will take according to his preference. The five itineraries are organized through the combinations between the areas of knowledge, the structuring axes and the technical and professional training. But despite the guidelines guaranteeing the right to learning, education systems are required to offer only two formative itineraries and students will have the responsibility to choose a mandatory itinerary or opt for more than one, according to the availability of vacancies.

In this change, Portuguese and Mathematics are mandatorily included in the general training and retain their workload, in addition to maintaining in an integral way the structure of their contents, but all disciplines are divided into areas of knowledge, that is, the formative itineraries, namely: Languages and Their Technologies; Natural Sciences and Their Technologies; Mathematics and Its Technologies; Applied Humanities and Social Sciences; Technical and Professional Training. The disciplines Physical Education, Philosophy and Sociology are mandatorily included, but not during the entire High School, which may mean that they will only be a short-term module. The Foreign Language has a mandatory offer (VALE, 2022).

In this sense, from the reform, the National Common Curricular Base (BNCC) of the MS was approved on December 17, 2018, and consists of a document that directs the reformulation of High School through the delimitation of skills, competences, values and attitudes to be developed and worked on in the school curricula for each area, focused on general education and training itineraries.

In addition, the BNCC, in its text guides the alignment of other actions and policies such as teacher training, evaluation and elaboration of didactic materials (CODES et al., 2021; VALE, 2022).

The NEM is marked by its differential, which is the emphasis given to technical and professional training, having its inclusion as a formative itinerary that, according to Codes et al. (2021, p. 20) "is considered a stimulus for the young person to opt for this alternative". With this, it is allowed to the educational institution, carry out the offer of vocational courses, which will grant the student the professional qualification at the technical level during High School. Also, this itinerary legitimized the performance of professionals without a degree to teach classes as teachers with "notorious knowledge".

The professional with "notorious knowledge", receiving the endorsement to teach classes in schools, is another major change made, that is, it is allowed to people without specific graduation to teach in some courses, but it is mandatory to have proven knowledge in their area of expertise. In the other itineraries, there remains the requirement that teachers have training and licensure in their disciplines (CODES et al., 2021).

In addition, the NEM provides for changes in relation to the resources of the Basic Education Maintenance Fund (FUNDEB), allowing educational institutions to sign agreements with distance education organizations; With this, the activities carried out in the distance modality, contemplating up to 20% of the total workload, can be included both in the formative itineraries and in the basic general training. Also, to ensure the financing of technical and vocational education, it is possible to establish partnerships with employer companies, through a professional learning program (CODES et al., 2021; VALE, 2022).

It is important to highlight that the NEM, approved through Law 13.415/2017, began to be implemented in 2022 throughout Brazil in a mandatory way in public and private schools.

3.3 EDUCATIONAL INEQUALITIES

The discussion around social inequalities in the context of education is extremely important, since the educational system can contribute both to reduce and to widen the existing disparities in society. The author Miguel G. Arroyo, in his article "Educational policies and inequalities: in search of new meanings", presents deep and provocative reflections on the need to rethink and reformulate educational policies in order to effectively address inequalities.

Arroyo (2010) emphasizes the importance of a critical analysis of educational policies, going beyond traditional quantitative indicators such as access and permanence in school. It is essential to understand the inequalities present in educational practices and discourses, which often perpetuate stigmas and marginalize certain social groups. One of the central issues addressed by Arroyo is the structural inequality that permeates the educational system, whose meritocratic vision attributes to the individual the responsibility for his failure or success in school, ignoring the social, cultural and

regional conditions in which he is inserted. In the author's view, educational inequalities are a reflection of broader social inequalities and, therefore, public policies should include affirmative and redistributive actions as a way to promote equity (ARROYO, 2010).

Arroyo (2010) also highlights the importance of understanding inequalities in the scope of pedagogical practices, since the school often reproduces, even if unconsciously, exclusionary and discriminatory logics. To counter these logics, the author proposes a pedagogy that values and respects the diversity of knowledge, cultures and trajectories of students, overcoming the tendency of homogenization that neglects individual singularities and potentialities.

Another significant point is the relationship between educational inequalities and evaluation policies. The meritocratic logical critique of graded exams, which tends to favor certain groups and strengthen stereotypes. The author defends the valorization of different forms of evaluation, taking into account the diversity of talents and abilities of the students, as well as the sociocultural contexts in which they are inserted (ARROYO, 2010). In addition, Arroyo emphasizes the importance of dialogue between various social actors in the formulation and implementation of educational policies. It highlights the need to listen to and involve communities, teachers, students and their families in discussions about education in order to build more democratic and inclusive policies.

One of the forms of manifestation of educational inequality lies in the unequal access to opportunities. This disparity can be observed from the earliest years of life, with children from more privileged families having access to quality preschool education, while poorer families face lack of access to daycare and preschools. In addition, access to quality education varies significantly between public and private schools, where financial resources and infrastructure can directly influence the quality of education offered.

Educational inequalities are also evident in regional disparities. In rural and peripheral areas, it is common to find schools with poor infrastructure, lack of didactic materials for teachers and also less qualified teachers. These conditions hinder access to quality education and limit students' learning opportunities in these regions

These inequalities have consequences for individuals and for society as a whole. Students who face barriers in accessing education and who receive low-quality education are less likely to reach their full academic and professional potential. This perpetuates cycles of poverty and social exclusion, limiting their future prospects and restricting their opportunities for growth. In addition, society as a whole also suffers from educational inequalities, as the lack of equal access to education limits collective development and the capacity for innovation.

Overcoming educational inequalities is a complex challenge, but there are approaches and proposals that can be adopted. It is essential to invest in public policies that prioritize equity in education, directing financial and infrastructural resources to the most disadvantaged regions and

schools. In addition, it is necessary to encourage and train teachers, offering them adequate training and encouraging their permanence in less privileged schools. Inclusion programs such as scholarships and access to educational resources can also help reduce disparities.

Educational inequalities represent a significant obstacle to building a more just and egalitarian society. To meet this challenge, a collective commitment is needed, involving government, educational institutions, families and communities. Only through strategic investments, inclusive policies and a joint effort will it be possible to promote an educational system that guarantees equal opportunities for all, regardless of their socioeconomic background, gender, race or geographical location.

3.4 PERSPECTIVES OF THE REFORM OF HIGH SCHOOL

When analyzing the applicability of Law No. 13,415/2017, which comprises the current reform of High School, there are major contradictions that focus on the flexibility of the curriculum, which leaves it reductionist, and whether the NEM is the appropriate way to contemplate the interests of young people, in order to improve their pre-existing talents and tastes (FERRETI, 2018). From the beginning, with the implementation of the provisional measure, the changes inserted in High School were the focus of much criticism and, therefore, reflections on the NEM are necessary, in view of the direct and indirect impacts that the practices of this law will reflect on education and the future of the country.

The approval of the NEM was supported by two main justifications. The first consists of the low quality of high school offered until then, and the second was the need for a more attractive curriculum to students, due to the high rate of allowance and failure of them. But Ferretti (2018) recalls that the low quality of education is not limited only to High School, as it is a problem that covers from the first school years, resulting in cumulative gaps and culminate during the last three years of basic education, extending to Higher Education courses.

Still for the author, the high rates of failure and abandonment are not exclusively the responsibility of the organization of the school curriculum, as justified by Law No. 13,415/2017, but occurs due to several factors that are from the inadequate infrastructure of schools, the need to work early among low-income students, teenage pregnancy and family violence. Thus, such reasons, also, should be considered during the elaboration of measures that effectively attack the school dropout observed and guided by the reform (FERRETTI, 2018).

It is inappropriate to attribute failure and abandonment exclusively to the curricular organization, without considering the cultural and social aspects involved. For Martin (2021), it is also necessary to take into account the career of the teacher, which are determinant for the result in such actions, in addition to having a negative influence on failure and dropout rates, since this category has insufficient salaries, causing them to seek other forms of hiring, increasing their workload in order to

overload their function and compromise the quality of teaching. In this sense, it is the teachers who are responsible for identifying the individual needs of each student, offering support and welcoming, making him able to reflect on good levels of encouragement and remain in school.

In the NEM, the exclusion of content present in the general formation raises problematic questions. By leaving these essential contents aside, it completely harms human formation, since the Human Sciences are providers of knowledge for critical analysis and reading of reality. On this issue, Ribeiro (2019, p. 26) points out that

> The removal of these contents is not by chance, nor is the obligation to teach Mathematics and Portuguese: these are the knowledge charged in large-scale evaluations that will compose the main Brazilian educational indexes, so important in the argument of the business reformers of education and in the monitoring carried out by multilateral organizations.

And these are also the main knowledge required by the demand for skilled labor. With regard to the increase in the workload, two concerns arise: the first consists of the structures of the schools, related to the financing for the implementation of this policy, since the increase in school activities will generate demands for food, hygiene and rest that must be offered to students. The second is the increase in the workload, a limiting factor of students who work during the day, or part shift, the NEM can generate the exclusion of this portion in the teaching stage (RIBEIRO, 2019; MARTIN, 2021).

By making teaching more flexible, through the formative itineraries, the NEM institutionalizes the differentiated and unequal access to knowledge. For Hernandes (2019, p. 5), public schools "[...] they will have to be content with what the State, in times of fiscal adjustment, can, wants or intends to offer them, except Portuguese, Mathematics and English", impoverishing the curriculum of schools, especially in relation to the areas of Philosophy, Arts and Science, as well as the other disciplines that will have their workload reduced to incipient doses.

In addition, it is evident that not all students have the same conditions to choose the subjects they wish to take. In many cases, public school students, especially those living in regions further away from urban centers, have limited access to information and guidance on the different areas of knowledge and opportunities offered by the labor market. In addition, many students face difficulties in reconciling school demands with extracurricular activities and family responsibilities (ARROYO, 2010).

In this way, curricular flexibility may end up benefiting only the most privileged students, who have greater resources and information to make more conscious and strategic choices. On the other hand, the most disadvantaged students are stagnant, without access to the information and guidance needed to make more assertive decisions about their education. In addition, passing the responsibility of curricular training to the student, makes him not live his adolescence fully, where he has the greatest

contact with different areas of knowledge and is forced to opt for a specialization early (ARROYO, 2010; RIBEIRO, 2019).

The valuation directed to technical and professional education, on the one hand, dialogues with the reality of offering an itinerary that directs students to the labor market, where the school turns to suppress the labor demands of capitalism, but Hernandes (2019) describes that the objective of promoting rapid training of students in occupational activities was added in the NEM to enter qualified and cheap labor "without requiring financial resources and, still, to meet the interests of entrepreneurs, the law proposes solutions that prove that it really meets the logic of capital and not the interests of high school students" (HERNANDES, 2019, p. 8).

With this, the school leaves the locus of formation of the student to enter the productive sector, the systematized knowledge will be abandoned to teach the practical experiences of the work environment. This aspect can cause inequality among high school students, especially if this training is offered in an unequal and segmented way.

In many cases, schools that offer technical training may end up receiving fewer resources and investments than schools that offer a traditional academic background. This can create a divide among students, where some have access to quality technical training, while others are deprived of this opportunity.

In this path of producing inequalities, Law 13,415, in the provision of school content, stipulates that compliance with the curriculum in the poorest education systems can be accomplished with the use of distance learning. In this context, the practice of teaching-learning, in this model, becomes difficult, because the possibilities of activities that are commonly used in the classroom are reduced. This proposal, disguised as flexibility, preaches the ideology of students learning autonomously, valuing learning through research, but in fact frees the student from integrating part of the basic curriculum of high school as formal education, that is, directly with teachers at school (HERNANDES, 2019).

Thus, it is noted that the reform of High School is considered an agent producing inequalities in school education, mainly because it is based on a meritocratic and selective conception. For Hernandes (2019), the reform prioritizes technical and professional training, to the detriment of general and humanistic training, which can strengthen social and economic inequality in the country. In addition, curricular flexibility, one of the main proposals of the reform, can favor only students with more resources, who are better able to choose the subjects they wish to take.

4 FINAL CONSIDERATIONS

The present work, in its development, addressed the reform of High School, presenting the main changes arising with the approval of Law No. 13,415/2017, as well as its main aspects and

divergences. Through qualitative bibliographic research with a narrative approach to literature, the initial objectives described in the project were partially met.

High School is one of the fundamental stages of basic education in Brazil and has undergone changes in recent years. With the NEM, a series of changes were established in the curricular structure and in the form of teaching. However, the scope demonstrated in the project, aligned with different ideological matrices, as well as the absence of more consistent financial mechanisms, make the applicability of the New High School unfeasible. Mistakes made They are a reflection of the absence of a more organic conduction, focused on a societal project that would found a political and cultural construction of the students.

It is evident in the current law the importance of ensuring that the technical training presented is updated and relevant to the needs of the labor market. Otherwise, students may end up receiving outdated training and struggle to get a job after completing high school. Another point to be considered is the need to ensure that students who opt for technical training are not stigmatized or seen as "inferior" in relation to students who opt for traditional academic training. It is necessary to respect all forms of knowledge and ensure that all students have the same opportunities to succeed in their careers.

The idea that education should be focused exclusively on the labor market is worrisome. While it is important for students to develop practical skills that can be applied in their future careers, it is equally essential that they learn to think critically and to have a sense of citizenship. The approach of competencies and skills can lead to a superficiality in learning. Instead of focusing on fundamental concepts and theories, students are taught to handle practical situations quickly and efficiently. While this can be helpful in some situations, it can lead to a lack of depth and understanding.

The flexibilization of the curriculum and the possibility of choice of formative itineraries by students can result in a natural selection of the most qualified and motivated students for the areas most valued by the market, leaving the most vulnerable students with fewer opportunities. In addition, it can intensify school segregation, resulting in schools with more homogeneous and less inclusive profiles. Students who already have socioeconomic advantages may have more opportunities to develop these skills than students from less privileged backgrounds. This can perpetuate inequalities that already exist in society.

Given this, it is important to investigate the relationship between the reform of high school and educational equity to develop educational policies that guarantee all students access to quality training and reduce educational inequalities in Brazil. Education should not be seen as a means to an end, but as an end in itself.

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Historical record about the state schools of professional education in Ceará

https://doi.org/10.56238/ptoketheeducati-065

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ABSTRACT
The professional education network in the State of Ceará was implemented in 2008 through the Department of Education with the project of implementation of the State Schools of Professional Education, through State Law No. 14,273 of 2008. This article seeks to describe the organizational and functioning characteristics of these institutions in the State of Ceará. It is a work that is part of the Dissertation of the Master's Program in Professional and Technological Education in National Network – ProfEPT, in progress at the Federal Institute of Science and Technology of the Sertão Pernambucano – IFSertãoPE. The data presented here were collected through bibliographical and documentary research, showing a little of the history, legislation, dynamics of operation and objectives of these educational institutions, which seek to carry out a work aimed at the integral formation of students with a view to developing a meaningful learning, capable of valuing culture and work, as well as a global understanding of production processes and scientific and technological knowledge. They are institutions that work in full shift with articulation between the disciplines of the technical base – professional axis and common base – disciplines of basic education. They use a management philosophy anchored in the Socio-Educational Business Technology - TESE, which served as the basis for the definition of the basic principles of the work, whose premises have as representative landmarks the connection between objectives, priorities and results expected by all members of the educational institution and the community.

Keywords: Professional Education, Integrated Curriculum, Ceará.

1 INTRODUCTION

The professional education network in the State of Ceará was implemented in 2008 through the Department of Education with the implementation project of the State Schools of Professional Education, through State Law No. 14,273 of 2008 and began with four technical courses: Informatics, Nursing, Tourism Guide and Work Safety, which inaugurated the union between High School and Technical Training for the world of work in the state schools of Ceará. For the choice of these courses, the socioeconomic profile of the municipalities and the development project of the state government were used as a parameter.

The proposal of the professional education network was to seek to expand the opportunities for professional qualification associated with formal basic education, having among its objectives to generate autonomous, responsible human beings imbued with a personal and professional

entrepreneurship beyond the world of work, involving a sustainable development of their community (CEARÁ, 2021), unlike when professional education emerged in Brazil, since it was understood as a training of labor, being very associated with the assistentialist and charitable character and directed to the unfortunate citizens of our country, associated with low-income individuals (GARCIA ET AL., 2018).

In Ceará, its central strategy was to integrate high school with technical professional training, with the provision of full-time education to young people from Ceará. It is a model of professional and technological education that was conceived as an opportunity to provide young people with effective access to meaningful learning, capable of valuing culture and work, as well as a global understanding of production processes and scientific and technological knowledge, in order to ensure the acquisition of skills and competencies essential for their personal and professional development (CEARÁ, 2021).

The students who migrated to these schools were enrolled in the schools of basic education and did so because they expressed interest and went through an internal selection, in which the student's academic record was the determining indicator of the approval to effect enrollment in the schools of integrated full-time professional education (XEREZ; COAST; SAINTS, 2017).

This work is part of the Dissertation of the Master's Program in Professional and Technological Education in National Network – ProfEPT, in progress at the Federal Institute of Science and Technology of the Sertão Pernambucano – IFSertãoPE and was developed from bibliographical and documentary research, with the objective of describing the organizational and functioning characteristics of the State Schools of Professional Education in the State of Ceará, showing a little of the history, legislation, dynamics of operation and objectives of these educational institutions.

2 METHODOLOGY

The data presented in this work were collected through bibliographical and documentary research, which were developed based on material already elaborated, consisting mainly of books, scientific articles and archival documents (GIL, 2008).

3 LITERATURE REVIEW

The Integrated High School in the State of Ceará is supported by Decree 5.154/2004 and is inspired by the essence of polytechnic education by announcing a theoretical-practical basis capable of incorporating professional and intellectual training to the various aspects of life, science, culture, technology, work and social practices. With this, it brings the promise of full formation, capable of forming beings of praxis, historically situated, aware of their social role and able to seek their own emancipation. On the other hand, it is observed that this education system has prepared, on a very unequal scale, more subjects to perform simple tasks and subservient to the productive forces than men

and women capable of integrating with social forces, assimilating the impacts of their actions within them (RIBEIRO et al (2020).

The technical professional education of medium level, in turn, is regulated by Resolution No. 413/2006 of the Council of Education of Ceará – CEC, as a modality that, integrated to the different forms of education, aims to provide qualification, qualification and specialization of young people and adults, based on general and specific competencies and skills for the exercise of productive activities, social and artistic-cultural (CEARÁ, 2021).

This resolution also lists the guiding principles of mid-level technical professional education, in addition to those already established in article 3 of Law No. 9,394/1996:

> I - Articulation with high school in an integrated, concomitant or subsequent way;
> II - Respect for aesthetic, political and ethical values;
> III - Development of skills for laborability;
> IV - Flexibility, interdisciplinarity and contextualization;
> V - Specificity of professional profiles;
> VI - Permanent updating of courses and curricula;
> VII - Autonomy of the school in the elaboration of its pedagogical project (CEARÁ, 2006, Art. 2º).

It is an education that seeks to expand the opportunities for professional qualification associated with formal basic education, having among its objectives to generate autonomous, responsible human beings and imbued with a personal and professional entrepreneurship beyond the world of work, involving a sustainable development of their community (CEARÁ, 2021).

All this is in accordance with Resolution No. 06/2012, which brings the national curricular guidelines for technical professional education of medium level and which defines, in its article 5, the purpose of technical courses of medium level: "to provide the student with knowledge, knowledge and professional skills necessary for the professional exercise and citizenship, based on the scientific-technological foundations, socio-historical and cultural" (BRASIL, 2012, p. 2).

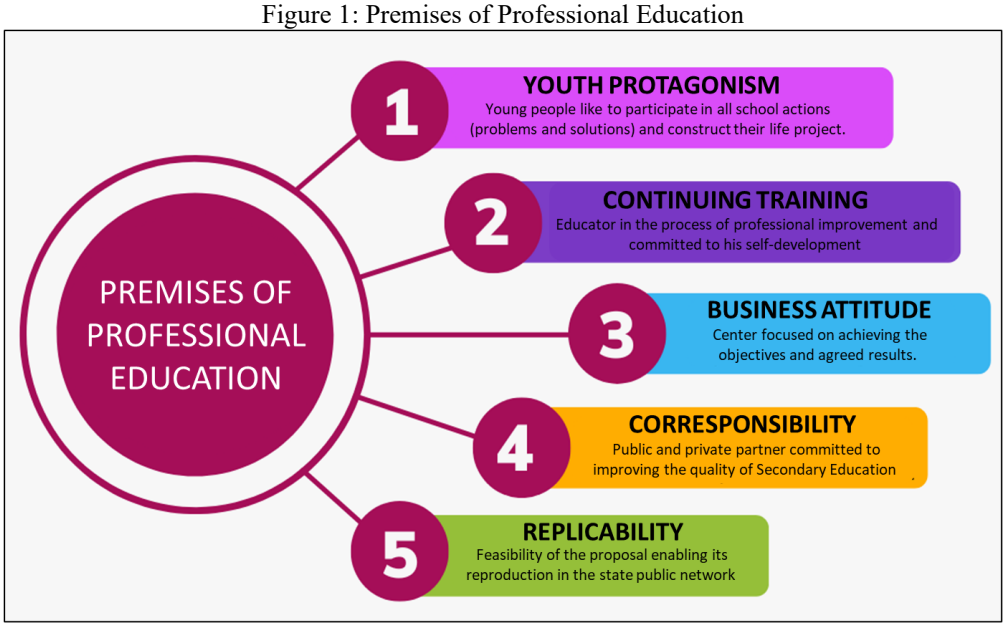
In this way, professional education in technical courses needs to provide the opportunity to develop the necessary skills beyond a job opportunity, providing tools for reflection and action in order to create survival adaptations in a world that is constantly changing. Thus, as the development of strategies throughout professional education, making students can evolve in analytical thinking, critical, reconsidering attitudes and values (DEPRESBITERIS, 2016).

In this perspective, a great reference for the implementation of the State Schools of Professional Education in the State of Ceará was the experience of the Development Program of the Experimental Teaching Centers - PROCENTRO of Pernambuco, which used a management philosophy called TESE - Socio-Educational Business Technology and served as a basis for the definition of the basic principles of work in the state schools of professional education (CEARÁ, 2021).

This technology has as representative milestones the basic principles, which should connect to the objectives, priorities and results expected in the action plan of these schools, in addition to guiding the elaboration of the Action Programs of all the members of the educational institution: managers and educators (ICE, 2008).

The premises selected as starting points were: Youth Protagonism, Continuing Education, Business Attitude, Co-responsibility and Replicability, which are conceptualized in Figure 1 and should be used in line with management tools, especially the Pedagogy of Presence and Education through Work, but may vary according to the local reality, level of understanding and lived experiences:

Figure 1: Premises of Professional Education



Source: Adapted from ICE (2008, p. 21).

Thus, all state schools of professional education in Ceará use these premises to guide their work by adapting them to their reality, so as not to be concerned only with the amount of hours of students in school, but also with the quality of this time in school: "[...] The various experiences of integral education have in common both a quantitative dimension (more time in school and in the surroundings) and a qualitative dimension (the integral formation of the human being). These two dimensions are inseparable" (GADOTTI, 2009, p. 32).

They also use the so-called PDCA cycle to elaborate their Action Plan, which according to the fundamentals of Business Technology, is a strategic plan whose foundation is based on a humanistic management philosophy. Thus, the PDCA (Plan/Do/Check/Act) is one of the management methods that aim to control and obtain effective and reliable results in the activities of an organization, highlighting four important stages:

> Plan – establish mission, vision, objectives, strategies that allow you to achieve the goals or results proposed.
> Do (Execute) – put into practice, execute what was planned, educate in service.
> Check (Verify, Evaluate) – monitor and evaluate processes and results, confronting them with the planned, adjusting or consolidating the information, generating reports.
> Act – act in accordance with the assessed and the reports, develop new action plans, in order to improve quality, efficiency and effectiveness, improving execution and correcting any failures. In short, act corrective (ICE, 2008, p. 11).

Therefore, at the time of planning, the mission, strategies, objectives and expected results are defined; In the execution, what was defined in the initial planning stage is put into practice; in the evaluation, it is verified and evaluated whether the selected strategies are leading to the planned objectives, adjusting them when necessary; and in the action the adjustment is made and new action plans are elaborated, in order to improve the quality of education and collaborate for the effectiveness and efficiency of the intended action.

However, in all these stages it is necessary the effective articipation of all those involved to obtain the expected results, because as proposed by the Basic Document of Technical Professional Education of High School Integrated to High School for integrated training to be an experience of participatory democracy and permanent recreation, it needs to be a collective action, since the integration movement is fundamentally interdisciplinary.

Thus, the ideas underway in schools can encompass projects that articulate art and science; scientific initiation projects; curricular components designed to understand the socio-political foundations of the professional area, among others.

Therefore, the student must have horizons capable of capturing the world beyond the school routines, the limits established and agreed by the school discipline, so that he can appropriate the theory and practice that make work a creative activity, fundamental to the human being (BRAZIL, 2007). For this, the curricula of the Professional Education courses have as a parameter the National Curricular Guidelines for Technical Professional Education of Middle Level (CEARÁ, 2021), with a curricular matrix that contemplates the learning areas described in Table 1:

Table 1: Learning Areas in the Curriculum Matrix

General Training	Disciplines of the Common National Base
Vocational training	Disciplines Related to Technical Courses
Diversified Part	Curriculum Focused on Citizen and Professional Training

Source: Adapted from CEARÁ (2020).

Thus, the curriculum of the EEEPs seeks to meet what is common and what is diverse, but also the specificities of each course, according to the choice of the students, contextualized in the local, social, school realities.

4 FINAL CONSIDERATIONS

Each vocational education school implemented by the government of the State of Ceará presents a reality of infrastructure, courses, faculty, student and functioning, but when it comes to the realization of the activities, all follow the guidelines issued by the Secretary of Education of the State of Ceará, based on the National Legislation.

The program began in 2008 with 25 schools and currently there are 118 EEEPs throughout the state, serving approximately 50,000 young people in its 53 courses offered in 94 municipalities. According to the Secretary of Education of Ceará, 61% of the students graduating from the EEEPs are inserted in the world of work or in some university (SAMPAIO, 2018).

There is no doubt that the professional schools are configured as a landmark for Ceará and a reference in national education, designing the possibility of a fairer future and with more opportunities for young people from Ceará.

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SEVEN
publicações acadêmicas

The practice of sports activities of the students of the physical education course at the Federal University of Ceará during basic education

https://doi.org/10.56238/ptoketheeducati-066

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ABSTRACT
This work discusses the practice of sports by students of the Physical Education course at the Federal University of Ceará (UFC), while they were attending basic education. For that, it is necessary to carry out a bibliographic survey capable of demonstrating the importance of sports activities in the formation of individuals in general, and, when we talk about future physical education teachers, this statement becomes more relevant, since school sports may be one of the most important tools within the body of knowledge that the future Physical Education teacher should have in his/her career; and a past practice of sports would be an important and even motivational factor in graduation. Faced with this problem, a text will be built based on qualitative and quantitative analyses, based on specialized bibliography in School Physical Education. The research will aim to collect data to understand the levels of sports practice by students of the physical education course at the Federal University of Ceará, as well as to analyze their sports preferences.

Keywords: School physical education, Sports practice in schools, Training.

1 INTRODUCTION

Currently, school physical education is inserted in basic education environments as a mandatory component. Such obligation demands a lot of attention from those who are inserted in the teaching-learning process, since the participation of students in classes may bring benefits or losses soon. According to Santos et al (2019) the schools, mostly have in their curricula, from one to three PE classes per week, lasting from 40 to 50 minutes. However, the number of classes may vary according to the educational institutions. From its insertion in Brazilian teaching centers, Physical Education was assigned the role of ensuring the improvement of students' health (MANTOVANI, MALDONADO E FREIRE, 2021). Thus, it is possible to affirm that school PE plays a fundamental role about the vital conditions for maintaining student health. However, in recent times, a portion of the students has shown some disinterest in the practical content taught in the classes, especially those related to the

performance of sports activities. Part of this is due to the methods adopted by some teachers, who in general prioritize a segregationist and individualized sports practice within the teaching context, as well as the existing structures in the national public-school scenario. A portion of the efforts to change the meaning of EFE were and continue to be built by the Curricular Guidelines of the area, from 1987, as well as by the dynamics of initial teacher education (FURTADO AND BORGES, 2020).

From this, it is possible that the relationship between sports practice in the context of basic education and the insertion in the undergraduate course in physical education have a close connection. To date, some studies indicate possible levels of physical activity practice by PE students. According to Da Silva et al (2021), research indicates a large predominance of physical activity among undergraduate students in physical education. Thus, this quantity may not be associated with sports practice, being limited to other scenarios of performance, maintenance and improvement of physical fitness levels, and especially the verification that this practice has also happened in the school scenario.

Physical activities, exercises and sports are factors that make adolescents like physical education (SANTOS et al, 2019). Thus, it is possible to say that the contact with sports practice in basic education may, or may not, influence the permanence of a student in the physical education course. The opportunities that condition boys to participate in school physical education are sports and physical exercise, while girls are physical fitness and health (SANTOS et al, 2019).

Thus, the need for an evaluation by a university community to analyze the conditions that established the relations with the sports environment in the lives of students who are part of the physical education course is highlighted.

2 METHODOLOGY

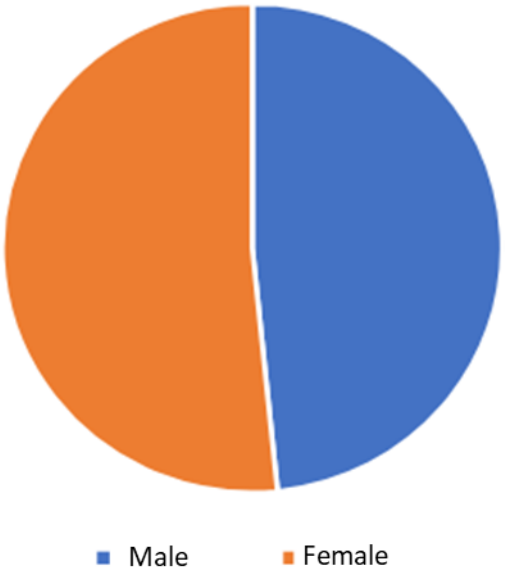
The present study used the GOOGLE FORMS tool to apply a semi-structured questionnaire of qualitative and quantitative character. In all, ten questions were established, divided as follows: eight closed questions (multiple choice) and two open questions (subjective). The questions sought to understand which student modality the participants were inserted (bachelor's or licentiate), in addition to understanding the shift of each of them (day or night). In addition, the questions focused on the previous life of those investigated, addressing themes related to the institutions in which they studied during basic education. In addition, some questions focused on the sports practices experienced during two stages of basic education (elementary and high school). The participants agreed to answer the questionnaire by presenting all the ethical commitments established by the researchers, preserving the identity and individual character of each participant.

The target audience of the present study is centered exclusively on students of the physical education course of the Federal University of Ceará, allocated within the Institute of Physical Education and Sports. During the application of the questionnaire, students of both sexes had access

to and answered the questions. The survey reached students from a variety of semesters, from freshmen to seniors. The data for the conception of the graphs were obtained through the answers present in the questionnaire, being later used the Excel program, from Microsoft, in the construction of these. It should be noted that the period available for completing the questionnaire extended from May 29, 2023 to June 10, 2023, that is, 12 days in total. A total of 31 students answered the questionnaire for data collection.

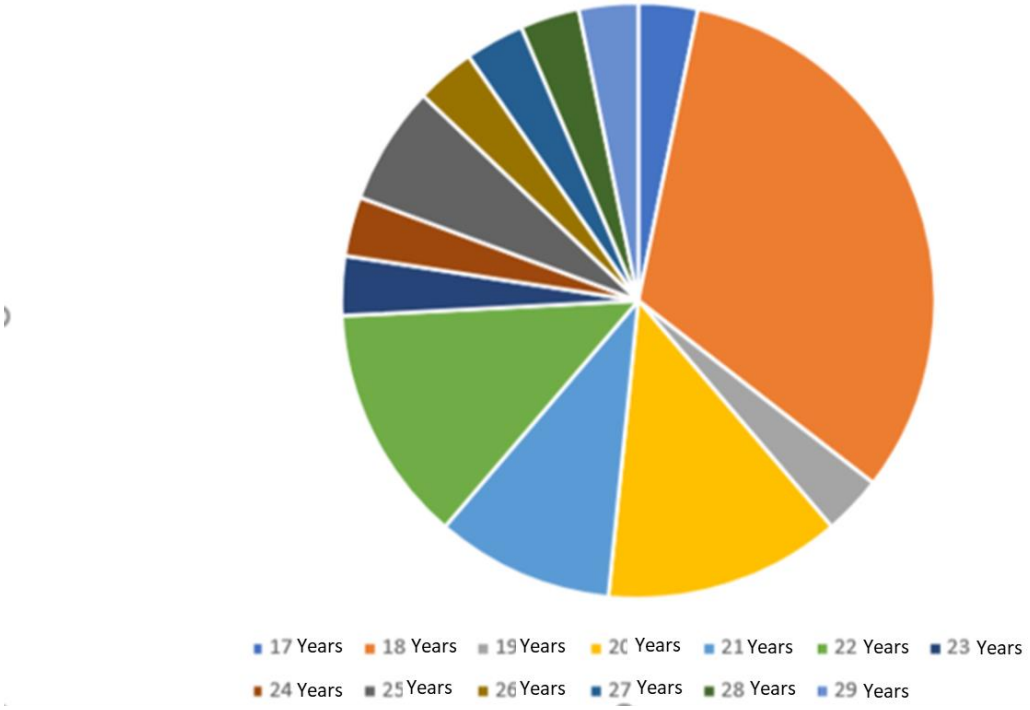
3 FINDINGS

3.1 THE FIRST QUESTION SOUGHT TO COLLECT THE GENDER OF THE PARTICIPATING INDIVIDUALS. BEING STRUCTURED AS FOLLOWS: 'WHAT IS YOUR SEX?'



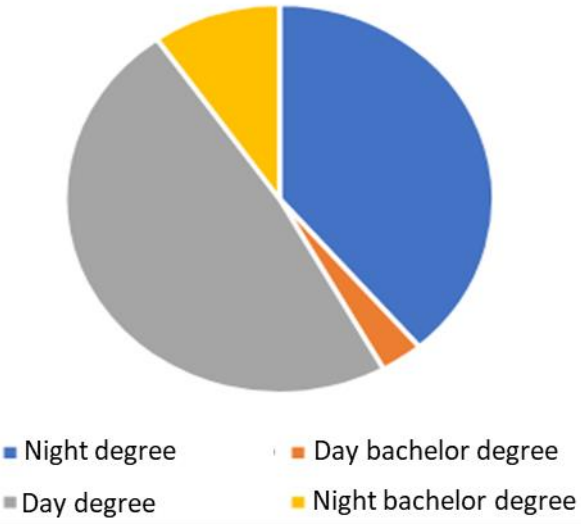
It was possible to observe a predominance of the female public, which represented 51.6% (16) of the total of respondents, while the male audience was slightly smaller, standing with 48.4% (15) of the respondent.

3.2 THE SECOND QUESTION SOUGHT TO ANALYZE THE AGE PROFILE OF THE PARTICIPANTS. BEING STRUCTURED AS FOLLOWS: 'HOW OLD ARE YOU?'



An age variation was observed, with the younger age being 17 years and the older age being 29 years. The age variation identified in the question may be related to the fact that the questionnaire reached students from the most diverse periods within the course, from freshmen to graduates.

3.3 THE THIRD QUESTION FOCUSED ON UNDERSTANDING IN WHICH MODALITY THE STUDENTS ARE INSERTED. BEING STRUCTURED AS FOLLOWS: 'WHAT COURSE ARE YOU ENROLLED IN?'

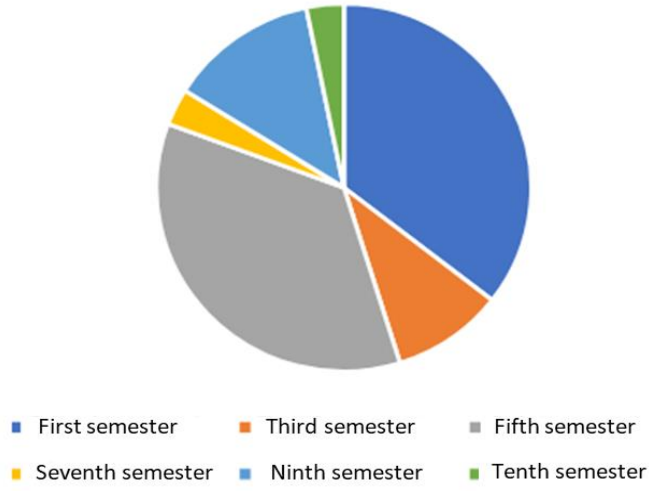


It was observed that 48.4% of the students investigated attended the daytime degree, and that 38.7% were inserted in the night licensure. However, the evening baccalaureate course represented only 9.7% of the participants, and the day baccalaureate held 3.2% of the public. According to Ghilardi (1998) it is emphasized that, both in the licentiate or Bachelor's degree, knowledge should be superior to simple bodily practice. Thus, the two modalities as a branch of science, present their due values in the production of knowledge with regard to bodily activities. Regarding the shifts, it is noteworthy that 48.4% of the students perform their academic activities at night, while 51.6% develop them in the day shift. Thus, it is noteworthy that there is a prevalence of students attending physical education in the morning and afternoon. According to Da Rocha, Dos Santos Coelho and Toledo (2019)

> The higher education courses in physical education are represented in the same areas in both courses, the only difference being the inclusion of training disciplines in the degree and complementary disciplines in the Bachelor's degree, which function as electives of the degree.

Therefore, it is valid to say that the breadth of research for both modalities is extremely necessary, since there is no significant differentiation in the curricular matrices.

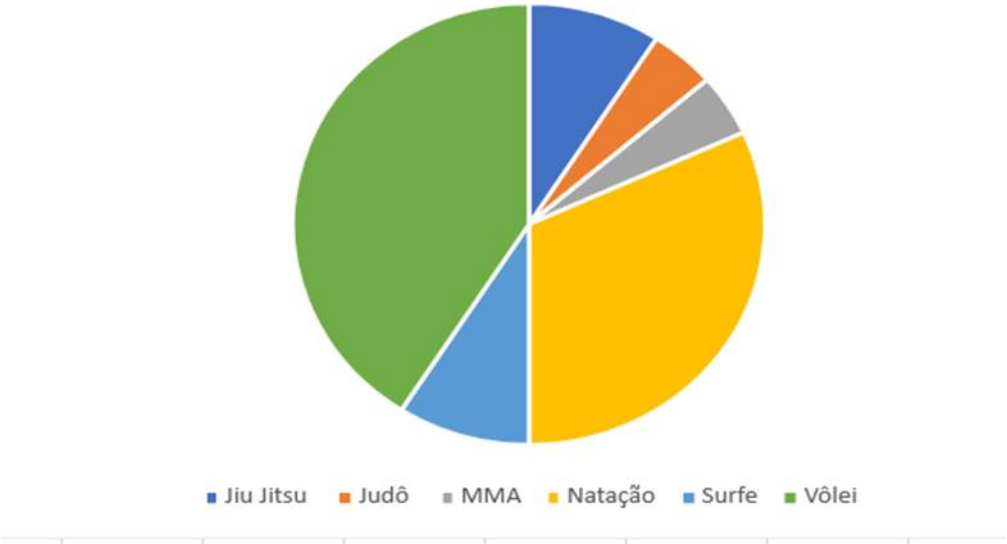
3.4 THE FOURTH QUESTION IS RELATED TO THE PERIOD IN WHICH THE STUDENTS WERE. BEING STRUCTURED AS FOLLOWS: 'WHAT SEMESTER ARE YOU TAKING?'



In this topic, it was observed that 35.5% (11) of the students belonged to the 1st semester, 35.5% (11) were in the 5th semester. Therefore, it was noted that the portions with the largest number of interviewees were from the initial period and the period referring to the beginning of the second half of the graduation, since the physical education course of the Federal University of Ceará is divided into 8 semesters, and the student can complete the same in up to 12. Consequently, 12.9% (4) of the interviewees were in the 9th semester, 9.7% (3) were in the 3rd semester, while 3.2% (1) were in the

7th and 3.2% (1) in the 10th. Given the above, it can be stated that the research was applied to students within a wide variety of school periods, showing the range of respondents.

3.5 THE FIFTH QUESTION FOCUSED ON UNDERSTANDING WHICH SPORT THE STUDENTS MOST APPRECIATE, THAT IS, INFERRING A SUBJECTIVE QUESTION TO RECEIVE FEEDBACK REGARDING THE STUDENT'S SPORTS PREFERENCE. THE QUESTION WAS PHRASED AS FOLLOWS: 'WHICH SPORT DO YOU ADMIRE THE MOST?'



In view of the above, it was possible to notice that the largest portion of the interviewees, that is, 29.03% (9) answered that volleyball is the sport they most admire, showing the influence that this modality exerts in the country. Soon after, swimming proved to be the second most appreciated modality by the interviewees, with 22.5% (7) of the total respondents. In addition, football still presented a significant number of admirers, with 16.12% (5) of the respondents. In addition, basketball, jiu-jitsu, and surfing presented the same percentage each, 6.4% (2), of the total public, totaling 19.2% of the sample. Finally, artistic gymnastics, rhythmic gymnastics, judo, mixed martial arts (MMA) showed the same percentage each, 3.22% (1) of the sample collected, totaling 12.88%.

In summary, it is noteworthy that team sports (soccer, volleyball, basketball) presented a higher prevalence in the students' responses, totaling 51.6% of the total number of students who collaborated. Thus, it is also valid to highlight the presence of water sports (swimming and surfing) as highlights in the research, totaling 29.03% of the sample. The fights (jiu-jitsu, judo, MMA) computed 12.9% of the total audience. Finally, gymnastics (artistic, rhythmic) complete 6.4% of the sample.

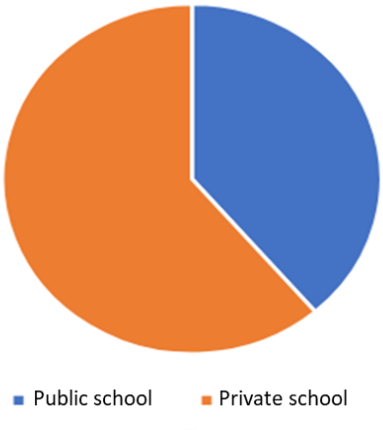
Thus, such information corroborates what Ramos, Valmor et al (2014, p. 241) states.

> For the teacher trainer, these conclusions imply important pedagogical issues, such as the definition of the strategies that should be used to direct this previous knowledge in favor of

the process of reconstruction of experiences and the incorporation of new formal knowledge, particularly regarding the procedures and models of teaching of sports contemplated in the literature.

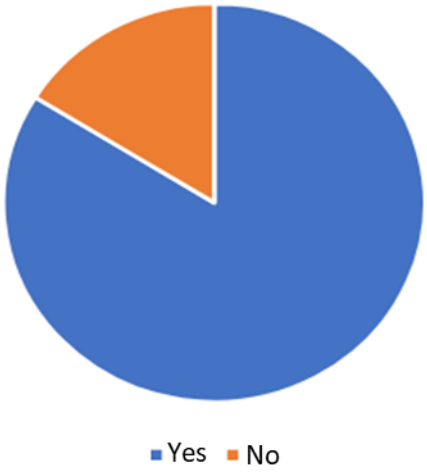
Thus, it can be assumed from the above, that future teachers at school physical education, can develop their work activities with greater vehemence from sports predilections that please them too much.

3.6 THE SIXTH QUESTION WAS RELATED TO THE INSTITUTION IN WHICH THE STUDENTS COMPLETED ELEMENTARY SCHOOL (PUBLIC OR PRIVATE). THUS, THE QUESTIONING WAS STRUCTURED AS FOLLOWS: 'WHAT KIND OF SCHOOL DID YOU STUDY AT DURING ELEMENTARY SCHOOL?'



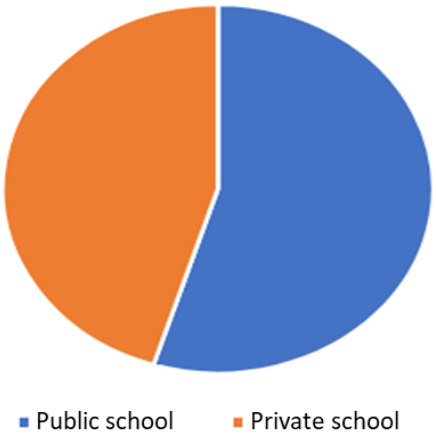
From the collection, it was possible to conclude that 61.3% (19) of the students of the course of Physical education at UFC attended elementary school in private schools, while 38.7% (12) of the students attended public schools. This fact demonstrates that most of the graduates of the undergraduate course in physical education of the Federal University of Ceará, studied in private schools during elementary school. On the other hand, a slightly lower percentage attended this stage of basic education in public schools.

3.7 THE SEVENTH QUESTION SOUGHT TO RELATE THE PRACTICE OF SPORTS ACTIVITIES BY STUDENTS WITHIN ELEMENTARY SCHOOL. BEING STRUCTURED AS FOLLOWS: 'IN ELEMENTARY SCHOOL DID YOU PLAY SPORTS IN PHYSICAL EDUCATION CLASSES?'



From the collection, it was possible to analyze that 83.9% (26) of the students claimed to have practiced sports activities in physical education classes during elementary school, while 16.1% (5) stated that they had not experienced these practices in physical education classes. For Moreira et al (2016, p. 825) it is necessary to reflect with the authorities of the area of education, public policies that guarantee an adequate number of hours per week, as well as the necessary conditions for physical education classes [...]. Thus, it is notorious a considerable percentage of absent participants in sports practices performed during elementary school, this fact can negatively influence future teachers around physical education, since the practical experience of sports modalities is central to the professional.

3.8 THE EIGHTH QUESTION AIMED TO UNDERSTAND IN WHICH TYPE OF SCHOOL THE STUDENTS ATTENDED HIGH SCHOOL (PUBLIC OR PRIVATE). THE QUESTION WAS STRUCTURED AS FOLLOWS: 'WHAT KIND OF SCHOOL DID YOU GO TO DURING HIGH SCHOOL?'



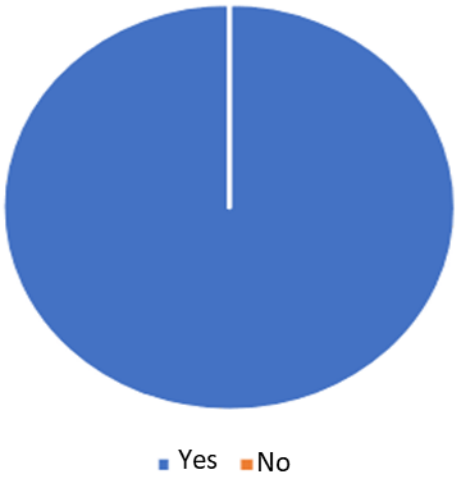
It was observed through the results obtained that 54.8% (17) of the students attended high school in public schools, while 45.2% (14) claimed to have studied in private schools. Thus, there is a considerable difference between the participants in relation to educational institutions, since most attended elementary school in private schools (61.3%), while in high school most of the public claims to have studied in public schools. Such numbers may point to a possible student migration in the shift from elementary school to high school.

3.9 THE NINTH QUESTION FOCUSED ON THE STUDENTS' UNDERSTANDING OF THE PRACTICE OF SPORTS ACTIVITIES DURING HIGH SCHOOL. BEING STRUCTURED AS FOLLOWS: 'IN HIGH SCHOOL DID YOU PLAY SPORTS IN PHYSICAL EDUCATION CLASSES?'



From the results measured, it was found that 77.4% (24) of the interviewees claimed to have performed sports practices during physical education classes in high school, while 22.6% (7) said they had not. Regarding the absence of sports practices, high school obtained a higher number in relation to elementary school, presenting a variation of 6.5% in relation to the previous question. Thus, it is important to highlight that such data are worrisome, because, according to Maria, Guimarães and Matias (2009, p. 616) the instabilities marked in adolescence can offer dangers to lifestyle, determining habits that can affect adult life. Thus, the responsibilities that mark high school, such as the concern with regard to college entrance exams and life after school may be factors linked to the greater absence of students during the performance of sports practices in physical education classes in high school. It is also noted a relationship between the increase of students in public schools during high school, if compared to elementary school, approximately 16.1% more than in the previous phase of education.

3.10 THE TENTH QUESTION AIMED TO UNDERSTAND THE APPRECIATION THAT STUDENTS HAD FOR SPORTS PRACTICE IN PHYSICAL EDUCATION CLASSES DURING BASIC EDUCATION. BEING STRUCTURED AS FOLLOWS: 'DID YOU LIKE OR WISH YOU HAD PLAYED SPORTS IN SCHOOL?'



Considering that the students investigated are part of the Physical Education course. With the reference highlighted above, it was found that 100% (31) of the students liked or would have liked to have practiced sports activities in physical education classes during basic education. Considering that the students investigated are part of the physical education course of the Federal University of Ceará, it is observed that the practice of sports was, in some way, striking in their lives, acting directly or indirectly in the students' work choices.

4 FINAL CONSIDERATIONS

From the results found in the present study, it is possible to perceive the close relationship between the practice of sports activities in the school environment by the students of the Physical Education course of the Federal University of Ceará. This practice became more forceful during elementary school, a period in which 83.9% of the students reported having performed sports practices, while in high school, this number decreases to 77.4%. It is possible to emphasize that the students have left the sports practice in the background due to the parallel dedication with the studies to provide vestibular. However, despite the percentage difference, the number of practicing students remained high, showing a strong involvement of students with sports practices. In addition, it is important to highlight the relationship between the migratory flow of students to public education institutions in high school with the reduction of sports practice, in which there was an increase of 6.5%, which may represent an indication of lag in Physical Education classes in the public network.

On the other hand, it was found a strong presence of team sports (Basketball, soccer, volleyball) as some of the most admired by students, totaling 51.6% of the interviewed public. In general, the modalities presented as favorites are easily applied in the school context, either in nature or through adaptations involving some changes of materials or spaces, using what is within the reach of the teacher. In addition, wrestling and gymnastics are sports modalities indicated as preferred by some students, making up 12.88% of the interviewed public.

Thus, the sports experiences within the school may have been determinant in the choice of higher education by the students, since 100% of the interviewees claimed to have enjoyed playing sports within the physical education classes. However, Physical Education encompasses a range of very broad themes and areas of study, not restricted only to sports. However, in the school environment, the practice of sports brings several benefits to the health of those who perform it, in addition to influencing the daily choices in the contexts outside the teaching centers.

The present study had as limitation a sample delimited to a public reduced to a single educational institution, aimed at students of a single course, divided into two modalities. For future studies, we suggest a sample that includes Physical Education students from two or more educational institutions, whether public or private.

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Creation of meanings in educational processes: Teaching practices with playful and experimental activities in the teaching of chemistry

https://doi.org/10.56238/ptoketheeducati-067

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ABSTRACT
This chapter aims to share partial results of a research that evaluated the development of a Potentially Significant Teaching Unit on the organic function of alcohol in Chemistry classes, with emphasis on recreational and experimental activities. The execution of the qualitative research, with the case study approach, took place in the months of February and March 2023, in a state school, in the municipality of Bom Jesus, with the participation of students from the third year of high school. The relevance of this study lies in the finding that, by using playful and experimental activities in teaching practices in different educational processes involving the Teaching of Chemistry, we create in students different senses with a view to meaningful learning. The discursive textual analysis allowed the construction of metatext that pointed to the construction of knowledge through the awakening of students' interest by using playful and experimental activities created by teachers in Potentially Significant Teaching Units.

Keywords: Educational Processes, Meaningful Learning, Playful and Experimental Activities.

1 INTRODUCTION

The traditional teaching of Chemistry in High School is seen by society as a simple memorization of the contents and, according to Ausubel *et. al.* (1980), as little effective to meaningful learning[1], since it is based on the unidirectional transmission of knowledge, with students being passive figures, who practically do not exercise criticality. Given this understanding, it is necessary to help teachers to reflect on their educational practice, so that classes are more attractive and pleasurable, aiming at the learning of the student who is willing to learn. These assumptions are in line with the Theory of Meaningful Learning proposed by Ausubel (1963) and addressed in this chapter.

Thus, we sought in this study to share the partial results of a research that evaluated the development of a Potentially Significant Teaching Unit on the organic function of alcohol in Chemistry classes, with emphasis on recreational and experimental activities. The execution of the qualitative research, with the case study approach, took place in the months of February and March 2023, in a state school, in the municipality of Bom Jesus, with the participation of students from the third year of

[1] The discussion and understanding of meaningful learning will be deepened in the chapter "Meaningful Learning and Playfulness".

high school. The relevance is the creation of playful and experimental activities in teaching practices in the different educational processes that involve the Teaching of Chemistry.

Moreira (2011) highlights that meaningful learning can occur in two ways: (a) the first depends on the didactic material, which must be potentially significant; (b) the second depends exclusively on the learner, that is, the student must have a predisposition to learn. In this approach, the teacher ceases to be the center of teaching and learning, as it was in other premises, [2]and begins to act as a facilitator/mediator who will lead the student, through significant didactic materials, to an environment that favors the construction of a solid knowledge. In the Theory of Meaningful Learning, it is evident the need to promote discussions that integrate the previous knowledge that accompanies each student, since they are more effective as a didactic resource to explain the relatability of the new material with subsuming concepts already existing in the cognitive structure of the student. To promote this relatability, it is necessary for the teacher to develop didactic resources that enhance these interactions.

The use of games in the Teaching of Chemistry as a way to motivate students is, according to Russell (1999), a teaching practice existing for decades to teach nomenclature, formulas, chemical equations, general concepts in chemistry, organic chemistry and instrumentation, and the first detailed game is dated 1935 and was called Chemical Bingo. The game is an effective, pleasurable and motivating methodology, which in a playful way involves the student, making him participate in all stages. So, what are the meanings in the educational processes of valuing this teaching practice in the contemporary moment?

The sense is to make this game a significant methodological material, and for this, it needs to be well elaborated and have well-defined commands. This is in line with Kishimoto (1996), who says that games, specifically educational games, are directly linked to play, fun, pleasure and displeasure and the educational function, whose objective is the expansion of knowledge. It is necessary that there is a balance between pleasure and knowledge, being able to achieve them through the rules that must be "freely consented, but absolutely obligatory" (HUIZINGA, 2007, p. 24). With this, we seek to signal the meanings in the educational processes that involve: student interest, teacher mediation and syntheses of the construction of knowledge. These meanings interfere in the promotion of the construction of knowledge by students by using playful and experimental activities created by teachers in Potentially Significant Teaching Units in the Teaching of Chemistry.

In the development of the work, the Theory of Meaningful Learning proposed by Ausubel (1963), the Potentially Significant Teaching Unit proposed by Moreira (2012b), the playful activities and games by Brougère (2003), Huizinga (2007), Kishimoto (1994,1996,1997), Ramos (1997) and Soares (2013, 2004) were deepened. The analysis of the data that make up the *corpus* of the research was carried out from the Discursive Textual Analysis, by Moraes and Galiazzi (2016).

[2] In traditional learning, the teacher is seen as a transmitter of knowledge.

The chapter is organized into three topics of discussion: (a) the first presents a literature review on the playful and experimental activities in the Teaching of Chemistry; (b) the second addresses how each experiential activity assists in meaningful learning; (c) the third points to the use of playful activities in the UEPS, especially games, as resources used in teaching practices. This chapter ends with a discussion of the topics presented.

2 LITERATURE REVIEW ON RECREATIONAL AND EXPERIMENTAL ACTIVITIES

In order to deepen the literature review, searches were conducted on the page of the journal Química Nova na Escola[3], the most important journal in the area of Chemistry Teaching and Learning in Brazil, and a six-year time frame was carried out, from 2015 to 2021. The search terms used were: Teaching Chemistry, Playfulness in Chemistry and Didactic games in Chemistry classes. A total of 16 articles were found. Table 2 shows a summary of what was found, containing the title, authorship, volume of the journal, number and keywords.

Table 2 - Results of the Bibliographic Review in the journal Química Nova.

Title	Authors	Vol. and Publication No. in the journal	Keywords
Pedagogical game for the teaching of thermochemistry in youth and adult education classes	Maria Aparecida S. Leite and Márlon H. F. B. Soares	Vol. 43, No. 3, p. 227-236, August 2016	Pedagogical game; thermochemistry; EJA
The educational game as an interdisciplinary resource in the teaching of Chemistry	Antonio L. de Oliveira, José Clovis P. de Oliveira, Maria Jucione S. Nasser and Maria da Paz Cavalcante	Vol. 40, No. 2, p. 86-89, May 2018	Chemistry Teaching; educational game; Didactic resource
The use of a teaching workshop in the formative process of teaching students and undergraduates	Manuel E. G. Winkler, João R. B. de Souza and Marilde B. Z. Sá	Vol. 39, No. 1, p. 27-34, February 2017	Initial teacher education; teaching workshops; differentiated teaching
Investigative didactic game: a tool for teaching inorganic chemistry	Bruna da Silva, Márcia Regina Cordeiro and Keila Bossolani Kiill	Vol. 37, No. 1, p. 27-34, February 2015	Didactic game; periodic table; Inorganic functions
A board game involving concepts of mineralogy in the teaching of Chemistry	Edemar Benedetti Filho, Alexandre D. M. Cavagis, Karen O. dos Santos and Luzia P. dos S. Benedetti	Vol. 43, No. 2, p. 167-175, May 2021	Chemistry Teaching; mineralogy; board game
Active-collaborative-interactive learning: interrelationships and investigative	Tâmara N. P. Santos, Carlos H. Batista, Ana P. C. de Oliveira and Maria C. P. Cruz	Vol. 40, No. 4, p. 258-266, November 2018	Electrochemistry; experimentation; homemade batteries

[3] Research link, New Chemical Journal: http://qnesc.sbq.org.br/

experimentation in the teaching of electrochemistry			
Organic clues: a game for the teaching and learning process of Chemistry	Janduir E. da Silva, Carlos N. da Silva Jr., Ótom A. de Oliveira and Diego O. Cordeiro	Vol. 40, No. 1, p. 25-32, February 2018	Didactic games; organic functions; Chemistry teaching
A didactic game for the review of chemical concepts and safety standards in Chemistry laboratories	Edemar Benedetti Filho, Alexandre Donizeti Martins Cavagis and Luzia Pires dos Santos Benedetti	Vol. 42, No. 1, p. 37-44, February 2020	Playful activities; Chemistry teaching; Chemistry Laboratory
The use of concept maps in the teaching of the periodic table: an experience report in PIBID	Neusa N. Fialho, Ricardo P. Vianna Filho and Magda R. Schmitt	Vol. 40, No. 4, p. 267-275, November 2018	Periodic table; concept maps, JPCM
The corn of the typical June foods: a didactic sequence for the sociocultural contextualization in the teaching of Chemistry	Jéssyca B. S. Rodrigues, Patrícia M. M. Santos, Rozeane S. Lima, Teresa C. B. Saldanha and Karen C. Weber	Vol. 39, No. 2, p. 179-185, May 2017	Sociocultural contextualization; pedagogical moments; corn
The teaching of Chemistry using Guanabara Bay theme: a strategy for meaningful learning	Nathália Souza Abreu and Jefferson Leite Maia	Vol. 38, No. 3, p. 261-268, August 2016	Generator theme; meaningful learning; Guanabara Bay
Periodic table: conceptions of students throughout high school	Nycollas S. Vianna, Camila A. T. Cicuto e Maurícius S. Pazinato	Vol. 41, No. 4, p. 386-393, November 2019	Apprenticeship; alternative conceptions; periodic table
The playful in the teaching of Chemistry: considerations from the historical-cultural psychology	Hélio da Silva Messeder Neto and Edilson Fortuna de Moradillo	Vol. 38, No. 4, p. 360-368, November 2016	Ludic; historical-cultural psychology; Chemistry teaching
Use of the critical debate model as a didactic strategy for the construction of chemical knowledge from the perspective of critical meaningful learning	Kátia Aparecida da S. Aquino, Géssica Karla de Queiroz and Fabiana da S. Aquino	Vol. 43, No. 1, p. 119-128, February 2021	Chemistry Teaching; argumentation; concept maps
From intentionality to playful responsibility: new terms for a reflection on the use of games in the teaching of Chemistry	Cinthia M. Felício and Márlon H. F. B. Soares	Vol. 40, No. 3, p. 160-168, August 2018	Ludic; Chemistry teaching; games in Chemistry teaching
An active teaching approach in an electrolysis experiment	Gabriel S. Arini, Isis V. S. Santos e Bayardo B. Torres	Vol. 43, No. 2, p. 176-182, May 2021	Teaching of electrolysis; active learning;

			experimentation in teaching

Source: Information taken from the journal Química Nova and adapted by the author (2021).

Leite and Soares (2020) built a game containing simple rules in order to work the didactic method for the teaching of thermochemistry. This game was applied in a class with students of Youth and Adult Education (EJA). The game consisted of a board that occupied the space of the entire room, causing the students to move from a passive to active attitude. Initially, there was some resistance to the game by the students, who did not see the game as something serious but as a joke, but in the course of the activity, there was interaction and the concepts were successfully discussed and understood.

Oliveira *et al*. (2018) conducted an interdisciplinary activity involving Chemistry, History and Portuguese Language. The objective was to make a didactic game for the content called periodic classification of the chemical elements. The game called "Assembling the periodic table" was developed in groups, in which students were led to investigate the chemical elements, as well as their peculiarities and historicities. During the application, the role of the teacher was that of mediator, clarifying doubts and encouraging cooperation. The results were promising, facilitated learning and made interactions between teacher and students better. Another highlight for this application was that the students, in their majority (91%), never had contact with games during the educational process.

Winkler, Souza and Sá (2017) discuss the use of differentiated methodologies for the teaching of Chemistry with emphasis on teaching workshops (OE), which aim to promote teaching based on contextualization and dialogue. In this work an EO was developed to work on the content of natural products. The workshop was evaluated through the interpretation of students' questionnaires and through reflection on the practice of future teachers. The conclusions show the effectiveness of the method for learning, as they bring the content closer to everyday life and facilitate the interaction of students.

Silva, Cordeiro and Kiill (2015) believe that games are important tools for the teacher, since they seek to arouse the interest of students, promote integration in the classroom and facilitate the understanding of the contents addressed. The work carried out by the authors consists of developing, applying and evaluating a didactic game with an investigative character for the content of organic chemistry in a high school class. To obtain data for analysis, questionnaires were applied that were analyzed considering Vygotsky's conceptions about learning and interaction. The final considerations point to a feasibility of the use of didactic games for the teaching and learning process and a learning through the interaction between students.

Benedetti *et al*. (2021) developed and applied a board game called "Minerals" for teaching mineralogy concepts in a high school class. After the preparation of the game, it was sent to some students of the Chemistry course in order for them to evaluate the pedagogical potential, the

playfulness, the gameplay and the dynamics. The game was later applied to students, and data collection took place through interviews and registration in a field diary. Through the speech of the students, it can be noted that often the acceptance to play has a hobby bias and not a differentiated form of learning about the content. However, the authors indicate that, in the course of the activity, this bias ends up being modified when it is observed that students leave aside their notes and become protagonists of their own learning.

Santos *et al*. (2018) had as their objective, in their research, an experimental investigative methodology elaborated through the use of viable and non-toxic products so that the students could develop in practice the construction of a biochemical pile (made with lemons and English potatoes). The research was carried out in three stages. The first was a general approach in order to highlight previous knowledge about the content of electrochemistry. The second stage consisted of an *online research* on the possibility or not of batteries being made with biochemical materials and the construction of these batteries through the mediation of the teacher. In a final step, the texts transcribed by the students were analyzed through the Discursive Textual Analysis (DTA) method. It can be seen, through the reading of the textual productions, that it is possible to admit the concretization or the comprehension of a theory.

Silva *et al*. (2018) presented a teaching proposal to work organic chemistry in a playful way both in High School and in Higher Education. In order to get away from the mechanical and static learning of the nomenclature of organic compounds, the authors adapted an existing game and called it "Organic Clues". For data collection, questionnaires and field diary entries were used. The final considerations point out that the students present difficulty in contextualizing the contents and, through the games, they can develop a more significant learning of some concepts, such as properties and characteristics of the main organic functions, which are not so valued in dialogued expository classes.

Benedetti Filho, Cavagis and Benedetti (2020) innovated the traditional "Game of Seven Errors", applying it to revise safety standards in Chemistry laboratories. The activity was applied to all years of high school in a public school with the objective of providing a differentiated learning from the traditional perspective. The students were surprised by the activity and showed interest in solving it. The results obtained point to a lack of experimental and playful activities in public schools and show that, when they are performed, students value them, interacting in their groups with the help of the teacher of the discipline, who acts as a mediator to direct the discussions.

Fialho, Vianna Filho and Schmitt (2018) present in their research an account of experiences on the use of concept maps in the study of the periodic table of chemical elements. Concept maps can help the teaching of Chemistry in a significant way, stimulating students to deal with information to transform it into knowledge. After the presentation of how to perform the construction of concept maps, the students performed an evaluative activity using a puzzle of concept maps called *Jigsaw*

Puzzle Concept Map – JPCM. In order to evaluate the activities, the students answered a questionnaire. The final considerations reveal the relevance of using the concept maps in teaching practices, with indications of advancing with this teaching strategy due to the interest of the students in carrying out the activities and, mainly, to the exchange of ideas among them on the theme addressed.

Rodriguez *et al.* (2017), Seeking an approximation between the chemical concepts and the reality of the students, they proposed a didactic sequence structured in the dynamics of pedagogical moments. The theme chosen for this sequence was "Corn", because it is an ingredient widely used in Festas Juninas, which is common in our country. An initial questionnaire was applied in order to know the students' previous knowledge, and an approach was made to the content of Chemistry to be studied, using transversal themes related to agriculture and health. Finally, an evaluative questionnaire was applied to obtain data. The results show that, from the activities developed, there was an awareness about the presence of science in real situations of daily life and, it should be emphasized, the relevance of the discussion of socioeconomic issues that involve scientific concepts as a fundamental exercise in the search for the development of critical thinking.

Abreu and Maia (2016) worked on their research with the generative theme and, for this, they chose Guanabara Bay and a 9th grade class to apply the research, always aiming at meaningful learning. There was a diagnostic evaluation in order to raise previous knowledge. Subsequently, there was a debate on the generating theme, followed by a game on the periodic table in which the students contextualized the chemical elements with the substances found in the Bay. They made models with the objective of assimilating the content and, finally, there was an evaluative questionnaire. The final considerations showed that the teaching of Chemistry through the generating theme Guanabara Bay contributed to a more significant learning, because it enabled the interaction between the knowledge and the daily experiences of the students and the scientific knowledge, evidenced through the evolution of the answers given.

Vianna, Cicuto and Pazinato (2019) proposed a research paper in relation to the periodic table. The objective was to verify the learning on the subject in the three years of High School. The authors developed a questionnaire containing 27 statements with which students should agree or disagree. The results were evaluated by multivariate statistical methods, which allow the recognition of natural patterns. The results showed that the students had difficulties when consulting the periodic table to obtain explicit information, such as mass number and atomic number, and often cannot relate the chemical elements in everyday applications. Despite the difficulties encountered, there were indications of the occurrence of significant learning in some students throughout high school.

Messeder Neto and Moradillo (2016) address the theme of playfulness in the teaching of Chemistry and its relevance for a more dynamic and motivating class. Even with this subject so much on the agenda, there is still a lack of theoretical reference when these practices are applied. Aiming to

collaborate for the use of the playful in the teaching of chemistry, the authors sought some theoretical contributions from historical-cultural psychology to this field of study. One of the authors approached was Vygotsky, using two important concepts: elementary psychological functions (PEF) and higher psychological functions (SPF). It was also used the concept of zone of proximal development (ZDP) of the same author, which discusses what the student can do with the help of a pair and soon will be able to do alone. The authors' conclusions point to the use of theoretically well-founded playfulness, because when this does not happen, the game or activity becomes meaningless and becomes a mere joke.

Aquino, Queiroz and Aquino (2021) aim, in their research, to develop a teaching strategy from an argumentative environment that allows promoting the knowledge of chemical concepts through criticality and reflection. In order to achieve the proposed objective, they developed a didactic sequence adapted to the Critical Debate Model to be applied in a public school. Data were collected through concept maps that the students produced before and after the intervention. The final considerations show the importance of planning in teaching practice for the intervention to be effective, as well as the valorization of students' previous knowledge. Finally, the Critical Debate proved to be a strategy with potential for the development of critical thinking and for the promotion of Critical Meaningful Learning in the teaching of chemistry.

Felicio and Soares (2018) proposed a reflection on the theme of the playful in the teaching of chemistry from some aspects of the literature, as well as the possibilities of application in the classroom and even in the training of teachers. The authors address the theories about the games, which point out that the game needs to have an intentionality and be voluntary. The playful can contribute for the reenchantment of teaching, because it emerges naturally as an element of human culture, being intrinsic to being human. The basic idea was to propose new terms that can help researchers in some aspects of the game in its application.

Arini, Santos and Torres (2021) developed a didactic sequence to apply the active teaching strategy to an electrolysis class. Students started by answering a pre-test, followed a script for an experiment on the topic, and finished by answering the questions of a post-test. The results point to a significant improvement in the post-test responses. There were indications of significant learning, because by avoiding the class through exposure only, there was a more active teaching, in which students obtained more confidence and autonomy in their practice.

In this literature review, it is perceived the relevance of creating alternative tools for teaching and learning the content of chemistry, as well as the fundamental role of the teacher in daring in his practice, using playfulness, through games, as they are presented in the articles by Leite and Soares (2020), Oliveira *et al*. (2018), Silva, Cordeiro and Kiill (2015), Benedetti *et al*. (2021), Silva *et al*.

(2018), Benedetti Filho, Cavagis and Benedetti (2020), Messeder Neto and Moradillo (2016) and Felicio and Soares (2018).

None of the articles used UEPS, however, in seven articles were found authors in common with this research and that deal with significant learning. In the articles, names of theorists such as Ausubel and Moreira also appeared. In only one of the articles, written by Santos *et al*. (2018), Discursive Textual Analysis was used as a method for data analysis, a methodology that will be chosen for this research. Eight of the articles found deal with games and playfulness, using authors such as Huizinga, Kishimoto and Soares, who will be addressed in the course of this writing.

In the article written by Leite and Soares (2020), there is an important distinction between didactic games and educational games. Every didactic game is an educational game, but not every educational game is a didactic game. Soares (2015) goes further: for him, the educational game is half game and half education, fulfilling balanced functions. Such discussions go against what Kishimoto (1994) says, for which, in the broad sense, the educational game is like a material or a situation that allows free exploration in enclosures organized by the teacher, aiming at the general development of skills and knowledge in a restricted sense. For the didactic game, there is a need for material that requires guided actions with a view to the acquisition or training of specific contents or intellectual skills.

The other articles found and pertinent to the research point to the displacement towards a more significant learning, trying to move away from mechanical learning. The articles developed by Winkler, Souza and Sá (2017), Benedetti Filho, Cavagis and Benedetti (2020), Silva *et al*. (2018), Fialho, Vianna Filho and Schmitt (2018), Abreu and Maia (2016), Vianna, Cicuto and Pazinato (2019), Aquino, Queiroz and Aquino (2021) and Arini, Santos and Torres (2021) present, in common, ideas attributed to theorists Ausubel, Novak and Moreira.

Of the articles found, eight mention directly in their titles Games and Playfulness and have authors in common: Huizinga (2007), Kishimoto (1999) and Soares (2013).

The word playfulness was used frequently, but at no time was it defined. Playfulness, according to Luckesi (2014), is an internal phenomenon of the subject that results in external manifestations, that is, a certain activity can be qualified as playful (or not) depending on the subject who experiences them and the circumstance in which this occurs. Each student ahead of a given situation may have different feelings; If they are feelings of joy and fullness, one can consider the activity as playful. If the student does not feel happy to participate in a certain activity or is divided among other tasks, the activity will not be playful for him.

It is highlighted, then, that an activity, which may be an experimentation or a didactic game, presents a playful potential, but the experience or not of this Playfulness is individual. We can observe this fact in Luckesi's speech:

> Playing, playing, acting playfully, requires a total surrender of the human being, body and mind, at the same time. Playful activity does not admit of division; and, the playful activities themselves, lead us to this state of consciousness. If we are in a dance hall and we are truly dancing, there will be no room for anything other than the pleasure and joy of the rhythmic, harmonic and graceful movement of the body. However, if we are in a dance hall, pretending that we are dancing, but in fact, we are observing, with a critical and judgmental eye, how others dance, for sure, we will not be playfully experiencing this moment. (LUCKESI, 2000, p. 21)

The playful potential is specific. Perhaps what might make sense to one student will not make as much sense to another, since each will have their own experiences and different ways of interaction. According to Oliveira *et al*. (2018), the playful activity only becomes intentional when the teacher stimulates the students, directing the activity (game) as a mechanism in the learning process, which meets Kishimoto:

> When playful situations are intentionally created by the adult in order to stimulate certain types of learning, the educational dimension arises. As long as the conditions for the expression of the game are maintained, that is, the intentional action. (KISHIMOTO, 1999, p. 38)

According to Soares (2013), it is difficult to define game, because often what one person treats as a game may not represent the same meaning for another. The author cites the example of an indigenous child with a bow and arrow: for a person looking at the situation from the outside, it could be something playful, for the child, it is part of learning to hunt and survive. Kishimoto (1996) differentiates games through three levels: a) the meaning of the game depends on the social context, since each individual understands the game in a different way and this cannot be taken as something simplistic; b) a system of rules – the games are differentiated by their rules, it is these sequences of rules that allow the relationship with playfulness; c) an object – which is responsible for characterizing and playing.

Detailing the understandings about the concepts of games, the cited authors make a distinction between educational games and didactic games. For Soares (2013), the educational game seeks to approximate the existing playful character to the possibility of improving cognitive development, making the game balanced by becoming half game and half education. Kishimoto (1994) defines educational game as a material or a situation that allows free exploration in enclosures organized by the teacher, aiming at the general development of skills and knowledge in a restricted sense. When this material requires some form of guidance and aims at the training of specific contents, it is called a didactic game.

Another author often cited in the researched articles is Huizinga, who defends in his work **"Homo Ludens"** that knowledge itself is a game, and that the game is part of the essence of the human being. The game takes place in a sphere of fiction[4], but, paradoxically, there are rules.

> The game is a free action, but consciously understood as fictional and situated outside of real life. It is able to completely absorb the player in an action devoid of any material interest and any utility, which takes place in a circumscribed time and space, developing according to given rules and situated in the relation of groups, involving simultaneously tension and joy, and an awareness of being outside of ordinary life. (HUIZINGA, 2007, p.11)

In this clipping, the author brings us the idea of absence of usefulness in the game. We find here a paradox with the research, because, as it is a didactic game, we can understand that the goal is not to learn Chemistry as a chemist, or an engineer, an action that would be finalistic, outside, therefore, of what Huizinga understands as a game. On the other hand, a game involving Chemistry could enrich the daily life of the student, especially from the point of view of his interaction with colleagues and the teacher. In this sense, the game would "educate" rather than "teach."

For Felício and Soares (2018), it is necessary to clarify that the game has an end in itself. As considered by Huizinga (2007), this end in itself is related to the freedom that characterizes it and to the system of rules that need to be followed as a participant in the activity. Often, it can be a delineator of the rules of conduct or procedures essential to the game, which, when ruled, can become an educational game, developing autonomy and criticality.

3 EXPERIMENTAL ACTIVITIES

The importance of experimental activities is explicit in the National Common Curricular Base (2018), which emphasizes that students should appropriate procedures and practices of the contents, such as the sharpening of curiosity about the world, the construction and evaluation of hypotheses, the investigation of problem-situations, experimentation with data collection and analysis.

However, the teacher has a very important role in these activities, because they only become valid if they awaken the character invstigative in the student and possess the pedagogical function of assisting in the understanding of the phenomena

It is common to associate experimental activities as the practical demonstration of a theory, this mistake is not only committed by students, but by teachers as well. According to Galiazzi and Golçalvez (2004) when working experiments in classes, it is necessary to overcome the view that the experimental activity has the sole and exclusive function of proving the theory, because this would not be possible in just a few minutes of classes. What actually happens is a problematization of the content that is done through an observation of something that is happening.

[4] When it causes the shutdown of everyday life to introduce a world of "make-believe".

Linking the experimental activities to the Theory of Meaningful Learning, the teacher must conduct the class with questions, taking into account previous knowledge. Still second Galiazzi and Golçalvez (2004) for the teacher to perceive the way of thinking of this student it is necessary that he verbalizes this knowledge, it can be through an action articulated by the teacher that promotes discussions and debates. From the moment that there are no ready answers, the student is invited to problematize and question the knowledge, thus assisting in the teaching and learning process.

The experimental activities are, therefore, auxiliary in the learning process, because they promote discussions and invite the student to externalize his knowledge in order to explain the process and the results. They are based on observation and the mediation of the teacher helps in the teaching and learning process, by leaving the student more free to participate in the class and not demand a ready answer but something that can be built and discussed in the large group (colleagues).

4 PLAYFUL ACTIVITIES: GAMES

As already mentioned in the previous text, playfulness is an internal state of full experience, therefore, playful activities may or may not be fun and pleasurable depending on the student who will receive them. According to Luckesi (2005) the constructive side of the playful activities is in the instrumentalization of the creation of personal identity, that is, they establish a bridge between the inner reality and the outer reality and it is precisely in this bridge that the previous experiences can make them pleasurable or not. The playfulness is changing with the phases of life, but this does not mean that an adult will not have happy feelings when seeing a toy that was part of his childhood. But on the other hand, the adult seeks seriousness and this makes the game meet resistance, not because he does not want to participate in it but because of fear of society that does not understand games as something productive.

Several times the playfulness finds this resistance to be worked in classes that are not of early childhood education, because according to Ramos (1997) the term playful is often linked to the infantile, interpreted with a non-serious and inconsequential action as well as an activity that can not be deposited much time for the development.

It is up to educators, little by little, to introduce more playful activities in classes and present the positive results that they bring, through the development of creativity.

> The playful is the creative, free space that the child / adolescent has to develop their potentialities, there, playing, allows themselves to create and recreate possible and imaginary situations. Establish contact with the real and the imaginary, to the point that, being the main actor and active agent in the whole process, propose new learning experiences. It is also in this context that the child is placed as belonging to a society, because the rules, explicit or not are biological characteristics, but also socio-cultural interfering in the choices (YOSHIMURA, 2019, p. 50).

Also according to Ramos (1997), playfulness is not tied to a specific form, nor to an object, because it is a subjective interaction with the world, because several daily activities, professional or not, are impregnated by playful aspects. Regarding the learning process present in these activities, it can be said that:

> If the act of playing implies the use of rules or the mastery of a skill, learning will be intrinsic to the act of playing with that material and/or idea. Thus, even in an apparently disinterested game, the subject can unconsciously "supply" himself with information (through his actions) (RAMOS, 1997).

In the teaching of Chemistry, the use of games or games that contain rules aimed at learning a certain content, can rescue playful aspects and provide access to knowledge among all students. These activities will not be the assurance that learning has occurred, but they will act as catalysts in the cognitive process.

Ramos (1997) reports some possibilities that can happen when the teacher uses playful activities to develop a certain subject, such as: the formation of new concepts, cognitive development, the exercise of existing cognitive and motor structures and can also contribute to future learning, through a familiarization with the objects of the content.

From the playful activity that was carried out in this work, it is necessary a brief conceptualization of games as activities used in education.

There are a diversity of definitions for the word game, as the term is used for different situations. According to Brougère (2003) briefly game is a structure, a system of rules, which exists in an abstract way, for example, board games, everyone knows what these games are, without needing to be in physical contact with them. The author also mentions that game is what the scientific vocabulary calls "playful activity". When the game happens, there are basically three levels of games, the first is attributed to the playful situation, the second to the game containing a system of rules and the third level, associates game to the theme "toy". The last level is easily differentiated by the lack of rules it has. The first and second levels overlap, because both situations can happen in the same game, because games when physical/material explicitly imply a playful use that usually takes the form of a rule.

The rules are very important for the game, they provide limits so that the group experience is respectful. Teachers can use them to adapt already known games, changing the levels of difficulty and trying to insert the objectives to be fulfilled in the class.

Soares (2004) says that the games themselves present problems and challenges of various levels and that they require several strategies and this goes against the rules. Students must master them in order for the game to move forward.

Still according to the author, there are two main strategies that are used in games, the first, called macroscopic, which are objectives that must be achieved by the player, as for example, in the

board game used in this work, the objective will be to hit the answers to continue "advancing the houses". The other strategy is the microscopic one, which are composed of contextual decisions at each moment. As the game to be developed in this work uses a dice, it is considered lucky, but the decisions made for each answer go against the strategies cited as well.

In order for the desired learning process to be achieved in the course of the game, it is necessary that the rules are well defined and the role of the teacher is to predict each play and think of strategies that can achieve their goals.

To understand the use of games in education it is necessary to deepen the so-called educational games that according to Kishimoto (1999) are not games that began to be used now, quite the contrary, are dated in the Renaissance and began to gain prominence with the emergence of early childhood education. Educational games are understood as a resource that teaches, develops and educates in a pleasurable way. Every time the educator uses games in the classroom, he is enhancing the conditions of teaching and learning, because these actions maximize the construction of knowledge, introducing the properties of play, pleasure, the capacity for initiation and active and motivating action.

The author makes an important definition of the two functions that the educational game assumes. The first function is playful: it happens when the game provides fun, pleasure or even displeasure. The second function is educational: it occurs when the game teaches anything that completes the individual in his knowledge, his knowledge and his apprehension of the world.

> The balance between the two functions mentioned is the goal of the educational game. If one of these functions is used more than the other, that is, if there is an imbalance between them, two situations are caused: there is no more teaching, only play, when the playful function predominates too much, or the educational function eliminates all playfulness and fun, leaving only teaching. In the case of proposing a game in the classroom by the teacher, there is no voluntary choice of the game by the students, making the beginning of the activity have more of an educational function than a playful one (SOARES, 2004, p. 53).

For these functions to occur in a balanced way, it is the role of the educator to select and adapt the game, because when the playful activities are created with some intention that seeks clues of learning, they start to have an educational role as well.

Reflecting on these conditions, the game selected and adapted for this work, underwent modifications, starting to contain questions about the content with varying levels of difficulty, not leaving behind the playful character of the original board game, played with dice and a series of mysterious cards in which the error or hit resulted in something specific. The game, like all others, has rules to be respected and that will be defined at the beginning of the activity for a better progress.

5 MEANINGFUL LEARNING PRESENT IN PLAYFUL ACTIVITIES

Thinking of an activity proposal that arouses interest on the part of the students, it is sought to include the playful and experimental activities as a strategy to involve the students in the learning process, since:

> In the experience of a playful activity, each one of us is full, whole in that moment; we use mindfulness, as defined by the Eastern sacred traditions. As long as we are truly participating in a playful activity, there is no place in our experience for anything other than that activity itself. There is no division. We are whole, full, flexible, joyful, healthy. (LUCKESI, 2002, p. 23)

The speech of Luckesi (2002) points out that the playful activities can arouse the interest of the student and makes him willing to acquire knowledge from the interaction and the full attention that they have for this moment.

The educator needs to seek didactic alternatives in order to motivate and arouse the interest of his students, approaching the content of the day to day in which they are inserted. This is one of the most important points in Ausubel's theory:

> If I had to reduce all educational psychology to a single principle, I would say the following: of all the factors that influence learning, the most important is what the student already knows. Find out about it and teach yourself with it in mind. (AUSUBEL *et al.*,1980, p. 8).

This appreciation of the student's previous knowledge can be carried out in several ways. Using the Playfulness, already mentioned, one can resort to games that, in their development, can take into account what the student, in general, already knows and, then, provide him with opportunities to elaborate ideas of a higher level of the subject in question.

According to Soares (2013), the games carry in themselves problems and challenges of various levels and that require alternatives and strategies, which are defined through the creation of rules, that is: in the same way that the rules create steps for the game to happen, it will be mandatory for the player to master them for the game to advance. The operations that will compose the strategies can be defined from the objective that the student must achieve at the end of the game.

Still in this view of games as facilitators of teaching and learning, one can cite the previous organizers, defined by Ausubel as a didactic resource whose main function is to serve as a bridge between what the student already knows and what he should know so that he can acquire in a significant way a certain new knowledge. However, according to Moreira (2011) probably, previous organizers are more effective as a didactic resource to explain the relatability of the new material with subsuming concepts already existing in the cognitive structure of the student.

Therefore, the experimental and playful activities will be treated as auxiliaries in the process of Meaningful Learning, because they will have the function of arousing the interest of students

through activities different from the usual, carried out in groups and that seek the verbalization of knowledge with discussions and interactions.

The theoretical deepening points to positive evidence in the use of these activities in classrooms, because they act as motivators and motivation arouses interest. The playful activities developed through games and the experimental activities developed according to the discussions presented here in this chapter, will help in the construction of the knowledge of the Teaching of Chemistry. The variation of didactic material for use in classes meets the second condition for Meaningful Learning to occur:

> that the learning material (books, classes, applications, ...) has logical meaning (that is, it is relatable in a non-arbitrary and non-literal way to an appropriate and relevant cognitive structure) (Moreira, 2012, p. 8).

Emphasizing that the didactic material is only potentially significant, because the meaning is in the meanings attributed by the students: interest of the student, teacher mediation and syntheses of the construction of knowledge. These meanings interfere in the promotion of the construction of knowledge by students by using playful and experimental activities created by teachers in Potentially Significant Teaching Units in the Teaching of Chemistry.

Students are receptive to the use of games in the teaching of Chemistry, because for some, it may awaken feelings related to the internal state (childhood) and for others it may not have aroused any feelings at all. According to Ramos (1990), when using playful activities, several possibilities can happen such as: the formation of new concepts, cognitive development, the exercise of existing cognitive and motor structures and can also contribute to future learning, through a familiarization with the objects of the content.

Playful activities are not synonymous with success in learning, but serve as catalysts for the process. The signs of learning are present in the cognitive development that the game helped, because students need to think and reflect for the resolution of the questions. In the cognitive and motor structures that show the ability to apply a studied concept. According to the theory of Ausubel (1963) it is not possible to affirm that a student "learned in a significant way", but one can present indications that there was a significant potential in learning.

Thus, the teaching practices in the Teaching of Chemistry that use experimentation activities and games are different from the usual teaching and put the motivation of the students in evidence, with interest in participating in all activities. In this sense, the educational processes that involve the intentional planning of the different potentially significant activities are fundamental to create meanings in the construction of knowledge.

The production of this chapter allowed to broaden the reflection on teaching and to mark the importance of disseminating the practices with playful and experimental activities in the Teaching of

Chemistry to other teachers, so that they know this theory, in order to seek activities that really have the potential to achieve Significant Learning.

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SEVEN
publicações acadêmicas

School dropout in the pedagogy course

https://doi.org/10.56238/ptoketheeducati-068

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ABSTRACT
The objective of this work entitled "School Dropout in the Pedagogy Course" is to investigate the process of initial and continuing education of teachers of the degree course in pedagogy at ISEPAM, for best teaching practices; through a virtual questionnaire. Its object of study is pedagogical practices. The problem involves the questioning: why is there in ISEPAM a high rate of students in the Degree in Pedagogy, who have access to the university and when they can be part of it, most of them abandon the course or when they can complete they do not present the Monographic Project? Its target audience is teachers of the Degree Course in Pedagogy of ISEPAM. Antunes (2011) emphasizes the relevance of continuous training and the constant updating of the teacher to achieve the success of the educational process. The methodology is characterized as bibliographic for using theoretical sources; qualitative for appropriating the subjectivity of the authors used; quantitative, for generating numerical data after the application and analysis of a questionnaire for the faculty of the Degree in Pedagogy of ISEPAM, in the municipality of Campos dos Goytacazes/RJ/Brazil. It is also characterized by exploratory, for investigating the phenomenon "School Dropout in the Pedagogy Course", bringing it closer to the scientific community. The authors used were: Gadotti (2003), Freire (1996), Libâneo (2017), Sacristán (2013), among others.

Keywords: Continuing teacher education, School dropout, Degree in Pedagogy.

1 INTRODUCTION

Antunes (2011) emphasizes the relevance of continuous training and the constant updating of the teacher to achieve the success of the educational process. Thus, continuing education consists not only in updating the teacher in pedagogical terms, but providing teachers with moments of reflection and evaluation about their educational practices.

This work has as general objective to investigate the process of initial and continuing education of teachers of the Pedagogy course of the Higher Institute of Education Professor Aldo Muylaert (ISEPAM), for best teaching practices; through a virtual questionnaire.

Vasconcellos (2019, p. 73) states that "the movement of democratization and qualification of education is a broad and complex process, which has as its goal the change of practice in the classroom

[...]". The research theme in question will contribute significantly to open paths and new studies related to the theme seeking its importance in the virtual media. Therefore, it is necessary to study it.

Its target audience is teachers of the Degree Course in Pedagogy of ISEPAM, in the municipality of Campos dos Goytacazes/RJ/Brazil. The problem involves the question: "why is there a high rate of students in the Pedagogy Degree course at ISEPAM, who have access to the university and when they can be part of it, most of them abandon the course or when they can complete it, they do not present the Monographic Project?". The hypotheses are summarized in several premises: outdated methodologies; outdated teachers;and lack of encouragement to authorial reading and writing.

The specific objectives are: to mention any failures that occur in the educational process that contribute to dropout and the non-presentation of the monographic project in the Degree in Pedagogy at ISEPAM; present statistical data of dropout and students in the phase of CBT in the course of Pedagogy of ISEPAM; and dstress the importance of continuing education.

According to Libâneo (2013) there are whining in the academic environment of outdated education professionals who do not adapt to new technologies. Dropping out of school is a reality for many young academics and public universities in the country.

2 METHODOLOGY

The methodology is characterized as bibliographical, for using theoretical sources; qualitative for appropriating the subjectivity of the authors used; quantitative, for generating numerical data after the application and analysis of a questionnaire intended for the faculty of the Degree Course in Pedagogy of ISEPAM, in the municipality of Campos dos Goytacazes/RJ/Brazil. It is also characterized as exploratory, for investigating the phenomenon "School Dropout in the Pedagogy Course", bringing it closer to the scientific community. According to Lakatos and Marconi (2003), the dialogue that proposes an assertive solution and timely knowledge are authentic techniques that are perfected in cycles with practice and experience. It is essential a well-prepared interviewer, good listener and with an enlarged look and when the researcher knows the field to avoid setbacks.

3 THEORETICAL FRAMEWORK

3.1 CURRICULUM, CHALLENGES AND SCHOOL DROPOUT IN THE PEDAGOGY COURSE

The National Common Curricular Base – BNCC, Brazil (2018) defines that the curriculum is divided into two parts, the "common" being the disciplines that must be taught such as: languages and codes, human and natural sciences among others, and the "diversified" part that in what concerns it should objectify, develop and consolidate knowledge in a contextualized way involving social and productive practices aimed at the formation of active and participatory citizens. The BNCC is "a

national reference for the formulation of the curricula of the school systems and networks of the States, the Federal District and the Municipalities and the pedagogical proposals of the school institutions [...]" (BRAZIL, 2018, p. 6). Thus contributing to the orientation of policies related to teacher education.

Sacristán *et al* (2013) highlights that the curriculum is the selection that will determine the knowledge, skills, abilities and values to be taught and learned in the school institution.

> There are few elements, phenomena, activities and facts of the school reality that do not, have any implication in the curriculum and are not affected by it. Problems such as school failure, demotivation of students, the type of relationship between teacher and students, indiscipline in class, etc., are concerns and themes of content that undoubtedly relate to the curriculum offered to students and the way it is offered [...] (SACRISTÁN *et al*, 2013, p. 10).

According to this author, the curriculum is responsible for selecting and organizing the contents in cycle and coordinating the teaching practice, its elaboration process involves political, social and economic forces and 'praxis' of control and supervision of the educational system.

According to CNE/CP Opinion No. 5/2005, which provides for the National Curriculum Guidelines (DCN) for the Pedagogy Course, the curriculum in the Pedagogy course should provide the undergraduate with a set of studies essential to the formation of the future pedagogue.

> The curricular organization of the Pedagogy course will offer a core of basic studies, one of deepening and diversification of studies and another of integrative studies that provide, at the same time, breadth and institutional identity, related to the formation of the graduate. It will include, in addition to classes and individual and collective studies, pedagogical work practices, monitoring, curricular internship, research, extension, participation in events and other academic-scientific activities, which broaden the experiences of students and consolidate their training. (BRASÍLIA, 2005, p. 10)

Thus, this set of studies aims to expand the training of the undergraduate student through basic, in-depth and integrated contents pertinent to the Pedagogy course grid.

Masetto (2012) emphasizes that managers, in the flexibility of the curriculum, must take into account the reality of their students and the community in which the school is inserted. Emphasizing that "the teacher is not only responsible for following the curricular guidelines. He must also be attentive to the reality of his students, to the social environment in which they live, which calls him to serve to intervene in the curricular process itself" (MASETTO, 2012, p. 90). The teacher must have autonomy to adapt the school curriculum to the social reality of the students and the institution.

Queiroz (2004) points out that there are several factors that lead the student to evade from the school space, "several studies have pointed out social aspects considered determinants of school dropout, among them family breakdown, public policies and unemployment [...]" (QUEIROZ, 2004, Q. 1). Thus, the economic/social factor and a well-structured family are determinants for school success.

Arroyo *et al* (2014) clarifies that "school failure replaces forms of segregation and denial of the right of millions of students to paths worthy of formation, socialization, apprehension of cultural heritage and knowledge." (ARROYO *et al*, 2014, p. 10). Dessarte, school failure is a worrying phenomenon because it denies thousands of Brazilians the right to acquire cultural capital and an integral education.

For the authors Schargel and Smink (2001) the problem of school dropout occurs well before it actually happens. It begins in Basic Education due to some condition of vulnerability, making it necessary to address this subject even in the early years.

> There are those who see dropping out of school as an occurrence. Educators consider it the process. In general, the process begins in elementary school. Over time at school, an accumulation of negative experiences increases the likelihood of dissent on the part of students. Because some students are unable to physically drop out of school in first grade, the problem manifests itself initially in first or second grade. However, it is increasingly perceived that the needs of at-risk students can and should be addressed in elementary school (SCHARGEL; SMINK, 2001, p. 28).

According to the highlight of the authors, it is perceived that the problem of school dropout and school dropout begins in the basic grades and, for this reason, both the government and the school have the duty to create effective combat strategies.

Arroyo *et al* (2014) clarifies that the debate in the face of school failure is something very recent. And he cites the famous intelligence test created by Binet and Simon in 1905 in France. This test was often considered a tool of the elite, which aimed to hide the learning difficulties of the students of the Republican elementary school. This is the means that the elite found to circumvent the system and make the will of minority groups prevail. Thus, "many of those students who could not follow the teaching, for reasons that, nowadays, would be attributed to social factors, were labeled by the teachers as "retarded", with a request to refer them to "special" classes, that is, classes for the mentally disabled" (ARROYO *et al*, 2014, p. 19). Demonstrating that the ruling elite is not interested in the schooling of minorities, for this purpose mechanisms of exclusion and segregation of these young people are created.

Libâneo (2017) emphasizes that school dropout in the university is related to the basic formation of the student, who arrives at the university with serious problems in the course of his training, a classic example are the problems that young people have in the cultivation of the habit of reading and consequently in the interpretation and elaboration of texts.

Pereira (2016) clarifies that the aspects that focus on school dropout or retention are the most diverse, among this difficulty exposes the lack of training of education professionals in the training of new pedagogues, the way of dialoguing with students, the loss of socializing capacity, segregation by teachers and the impact of technological innovations, that can determine the school failure of several individuals.

3.2 PEDAGOGICAL PRACTICES IN THE PROCESS OF TEACHER EDUCATION AND CONTINUING EDUCATION

According to Demo (2013) the act of learning requires the passage through several levels of knowledge mediated by the teacher. It is the duty of the teacher to make the student reach the highest levels of learning, always proposing new challenges that aim to make the student develop all their potential by exploring new paths.

Libâneo (2017) highlights that the exercise of teaching is a manifestation of educational practice and requires from the teacher skills to make young people realize the interest and influence of various social, political, economic and cultural orders that directly interfere in the teaching-learning process.

Regarding teacher education, the Law of Guidelines and Base of National Education (LDB) Law No. 9,394/96, Brazil (1996) in its article 43 establishes that higher education has for one of its purposes:

> I- to stimulate cultural creation and the development of the scientific spirit and reflective thinking;
> III- to encourage the work of research and scientific investigation, aiming at the development of science and technology and the creation and diffusion of culture, and thus develop the understanding of man and the environment in which he lives [...] (BRAZIL, 1996, p. 32).

According to the above-mentioned law, the training of professionals for the exercise of teaching has the duty to train professionals capable of emancipating the subjects, encouraging research and stimulating them to teaching practice with autonomy, as well as conscious use of information and communication technologies (ICTs).

Vasconcelos (2014) emphasizes that the teaching profession lacks planning and contextualization, and this requires from the teacher skills such as: knowing how to research, integrate, create, recreate and reinvent. In the long run the results will facilitate the work of the educator, raising the efficiency and quality of the practices developed in the classroom.

Saviani (2021) highlights that educational practices become efficient and attractive to young people when there is a union between theory and practice.

> When we understand that the practice will be all the more coherent and consistent, it will be all the more qualitative, it will be all the more developed the more consistent and developed is the theory that underlies it, and that a practice will be transformed to the extent that there is a theoretical elaboration that justifies the need for its transformation and proposes the forms of transformation, We are thinking in practice from theory. But it is also necessary to make the reverse movement, that is, because if practice is the foundation of theory, its criterion of truth and its purpose, this means that the development of theory depends on practice (SAVIANI, 2021, p. 175 and 176).

According to the author's highlight, theory and practice are inseparable, because there is a relationship of dependence. Thus, the teacher has the duty to provide the student with a transformative learning, different from traditional practices where theories are valued to the detriment of practices.

Freire (1996) points out that "my discourse on theory should be the concrete, practical example of theory. His incarnation. When talking about the construction of knowledge, criticizing its extension, I must already be involved in it, and in it the construction, be involving the students" (FREIRE, 1996, p. 44). In this way, the student does not learn based on theoretical foundations is necessary concrete examples for the student to understand and build new knowledge.

According to Libâneo (2017) there are several essential attitudes that it is up to the teacher in exercise of teaching, such as valuing interdisciplinarity, which is the interaction of two or more disciplines, which allows the teacher the possibility of discussing various subjects within a given context. Teach the student to think, providing him with means for the construction of autonomous social knowledge. Stimulate students to the critical search for knowledge, where the intention is not the accumulation of knowledge, but rather to create favorable conditions so that the student can understand the reality around him and criticize it.

Gadotti (2003, p. 29) emphasizes that " the formation of the new teacher must have dialogue as a basis and aim at the reconstruction of the functions defining their roles by changing the education system, and an uninterrupted elaboration of the pedagogical political project [...]". According to the author, in initial training, the education system needs to define the role of each subject in the institution and the constant participation of all those involved in the execution of the pedagogical political project.

Ferreira *et al (2007)* point out that knowledge should be uninterrupted and corroborate with the transformation of education and its teaching ideal, "the practices of continuing education do not only contribute to transform the "knowledge in reference" of the sciences into "school knowledge", but also contribute to generate/consolidate/transform their own ideals into schooling" (FERREIRA et al, 2007, p. 24). The authors highlight that continuing education is not limited to the learning of pedagogical methods and the use of technological devices, but rather in the transformation of the mentality of teachers.

Gadotti (2003) highlights the relevance of continuing education and adds that, "the continuing education of the teacher should be conceived as reflection, research, action, discovery, organization, foundation, review and theoretical construction and not as mere learning of new technologies [...]" (GADOTTI, 2003, p. 31). Thus, the constant training of teachers contributes to their search for new horizons in order to improve their performance in educational practice.

Demo (2013) points out that teachers need a good training during the undergraduate course to be able to form citizens, ethical, researchers, questioners, creative and unsubmissive.

> In this sense, the broad validity of the instructional class clearly reveals that the training process was "deforming", producing "the malformed trainer". An antiquated view of knowledge is maintained, as if it were a stock of content to be transmitted by class. Deconstructing and reconstructing knowledge, typical dynamics of disruptive and innovative knowledge seem unknown challenges in figures who do not research and elaborate, do not produce their own knowledge, are not authors, nor reveal any degree of academic autonomy (DEMO, 2013, p. 59).

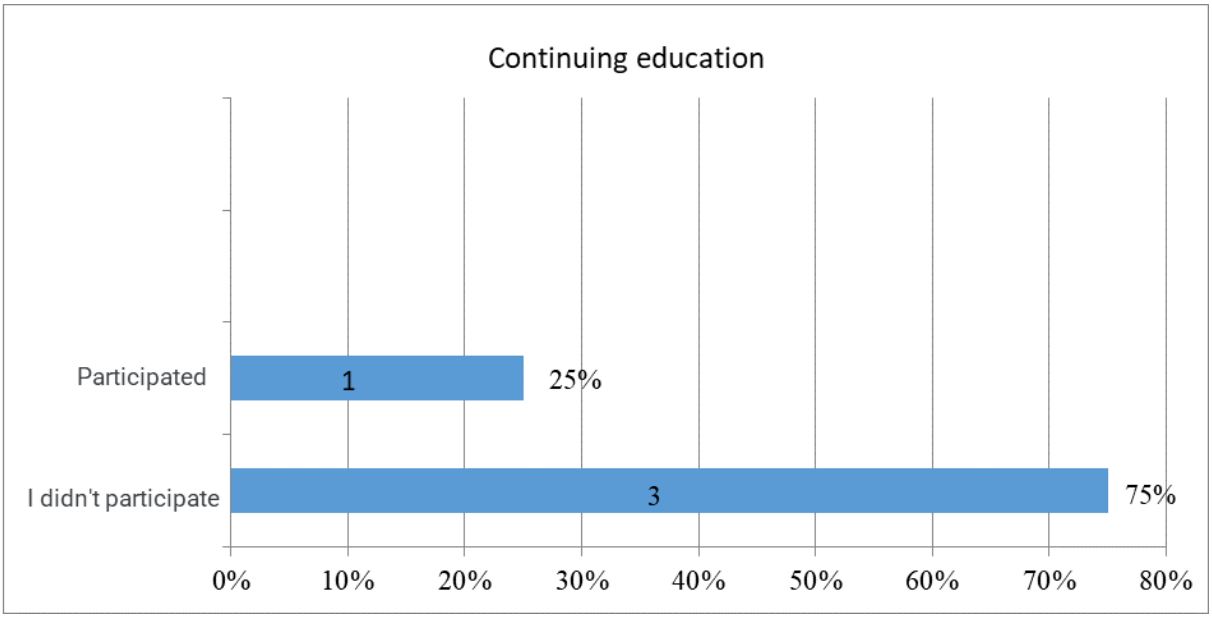
For the aforementioned author, a class where the teacher passes only instructions is worthy of those who never knew how to learn.

Libâneo (2013) emphasizes that contemporary society needs professionals prepared and with innovative proposals to meet the student of the twenty-first century. And he clarifies that, "however, new educational requirements ask universities for a new teacher capable of adjusting their didactics to the new realities of society, knowledge, the student, the media" (LIBÂNEO, 2013, p. 27). Thus, the teacher must be a connoisseur of different cultures, have the ability to "learn to learn", be competent and master the newest means of communication.

Demo (2013) shows that poorly trained teachers is still a reality in our country in undergraduate courses in Pedagogy, because they had an inadequate training focused on instructionalism and content transfer. And it points out that, "when they attended pedagogy or licensure, the current teachers were subjected to demeaning instructional contexts, without in-depth study and intensive reading, without research and own elaboration, that is, they did not learn to learn" (DEMO, 2013, p. 86). Thus, teacher training in most undergraduate courses in pedagogy is inefficient and traditional.

4 RESULTS AND DISCUSSION

CHART I



Source: authors 2022

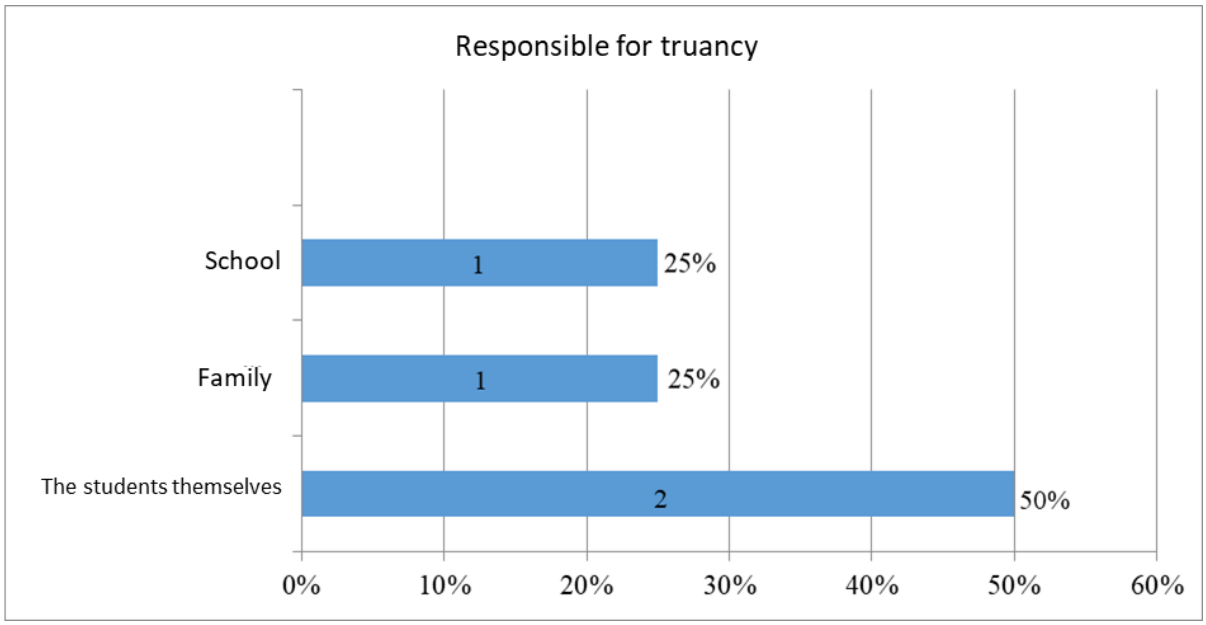
In this graph it is noticed that of the 04 teachers who participated in the research 3 who represent 75%, said they had not taken any training course in recent years and the other 25% who represent 1 teacher said they had participated in the continuing education course offered by the institution in 2019.

Gadotti (2003) explains that the continuing education of teachers consists of research, investigation, rediscovery, innovation and is not limited only to the domain of new pedagogical methods and neither in the use of new technological tools.

> Teaching, as a learning of the relationship, is linked to a special professional, a professional of meaning, in an era in which learning is living with uncertainty. Hence the need to reflect today on the new role of the teacher, the new demands of the teaching profession, especially the continuing education of the teacher, of the teacher". (GADOTTI, 2003, p. 22).

For this author, continuing education allows teachers the opportunity to reflect critically on their teaching practices, as well as the possibility of adapting them to the demand of students in the contemporary school.

CHART II



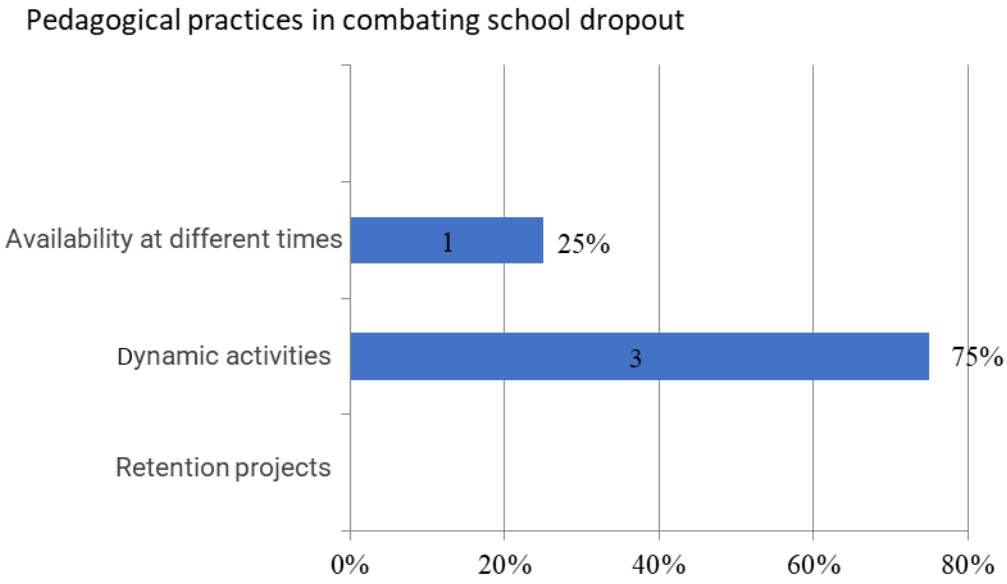
Source: authors 2022

In the aforementioned graph of the 4 teachers who answered 2 teachers who represent 50% pointed out that the fault of the evasion is of the students themselves, 25% that is equivalent to 1 teacher attributed the fault of the student evading the family and the other 25% who represent the other teacher attributed to the school the factor of the students evading.

According to Corrêa and Loureiro (2020) " evasion is the act of evading, fleeing, abandoning; go out, give up; not staying somewhere. When it comes to school dropout, it is understood that it is the escape or abandonment of school due to the performance of another activity" (CORRÊA; LOUREIRO,

2020, p. 142). Thus, the student considered evaded, is the one who no longer remains in the institution. And school dropout occurs when the student leaves the institution and returns for some reason.

CHART III



Source: authors 2022

In graph III, it was observed that none of the teachers who responded, there were proposals or intervention project to combat school dropout. Of the 04 professors who answered the questionnaire, 75% who are equivalent to 3 professors said that the solution is to propose dynamic activities and the other 25% that represents 1 professor revealed to be available at the most diverse times in order to solve any type of doubt that could arise.

Schargel and Smink (2001) point out that the problem of truancy is a systemic problem and that it can only be effectively addressed through a systemic approach. For these authors "we must examine with lucidity everything we do in schools" (SCHARGEL; SMINK, 2001, p. 29). For the authors, it is not enough to keep students in school so that they can complete their studies, it is necessary to prepare them to have a full and productive life.

5 FINAL CONSIDERATIONS

After carrying out this research it can be highlighted that the teachers of the institution urgently need continuing education, adaptation to new technologies, recycling and a rethinking about their pedagogical practices. For they are outdated and do not benefit the integral development of the future pedagogue, nor will it transform society as is the purpose of education. One of the many difficulties observed during the research was the lack of strategies to combat truancy by both the school and the government.

The challenges faced by future pedagogues are the most varied, making it necessary to take a close look at this recurring phenomenon in the Pedagogy course. It is worth mentioning the lack of scientific pedagogical support, innovative methodologies that arouse curiosity in the student and make him remain in the university not only for the purpose of obtaining a degree, but to take the teachings to life.

It should be noted that among the many unprepared and outdated professionals, there are in the institution professors committed to public service, motivators, who update themselves, who plan their classes and make them an exchange of experiences that awaken in students the curiosity that they bring with them into the university, who are really concerned with the formation of the future pedagogue and the destiny of the nation, taking seriously the exercise of teaching, embracing the philosophy of formation and lifelong learning.

The data obtained from this research point to the need to improve in pedagogical, political, social and economic terms so that in fact the legislation is fulfilled and a quality education can be offered to all. It is not enough for the university to increase the number of enrollments if it does not offer minimum conditions for the student to stay and learn. School dropout is a current theme in Brazil and still little discussed in academia. Therefore, the school community should be attentive and concerned with this phenomenon trivialized by society, teachers, the public power and the institution in general.

Thus, this research confirms the problem and the high rate of dropout and retention of existing students in the institution and will contribute to a greater attention on the part of academics and subsequent studies related to the subject.

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SEVEN
publicações acadêmicas

Comparison between brazilian education and that of countries with good results in the PISA exam: A study based on TALIS

https://doi.org/10.56238/ptoketheeducati-069

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ABSTRACT
Brazil has obtained poor results in basic education compared to other countries, especially developed ones. One of the most important actors in the education process are the teachers. The Teaching and learning international survey (TALIS), coordinated by the Organization for Economic Cooperation and Development (OECD), provides relevant information about the learning environment and working conditions of basic education professionals. This article proposes a study on TALIS, comparing Brazilian basic education with that of well-ranked countries in the examination of the Program for International Student Assessment (PISA) and verifying how adjusted Brazilian basic education is to the best international practices. The Apriori algorithm was used to mine the rules of association, allowing the investigation of which factors are associated with the improvement of education in high school institutions in the perception of the teaching public.

Keywords: TALIS, PISA, Data Mining, Education, Machine, Learning.

1 INTRODUCTION

The National Institute of Educational Studies and Research Anísio Teixeira (INEP), a Brazilian government institution, makes available on its portal several types of microdata that are collected in research, evaluations and examinations, which can involve both basic and higher education. The TALIS (Teaching and Learning International Survey) encompasses one of these microdata and consists of "an international survey coordinated by the Organization for Economic Cooperation and Development (OECD) focusing on the learning environment and working conditions of basic education professionals" [2].

The most recent TALIS data released on the INEP portal refer to the international report of the year 2018, having as target audience of the research directors and teachers of elementary and secondary education (Brasil, 2020). The microdata bring information, such as: qualification of those involved in

the research, working conditions, professional development, teaching offered, aspects related to student diversity, school climate and job satisfaction, school leadership, etc.

Among the different stages of an individual's educational formation, from literacy to graduate school, there is no doubt that basic education is of great relevance for the intellectual development of the student, providing the development of skills that will allow their rapid insertion in the labor market or underpinning the verticalization of their studies. In a broader context, basic level education is fundamental for the development of a country, because if it is deficient, undergraduate and graduate programs will also be harmed, leading to a gap in technical and scientific labor.

The purpose of this article is to conduct a study of the microdata of TALIS in its most recent publication (until the date of submission of this article, the most recent publication corresponds to the year 2018), evaluating the aspects related to quality teaching in Brazilian education and comparing them with countries well ranked in the examination of the Program for International Student Assessment (PISA). The study will be conducted using data from Brazil, Canada, Sweden and Chinese Taipei. It seeks to answer the following questions: What are the educational practices adopted in countries that are reference in the PISA exam? Are schools with better performance in Brazilian basic education in compliance with the educational practices adopted in countries with good PISA exam scores? To conduct this study will be used data mining techniques through the *Apriori algorithm*.

The general objective of this work is to identify the best international practices adopted by teachers of basic education and to verify how adequate Brazilian education is to this reality. Based on the results obtained in the research involving Brazilian educational institutions in comparison with foreign institutions from 3 countries well ranked in the PISA exam, some measures are proposed in order to improve Brazilian basic education at the secondary level.

This article is organized as follows: Theoretical foundation section; Methodology section used in the research; Section of Studies carried out; Conclusions section where the definitions obtained throughout the study are displayed.

2 THEORETICAL FOUNDATION

This Section is divided into two subsections: the PISA subsection discusses the PISA exam and its relevance as an indicator of quality in the context of basic education; The TALIS subsection discusses the structure of the TALIS questionnaire and the studies related to the topic. Next, the Association Rules Mining subsection introduces the technique of mining association rule data via the *Apriori algorithm*.

3 PISA

The Programme for International Student Assessment (PISA) is a study conducted by the OECD with adolescents aged 15 years that makes it possible to measure the performance of students in several countries in three domains of knowledge: Mathematics, Science and Reading. [16]

In Brazil, since 2000 when it was the first edition of PISA, the body responsible for directing this study is INEP. Since then the country has always participated as a guest, being considered a potential member country by the organization [16].

In general, Brazil obtained in this exam scores below the average of the OECD member countries, but, since the PISA result was considered a reference in the guidance of policies in the area of education, in the 2012 edition "Brazil had the third largest evolution in the overall performance of the program until 2009" [16], being the country with the greatest absolute advance in proficiency in mathematics taking into account previous editions. Since then the country has remained stagnant with the grades without showing a great evolution [16].

PISA exam results are divided into levels ranging from 1 (worst performance) to 6 (best performance). In the last result released for this exam (2018), Brazil had only 2% of students in the reading category reaching the maximum level predicted by the OECD, while 50% of students reached at least level 2 of reading proficiency (OECD average for this same classification range was 77%). In mathematics the result was even worse: only 1% of the students had the best performance (levels between 5 and 6). For comparison, China had 44% of its students reach the highest performing levels in mathematics. Chinese Taipei, the country covered in this study (as will be highlighted in the Section of Studies Carried Out), had 23% of students reaching the highest levels of performance in mathematics. In the area of Science, 45% of the Brazilian students assessed reached level 2 or higher (against an OECD average of 78%), while only 1% of students performed better (against an OECD average of 7%).

However, Brazilian schools in the private and federal spheres exceed the national average and are above the OECD average [10]. In a study done and made available by the MEC portal related to the Program for International Student Assessment (PISA) involving 597 schools (MEC, 2019), the proficiency of education in Brazil in Reading, Mathematics and Science was verified. Despite the increase in investments made by the Brazilian government in public schools, private schools came out ahead in the 3 categories measured: Reading - score of 510, while OECD member countries had 487 average and national average was 413; Mathematics – score of 473 while OECD member countries averaged 489 and the national average was 384; Science – score of 495 while OECD member countries averaged 489 and the national average was 404 [10]. Due to the satisfactory results in PISA, Brazilian private schools were selected to be studied in order to understand which factors are associated with the

improvement of the quality of education in the perception of the teachers of this institution. Details about this study can be found in the Studies Conducted Section.

4 TALIS

TALIS, as already described in the Introduction Section, collects data on the educational environment and working conditions in elementary and secondary schools, consisting of two questionnaires that are applied together with the PISA exam: one for the teacher and the other for the director [5]. Evaluations of this type, made on a large scale, make clear the precarious situation of many schools, especially those of the public network, with performance of their students below the expected [5].

TALIS investigated 48 countries during the years 2017 and 2018 evaluating the teaching and learning environment in elementary and secondary schools, verifying the perception of teachers and principals [3]. In 2009 there was the first round of the TALIS survey, with 24 countries participating, including Brazil [3]. In 2014 there was a second round, with 34 countries where Brazil again participated [3]. In its third round (most recent research conducted in the years 2017 and 2018) TALIS addresses new aspects, such as the theme of teaching in environments with diversity [3].

Some perceptions about education in Brazil were revealed by the national report of the international survey on teaching and learning - Talis 2018 (Brasil, 2019), such as:

- 97% of Brazilian teachers in the final years of elementary school stated that they are prepared to teach the content of some or all of the subjects included in their initial or complementary training, and the same perception was verified among 97% of high school teachers;
- According to elementary school teachers, the sectors that require the most investment in education are: high-quality professional development for teachers (95%), salary increase (93%) and support for students with special needs (88%). When high school teachers were questioned on the same subject, the following percentages were reached: high-quality professional development for teachers (93%), salary increase (93%) and support for students with special needs (83%).

The following table presents a compilation of some authors who studied the TALIS data and the respective techniques employed in the study.

Table 1. TALIS Studies

Author	What you studied	Techniques used
Batista (2015)	It analyzed the styles of school leadership in basic education in Brazil and Spain according to the TALIS survey, verifying that in Brazil, the instructional school leadership style has predominated and, in Spain, the administrative school leadership style	Analysis of the TALIS report (year 2009)
Brasil (2019)	It describes the application of the TALIS survey by INEP in Brazil and brings analyses to the sample of Brazilian teachers and directors used in the research.	Descriptive statistics
Capistrano e Cirotto, (2014)	It analyzed the degree of job satisfaction reported by Brazilian elementary school teachers	Descriptive statistics
Corradini (2012)	It analyzed possible justifications for the results verified in PISA (Program for International Student Assessment) and in the TALIS survey, considering the configuration of well-evaluated schools and their institutional practices	Interviews, questionnaires, survey of PISA and TALIS results using descriptive statistics
Trojan e Landini (2013)	It evaluated some aspects related to the working conditions offered by schools to teachers in Brazil and Spain.	Analysis of the TALIS report (year 2009)
Trojan e Sipraki (2015)	It analyzed the use of the Likert Scale in the TALIS survey. Problems were identified in the formulation of the applied questions and in the analyses present in the report, which hinder the evaluation of the themes investigated in the TALIS research.	Likert Scale
Zukowski-Tavares,	It discussed the profile of the basic education teacher of a	Descriptive and inferential statistics

Fernandes e Luz (2017)	confessional teaching network in interface with national and international reports, concluding that the joint accountability of educational results is essential in the continuous commitment to the construction of plural and citizen curricula together with the support for the professionalization and valorization of the teaching career.	

It is noteworthy that Table 1 presented does not exhaust the theme related to the study of TALIS. It should also be noted that, until the date of submission of this article, no studies were found with the microdata of TALIS of 2018 (the most recent published) that discussed the Brazilian reality. For the 2018 TALIS, only studies mentioning foreign countries were located. These studies were omitted from this article.

5 MEMBERSHIP RULES MINING

The *Apriori* algorithm will be used in this work to mine the association rules. It seeks to discover important associations between the factors that lead to better or worse education in Brazil regarding the data present in the questionnaire completed by the teachers.

According to Romão et al. [12] "One of the most attractive techniques is the Mining of Association Rules, which has as a highlight the *Apriori* algorithm. It can work with a large number of attributes, generating several combinatorial alternatives between them."

According to Hoed [8], the mining of association rules has many commercial applications, for example, in supermarkets, when one can analyze, from a database, the correlation between the sale of different products. The discovery of rules of association of this type can help in decisions such as: To arrange the goods in the best way in the supermarket, strategically placing the correlated products next to each other. "The goal, then, is to find all the relevant rules of association between the items, of type X(antecedent) ⇒ Y(consequential)" [12]. According to Hoed [8], association rule mining is not only useful in business transaction contexts, but can be employed in other cases such as large educational databases. With regard to the problem studied in this article, it will be verified, in the Section of Studies Carried out, the factors related to the improvement of education in high schools, according to the perception of teachers of this modality.

The discovery of association rules can be broken down into two steps, according to Agrawal [12]: locate the sets of items (itemsets) that are supported above the defined minimum; Use the itemsets

obtained in step 1 to generate the database membership rules. Some important definitions about association rule mining: "To every association rule A → B we associate a degree of confidence, determined by conf (A → B)" [6]. The degree of confidence would be the probability that a transaction that has one item also contains the other item. The following Equation 1 formalizes this definition [6]:

$$conf(A \rightarrow B) = \frac{number\ of\ transactions\ that\ support\ (A \cup B)}{number\ of\ transactions\ that\ support\ A} \quad (1)$$

According to Ribeiro [11], to find rules considered strong, in addition to support and trust, the lift measure is also used, which is defined by Equation 2:

$$lift(A,B) = \frac{P(A \cup B)}{P(A)P(B)} \quad (2)$$

Also according to Ribeiro [11], "The occurrence of an item A is independent of an item B if P(A U B) = P(A)P(B). If not, there is a correlation between the items." Thus, if the value of Equation 2 is less than 1, then the occurrence of A correlates negatively with the occurrence of B. If the result is greater than 1, A and B correlate positively, evidencing that the occurrence of A implies the occurrence of B. As will be detailed in the Methodology Section, within the scope of this study, Only the rules obtained whose *lift* is greater than 3, indicating a positive correlation between the right and left part of the rule, will be considered as valid.

The execution phases of the *Apriori algorithm* comprise generation, pruning and validation [6]. Briefly, without going into too much detail, in the generation phase the itemsets that have some chance of being frequent are generated. In the pruning phase, the itemsets are discarded without chances of being frequent and in the last phase the support of each of the itemsets of the set is calculated [6]. The operation of the *Apriori* algorithm is described as follows:

> In the first passage, the support for each individual item (sets-of-1-item) is counted and all those that satisfy the suporte_mínimo are selected, constituting the frequent sets-of-1-item (F1).
> In the second iteration, candidate sets-of-2-items are generated by joining the 1-item sets (the joining is done through the *Apriori-gen* function) and their supports are determined by searching the database, thus finding the frequent 2-item sets. The *Apriori* algorithm proceeds iteratively, until the set-of-k-items found is an empty set. [7].

6 METHODOLOGY

In this work we used the technique of mining rules of association through the *Apriori* algorithm and used the methodology of data mining Cross Industry Standard Process for Data Mining (CRISP-

DM) which comprises the following steps: business understanding, data understanding, data preparation, modeling (application of data mining techniques), evaluation of results and development.

In the stage of understanding the business, studies were made to understand the objectives of the research as described in the Introduction Section of this work.

In the stage of understanding the data, the analysis of the TALIS microdata applied to Brazil available on the INEP Portal (https://dados.gov.br/dataset/inep-microdados-da-pesq-inter-ensino-e-aprendizagem-talis) was made, being verified which categories and variables are important for the study with the use of the Microsoft Excel spreadsheet software. The same procedure was conducted for the countries chosen in this research: Canada, Sweden and Chinese Taipei. Talis microdata for these countries can be found on the OECD portal [21]. Canada, Sweden and Chinese Taipei are, respectively, in the following PISA exam placements in the Reading category: Canada – 6th, Sweden – 11th, Chinese Taipei – 17th; Mathematics: Canada - 11th, Sweden - 16th, Chinese Taipei - 4th; Sciences: Canada - 8th, Sweden - 19th, Chinese Taipei - 10th. The reason that countries that are not in the top 3 places of PISA were chosen to integrate this study, is due to the fact that the TALIS microdata studied correspond to high school, and, as explained in the PISA subsection of this article, this exam is not mandatory at the secondary level and therefore was not conducted for this modality of basic education in all countries, but only in a few.

It is worth mentioning that the microdata are arranged and divided into eight different categories and for this study the following categories were used: Basic information and qualification; Current work; Professional development; Teaching in general; School climate and job satisfaction and derived variables/scale variables. Excel was used in this step, because most of the data analyzed are in Comma Separated Values (CSV) format. The microdata corresponding to the year 2018 were used. In the case of Brazil, the study was conducted by filtering the schools of the private sphere, because the intention is to verify the factors related to quality education and these institutions are the best ranked in PISA as mentioned in the subsection "PISA" of this article. Several variables were considered in this study using the microdata of the general and specific questions applied to Brazilian, Canadian, Swedish and Chinese high school teachers, such as:

- TT3G03: Highest level of formal education completed
- TT3G11B: Years of experience working as a teacher
- TCHAGEGR: Age group
- TT3G53J: Job satisfaction level
- TT3G54A: Level of satisfaction with salary
- TT3G62D_BRAX23: Opinion about education in school whether it is improving or not (this variable is present only in TALIS corresponding to Brazil)

- Among other 20 variables of the questionnaire that involve factors such as professional development, school climate, teaching in general, etc.

During data preparation, the databases were cleaned by removing variables that are not important for the study. The Excel software was used in this process. Some variables were discretized to facilitate data analysis: TT3G11B, TCHAGEGR.

In the discretization of the variable about the years of experience, the mathematical quartiles were used to classify the values. The variable TT3G11B was discretized as follows: between 0 and 9 years of experience: classified as little experience (below the first quartile); Between 9 and 15 years of experience: classified as below average experience (between the first and second quartiles); Between 15 and 22 years of experience: classified as average (between the second and third quartile); Over 22 years: classified as experienced (above the third quartile). The TCHAGEGR variable that defines the age range of teachers was based on the classification used by the United Nations Demographic Yearbook review [9]. Enrollees aged between 15 and 25 years are considered young, between 25 and 59 years are considered adults and those aged 60 years or more are considered elderly.

During the modeling phase, the Apriori *algorithm was used* to verify which variables are associated with higher quality high school education in Brazil, Canada, Sweden and Chinese Taipei, according to the perception of teachers working in this modality. In this step, the software R version 4.2.1 was used.

The rules were filtered considering the following parameters:

- Minimum confidence of 85%
- Minimum support of 0.01
- *Lift* equal to or greater than 3.

In relation to Brazil, rules that do not present the variable TT3G62D_BRAX23 were removed from the study, because it is intended to locate rules associated with the improvement of education in institutions in the perception of teachers, which is precisely what this variable signals. In relation to the other countries, the rules were ranked according to the filters mentioned in the previous paragraph.

During the evaluation phase, the results generated by the *Apriori* algorithm were discussed and analyzed, which will be detailed in the Studies Section of this article.

During the development phase, actions to improve teaching in Brazilian schools are discussed, taking into account the results obtained in the previous phase and comparing the rules found for the countries selected for the study, as will be detailed in the Conclusions Section.

7 STUDIES

The following tables demonstrate the outputs of the R software when applying the *Apriori* algorithm. The rules presented are only a portion of those that were generated by the algorithm. The

10 rules displayed comprise those with the highest value for the *lift* parameter among Brazilian private schools where teachers agree that teaching is improving and for other countries comprises all high schools. As mentioned in the Methodology Section of this article, the choice to work with rules on private schools is due to the fact that they stand out in the last published result of PISA (2018), being close to the OECD average. With this, it is intended to identify factors that favor the good performance of these schools and enable the comparison with the countries studied well ranked in PISA. Here are the meanings of each of the variables used: TT3G62D_BRAX23 = "Overall, I believe that education in my school is improving"; TT3G06C1 = "Have the following components been included in your initial or complementary training? Pedagogy (didactics) in general"; TT3G08 = "Was teaching the first career choice?"; TT3G11B: "Years of experience working as a teacher"; TT3G22D = "Participation in qualification program in the last 12 months"; TT3G23E = "Have any of the following topics listed below been included in your professional development activities during the last 12 months? ICT (Information and Communication Technology) skills for teaching"; TT3G27A = ""; TT3G06H1 = "Have the following components been included in your initial or complementary training? Use of ICT (Information and Communication Technology) for teaching"; TT3G24H = "With respect to the professional development you have participated in in the last 12 months, have you received any of the following supports? Increase in salary"; TT3G27E = "For each of the areas listed below, please indicate to what extent you currently need professional development. ICT (Information and Communication Technology) skills for teaching"; TT3G32A = "Teachers in this school seek to develop new ideas for teaching and learning"; TT3G54A: "Salary satisfaction level"; TT3G53J = "We would like to know how you feel, in general, about your work. To what extent do you agree or disagree with the following statements? Overall, I'm satisfied with my work." TT3G49A = "To what extent do you agree or disagree with the following statements about what happens in this school? Teachers and students generally get along with each other." TT3G03 = "Highest level of formal education completed"; TT3G06C2 = "To what extent do you feel prepared for each component of your teaching? Pedagogy (didactics) in general"; TT3G06H2 = "To what extent do you feel prepared for each component of your teaching? Use of ICT (Information and Communication Technology) for teaching"; TT3G34M = "With respect to your teaching, to what extent are you able to do the following? Support student learning through the use of digital technologies (e.g., computers, tablets, interactive whiteboards)"; TT3G34L = "With respect to your teaching, to what extent are you able to do the following? Vary teaching strategies in my class"; TCHAGEGR = "Age group".

Regarding the columns of the tables, the meaning of each of them follows: **N** – Number of the rule generated on the scale of 1 to 10; **Left item** – Left side with the rule generated by the algorithm; **Right item** – Right side with the rule generated by the algorithm; **Sup** – Support of the generated rule. **Con – Trust of the generated rule and** L **–** Lift *of the generated rule.*

Table 2. Rules of association obtained for schools in Brazil

N	Left Item	Right Item	Sup	Con	*L*
1	{TT3G62D_BRAX23=FOUR}	{TT3G06C1=UM}	0,7	0,91	9,8
2	{TT3G08=UM, TT3G23E=UM}	{TT3G62D_BRAX23=FOUR}	0,25	0,89	3,56
3	{TT3G06H1=UM,TT3G24H=TWO,TT3G27E=TRES}	{TT3G62D_BRAX23=FOUR}	0,25	0,89	3,56
4	{TT3G53J=FOUR}	{TT3G62D_BRAX23=FOUR}	0,2	0,89	3,5
5	{TT3G06C1=UM,TT3G06H1=UM, TT3G27E=THREE,TT3G49A=THREE}	{TT3G62D_BRAX23=FOUR}	0,19	0,91	4,7
6	{TT3G03=FIVE,TT3G06C1=UM, TT3G23E=UM,TT3G27E=TRES}	{TT3G62D_BRAX23=FOUR}	0,15	0,89	5,9
7	{TT3G06C2=TRES,TT3G06H1=UM, TT3G06H2=TRES,TT3G49A=TRES}	{TT3G62D_BRAX23=FOUR}	0,15	0,89	5,9
8	{TT3G34M=TRES,TT3G49A=TRES ,TT3G53J=TRES}	{TT3G62D_BRAX23=FOUR}	0,14	0,88	6,2
9	{TT3G27A=THREE,TT3G34L=THREE, TCHAGEGR=ADULT}	{TT3G62D_BRAX23=FOUR}	0,14	0,88	6,2
10	{TT3G27A=TRES,TT3G34L=TRES, TT3G53J=TRES }	{TT3G62D_BRAX23=FOUR}	0,15	0,88	5,8

It is important to note that all the rules contain the variable TT3G62D_BRAX23 with a value of four, which refers to teachers who agree that education in the school in which they teach is improving. Therefore, the variables in each rule found that are associated with this opinion will be presented below. For better understanding, the following are the comments of the rules obtained: **Rule 1** – 91% of teachers had pedagogy inserted in their training; **Rule 2** – 89% of teachers had teaching as their first career option and studied Information and Communication Technology (ICT) resources in the last 12 months; Rule 3 – 89% of teachers had ICT in training, had no salary increase in the last 12

months and feel moderate need to improve with ICT; **Rule 4** – 89% of teachers are totally satisfied with their work; **Rule 5** – 91% of teachers have had pedagogy and ICT inserted in their training, feel moderate need to improve the use of ICT and teachers and students get along; **Rule 6** – 89% of teachers have as their level of training the graduation, had pedagogy inserted in the training, studied ICT in the last 12 months and feel moderate need to improve with ICT; **Rule 7** – 89% of teachers feel well prepared to deal with pedagogy in general, have had ICT in training, feel well prepared to use ICT and claim that teachers and students get along; **Rule 8** – 88% of teachers are very supportive of their students using technological methods, claim that teachers and students do well and are satisfied with the work; **Rule 9** – 88% of teachers seek to vary the teaching greatly during class, feel moderate need to improve their knowledge in their area of teaching and are adults (age between 25 and 59 years); **Rule 10** – 88% of teachers seek to vary the teaching greatly during class, feel moderate need to improve their knowledge in their area of teaching and are satisfied with the work.

Table 3. Membership rules obtained for schools in Canada

N	Left Item	Right Item	Sup	Con	*L*
1	{TT3G06C1=UM, TT3G23E=TWO,TT3G24H=TWO}	{TT3G22D=TWO}	0,37	0,94	3
2	{TT3G06C1=UM, TT3G24H=TWO,TT3G34M=FOUR}	{TCHAGEGR=ADULT}	0,37	0,94	3
3	{TT3G06C1=UM, TT3G06H1=UM,TT3G08=UM,TT3G22D=TWO,TCHAGEGR=ADULT}	{TT3G24H=TWO}	0,39	0,98	3
4	{TT3G06C1=UM, TT3G06H1=UM,TT3G08=UM,TT3G22D=TWO,TCHAGEGR=ADULT}	{TT3G03=FIVE}	0,34	0,86	3
5	{TT3G03=FIVE,TT3G06C2=TRES,TT3G24H=TWO}	{TT3G22D=TWO}	0,37	0,93	3
6	{TT3G23E=TWO, TCHAGEGR=ADULT}	{TT3G22D=TWO}	0,37	0,94	3
7	{TT3G06C1=UM, TT3G24H=TWO,TT3G34L=TRES}	{TT3G22D=TWO}	0,37	0,94	3
8	{TT3G06H1=UM, TT3G08=UM,TT3G22D=TWO,TT3G24H=TWO,TCHAGEGR=ADULT}	{TT3G03=FIVE}	0,33	0,85	3
9	{TT3G06H1=UM, TT3G24H=TWO,TT3G53J=TRES,TCHAGEGR=ADULT}	{TT3G06C1=UM}	0,39	0,99	3
10	{TT3G03=FIVE,TT3G06C1=UM,TT	{TT3G22D=TWO}	0,36	0,93	3

	3G06C2=TRES,TT 3G24H=TWO}				

Here are the comments for the rules obtained in Table 3: **Rule 1** – 94% of the teachers who had didactic pedagogy in general in the training process, did not seek professional development during the last 12 months in relation to ICT, did not have a salary increase, also did not participate in any qualification program in the last 12 months; **Rule 2** – 94% of teachers who had didactic pedagogy in general in the training process, did not have a salary increase, are very supportive of student learning through technological means, are also adults; Rule 3 – 98% of teachers who had didactic pedagogy in general in the training process, had use of ICT in the training process, teaching was the first career option, did not participate in any qualification program in the last 12 months, are adults, also had no salary increase; **Rule 4** – 86% of teachers who had didactic pedagogy in general in the training process, had use of ICT in the training process, teaching was the first career option, did not participate in any qualification program in the last 12 months, are adults, also completed Higher Education; **Rule 5** - 93% of teachers who have completed Higher Education, feel well prepared to deal with pedagogy, had no salary increase, also did not participate in any qualification program in the last 12 months; **Rule 6** – 94% of teachers who have not sought professional development during the last 12 months in relation to ICT and who are adults, also did not participate in any qualification program in the last 12 months; **Rule 7** – 94% of teachers who had didactic pedagogy in general in the training process, did not have a salary increase and who seek to vary their teaching strategies greatly, also did not participate in any qualification program in the last 12 months; **Rule 8** – 85% of teachers who had use of ICT in the training process, in which teaching was the first career option, did not participate in any qualification program in the last 12 months, had no salary increase and who are adults, also completed Higher Education; **Rule 9** – 99% of teachers who had use of ICT in the training process, had no salary increase, are satisfied with the work and who are adults, also had didactic pedagogy in general in the training process; **Rule 10** – 93% of teachers who completed Higher Education, had didactic pedagogy in general in the training process, feel well prepared to deal with pedagogy, had no salary increase, also did not participate in any qualification program in the last 12 months.

Table 4. Rules of association obtained for schools in Sweden

N	Left Item	Right Item	Sup	Con	*L*
1	{TT3G03=SIX,TT3G08=UM}	{TT3G22D=TWO}	0,39	0,98	3
2	{TT3G03=SIX,TT3G08=UM}	{TT3G24H=TWO}	0,37	0,95	3
3	{TT3G03=SIX,TT3G08=UM}	{TT3G06C1=UM}	0,39	0,99	3
4	{TT3G03=SIX,TT3G08=UM,TCHAGEGR=ADULT}	{TT3G24H=TWO}	0,37	0,95	3
5	{TT3G03=SIX,TT3G08=UM,TCHAGEGR=ADULT}	{TT3G06C1=UM}	0,39	0,99	3
6	{TT3G03=SIX,TT3G23E=UM}	{TT3G06C1=UM}	0,39	0,98	3
7	{TT3G06H1=UM,TT3G24H=TWO,TCHAGEGR=ADULT}	{TT3G06C1=UM}	0,38	0,96	3
8	{TT3G03=SIX,TT3G23E=UM}	{TT3G22D=TWO}	0,39	0,98	3
9	{TT3G03=SIX,TT3G08=UM,TCHAGEGR=ADULT}	{TT3G22D=TWO}	0,39	0,98	3
10	{TT3G03=SIX,TT3G23E=UM,TCHAGEGR=ADULT}	{TT3G22D=TWO}	0,39	0,98	3

Here are the comments for the rules obtained in Table 4: **Rule 1** – 98% of the professors who are in the doctoral process and teaching was the first career option also did not participate in any qualification program in the last 12 months; **Rule 2** - 95% of the professors who are in the doctoral process and teaching was the first career option, also had no salary increase; **Rule 3** - 99% of the professors who are in the doctoral process and teaching was the first career option, also had didactic pedagogy in general in the training process; **Rule 4** - 95% of teachers who are in the doctoral process, teaching was the first career option and are adults, also had didactic pedagogy in general in the training process; **Rule 5** - 99% of the professors who are in the doctoral process, teaching was the first career option and are Adults, also had didactic pedagogy in general in the training process; **Rule 6** - 96% of the teachers who had use of ICT in the training process, who did not have a salary increase and who are adults, also had didactic pedagogy in general in the training process; **Rule 7** - 98% of professors who are in the doctoral process and sought professional development during the last 12 months in relation to ICT, also did not participate in any qualification program in the last 12 months; **Rule 8** - 98% of professors who are in the doctoral process and who have sought professional development during the last 12 months in relation to ICT, also did not participate in any qualification program in the last 12 months; **Rule 9** - 98% of teachers who are in the doctoral process, teaching was the first career

option and who are adults, also did not participate in any qualification program in the last 12 months; **Rule 10** - 98% of professors who are in the doctoral process, have not had a salary increase and who are adults, also did not participate in any qualification program in the last 12 months.

Table 5. Rules of Association obtained for Chinese Taipei schools

N	Left Item	Right Item	Sup	Con	*L*
1	{TT3G03=SIX,TT3G06H1=UM}	{TT3G06C1=UM}	0,39	0,97	3
2	{TT3G03=SIX,TT3G06H1=UM}	{TCHAGEGR=ADULT}	0,39	0,98	3
3	{TT3G22D=TWO,TT3G24H=TWO,TT3G32A=TRES,TT3G49A=TRES}	{TT3G06C1=UM}	0,38	0,96	3
4	{TT3G22D=TWO,TT3G24H=TWO,TT3G32A=TRES,TT3G49A=TRES}	{TCHAGEGR=ADULT}	0,38	0,95	3
5	{TT3G06C2=TRES,TT3G22D=TWO,TT3G24H=TWO,TCHAGEGR=ADULT}	{TT3G06C1=UM}	0,39	0,98	3
6	{TT3G06C1=UM,TT3G24H=DOIS,TT3G49A=THREE,TT3G53J=THREE,TT3G54A=THREE}	{TT3G22D=TWO}	0,34	0,85	3
7	{TT3G08=UM,TT3G24H=DOIS,TT3G32A=THREE,TT3G49A=THREE}	{TCHAGEGR=ADULT}	0,38	0,96	3
8	{TT3G08=UM,TT3G24H=DOIS,TT3G32A=THREE,TT3G49A=THREE}	{TT3G06C1=UM}	0,38	0,97	3
9	{TT3G06C1=UM,TT3G06H1=UM,TT3G24H=TWO,TT3G49A=TRES}	{TCHAGEGR=ADULT}	0,38	0,97	3
10	{TT3G06C1=UM,TT3G06C2=THREE,T	{TCHAGEGR=ADULT}	0,38	0,95	3

	T3G24H=DOIS,TT3G49A=THREE}				

Here are the comments for the rules obtained in Table 5: **Rule 1** - 97% of the teachers who are in the doctoral process and who had use of ICT in the training process, also had didactic pedagogy in general in the training process; **Rule 2** - 98% of the professors who are in the doctoral process and who had use of ICT in the training process, are also Adults; **Rule 3** - 96% of teachers who did not participate in any qualification program in the last 12 months, who did not have a salary increase, who stated that most teachers in this school seek to develop new ideas for teaching and learning, who stated that teachers and students get along, also had didactic pedagogy in general in the training process; **Rule 4** - 95% of teachers who have not participated in any qualification program in the last 12 months, who have not had a salary increase, who stated that most teachers in this school seek to develop new ideas for teaching and learning, who stated that teachers and students get along, are also adults; **Rule 5** - 98% of teachers who feel well prepared to deal with pedagogy, did not participate in any qualification program in the last 12 months, had no salary increase and who are adults, also had didactic pedagogy in general in the training process; **Rule 6** - 85% of the teachers who had didactic pedagogy in general in the training process, who stated that teachers and students do well, who are satisfied with the work and satisfied with the salary, also did not participate in any qualification program in the last 12 months; **Rule 7** - 96% of teachers who had teaching as their first career option, who stated that teachers and students get along, who stated that most teachers in this school seek to develop new ideas for teaching and learning and who are satisfied with the work, are also Adults; **Rule 8** - 97% of teachers who had teaching as the first career option, who stated that teachers and students get along, who stated that most teachers in this school seek to develop new ideas for teaching and learning and who are satisfied with the work, also had didactic pedagogy in general in the training process; **Rule 9** - 97% of teachers who had didactic pedagogy in general in the training process, had use of ICT in the training process, who stated that teachers and students get along well and are satisfied with the work, are also Adults; **Rule 10** - 95% of teachers who had didactic pedagogy in general in the training process, feel well prepared to deal with pedagogy and stated that teachers and students get along, they are also adults.

In general, the rules shown in Tables 3, 4 and 5 indicate the following reality for a good portion of the teachers who work in basic education in Canada, Sweden and Chinese Taipei: adequate pedagogical teacher training (including having a doctorate as training, a situation that is different from the reality of most Brazilian basic education teachers), appropriate use of ICTs and teaching methodologies, where teachers feel prepared for the exercise of the profession and satisfied with their work.

8 CONCLUSIONS

The reference work demonstrates the factors that are linked to quality education in Brazil, Canada, Sweden and Chinese Taipei.

As I commented in the previous section, several rules have been generated. In the tables of the section "Studies Performed" were presented only the 10 rules with the highest *lift* for each country evaluated. However, it can be verified that, among the rules that were not selected by this filter, several cite Brazilian teachers dissatisfied mainly with salary and who claim that professional development is expensive. Having this statement among the rules, it is possible to identify that the remuneration of teachers in Brazil is not at all flashy for recent graduates and, for those who wish to pursue a career, professional development is not consistent with the salary they receive.

It is worth highlighting here other factors not elucidated in the rules of the previous section and that also contribute to quality education in foreign countries. A common factor among Canada, Sweden and Chinese Taipei is the ability of each province/municipality to provide an equal education structure for all students regardless of their socioeconomic class. Of course, there are also the specifics of teaching in these countries. Chinese Taipei, for example, follows a stricter and more disciplined line in its school base compared to the other two countries mentioned. Another factor in common among these 3 countries is the salary floor for teachers: converting the amounts into dollars, the monthly amount for Canada, Sweden and Taipei are respectively: US$ 9,000.00; $5,000 and $8,000. On the other hand, in Brazil, teachers receive an average of US$ 650 (Quotation 09/25/22) [17].

Clearly the salary floor in Brazilian education is discrepant compared to other countries. There are well-ranked countries in PISA where the salary floor for teachers is equivalent, for example, to the banking profession which is well paid in many countries. An example is one of the countries being studied: Chinese Taipei, which seeks the equivalence of a good remuneration for teachers [20]. In addition, the teaching profession is seen as the basis for the general improvement of these countries. No wonder, it is very judicious to choose teachers for each institution.

Another factor that influences this disparity in remuneration are the privileges for certain classes of Brazilian public servants, such as those linked to the legislative and judicial branches. There are similar services within the Brazilian public sphere, but depending on the position of the server the salary difference can be up to 7 times greater if we compare, for example, an ambulance driver with a senator or deputy driver. A solution to this discrepancy would be to establish a parity between the wages paid in the country, in addition to extinguishing any monetary privilege that makes this disparity possible. This would include far-reaching legislative and political reforms, including even constitutional reform [22].

In the latest report released by PISA (year 2018), China led the ranking followed by Singapore [25]. Something to highlight in the educational practices of these countries is the issue of content in

Chinese schools, as well as cultural rigidity (as in Chinese Taipei mentioned earlier in this section). In everyday life classes are usually short lasting up to 35 minutes, where teachers teach only a single type of concept at a time and since primary school students have English and mathematics classes [26]. On the other hand, classes in Brazil last between 50 minutes and an hour in most elementary and middle school institutions. In Singapore they adopt a policy in which it is not enough for the student to learn how to solve problems, but how the whole process of solving works. In these countries, having the teaching profession is something respectful and desired. In addition, in Singapore, teachers have the incentive to specialize, because as it is a desired area the competition is also great. Another important factor is the massive use of technological means made available by the educational institution for student learning (ICTs). There is also concern about students' psychological issues that are treated as something serious within education and when preparing for professional competition [27].

The Brazilian schools in their great majority compared to the top 3 countries of PISA completely escape from the educational reality implemented in these countries, taking into account all the institutions (public and private) the policies adopted in Brazil do not understand the practices of the reference countries, although most of the teachers have the pedagogy implemented in their training, There are no incentives as in these countries that enable a narrative where competition is equal in all school categories, so federal and private schools, as already mentioned, are ahead of most other Brazilian schools, because the policies adopted are closer to the reference countries, be it competitiveness, above average salary, possibility of using ICTs etc.

Brazil suffers from structural political changes with each mandate, interfering in every important base for society, such as education, health, transportation, etc. It should also be considered that Brazil, being a country with a vast territory, has more difficulties in managing its education than territorially smaller countries, since there is a diverse cultural and also very large income distribution among the different Brazilian regions. To deal with this geographical factor, Brazil can take the example of Canada, which allows provinces to adopt the best methodology, taking into account their specificities. Greater decentralization of power, giving greater autonomy to Brazilian municipalities is, therefore, something to be studied and considered. Regarding investment, a good example would be Sweden, which invests an average of US$ 11,400 per student [23], while in Brazil an average of US$ 3,900 is spent[24].

It is clear that the policies adopted in countries whose education has prospered need to be analyzed and evaluated regarding the feasibility of adoption in Brazil. However, this analysis must take into account the Brazilian particularities, since our economic, social and cultural reality differs greatly from the reality of the countries that were the object of this study and other countries that are part of the OECD. With this in mind, it is important to note that, as verified in the section Studies carried out from the rules obtained by *the Apriori* algorithm, countries such as Sweden, Canada and

Chinese Taipei, which are a reference in education, have teachers with good pedagogical training, who attend or have attended a doctorate, teachers have adopted teaching as the first option of work (which shows the attractiveness of the profession in these countries) and had ICTs in the training process. In Brazil, private schools, which presented the best results in PISA among national schools, the rules obtained also point to the use of ICTs in teacher training, for adequate pedagogical training and the use of diversified methodologies and in constant improvement. Thus, there is evidence that some practices adopted in Brazilian private schools of basic education are in accordance with the best international practices, at least with regard to teacher training and teaching methodology adopted by them. Emphasizing what has already been mentioned in this section, it is necessary to make the teaching career in Brazil attractive, valuing teachers with more adequate training, so that the best minds in the country are attracted to teaching, avoiding losing these professionals to other market segments and/or other countries.

ACKNOWLEDGGE

To the Federal Institute of Education, Science and Technology of the North of Minas Gerais (IFNMG) – Campus Januária, institution where I am a student of the Bachelor of Information Systems course, for the support granted through the provision of infrastructure (laboratory and computers) to carry out this research and for the financial support for the publication of this article. I also thank my guiding professors, Raphael Magalhães Hoed and Pedro Fábio Saraiva, for their valuable guidance in conducting this research.

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SEVEN
publicações acadêmicas

Teacher training pathway to work in distance education

https://doi.org/10.56238/ptoketheeducati-070

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ABSTRACT
To support the teaching practice in distance education, it is necessary for the teacher to acquire and/or improve didactic, pedagogical and digital skills. Thus, the objective of the present work is to describe the design of the Teacher Training on Distance Education course considering the objectives, the modular structure, the content topics, the methodology and the evaluation process. This course was structured in three modules: 1- Conceptual contributions and institutional and pedagogical design of distance education at UFRN; 2- Didactic-pedagogical organization of the teaching action; 3- The Mandacaru Moodle as a space for teaching action: from tools to methodological approaches. The modules were taught synchronously through Google Meet, lasting 3 hours each and on 3 consecutive days. At the end of the synchronous stage, the teachers participated in the asynchronous moments for 30 days. In the virtual learning environment, complementary bibliographies and communication forums were made available so that the participants could answer questions after the synchronous stage. The process of evaluating teacher training was procedural, considering the course participant's participation in the forums, the nature of the questions formulated by him and the feedback obtained at the end of the course in terms of evaluation regarding the content, methodology and training contributions to the teaching performance in distance education.

Keywords: Teacher training, Planning, Teaching practice.

1 INTRODUCTION

In the last decades of the twentieth century, humanity experienced significant transformations resulting from the development of science and technology, which had an impact on different social segments, among which education stands out. In this context, educational policies and actions were modified in order to adapt to the demands that were configured by the progressive use of digital technologies in teaching and learning processes.

In Brazil, this situation favored the dissemination of Distance Education (EaD (pt-BR)), the framework of which was the sanction of the Law of Guidelines and Bases of National Education (LDB) in 1996 (BRASIL, 1996), an instrument that supports the offer of this modality in the country. This legal framework effectively contributed to the strengthening of the Teacher Training policy, at the undergraduate level, which aims at improving the quality of teaching and training in Basic Education.

Within the scope of this policy, higher education institutions were stimulated to experience a challenging situation: to build an institutional and pedagogical development for distance learning degrees and, simultaneously, to offer training courses for their own teachers aiming to work in this modality. Since the establishment of the legal framework, the higher education institutions that have taken on these challenges have accumulated lessons and experiences that have led to quite positive results, including the fact that these experiences have become the object of study by researchers and are constantly subjected to internal and external evaluation processes.

Based on these assumptions and considering the need to delimit the subject, we opted for an approach to teacher training for working in EaD, taking as a reference the (per)formative course implemented at the Federal University of Rio Grande do Norte (UFRN) for its teaching staff. In this perspective, the objective is to describe the outline of the course of Teacher Training in EaD adopted by the institution from the objectives, the modular structure, the content topics, the methodology and the evaluation process. The methodological procedures that guided the research in the guideline correspond to the bibliographic and documentary research and to the activity as teacher-researchers in the course of planning and offering teacher training courses aiming to work in EaD.

2 TEACHER TRAINING: CONTEXTUALIZATION ELEMENTS

The issue of teacher training is widely discussed in the field of education studies and, in Brazil, it has been instituted as a public policy forged in the context of the problems that involve training processes at different levels and the recognition of the need for improvements in educational policies and actions.

Corroborating the assertion of Tardif (2014) - when he states that the teacher's knowledge is not a set of cognitive contents defined once and for all, but a process under construction throughout a professional career -, it is considered fundamental that, being digital technologies a trait of contemporary culture, training opportunities are generated for higher education teachers aiming at acting in the EaD. Finally, education mediated by digital technologies is a modality that is in tune with the present time, whose relationships and interactions are increasingly made possible by digital supports and tools.

In this context, it is a challenge to consider that, in addition to the mastery of the content and didactic and pedagogical skills so dear to the teaching practice, it is necessary that the teacher acquires and/or learns skills related to the use of digital technologies. It is emphasized, however, that technological competences are required for teaching, regardless of whether it is face-to-face or distance mode, yet it is an essential condition for practice in EaD. This affirmation finds resonance in Freire's (1991, p. 80) saying that teacher training should consider, among other elements, "the appropriation,

by educators, of scientific advances in human knowledge that can contribute to the quality of the desired school".

Teacher training in Brazil can be carried out through different formats such as training, apprenticeship, recycling, training and continuing education, each one reflecting a conception of the role to be played by the teacher in his or her professional practice (AMARAL, 2003).

Thus, recognizing the importance of teacher training, regardless of context or modality, and in the expectation of sharing knowledge accumulated throughout the experiences with technology-mediated education, we will now present the outline of the Teacher Training course in EaD, offered every semester by UFRN.

3 TEACHING IN EAD: (PER)FORMATION COURSE

The EaD Teacher Training Course is one of the action strategies of the Distance Education Secretary (Sedis) of the UFRN, in partnership with the People Management Program (Pro-reitoria de Gestão de Pessoas - Progesp), which has as its general objective to train teachers who work in the institution's undergraduate courses in the acquisition and/or improvement of competencies and skills for the exercise of their attributions in the teaching and learning process in the distance modality. As specific objectives, it seeks to understand the concept of EaD; to identify the characteristics and the subjects that work in this modality, highlighting their attributions within the model adopted at UFRN; to understand the didactic-pedagogical organization of the teaching action; to develop competences and skills regarding the use of the resources of Moodle Mandacaru, the virtual learning environment (VLE) adopted by UFRN, associated to active methodologies.

In harmony with the objectives outlined, the course was structured in three modules. Each one of them includes theoretical and practical learning sections, whose design took into consideration the institutional and pedagogical development adopted by UFRN for the distance learning degree program. Thus, the structure of the course and its respective contents include:

Module 1: "Conceptual contributions and institutional and pedagogical development of EaD at UFRN". It covers learning lessons about the EaD from the perspective of its definition and characteristics, as well as the differences between the distance mode and the emergent remote learning. The institutional and pedagogical development adopted by the UFRN for the offer of distance graduation courses and of the distance curricular component in face-to-face courses are also objects of study of this module. In this context, the elements that make up and/or subsidize this development are addressed, focusing on the approach of the AVA Moodle Mandacaru, the Presential Support Center, the Tutoring System and the Didactic Material. In addition to the elements, the subjects that are part of this distance learning network and their respective attributions are presented. They are: teacher,

student, course coordinator, course coordinator, course coordinator, tutoring coordinator, teaching assistant and multidisciplinary team.

Module 2: "Didactic-pedagogical organization of the teaching action". It deals with the planning of the teaching action, from the systematization of the teaching plan of the curricular component to the preparation of the virtual classroom in AVA Moodle Mandacaru Acadêmico. The initial approach highlights the importance of planning, communication and interaction in EaD. The didactic-pedagogical orientations assume a sequence, according to the following description: planning, which takes into account the study of the curricular component and the didactic material produced for the distance courses, and is carried out by means of the choice and definition of methodological and evaluation strategies, complementary materials and audiovisual resources; elaboration of the teaching plan of the curricular component (characterization of the component, methodology, objectives, contents, methodological procedures, learning assessment, schedule of activities and bibliographic references); and organization of the virtual classroom, considering the didactic-pedagogical orientations in all its aspects (study and activity orientation, assessment process, among others). In this module, the teacher understands the dynamics of the practice characteristic of the modality, observing, above all, the planning, the management of time and activities, both asynchronous and synchronous, considering the specificities of the academic calendar.

Module 3: "Mandacaru Moodle as a space for teaching action: from tools to methodological approaches". It comprises learning modules about the AVA, having as content the conception and design of the virtual environment, with focus on the virtual classroom. In this perspective, the existing resources and functionalities of the VLE are presented, such as forums, chats, file and image uploading, creation of web conferences using BigBlueBotton©, sending individual and mass messages, creation of *on-line* questionnaires and delivery of *off-line* assignments, among others. This module emphasizes the conceptual approach to active methodologies and learning process.

The offer of this course is made possible by means of registration of interested parties in the institution's Academic Activities Management System (Sigaa), where information is available, among which the agenda, the modular structure of the course, the program and the link to access the synchronous sessions carried out through Google Meet stand out. In the synchronous meetings, which last 3 hours each, distributed in 3 consecutive days, after the presentation of the module content topics by the lecturers, we proceed to the interaction with the trainees through a dialogue based on questions and answers, as well as exchange of knowledge and experiences.

Once the synchronous stage is finished, the teachers are directed to the AVA, in order to participate in the asynchronous moments, which last 30 days. In this environment, complementary bibliographic references are available. In addition, there are communication forums for the participants to expose their doubts, thus enabling the exchange of experience on the practice. The process of

evaluation of the teacher training takes place in a processual perspective, considering the participation of the trainee in the forums, the nature of the questions formulated by him/her and the *feedback* obtained during the course in terms of evaluation regarding the content, the methodology and the contributions of the training to the teaching practice in EaD.

4 FINAL CONSIDERATIONS

The UFRN, recognizing the importance of teaching in EaD, has implemented policies and actions in this modality, stimulating the formative course of the subjects who work in it. The EaD Teacher Training Course focuses on contents related to didactic, pedagogical and digital competences that are fundamental to work in the distance learning modality. In this context, it addresses the conceptual contributions, the institutional and pedagogical development of the modality and the didactic-pedagogical organization of the teaching action, and presents the Mandacaru Moodle as a space for teaching action. The offer of courses of this nature is in tune with the perspective that continuous training is essential to maintain the quality of educational services.

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SEVEN
publicações acadêmicas

The complexity of the classification: Representation in information science education

https://doi.org/10.56238/ptoketheeducati-071

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ABSTRACT
The teaching-learning of classification for Brazilian Information Science education requires the apprehension of the use of table mechanisms for the formation of a notation or a document classification number and also to understand the variables that must be taken into account in the act of classifying an information resource. We start from the premise that classification is an act inherent to the human being, and, at the same time, involved in complexity, requiring a dimensional knowledge about things for the classification process. Based on Jansen (2008), this study explores the complexity of classification through the discussion of the taxonomy of Chinese animals, presented by Jorge Luís Borges (1981). It seeks to answer the objective question: What lessons can we learn from TAB, which is a classification built for the representation of Chinese animals, in order to contribute to the teaching-learning of classification of documentary resources? To this end, it conducted a narrative review and sought conceptual inputs from Aristotle's hierarchical principles: Rationale; Structure; Disjunction; Thoroughness; Clarity; Uniformity; and Explicitness and precision. These principles were scrutinized and related to the 14 classes of Borges' Taxonomy, enabling a heuristic analysis and pointing out some of the mistakes that can be made in the construction of a classification system.

Keywords: Classification, Bibliographic classification, Complexity of classification, Borges' taxonomy lessons, Hierarchical principles of Aristotle.

1 INTRODUCTION

The teaching of classification for Brazilian Information Science training includes undergraduate courses in Archivology, Librarianship and Museology, and requires going beyond the apprehension of the use of mechanisms for the formation of a notation or a document classification number, employing the syntax of classification schemes (tables) in an appropriate way. It is also necessary to understand the variables that must be taken into account when classifying an information resource, which makes this activity complex. Some of these variables involve knowing the types of resources in the collection, the subject matter, the institution, the type of information unit and, most importantly, the user community.

Thus, the classification process can be considered an act involved in complexity, indicating the possibility of a close relationship between these two concepts. This can be evidenced when we look

for the origin of the two words. The word *complexity*[1] , of etymology complex + age, derives from the Latin *complexus*, meaning encompassed and understood, which acts in an integrated and not isolated way, as a whole articulated by actions that show a phenomenon (RIBEIRO, 2011). The ending of the word in *-idade* gives the noun an attribute (quality, state, condition, among others).

In turn, the word *classification*[2] , of etymology classify + *-tion, and* the word classify, derives from the Latin *class + ficāre,* meaning, according to the Priberam Dictionary (©2020), to distribute in classes, categories or taxonomic groups[3] , bringing together, according to pre-established criteria, those objects or things with similar characteristics. The suffix -ção, derived from the Latin *-tio,* conveys the meaning of action or result of an action, and occurs in the formation of nouns derived from verbs.

So, if the principle of complexity determines that it is "necessary to build multidimensional knowledge", which allows us to integrate "things that are disjointed in relation to each other" (RIBEIRO, 2011, p. 44), the action of classification is inherently linked to this principle, since it is the search for structuring that gives order to chaos, based on the actions of grouping similar ones under pre-established criteria. Given these findings, it can be said that, even though they are distinct, complexity and classification are closely related.

The classification, as mentioned, even being something apparently commonplace and intrinsic to human nature, since in historical-methodological terms there has always been a need to organize objects and information for location, has in its essence a problem. Pombo (2006) points out that this problem presents itself as its inscription in the desire and primordial need to understand and order the variety of things that surround us. The author reports that there are four orientations for classification, which cover both beings and knowledge: 1) ontological (classification of beings); 2) gnosiological (classification of sciences); 3) librarianship (classification of books); and 4) informational (classification of information). For this article, guidelines 3 and 4 will be considered, which deal respectively with Librarianship and Information Science.

The complexity of information classification was explored by Jansen (2008) when he discussed a taxonomy of Chinese animals, taken from the Chinese encyclopedia "*Celestial Emporium of Benevolent Knowledge*" and presented by Jorge Luis Borges[4] (1985) and created by John Wilkins, a 17th century philosopher. For the present study, Borges' taxonomy was named TAB, short for Borges' taxonomy, in order to facilitate and simplify the discourse, since it will be analyzed to answer the following question, which closes the proposed objective: *What lessons can we learn from TAB, which*

[1] Retrieved from https://www.dicio.com.br
[2] Retrieved from https://dicionario.priberam.org
[3] Taxonomy: derives from the Greek *taxis*, meaning order, and *nomos*, meaning rule.
[4] Jorge Luis Borges, translator, critic and writer, lived to the age of 87. He was born in 1899 in Buenos Aires and died in 1986 in Geneva (FUX, GOMES, 2013).

is a classification built for the representation of Chinese animals, in order to contribute to the teaching-learning of the classification of documentary resources?

To answer the question, we used the narrative review strategy, which allowed us to explore the literature and seek conceptual inputs on complexity, classification and Aristotle's hierarchy principles. This methodological basis, described by Elias *et al.* (2012) and Rother (2007), supported the choice of documents used, which sought to stick to seminal authors in the field and quality sources, whose contents supported the critical interpretation of the phenomena under discussion in this study.

After this introduction, this chapter is organized as follows: section two addresses the concept of complexity, seeking to relate it to the representation of knowledge, which encompasses all recorded knowledge, showing that this representation goes beyond disciplinary boundaries; section three describes the classification process and characterizes bibliographic classification systems; section four presents the principles of building hierarchies proposed by Aristotle, providing inputs for the process of grouping and forming classes in classification systems; section five discusses the classes of Borges' taxonomy (TAB) from the perspective of Aristotle's principles, seeking to highlight the lessons learned; and finally in section six, it concludes with the final considerations.

2 A LITTLE ABOUT THE CONCEPT OF COMPLEXITY AND THE CLASSIFICATION OF KNOWLEDGE

The specific meaning of complexity comes into play in a more forceful way only at the end of the 20th century, built by the transformations that occurred in the natural and mathematical sciences, which put the deterministic view of the world into suspicion (NEVES; NEVES, 2006). In this new scenario of uncertainties, Morin (2003) proposes the concept of complexity for a new notion of knowledge, because, according to the author,

> All knowledge is both a translation and a reconstruction, based on signs, signals, symbols, in the form of representations, ideas, theories, discourses. The organization of knowledge is carried out according to principles and rules that it is not appropriate to analyze here; it involves operations of connection (conjunction, inclusion, implication) and separation (differentiation, opposition, selection, exclusion). The process is circular, moving from separation to connection, from connection to separation, and, furthermore, from analysis to synthesis, from synthesis to analysis. That is: knowledge involves, at the same time, separation and connection, analysis and synthesis (MORIN, 2003, p. 24).

In this conception, knowledge is interrelated and, as such, there is no room for fragmentation and simplification.

Within the scope of Library and Information Science, Dodebei (2002) discusses the need for individuals to order their own knowledge, creating models of representation, because the "models derive from the human need to understand reality, apparently complex and are, therefore, simplified and intelligible representations of the world [...]" (DODEBEI, 2002, p. 19), which allow the

communication process. These representations, which we can call social, are, as Moscovici (2004) describes, representations under which human creatures

> conventionalize the objects, people or events they encounter. They give them a definite shape, locate them in a certain category and gradually place them as a model of a certain kind, distinctive and shared by a group of people. All new elements are added to this model and synthesized in it. Thus, we come to say that the earth is round, we associate communism with the color red, inflation as a decrease in the value of money. Even when a person or object does not exactly fit the model, we force it to take a certain form, to enter a certain category, in fact, to become identical to others, otherwise it will neither be understood nor decoded (MOSCOVICI, 2004, p. 34).

From this perspective, we can consider that representing and classifying are essentially human processes, carried out to understand the context in which the individual is inserted and the reality that surrounds him. In this regard, Torres, Tornay-Mejías and Gómez-Milan (1999) state that these categorization processes occur from multiple perceptions, in accordance with different learning situations of each individual throughout life.

Also for contemporary science, the complexity of the phenomenal world, which expands and crosses disciplinary boundaries, requires considering the existence of different views on the same situation, objects or animals (rational and irrational). Thus, reality shows that it is also "impossible for science to eliminate the complexity of the world, even if it is heavy and oppressive for all of us" (PENA-VEGA; NASCIMENTO, 1999, p. 10).

Considering that knowledge has information as its essential constituent element, Baptista, Araújo and Carlan (2010) identified three levels of information analysis: 1) intuitive level; 2) rational level; and 3) professional level. The intuitive level occurs when we process information for everyday situations, for example, when classifying plants and animals into edible and inedible. At the rational level, we have solutions for occasions in which variable levels of analysis are required, in diverse circumstances (professional, leisure), which emerge from explicit criteria, when, for example, Aristotle classified living beings into viviparous (hot and humid, like men and horses), oviparous (hot and dry, which have perfect eggs, like birds and reptiles) or insects (cold, which produce larvae), among others. The professional level encompasses situations of specialized mediation of information products and services for different user communities.

It is at the third level, the professional level, that issues related to training in Information Science are involved, as this is where the processes involved in the construction of classification systems fall. These processes require the analysis and systematization of information about a given domain for its representation. Evidently, in this activity the rational level of information analysis is also used, although it must be taken into account that there will always be ambiguous cases and that, to some extent, every classification will be prescriptive. For example, in biology, there is the case of platypuses, which are oviparous mammals, challenging their classification. However, the presence of

exceptions does not invalidate a classification nor the criteria that were adopted in the subdivision of classes, but only demonstrates that reality will always have more complexity than the classification systems created as representations can establish.

3 BIBLIOGRAPHIC CLASSIFICATION AND CLASSIFICATION SYSTEMS

Classification reveals a process of the mind that seeks to group things according to their degrees of similarity and separate them according to their degrees of similarity, being inherent in the way the human being places himself in the world to try to understand it. That said, it is necessary to emphasize the importance of categorizing and classifying for human living (ARANALDE 2009). Thus, classifying is, in fact, as useful as it is natural. The indefinite multitude of particular and changing events is faced by the mind as acts of definition, inventorying, listing, reduction to common entries and separation into groups (DEWEY 1922, *apud* CASSIRER, 1994). Borges (1985, p.125) warns that there is no classification of the universe that is not arbitrary and conjectural, since we do not know what the universe is. And this could dissuade us from planning human schemes, although we are told that these are provisional.

Thinking about the essence of classification, it can be said that we classify from similarities and differences, and, according to Foucault (2007, p. 24), it is from the similarity that "the order of conjunction and distance" is imposed, which the author named as *convenientia*: "things that, approaching each other, come to be paired are 'convenient'; they touch at the edges, their bangs mix, the end of one designates the beginning of the other". Foucault (2007, p.25) states that this chain of similarities causes a spatial convenience, imposing a relationship of similarity between things from the sign of kinship. It is then possible to ensure classification through a closed circle, because "similarity imposes neighborhoods that, in turn, ensure similarities".

It can be said that such characteristics apply to both science classifications and historically produced bibliographic classifications, since according to Bhattacharyya and Ranganathan (1974: 119, *apud* Pombo 1998), the difference between science classifications and documentary and library classifications lies precisely in the generally merely speculative character of the former in contrast to the immediate functional purposes of the latter. While the former are global schemes, theoretical systems that do not go into detail or get entangled in the minutiae of classifying restricted domains, the latter are minutely elaborated proposals, generally accompanied by a code in which each class is designated by a symbol (see the case of Melvil Dewey's decimal classification). Within the scope of specific training in Brazilian Library Science courses, bibliographic classification systems play a relevant role among the work activities of these professionals. "In fact, when we refer to bibliographic classification, we imply a classification based on the subjects dealt with in the documents" (PIEDADE, 1977, p. 65). Thus, as a documentary language, a bibliographic classification system enables the

> arrangement of books into classes of subjects, while assigning them places on the shelves, according to these subjects. According to their hierarchical structure, the classifications assign to each descriptor an indicator that can be formed by numbers, letters or a combination of numbers and letters, identifying which group it belongs to (SOUZA, 1943, p. 24).

These systems are composed of headings that represent concepts and objects of a domain, in a systematic and hierarchical way. And we add that, in addition to subjects, there are other elements that can be represented (document type, dates, places, etc.).

A bibliographic classification system consists of "a set of classes presented in systematic order; a distribution of a set of ideas by a certain number of partial, coordinated and subordinate sets" (PIEDADE, 1983, p. 29), or even a complete map of any area of knowledge, showing its concepts and their relationships (LANGRIDGE, 1977). Classification systems, according to Piedade (1983), have some attributes, the main one being the principle of classification or division; it must contain natural characteristics, inherent or inseparable from the object and artificial characteristics, the occasional, accidental and variable; and yet, a classification system must have consistent, exhaustive and mutually exclusive classes.

As for the types of bibliographic classification system, there are: i) philosophical classification systems, created by philosophers, in order to give order to sciences or things, also known as classification of beings; ii) social classification systems, applied by individuals to organize things, people, objects and phenomena, based on their own purposes and classification interests; iii) bibliographic classification systems, developed to establish relationships between documents in a collection, in libraries and information or documentation centers, to facilitate their location, also known as classification of knowledge. For the present article, only the third type will be dealt with here.

It is after the documentary explosion that occurred during the Second World War, when the traditional methods of documentation were no longer effective, that the documentary and librarianship classifications began to be developed in order to facilitate the automation of the relationships between the various classes of documents (POMBO, 1998). According to the author, from the 1970s onwards, library classifications definitely began to allow the electronic computerization of the documentary process.

San Segundo Manuel (1996) states that in the 19th century the French bibliographic classification system dominated, which was replaced by Anglo-Saxon systems, still at the end of that same century, as occurred with the Dewey Decimal Classification (CDD) system, developed by Melvil Dewey. After that, according to the author, the Universal Decimal Classification (UDC) system was disseminated, created by Paul Otlet and Henri La Fontaine, who innovated by creating a classification system capable of allowing synthesis, represented by the combination of numbers, relational symbols and other auxiliary tables. Next, the author indicates the proposal of Shiyan Ramarita Ranganathan,

who revolutionized library systems by including the possibility of multidimensional representation of the subjects dealt with in information resources, so that their parts could be common characteristics and attributes, distributed in a set of categories (Personality; Matter; Energy; eSpace; Time: PMEST), of the same subject.

In the context of Information Science training, especially in Brazilian Library Science courses, we distinguish between the terms categorization and classification. The first term can be conceptualized as amorphous groupings, that is, more abstract, which do not have a well-defined delimitation, and which refer to a set of things that lacks a fixed or stable form, thus being able to change according to the circumstances of representation (TAYLOR; JOUDREY, 2009). The second term, according to the authors, can be understood as a hierarchical structure that encompasses more comprehensive knowledge, with the primary purpose of organizing information resources from collections on shelves.

The philosophical principles that Aristotle applied determined categories to classify nature in a dichotomous way, following rules and criteria of association and distinction of classes, in hierarchies ordered and systematized by different, which, according to Kwasnik (1999), are still applied today in the construction of classification systems, content that is discussed in the next section.

4 ARISTOTLE'S PRINCIPLES OF HIERARCHY

According to Aristotle, knowledge can be grouped into ten categories, which is the greatest possible generalization. For the philosopher, this knowledge is evidenced from the phenomena that we can observe, and not by ideas about reality, which can be expressed by each of the ten categories, according to the following example:

Table 1 - Aristotelian categories of knowledge

CATEGORY	ELEMENT
Substance	Composition of a being, without its predicates (accidents): table
Quantity	Measure or count (length, volume, etc.): table is three meters long
Quality	Something to be said about the substance (triangular, round, sweet, etc.): rectangular table
Relation or relative	Relation to something else or complement for understanding: table is higher than chair
Place	Location (in relation to objects surrounding the substance): table is in the dining room
Time or date	a point in time in relation to extrinsic events: table bought in 1930.
Situation or position	Arrangement or position of the substance in relation to a place: table is in the center of the dining room

CATEGORY	ELEMENT
Possession or state or condition	What the substance has with it or the state it is in: table has one of its feet broken off
Action	Action or process in relation to substance: table with peeling paint
Passion	Effect suffered by the substance from an action performed by some agent: deteriorated table (due to peeling paint, for example).

Source: prepared by the authors (2023), based on Aristotle's categories.

Starting from Aristotle's principles, beginning with the basic substance "table", which has two elements: matter (potential for a set of possible realizations; it could be the name of the class) and form (realization of the substance, which differentiates it from other objects with different forms). The other nine categories express attributes linked to it, which can be modified without "table" losing its essence. By analyzing the set of attributes for the substance "table", we find a pattern that makes it possible to insert it into a particular class, a principle that can be used for its classification.

Looking at the universe of living beings, some animals seem to offer some difficulty to be classified. For example, we could have doubts in identifying whether whales, seals and porpoises are mammals or fish, a decision that has already been made by anatomists.

Aristotle was the first to try to classify all types of animals, in a dichotomous way. He grouped and distinguished animals according to their similarities and differences, as animals with blood (vertebrates), without blood (invertebrates), living in water and living on land, describing the characteristics of each of them.

It can be seen that the principle of the classification system that Aristotle modeled was not evolutionary, and that the species of each class had no specific genetic relationship with each other. Another principle of the philosopher was that he considered the essence of species as fixed and immutable. With his hierarchical view of things, Aristotle determined, as a principle, that beings could be grouped in order, from the highest (genus) to the lowest (species). From this fact was born the principle of binomial definition (real definition), under which each type of organism can be defined by the names of its "proximate genus" and "specific difference", placing each object in a family and differentiating them by some unique characteristic.

5 BORGES' TAXONOMY (BAT) AND ARISTOTLE'S PRINCIPLES: LESSONS LEARNED

As mentioned, the concept of *Complexity* and *Classification* are closely related. This conceptual link is justified simply by the fact that classification is considered an action inherent to the human being. This action presents itself in a contradictory way, since it is necessary, commonplace and, at the same time, exhaustively complex. According to Jansen (2008), classifying is a standard practice, used for a long time by the natural sciences. Thus, it is no wonder that, for two and a half

millennia, philosophers have reflected on classifications, from Plato and Aristotle to contemporary philosophy of science. And it is on this statement that the present article deals, in order to bring some reflections about such complexity through a "parody of a classification, namely: the supposed ancient Chinese classification of animals described by Jorge Luis Borges" (JANSEN, 2008, p. 159).

Like Jansen (2008), the present authors corroborate the statement that Borges' taxonomy is a sophisticated piece of literature and that it is a good example of a classification that presents several inconsistencies. It is believed that sometimes the best way to teach is through counterexamples, following a deconstruction approach to the construction of concepts on a given topic. Jansen (2008) states that many of the errors that appear as comical features of GRT also appear in the scientific databases we use daily. And to illustrate such complexity, the author presents, in his study, the terminology database of the *National Cancer Institute* (NCI) of the United States, the NCI Thesaurus.

In view of such elucidations and facts, a question arises: *What lessons can we learn from the TAB, which is a classification built for the representation of Chinese animals, in order to contribute to the teaching-learning of the classification of documentary resources*? For this question to be answered conclusively, it is necessary to recall the already conceptualized and known hierarchical principles proposed by Aristotle, described in section four, and then relate them to Borges' Taxonomy. Thus, the reflection will be more fruitful and assertive.

Aristotle was responsible for bringing up the concept of dichotomy of objects in genus and species, which consequently ended up decomposing the unified nature into a whole and the whole into parts: through classes, subclasses, consecutively and exhaustively. This process, according to Carlan (2010), must follow a series of ordered and systematized rules of association and distinction. According to the principles of hierarchy proposed by Aristotle, only an exhaustive observation can reveal each true attribute of an entity and only philosophy can guide us in determining the necessary and sufficient attributes for the members of a class. Only when the entity is correctly classified and its essential properties are identified can we say that we truly know it (CARLAN, 2010). In the Aristotelian context, there are the defining characteristics, which are used to define things, and it is these that contain the essential characteristics, which are a reference to the Aristotelian term "real essential" of things (AGANETTE, 2015).

In view of this, Kwasnik (1999) states that Aristotle's legacy survives in the spirit of modern classification applications and suggests some requirements for an adequate hierarchical structure: inclusiveness, genus/species, inheritance, transitivity, systematic and predetermined rules for association and distinction, mutual exclusivity, necessary and sufficient criteria, complete and comprehensible information, inheritance and economy in notations, inference, real definitions and high-level view and holistic perspective.

Thus, presented the hierarchical principles proposed by Aristotle, it is necessary to relate them to the TAB, and for this, the study of Jansen (2008) is used, where he discusses the short story of Jorge Luis Borges, also entitled by him as "The analytical language of John Wilkins", which mentions a Chinese encyclopedia. This TAB categorizes and classifies Chinese animals into 14 distinct groups:

1. those who belong to the emperor,
2. embalmed animals,
3. trained animals,
4. Piglets,
5. mermaids,
6. fabulous animals,
7. stray dogs,
8. the animals included in this classification,
9. animals that tremble as if they were mad,
10. numerous animals,
11. animals drawn with a very fine camel brush,
12. others (etcetera),
13. animals that have just broken a flower pot,
14. animals that look like flies from a distance.

Based on the assumption of Jansen (2008), that it is necessary to emphasize the importance of categorizing and classifying for human living, since the classification reveals the attempt of the human mind, which is always seeking to group or separate things according to their similarities, the motivating question of the present study is resumed, based on principles proposed by Jansen (2008), such as: (i) Reasoning; (ii) Structure; (iii) Disjunction; (iv) Thoroughness; (v) Clarity; and (vi) Uniformity and (vii) Explicitness and precision. These principles, according to the author, are indispensable for building good classifications (hierarchies), which were disregarded when building the TAB and the NCI Thesaurus as well:

> i) Ontological foundation: in this principle, to build good taxonomies, one should create and define classes by means of properties, based on their essential characteristics. This premise excludes class (12): others (etcetera) from TAB. And yet, another misconception of TAB can be verified, since it classifies things by their relative appearance, as for example in (14) "animals that look like flies from afar", that is, it does not classify things based on their essential characteristics, belonging to them.
>
> ii) Structure: Jansen (2008) points out that to meet this criterion, good taxonomies should consider the fact that types of things have subtypes: for example, in biology there are genera and species. In parallel, for the structure of a taxonomy, one should consider the

classes and their respective subclasses. In the TAB there is a class (5) "mermaids" and at the same level a class (6) "fabulous animals", i.e. they occupy the same hierarchical position in the taxonomy. Ideally, given the "structure" of a taxonomy, (5) "mermaids" should be classified as a fabulous animal, and consequently become a subclass of (6) "fabulous animals".

iii) Disjunction: this principle provides that in a hierarchy of types and subtypes, classes of the same level must have characteristics that distinguish them, i.e. something that makes them different from other classes. The author presents biological systematics as an example of such a principle: every animal that is a horse is also a mammal. However, types with the same level of biological classification must be arranged in different classes, since no animal can be a mammal and a reptile concomitantly. Thus, it is clear that the GRT does not fit the "disjunction" criterion, since it presents class (1) "those belonging to the emperor" which theoretically would include class (3) "trained animals", but which are hierarchically arranged at the same level.

iv) Completeness: taxonomies must have an exhaustive class structure, that is, comprehensive, that seeks completeness, and that encompasses all the entities they intend to include. This is an arduous task, since in the current informational and technological context, frequent and new discoveries are common. And as far as can be seen, Borges disregarded in his proposed taxonomy, which has nothing exhaustive, on the contrary, it presents superficial classes and generic superclasses, as in (12) "others (etcetera)", a class that because it is so generic, would welcome all other animals, that is, all other classes presented. Class 12 also shows the impossibility of classifying: in the classification, however exhaustive it may be and however much one tries to order all the elements, there is always one (others), which, by definition, is responsible for the "rest", and through this it is possible to include "everything" in the classification. It can be said that a class of this nature, puts to waste all the effort spent on a good taxonomy, since it makes it unnecessary to classify.

v) Clarity: this principle indicates that classes should be defined without ambiguity or double meaning, since good taxonomies do not use terms that denote ambiguity. And once again, the TAB does not meet this criterion, since it presents in its structure class (2) "embalmed animals", class (5) "mermaids", class (6) "fabulous animals", and class (11) "animals drawn with a very fine camel brush". These classes refer us to the concept of dead animals, which according to the author, is different from the meaning given when referring to live animals, such as pigs or dogs. He adds that it can also be said that the painted animals are not animals, but paintings in which animals are represented.

vi) Uniformity: the criterion of uniformity is that which is uniform, similar, coherent; harmonious, constant and regular. Thus, taxonomies must have a well-defined domain, in which hierarchies must deal with specific subjects. When verifying the presence of uniformity in the TAB, there are different criteria, such as class (1) "those belonging to the emperor" classified according to their owners, class (4) "piglets" classified according to their species, class (7) "stray dogs" classified according to species and the absence of an owner, class (9) "animals that tremble as if they were crazy" classified according to the momentary behavior of the animal, class (13) "animals that have just broken a flower pot" classified according to the consequence of the behavior and finally class (14) "animals that from afar look like flies" classified according to the appearance of an animal from the perspective of a remote observer.

vii) Explicitness and precision: good classifications are explicit and precise. Thus, in TAB classes such as (10) numerous animals and (12) others (etcetera), do not meet this important criterion.

The classification under review, which makes us laugh at first, also,

> with its reading, it disturbs all the familiarities of thought - ours: the one that has our age and our geography -, shaking all the ordered surfaces and all the plans that make the profusion of beings sensible to us (FOUCAULT, 1999, p. ix).

For the author, in addition to being a distorted classification, it refers us to China, a mystical place, according to the Western imagination. However, we must remember that this classification was constructed by a 17th century philosopher. Foucault (1999, p. 59) points out that "in the seventeenth and eighteenth centuries, the very existence of language, its old solidity as a thing inscribed in the world were dissolved in the functioning of representation; all language was valid as discourse". Thus, things and words are distanced, giving way to an ordering of "classes, a nominal grouping by which their similarities and differences are designated" (FOUCAULT, 1999, p. ix), without commitment to the things of the concrete and real world. According to the author, it is at this time that taxonomies proliferate, creating classes and groupings no longer based on infinite similarities and real things, but as things classified according to their identities and differences, based on a particular interpretation of things.

Foucault (1999) clarifies that after the nineteenth century this classification thought gave way to a biological approach, which considers each being in itself, based on its functions, and not in relation to the characteristics it possesses. In contemporary times, we consider that, within the scope of courses in the field of Information Science, classifications are aligned with the communicational episteme, since the instrument can represent different sociocultural practices and experiences, as a communication mechanism as a space of alterity. Based on this principle, complexity is inherently

linked to the creation of a classification, when, initially, it is necessary to define the target audience (profile, behavior, culture, ideology), the context and the purpose it will serve, because, in the end, the classification should be useful for the proposed purpose. It is also necessary to take into account that a classification will never be finished, since knowledge is dynamic and the classification, as a representation tool, should be constantly updated and revised. When building a classification for materials used in furniture, for example, we have to take into account that the "classification of materials increases in complexity as new materials are constantly launched on the market" (FERROLI *et al*., 2019, p. 656). The authors explain that

> The simplistic view of the use of traditional materials such as wood for the body of the furniture, fabrics for upholstery and metals in the hardware, commonly used in the project descriptions of the catalogs, is no longer accepted in modern furniture, that is, a greater detail of specification is necessary. Especially today, with an audience increasingly attentive to environmental and sustainability issues as a whole, the description of the origin, origin and artificiality of the materials used can be decisive in making a purchase decision (FERROLI *et al.*, 2019, p. 659).

Thus, the complexity of contemporary reality will require classifications to be flexible enough to accommodate constant updates without having to reformulate their entire structure.

If we were to create a classification of the Chinese animals that predominate in this country, we could have the following representation.

domestic animals
puppies
chickens
geese
cats
ducks
pigs
wild animals
Golden pheasant (*Chrysolophus pictus*)
Manchurian crane (*Grus japonensis*)
naja artra (*Naja atra*)
pika-de-ili (*Ochotona iliensis*)
Asiatic black bear (*Ursus thibetanus*)
aquatic animals
herring
mackerel
eels
alligator

lizards

lubina

oysters

frogs

salamanders

turtles

sharks

representations of animals in the zodiac

Gŏu (Dog)

Hóu (Monkey)

Hŭ (Tiger or Panther)

Jī (Rooster or Hen)

Lóng (Dragon or Crocodile)

Mă (Horse)

Niú (Ox, Buffalo or Cow)

Shé (Snake or Serpent)

Shŭ (Rat)

Tù (Rabbit or Cat)

Yáng (Goat, Sheep or Ram)

Zhū (Pig or Boar)

China is recognized as an environment of great animal biodiversity, with many species that are endemic, i.e. cannot thrive in other environments, and others that are considered sacred. This same set of terms could be classified differently if, for example, we were to consider the consumption of fresh meat from domesticated and wild animals in China.

6 FINAL CONSIDERATIONS

This study had as its central point to reflect on complexity as an inherent element in the classification activity, with a view to guiding teaching-learning in the training of information scientists, including archivists, librarians and museologists. The analysis was guided by Jansen's (2008) proposal, by the TAB, which is the taxonomy presented by Jorge Luís Borges (1981), and sought to answer the following question: *What lessons can we learn from the TAB, which is a classification built for the representation of Chinese animals, in order to contribute to the teaching-learning of the classification of documentary resources?*

The TAB was used as a heuristic tool to highlight and, thus, facilitate pointing out some of the mistakes that can be made in the construction of a classification system. These errors can be verified

not only in literary parodies, such as the one presented by Borges (1981), and scrutinized in this study, but also in the contemporary practice of classifications, precisely because classification is an activity involved in complexity. The TAB can be considered as a caricature of such errors, since it was created at a time when there was a break with the principle of representation, which generated a series of distortions in the creation of classes and groupings, in a reductionist simplification that can cause both laughter and discomfort.

We have seen that Foucault (1999) establishes that from the twentieth century onwards language becomes an object of study and, as a consequence, man, who works, produces and lives, is considered as the bearer of a discourse. Thus, there is an epistemic difference between the time of the creation of GRT and the classifications that are built in contemporary times, when there is a need for an analytical approach to things. In this analytical exercise, the gathering of the parts enhances the whole of the whole, as it is linked to the concept of complexity. And we conclude with the words of Morin (2007, p. 13) on this concept when he states that "complexity is a fabric (*complexus*: what is woven together) of heterogeneous constituents inseparably associated: it poses the paradox of the one and the multiple". And it is with this responsibility that classifications should be built and also used in the work activities of information scientists.

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SEVEN
publicações acadêmicas

University experience: The use of Whatsapp application as a pedagogical tool through the insertion of gamification and didactic choreography

https://doi.org/10.56238/ptoketheeducati-072

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ABSTRACT
The pandemic was a difficult time of great social, economic, emotional and educational turmoil. School actors and families had to develop new skills in the face of Distance Education. With this we see that there was a greater commitment of parents to assume the responsibility of monitoring their children and providing guidance. Actions forgotten for a long time due to the fact that families transferred to the school the responsibility for educating their children. In view of these new demands, we seek to understand the use of whatsaap as a pedagogical tool for interaction with students through the use of didactic choreography and gamification. This experience report arose to meet the requirements of the discipline of University Teaching and Integration with the TDIC of PPGEdumatec / UFPE. During the discipline we tested tools and dialogued with theorists who moved us to research.

Keywords: Digital information and communication technologies, Didactic choreography, Gamification, Teaching.

1 INTRODUCTION

Digital Information and Communication Technologies (DICT) are seen in the educational context as tools that facilitate teaching and learning in the classroom. To streamline the work and provide meaningful learning, active methodologies have emerged as a dynamic support that can integrate (digital technologies) and methods (ways of proposing classes / studies / research).

Considering this reality, we aim to report an experience lived in the discipline offered by the Graduate Program in Mathematics and Technological Education of the Federal University of Pernambuco (PPGEdumatec - UFPE), entitled: University Teaching and Integration with TDIC, taught by Professor Maria Auxiliadora Padilha.

This discipline dealt with several topics, among them the integration of information and communication technologies as significant tools in the teaching and learning process in Higher Education.

The readings of the discipline provided content suggested by the teacher and students in class. The students were the researchers and proponents of activities that discussed Teaching in Higher

Education using various contents to broaden the discussion and active methodologies in order to experience them.

In this context, we had the possibility to experience the forms of meetings, face-to-face or online, that could merge our experiences and enrich our didactics actively. Thus, during the discipline, we discussed the content of Pedagogical Innovation in Higher Education with the proposal of the active methodology of Gamification and the online class modality.

Gamification, which is an active methodology, provided us with elements that characterize a game (gamer) when performing the activity. According to Signore and Guimarães (2016) the concept of gamification provides tools found in games that support a certain pedagogical process. In this way, we used a planned activity to conceptualize Pedagogical Innovation in Higher Education using WhatsApp as a tool for environment and support for sharing and discussing the content. As a modality it was proposed that we use online teaching.

This modality provided the experience to be more significant because online education has been demonstrating the possibility of becoming a pedagogical act even without a physical school space. It is also possible for the teacher to be in front of his students in a non-face-to-face manner and the school space is configured.

In view of this, online education has been gaining space and has become even more concrete with its potential considering the need for constant change in society. In this sense, combining all these elements provided a rich learning experience to amplify the possibilities of teaching and improving our teaching practices.

1.1 WHAT IS ACTIVE METHODOLOGY, PEDAGOGICAL INNOVATION AND DIDACTIC CHOREOGRAPHIES?

The debate on technology and its relationship with education has been going on incessantly. Considering the debate on the meanings and meanings existing in this phenomenon (PADILHA, 2019), the active methodology can be an example in this context. When it comes to using as an assumption the autonomy that students currently have in the face of technological processes and their platforms. It can also be noted the possibility of collaborative work between the knowledge brought by these same students and with the expertise that teachers can bring in their pedagogical practice.

The active methodology can be seen as "a starting point to achieve more advanced processes of reflection, cognitive integration, generalization, re-elaboration of new practices," (PADILHA, 2019) It is, therefore, the total particularity given to the student's protagonism in the educational act.

It can be seen as enabling the use of practices that open up possibilities for learners to develop their own ways of learning.

It also captivates the student in the sense that it makes the learning process more attractive and welcoming.

It is easy to notice that technological products and their paradigms are already part of the context of schools and Higher Education Institutes HEIs, such as the great growth in the incessant use of TDICS.

By understanding the active methodology as a contribution that considers the student the protagonist of the process in the construction of knowledge, didactic choreography can be seen as a significant tool that concretizes this description. It can be seen as a tool that concretizes all student action in the face of autonomous experience in the teaching-learning process.

Didactic choreography is a reference between the classroom and the world of dance (PADILHA; ZABALZA, 2016), which can be understood as the teacher's action in the face of the student's improvisation and potential, from the perspective of the relationship between the choreographer (teacher) and the dancer (student), the choreographer therefore accompanies and mediates the students' choreographies.

We can also imagine the following situation: the choreographer follows the (scenario) as the environment where the learning takes place; the (rhythm) which is the diversities of the intellectual styles; the planning as the (script) and the creativity of the students as the (improvisation of the dancer). The student, therefore, has the total freedom to develop his artistic aspects by understanding his learning process.

It is believed that the didactic choreography presents interface with the conception of pedagogical innovation or in the innovation of higher education. Given this, we see that the teacher can become the mediator of learning and stimulate the student in the personal process, guiding their paths and work developing discussions about the processing of knowledge production.

In this context, innovation in higher education can be seen as a new teaching practice that enables the resignification and reorganization of the curriculum based on the reanalysis of pedagogical practices.

Pedagogical practice can be used through the use of gamification and can streamline teaching with the use of games.

Gamification can be understood as the use of the elements that configure a game in a pedagogical practice and considers not only the competitive aspects of a competition or game, it can take into account broader characteristics of the construction of learning, such as emotional and cognitive development. With this, gamification offers in its configuration several potentialities that can be worked in education, in addition to those mentioned.

We believe that in some significant points gamification can be articulated in education, highlighting: stimulation, dedication, responsibility and engagement on the part of students when they

are inserted in activities based on this methodology (SGINORE; GUIMARÃES, 2016). We emphasize once again the viability of this student's autonomy in the construction of knowledge. Considering their prior knowledge, their conceptions and points of view.

2 METHODOLOGY

In this study we used a qualitative research. According to Trivinos (1987), qualitative research facilitates analysis with educational themes, because it allows the confrontation of different ideas. When it was decided what would be our theme (Pedagogical Innovation), form (online) and active methodology (gamification) to be worked on in the discipline, we started a research work. For our first impression about gamification is that it would be to create a game. And how would we do that? What resources would we use?

Research and texts on the subject have shown us that gamification is a way, that is, it is a proposed methodology to boost and provide engagement in classes and explore differentiated steps and new ways of thinking to mediate student learning, which in our case, were the colleagues of the discipline itself.

Faced with this innovation challenge, we used a WhatsApp group. In the second moment, we collected the phones of our colleagues and created a group with the university students and the teacher of the discipline. Then we released the rules of the "game" on whatsaap.

When we created the WhatsApp group, we asked the participants to observe the rules and familiarize themselves with the application tools. We agreed that the class schedule would be that of the face-to-face course, however we would do it online and asynchronously after this first moment through the WhatsApp group, which caused an anxiety in colleagues that we did not expect.

Figure 1 - Created for the WhatsApp group

1. Interact with provocations, explanations, fugurinhas, gifs, audio, videos and images relevant to the context discussed on Pedagogical Innovation in Higher Education.
2. Exercise interaction with colleagues based on the provocations launched. For every 15 group contributions, the class will earn bonuses of digital texts, images and video links directed to the concepts explored; (Observe the participation of colleagues).
3. For every 3 interactions with colleagues, the participant will earn a bonus in private. This bonus will be with extra materials, texts, images and video links on the content of pedagogical innovation, different from those shared in the group.
4. We will have 4 missions and they will have time to be executed and posted; ATTENTION the deadlines.
5. The activities will be individual, which does not prevent you from helping each other in private or in the group. If you do not mind collaborating and believe that it can be done! Observe the strategies used, the feelings that these activities cause you due to the difficulty of the missions;
6. Scores will be added up from:
• Individual presentation (presentation to colleagues in the virtual room via audio) - 1 point • 2 or more references in contributions - 1 point • Mastery of content - 1 point • Concept map - 7 points

7. The ranking will be released at the end of the day.

We planned the classes using the model of didactic choreographies, where we thought for the cognitive anticipations the mobilization of the students' learning that provided the understanding, reflection, development and systematization of the meaning and postures that involve pedagogical innovation.

In the same logic, the behavioral anticipations dealt with developing behaviors such as attesting WhatsApp as a pedagogical resource, producing activities with the tools available in the app and building a concept map on pedagogical innovation to be presented in the application itself.

Thus, the affective anticipations consisted of the knowledge and potentialities of the WhatsApp application, collaboration with the knowledge of colleagues mediating the creative possibilities that the application used would have to offer and also understanding the capacity of the development of didactic competences using it.

The contents were planned in this way: the factual: the TDIC and teaching methodologies; Conceptual: Pedagogical innovation in higher education; Procedural: research, record videos, write short texts and build a conceptual map and Attitudinal: the engagement, collaboration and aprticipation of university students.

The setting of this class was the application: WhatsApp; the materials were in links, digital texts and videos and the Equipment: the student's own (cell phone and computer). We made all the planning available in digital text shared in the application itself.

For this choreography to be put into practice we developed 5 strategies. They would have to be described and have observations explaining how they would be used within the proposal of didactic choreography, we chose to explain each one as the deadlines were met by the players. In this way, we introduced the activities, which we call missions, as shown in the next image below:

Figure 2 - Created for the WhatsApp group

1st Mission: Systematize in two paragraphs (maximum 10 lines) what you think is pedagogical innovation in higher education (Time: 24 hours, counting from the time of posting the guiding image).
2nd Produce a video exemplifying practices that you believe are innovative and justifying why. (Posting period: 3 days.)
3rd Build a mind map with the text: Padilha, M. A. S; Beraza, Z, A,M: Souza, V.C: **Didactic choreographies and innovative scenarios in higher education**, Redoc: Rio de Janeiro. V.1, n1, p.115. Sep/Dec, 2017. (Period for posting: 2 days).
4th Evaluate the learning processes and strategies used using the criteria: Difficulty of the missions; Strategies used and feelings that this activity caused you (Period for posting: Using creativity and the tools that WhatsApp has available they should post the activity after 12HS and we responsible will disclose the final ranking.

We realized that the majority of the class was engaged. There were approximately twenty students. All curious and some more eager to fulfill the missions. During the process we received feedback from colleagues and adjusted some situations, such as anticipating missions that the vast majority had already met the deadline.

3 RESULTS AND DISCUSSION

The demystification of the gamification methodology was the most enjoyable moment for us. This was the perception of most of the students participating in the research. Collaborative work and engagement was highlighted by students during the evaluation of the applied proposal.

With the behavioral and affective anticipations we visualize the students' interactions in the indicated activities. There was the use of guidelines exposed at all stages: in the dissemination of the proposal, in the rules and missions.

These anticipations (behavioral and affective) were perceived in their speeches when using whatssap. The use of this tool, which is easy to handle, enabled interactions through the use of pictures and gifs.

Considering the elements of didactic choreography (PADILHA; ZABALZA, 2016) and according to the above, the emotional and affective aspects were highlighted. We realized that elements were reflected positively in the other components of this choreography, among them the factual and conceptual ones for example.

In view of this, we show that the use of gamification can facilitate the teaching-learning process as a pedagogical tool for teachers and enable the construction of student learning by promoting an active and meaningful education for all subjects of this process.

4 CONCLUSIONS

The class held via WhatsApp pushed us towards pedagogical innovation, because it led us to create strategies with the resources we had. We realized the need to know a tool before using it and we saw how laborious it is to propose some didactic situations and not know how to manage them with mastery.

The results were encouraging and left us gratified with our research and commitment to mediate the proposed class, however, it is important to emphasize the need to expand our studies.

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Self-regulation of learning and its interface for the development of students of the pedagogy course in distance education of UNINASSAU

https://doi.org/10.56238/ptoketheeducati-073

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ABSTRACT
The research carried out aimed to analyze the self-regulation of learning and its interface for the development of Pedagogy students in distance education of the Ser Educacional Group. After analyzing the data, we can conclude that there was an interface of the principles adopted by the institution that contributed to the development of students. We interviewed 322 students and we highlight that the majority of students are female. This may be a striking feature of Pedagogy courses in Brazil. The 8th period students showed evidence that they mostly adopted learning strategies in their study routine. We also saw that the VLE (Virtual Learning Environment) enhances the development of strategies and can foster new habits and biopsychosocial development in students.

Keywords: Self-regulation of learning, Educational Technologies, Learning strategies.

1 INTRODUCTION

The literature has pointed out the recurrent need for the promotion and insertion of educational proposals that use learning strategies, aiming to foster the development of self-regulation through new technologies that enable the realization of individual activities and provide collaborative, interactive and flexible teaching applied to distance learning (SIMÃO, 2004) (ZIMMERMAN; SCHUNK, 2011).

Researchers have repeatedly shown the improving effects of self-regulatory behaviors on students' academic performance in regular classrooms. If self-regulatory learning skills were important for successful learning in the traditional classroom, with the teacher in a face-to-face manner, it can be expected that self-regulation of learning will play an even more important role in learning in the online environment.

In the Ser Educacional Group, the Pedagogy Course in Distance Learning accounts for 28% of the Group's enrollments in this type of Education. Having in 2019 the quantitative of 5200 students enrolled. Our interest in researching the self-regulation of student learning arose during the Coordination of the Pedagogy Course in EAD. Being this course, recognized by MEC in 2018, and

occupying the prominence in the country as the 4th best Pedagogy Course in Brazil. This data is relevant and in fact represents the efforts of all the teams involved. In view of this national result of great notoriety, we identified that some students have difficulties in the teaching-learning process. This was evidenced in their academic performance through the evaluations and in their participation in the virtual spaces of interaction in the VLE. Moment when students interact in the evaluative activity called collaborative challenge.

In view of the students' difficulties, we seek to understand whether in the virtual classroom (Virtual Learning Environment - VLE), we offer inputs that enable the development of self-regulation of learning and autonomy of students. In this endeavor we formulate the following questions:

> a) How does the students' self-regulation process occur when using the Virtual Learning Environment (VLE)? b) Are the learning paths offered in the VLE related to the assessment instruments offered to students? c) What are the strategies used by students in their teaching-learning process? As a premise of our reflection, we can ask: does the Pedagogy Course in Distance Education contribute to the development of self-regulatory behavior as a competence developed throughout their university education?

The exposed questions and the daily practice in the monitoring of students point out that the Pedagogy Course in EAD enables in its structure elements that will enhance the competences of students regarding academic development. This is the proposed hypothesis that will need to be proven or not in this research.

This research presents academic relevance that can guide not only the operation of the course, but also enable internal reflection if in fact the problems identified in students when taking the disciplines are gaps in their training or indications of pedagogical problems in the elaboration of the learning trails proposed in the VLE (Virtual Learning Environment).

To guide our research, we formulated the following specific objectives: to unveil the learning strategies used by students in their teaching-learning process; to identify in the Pedagogical Project of the Pedagogy Course concepts that promote the self-regulation of student learning; and to verify in the VLE (Virtual Learning Environment) evidence of encouraging self-regulation of student learning in their development process.

In our research we used the qualitative approach of exploratory objective, through the application of a survey of intentional non-probabilistic sample with the objective of analyzing the perception of 322 students from the 1st to the 8th period of the Pedagogy Course in EAD of UNINASSAU.

In this sense, the contribution becomes relevant in light of the recognition that students, future professionals in pedagogy, need to develop critical thinking skills, continuous learning and the ability to conduct the development of monitoring and self-regulation of students' own intellectual processing.

Next, in chapter 2 the theoretical foundation is presented, in chapter 3 the research methodology and in chapter 4 and 5 the results and conclusion, finally, in chapter 6 the references.

2 LITERATURE REVIEW

In this chapter an overview of ODL is provided, followed by the concept of self-regulation and learning strategies, and finally the clarification of meaningful learning and its relationship to the development of self-regulation strategies.

2.1 DISTANCE EDUCATION AND INNOVATIVE ASPECTS

In distance education (DE), the innovative elements of practice that are introduced through the physical separation between the teacher and the student, as well as the use of modern technology, create an educational environment characterized by learning autonomy and active engagement. This means that the student, in order to facilitate his/her own learning, manage the learning process and achieve academic success, is required to monitor, control and modify his/her own action through self-assessment of his/her cognitive skills and behaviors (PRETI, 2005).

Learning autonomy is considered an important factor for academic success in distance education. Learning in distance education presents challenges. Lack of self-regulation capacity is a significant reason for the increased dropout rate in online courses. This may be due, in part, to students not recognizing the effort and effort they put in the organization required to succeed in this modality (BELLONI, 2015).

Success in distance learning correlates positively with learners' ability to self-regulate and direct their own learning efforts. As a critical factor affecting learning performance in distance education, self-regulated learning has attracted considerable interest. Self-regulated learners can manage their learning activities efficiently, but researchers indicate that learners have difficulties in promoting self-regulated learning (SRL). Thus, providing support to facilitate the process of self-regulated learning becomes extremely important.

For Zimmerman (1989) self-regulation is the competence of the individual to self-manage thoughts, feelings and actions that are planned and cyclically adapted for the attainment of personal goals and objectives. Self-regulated learning emphasizes the role of learners in setting goals and strategies, dynamically approaching task planning and execution, and acknowledging and reflecting on perceptions and their influences alongside the learning task. Self-regulated learners can be defined as proactive in their efforts to learn, because they are aware of their strengths and limitations and because they are guided by personally set goals and task-related strategies. These learners monitor their behavior in terms of their goals and reflect on their increasing effectiveness. This increases their self-satisfaction and motivation to continue to improve their learning methods. Because of their

superior motivation and adaptive methods of learning, self-regulated students are not only more likely to succeed academically, but also to view their future optimistically (ZIMMERMAN, 2002).

2.2 SELF-REGULATION OF LEARNING

Self-regulated learning is the process by which students plan, monitor and regulate their own learning. It refers to thoughts, feelings and actions that are planned and adjusted to improve motivation and learning (ZIMMERMAN, 2008). For Zimmerman (2000), within the framework of the sociocognitive approach to learning processes, describes the structure of the self-regulatory process in three phases. The previous phase refers to the processes and beliefs that influence and precede the students' efforts to learn, marking the pace and level of this learning. The second phase of the self-regulatory process, is influenced by the previous one and involves the processes that occur during learning affecting the execution of the task, with emphasis on attention and self-monitoring. These processes help the learner to concentrate better on activities and improve their achievements. Finally, self-assessment is linked to actions that occur after the task is completed, giving the student the opportunity to review the directions taken and the choices made (ZIMMERMAN, 1998).

Cognitive and metacognitive theories of learning show that self-regulation actually influences the learner's actions. Therefore, any act of regulation depends on their active attitude (SCHUNK; ZIMMERMAN, 2012). Self-regulated students have a systematic view of their learning and control their cognitive processes, through planning, goal setting, monitoring and learning assessment of their own understanding at various points in the study process (BORUCHOVITCH, 2007).

According to Zimmerman (1989), Zimmerman (2008), motivation is an essential variable of self-regulated learning. Students will only employ learning strategies if they are motivated to do so. Bzuneck (2010) states that motivation is a theoretical construct that arises from the interaction between many factors, such as success, values, gratification, interests and self-esteem, among others. These aspects explain, according to the theory, the initiation, direction, intensity and persistence of goal-oriented behavior.

2.3 LEARNING STRATEGIES

All students, regardless of their level, use self-regulation strategies during the learning process (ZIMMERMAN, 1990). What distinguishes self-regulated learners is the fact that not only the value of this reciprocal relationship between cognitive learning strategies and learning outcome has been realized, but also these strategies are used to achieve their learning goals. Research findings in mainstream education confirm that more effective learners make use of more self-regulated learning strategies and that self-regulated learning is significantly correlated with high academic performance (ROSÁRIO, 2004).

Self-regulatory learning strategies refer to specific skills that are part of the process of self-regulation of learning and can be taught to learners so that they apply them in contexts (ZIMMERMAN; SCHUNK, 2008). This includes strategies such as Self-assessment, Goal setting and planning, Environmental structure, Seeking social help, Organization and transformation, Information seeking, Note taking, Repetition and memorization, Self consequences and Data review (ZIMMERMAN; PONS, 1986).

Educators (teachers and tutors) are recommended to use instructional support to help learners set appropriate learning goals and strategies (GANDA, 2016). In addition, educators need to develop students' attention and create moments of reflection, planning and evaluation, improving students' competence to make decisions about how to use learning resources during the course and the ability to coordinate learning skills, motivation and emotions to achieve the objectives (PANADERO; BROWN; STRIJBOS, 2016). According to (HAGENAUER; VOLET, 2014), the relation teacher-student in higher education is considered a condition for successful learning and can explain and prevent the phenomenon of school dropout.

2.4 MEANINGFUL LEARNING

The challenges imposed by the contemporary world have indicated the need to consider more systemic and complex conceptions regarding the construction of knowledge and human formation. In this direction, it was necessary to conceive methodologies consistent with the production of senses and meanings about their learning, in a way that would contextualized and protagonist, taking into account the prior knowledge they bring from the school sphere and beyond (TRIFONE, 2017).

Promoting meaningful approaches to learning in the 21st century classroom follows in the tradition of transformative education by fostering a constructivist pedagogical framework that promotes the development of an epistemology necessary for the creation of personal meaning. This framework promotes the acquisition of higher reasoning, critical and creative thinking skills. Under this perspective, the learner is not perceived as someone disconnected from the learning environment. Instead, the learner is a participatory member of a learning system composed of the teacher, the students, and the physical and virtual learning environment in which they are embedded (BACICH; JOSÉ, 2017).

For Piaget (1973) two mechanisms occur during intellectual development, assimilation and accommodation. In assimilation the individual uses what he already has to give meaning to what he is receiving, the second mechanism is accommodation, and is considered every modification of assimilation schemes under the influence of external situations to which they apply (TAFNER).

For meaningful learning to take place, it is necessary to be available for the student's involvement in this process, in addition to the commitment to establish relationships between what

they already know and what they are learning, to use the appropriate instruments they know and have to achieve the greatest possible understanding (MOREIRA, 2012). Meaningful learning and thinking consist of the application of cognitive and metacognitive learning strategies and experiences. that challenge their preconceived assumptions and level of conceptual understanding. These learning experiences create a disparity between what learners observe and what is predicted based on their current level of understanding. Thus, they promote the development of a unique and personalized relationship between the individual and the ideas and information under consideration. Meaningful learning occurs if the learning task can be related in a non-arbitrary and substantive (non-verbal) way to what the learner already knows (AUSUBEL, 1963). This is where the constructivist educator can capitalize on the state of cognitive dissonance of learners to make a real difference by motivating them to reconstruct their cognitive schema in a way that transforms misconceptions into valid concepts.

3 MATERIALS AND METHODS

This work is based on qualitative research, as it involves obtaining descriptive data about people, places and interactive processes by the direct contact of the researcher with the studied situation, seeking to understand the phenomena according to the perspective of the subjects, that is, the participants of the situation under study (GODOY, 1995).

We used the Survey as a methodological instrument for exploratory collection of initial research on the topic addressed (BABBIE, 1999). 322 students of the Pedagogy Course in EAD answered closed and open questions about the application of self-regulation strategies of learning.

The criteria for choosing the students were: the degree course in pedagogy, due to the character of their training in contributing to the quality of teaching and learning, strengthening the construction of knowledge; and the teaching modality in distance education.

4 RESULTS AND DISCUSSION

Throughout our research we can find data that can be considered relevant for professionals who develop the educational process in distance education with students. It is not only about listening to students, but also about developing new principles that enable students to develop learning strategies.

Before presenting the data, it is necessary to contextualize who the interviewees are. We interviewed 322 students, 291 women (18 to 61 years old) and 31 men (33 to 53 years old). With this we verified that the majority of the interviewees are women. This female representation can happen in view of the fact that the female public mostly makes up the Pedagogy course.

In our sample we identified that 46 students attend their first distance learning higher education course. And 276 students have already attended a higher education course in distance learning. By understanding that most students have never attended any distance learning course, we can see the

results, understanding that the first experience for these students not only impacts their lives, routines, habits, but also inserts them into new technologies, new habits and challenges. Bearing in mind that our Brazilian culture for centuries has been traditional and without the use of digital technologies. Especially for those who present an average of 40 years.

Throughout our research we can find data that can be considered relevant for professionals who develop their educational process in distance education with students. It is not only about listening to students, but also about developing new principles that enable students to develop learning strategies.

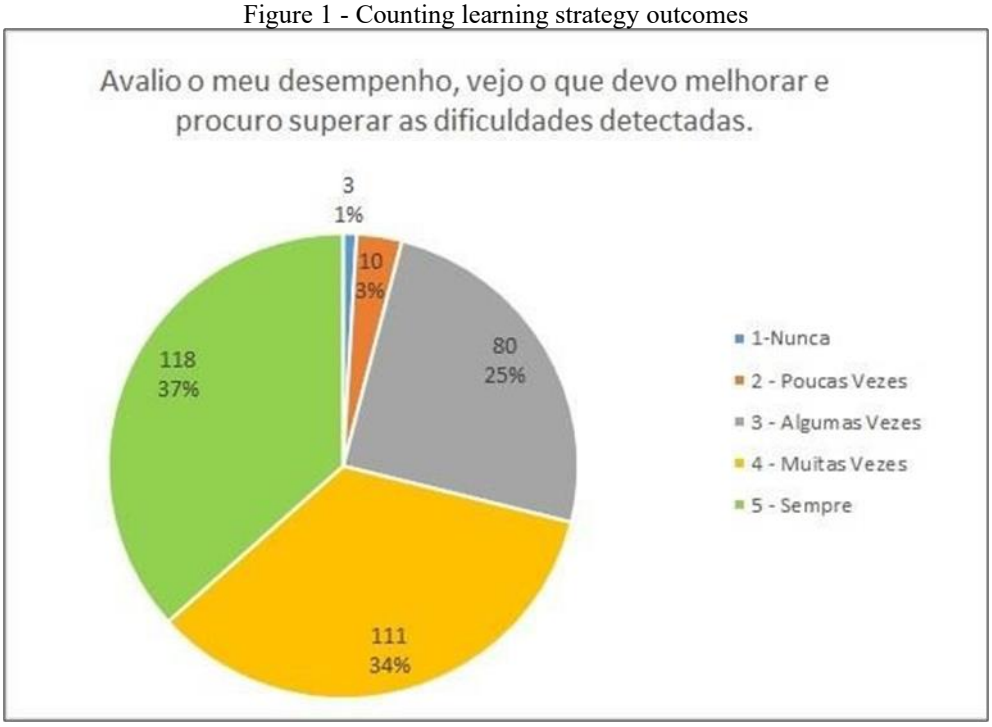
Before presenting the data, it is necessary to contextualize who the interviewees are. We interviewed 322 students, 291 women (18 to 61 years old) and 31 men (33 to 53 years old). With this we verified that the majority of the interviewees are women. This female representation can happen in view of the fact that the female public mostly makes up the Pedagogy course.

In our sample we identified that 46 students attend their first distance learning higher education course. And 276 students have already attended a higher education course in distance education. By understanding that most students have never attended any distance learning course, we can see the results, understanding that the first experience for these students not only impacts their lives, routines, habits, but also inserts them into new technologies, new habits and challenges. Bearing in mind that our Brazilian culture for centuries has been traditional and without the use of digital technologies. Especially for those who present an average of 40 years.

To facilitate data analysis and reader understanding we will present graphs of the results and our reflection.

Regarding the student's self-assessment of their performance, we found that the majority reported that they have the habit of self-assessment, with 37% and 34% reporting that they always and often, respectively, evaluate their performance to overcome possible problems difficulties. This is a good percentage compared to the number of students. Self-assessment results in the development of self-regulation of their own learning. Let's see in Figure 1.

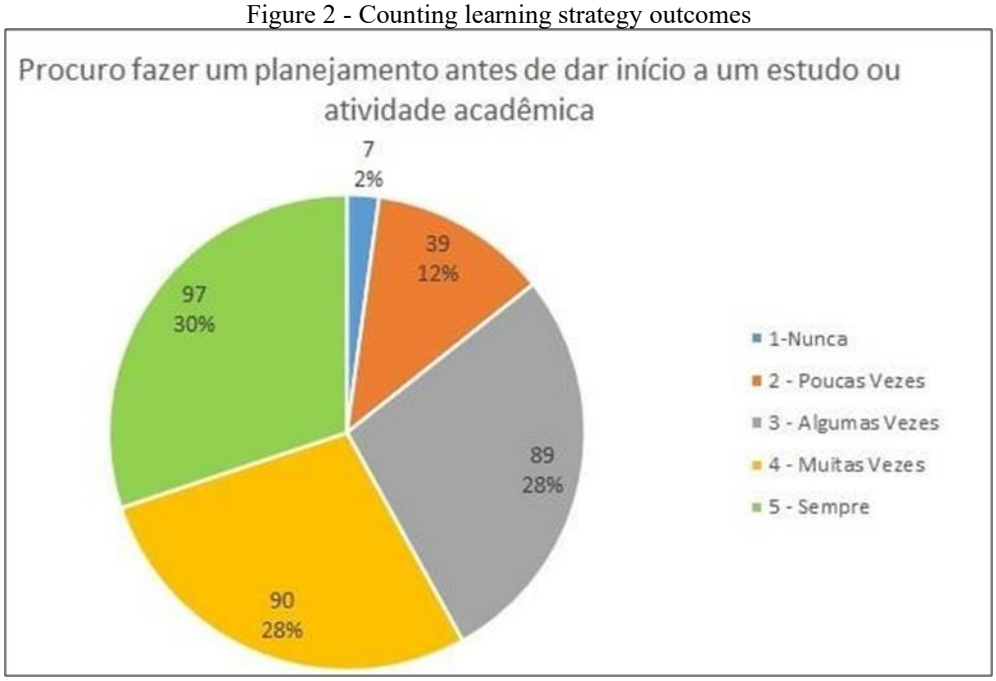
Figure 1 - Counting learning strategy outcomes



Prepared by the Author

About adopting Figure 2 planning in their study routine, most students reported that they always and often plan before studying. We emphasize that the act of planning is a national difficulty. Whether due to lack of culture or gaps in student training since early childhood education. The lack of planning and non-use as a learning strategy can prevent the individual's student success.

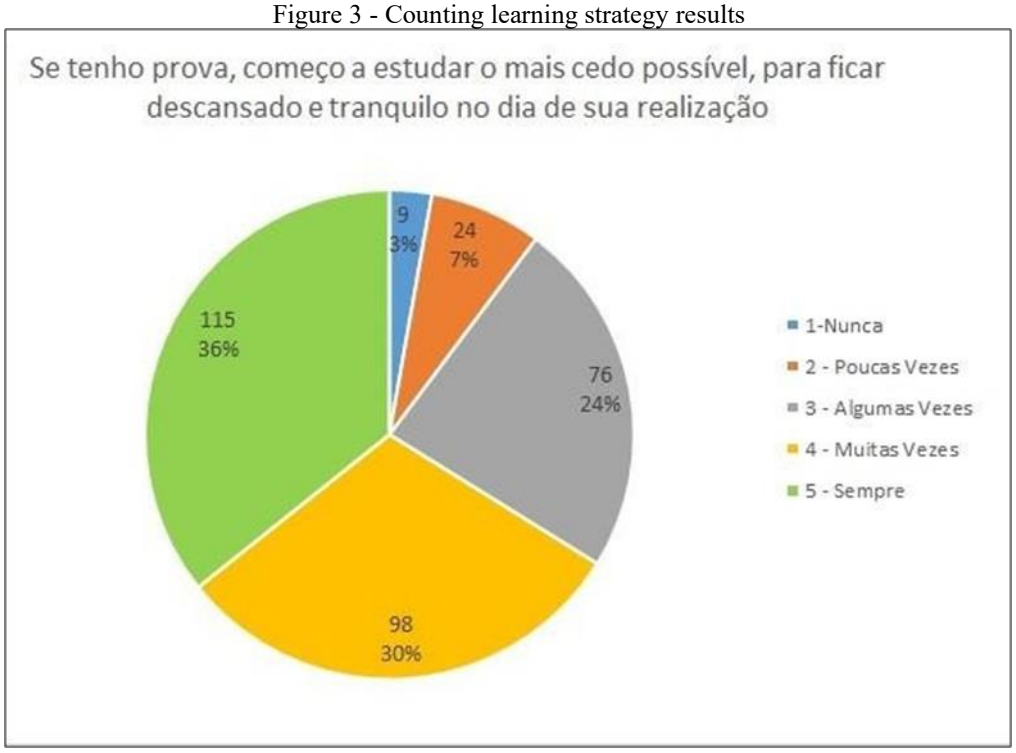
Figure 2 - Counting learning strategy outcomes



Prepared by the Author

Asked about the study routine before the tests, the students mostly reported that "Always" and "Often" study in advance. In order to prepare calmly. This data is consistent with the previous one, see Figure 3.

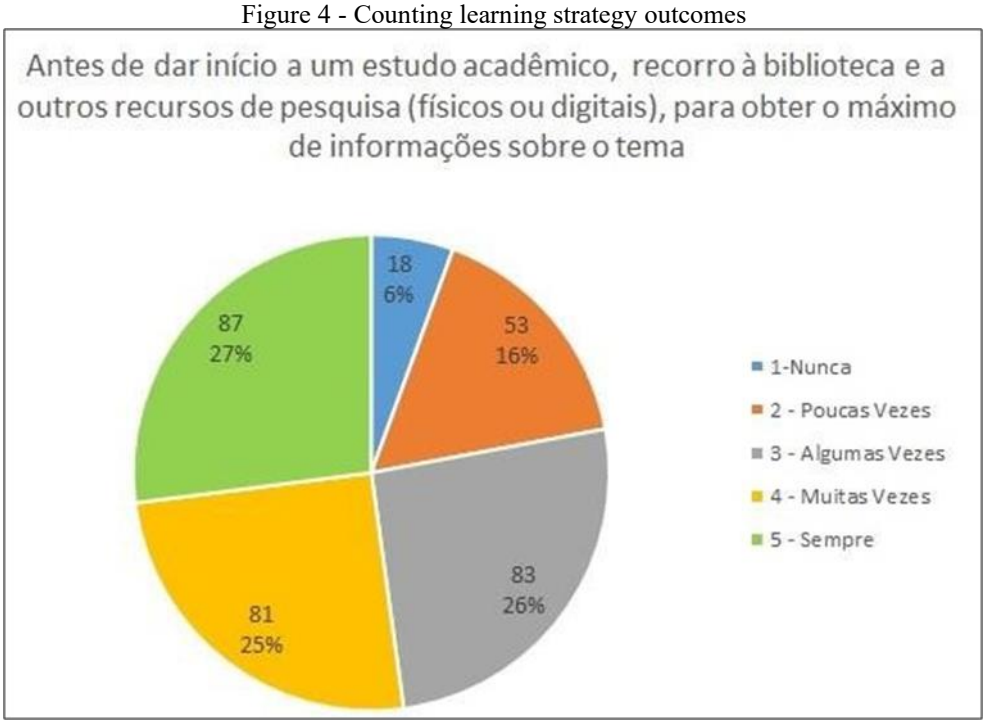
Figure 3 - Counting learning strategy results



Prepared by the Author

Regarding the fact that they research content in study sources to expand their competences, the students mostly reported that they "Always" or "Often" do this, see Figure 4. The habit of researching the subjects to be studied denotes the critical awareness of most students. It is indispensable for students of the distance learning modality to internalize this autonomous and active behavior in their teaching process.

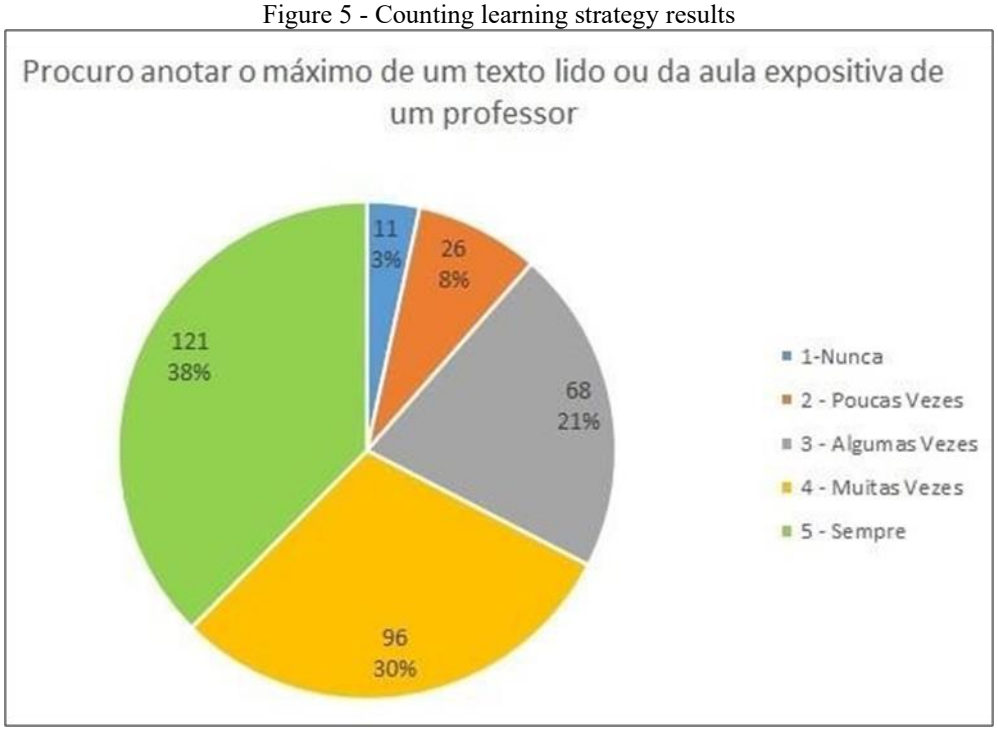
Figure 4 - Counting learning strategy outcomes



Prepared by the Author

When analyzing the fact that students write down the knowledge acquired, Figure 5, we note that most are in the habit of writing down the information from the classes. Being an important point in your learning process.

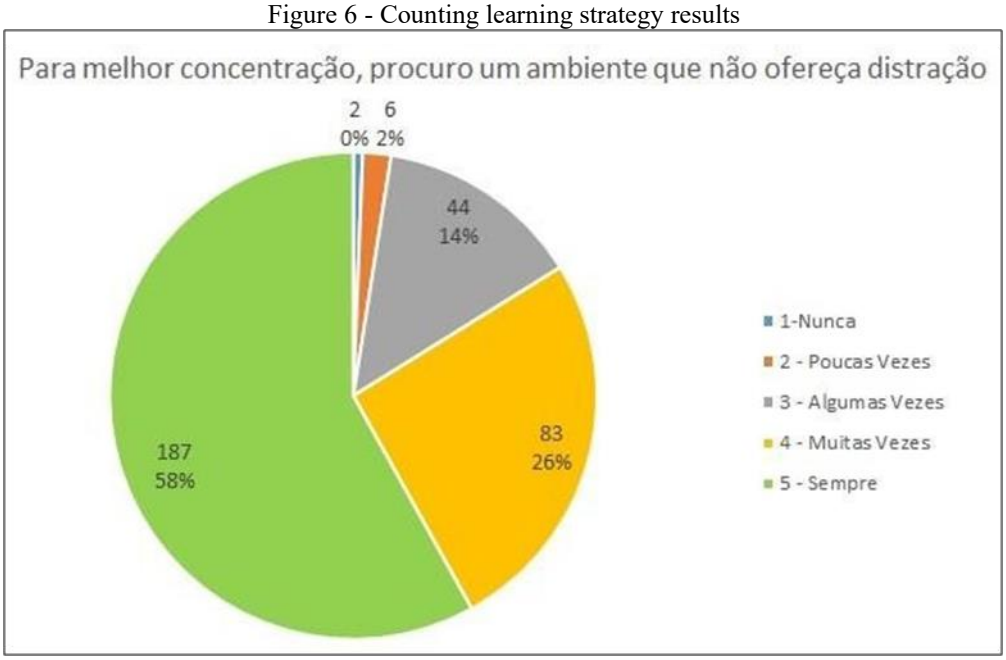
Figure 5 - Counting learning strategy results



Prepared by the Author

The organization of the study place is fundamental for the activity to be carried out according to a favorable context for learning. Most students reported that they have a favorable environment that does not distract them, as shown in Figure 6. It is also important to note that this item was the one with the lowest number of "Never" responses, which facilitates the teaching and learning process for students.

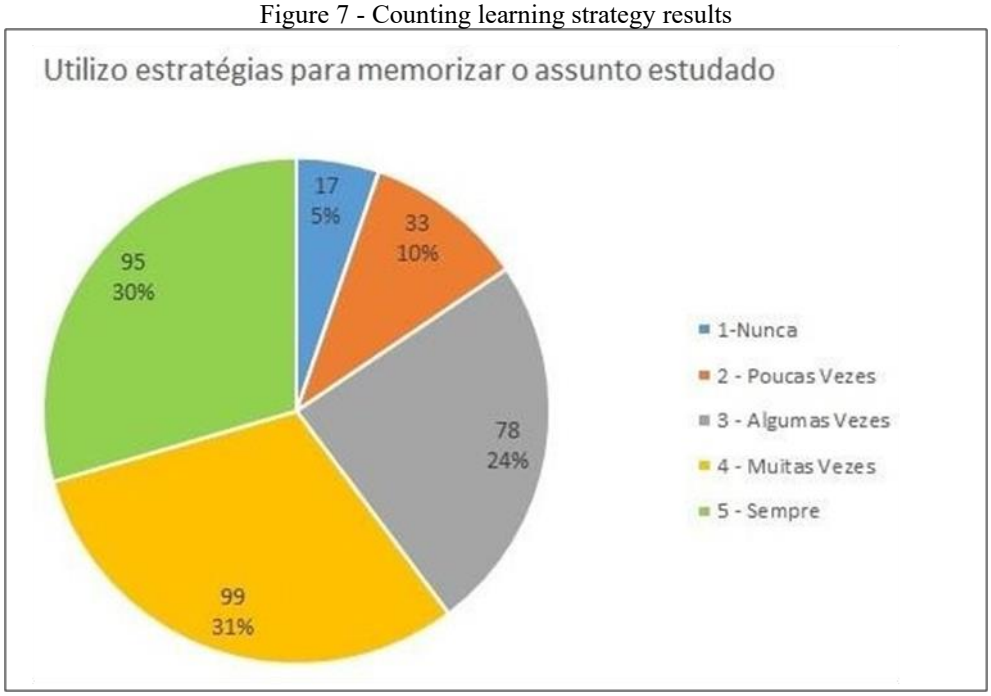
Figure 6 - Counting learning strategy results



Prepared by the Author

Asked about the use of strategies that help them memorize subjects, 61% of students reported that they always use or often use strategies for memorization, Figure 7. By using this strategy, students will be able to enhance learning from memory retrieval and what has been taught.

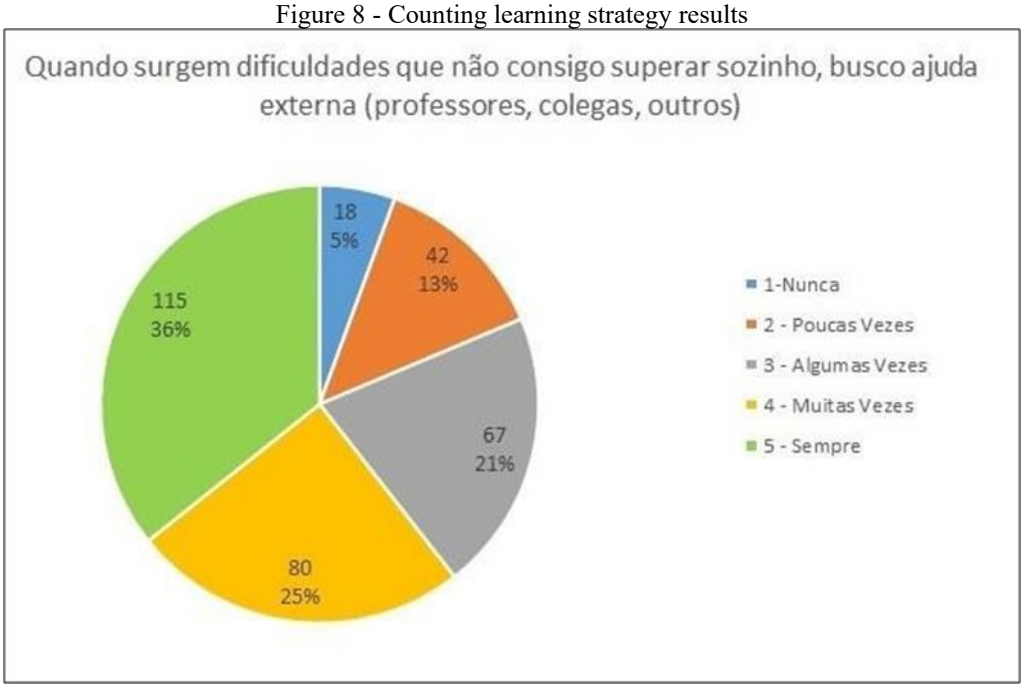
Figure 7 - Counting learning strategy results



Prepared by the Author

Figure 8 shows that 61% of students always or often seek help in their studies from teachers, peers and others. This result is important as it shows that they interact with each other and confirms the importance of online tutoring and discussion forums. Interaction is one of the fundamental principles for self-regulation of learning.

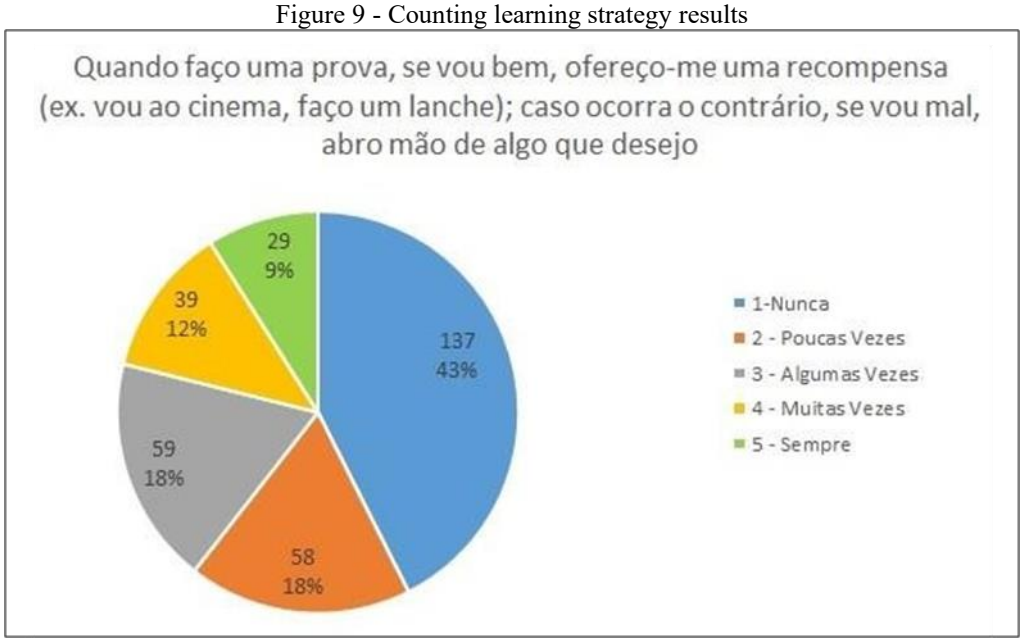
Figure 8 - Counting learning strategy results



Prepared by the Author

One of the highlights of the survey is related to the result obtained when asked about the moment after the assessments, as can be seen in Figure 9. Most students, 61%, reported that when performing them, they never or rarely apply compensation to themselves for the performance spent. Self-rewards are often used as a motivational strategy for the student to value learning, or to lead themselves to the desired goal.

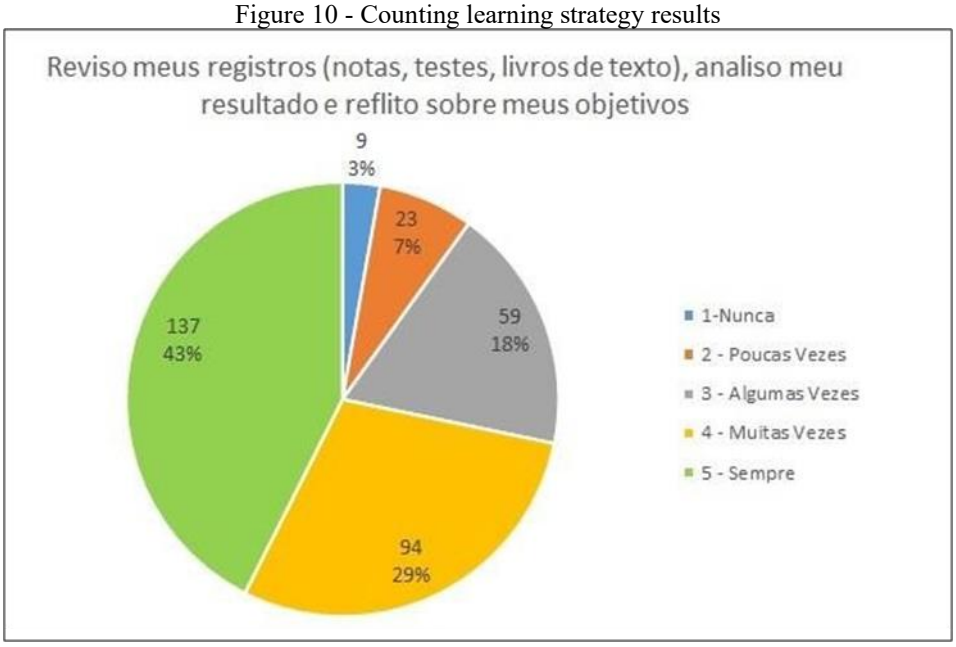
Figure 9 - Counting learning strategy results



Prepared by the Author

The act of reviewing the records, analyzing and reflecting on the objectives is carried out by most students, see Figure 10. Evaluating the plan and the choices made during the learning process is very important, as it allows each student to self-assess in relation to each objective set and to always keep this self-assessment in mind, so as to be able to regulate their learning, working according to their difficulties during the time of self-study.

Figure 10 - Counting learning strategy results

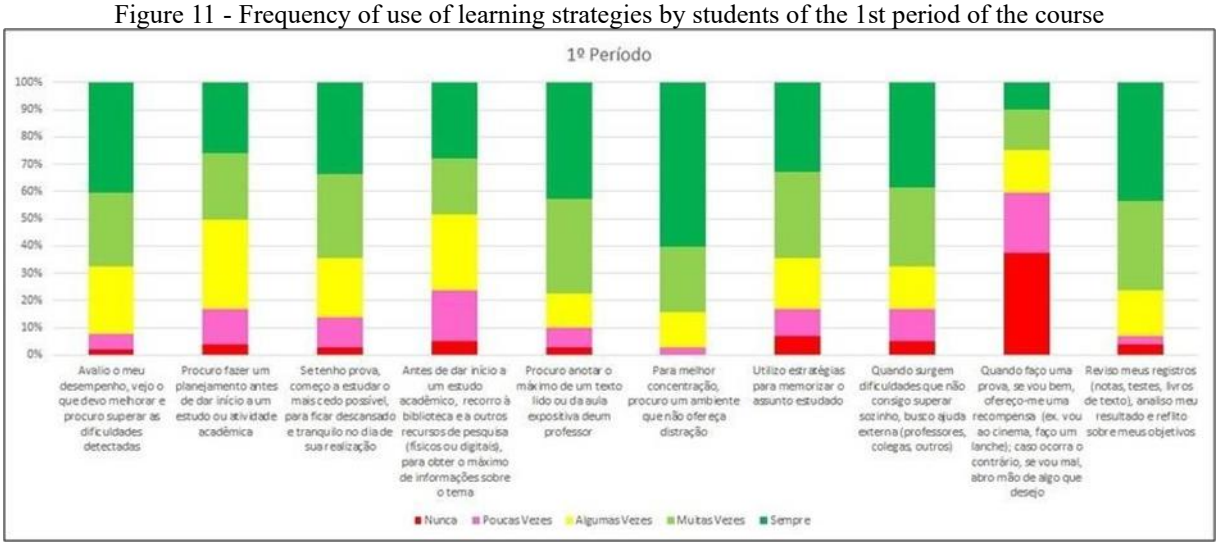


Prepared by the Author

We will now present a comparative analysis of the periods (1st and 8th of the Pedagogy Course), and thus describe some indications of results. We emphasize that we would need to broaden the discussions to deepen some specific points.

In the analysis of the responses of the students of the 1st period of the EAD Pedagogy course, presented in Figure 11, we identified that 7% of the students' responses were related to the frequency "Never" for the application of some learning strategy. Characterized by the red color in the graph. This result may represent ignorance of the strategies or lack of adaptation to the context, which makes a pedagogical and permanent approach of the institution special, being attentive to the processes, paths and needs of the students.

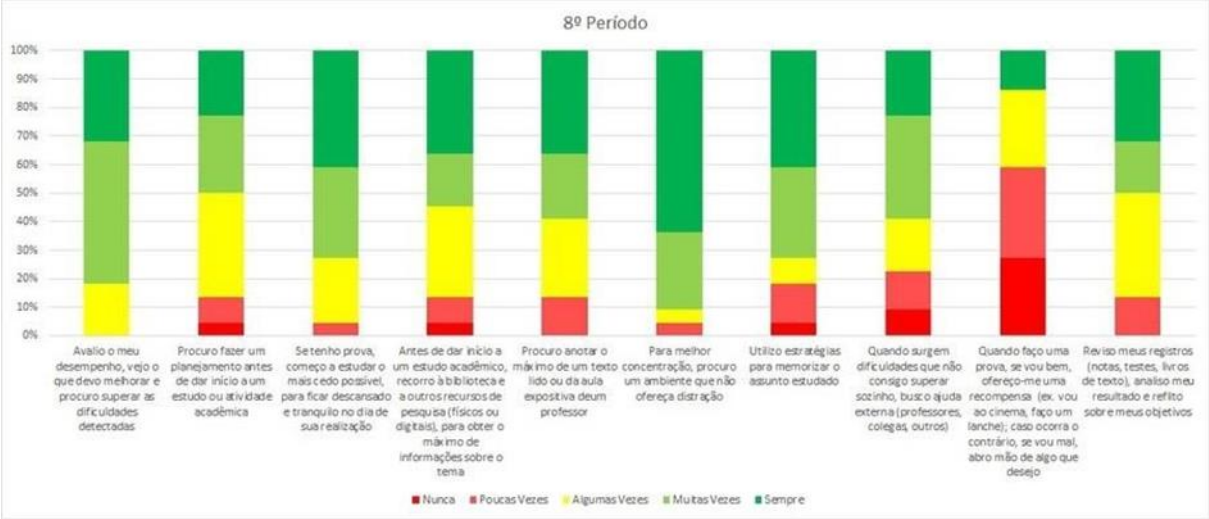
Figure 11 - Frequency of use of learning strategies by students of the 1st period of the course



Prepared by the Author

In the categories presented to the students of the 8th period we found that they mostly stated that they apply learning strategies with some frequency.

Figure 12 - Frequency of use of learning strategies by students of the 8th period of the course



Prepared by the Author

Regarding the frequency of "Never" for any of the strategies presented, we can see a slight reduction in the 8th period class, accounting for 5% of the records. With this, we visualize that this period reaches more satisfactory levels of application of the strategies.

We cannot say that the improvement highlighted would be associated with the time already elapsed during academic training. However, for this analysis, it is necessary to expand the discussion and research with these actors. We believe that these factors can foster their internalization of strategies. Considering that the study in distance education even involuntarily predisposes and induces the individual to adopt a dynamic and habit that he was not used to. From the beginning of his insertion in the distance education, the individual, if he does not adopt an active and autonomous posture related to the organization of studies, planning of activities and compliance with dates, will not be able to be approved.

5 CONCLUSION

The research on self-regulation of learning and its interface was an opportunity for us to reflect on guiding questions of our pedagogical practice. By looking at themselves we can uncover encouraging results for the continuity of our work. As already described in the results, the students of the 8th period present better development regarding the use of learning strategies. When we compare the students of the 1st and 8th period we emphasize that there is a gap in the use of strategies. The possible cause of this gap can be attributed to the training time of these students during graduation.

However, we understand that we need to expand on these questions in a future survey. There are variants that need to be reflected. From social, cultural issues, use of technology and other topics.

When analyzing the Pedagogical Project of the Pedagogy Course, we verified in its structure elements that enhance the development of pedagogical strategies. From the conceptual basis to the curriculum matrix, we identified that its content is directly related to the development of student learning strategies.

Our third specific objective was to establish the relationship between self-regulation strategies and the use of the VLE (Virtual Learning Environment). We found that the environment offers development conditions for the internalization of strategies. Even with this indication, we understand that a closer alignment of the tools offered with the strategies is necessary. In the VLE we can identify that there is investment in student interaction through the collaborative challenge, talk to the tutor, communities and talk to the coordination. This favors the search for external help, whether as teachers, colleagues or others to overcome the difficulties encountered. For a better alignment, it would be interesting if the other pedagogical elements were aligned to offer the principles of self-regulation, from the learning path to the evaluation process. These indications move us to continue our research seeking answers that can point to the effectiveness of the environment as a space that enhances self-regulation of learning. We can conclude that the proposal of distance learning offered by this HEI can offer students subsidies that promote their development through a a perspective for self-regulation of learning.

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SEVEN
publicações acadêmicas

The development of learning strategies by distance learning students in the face of self-regulatory activities

https://doi.org/10.56238/ptoketheeducati-074

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ABSTRACT
The purpose of our research was to analyze the development of learning strategies used by distance learning students of Pedagogy and ADS courses in the face of self-regulatory activities. This research presents as a differential the fact that the didactic and pedagogical elements were elaborated in an unprecedented way so that there was an adjustable environment with a learning trail built on the principles of cognition, planning and self-motivation. We interviewed 100 students, in which they were submitted to a semi-structured questionnaire that would offer us clues as to how the process of strategy development took place during the 30 days in which the virtual room was available in the VLE of the Ser Educacional Group in EAD. As a general objective, we seek to analyze the development process of students of the Pedagogy and ADS Course in EAD da Uninassau in the face of pedagogical activities from a perspective of self-regulation of learning, as this, we propose to: identify students of the 1st period of the Pedagogy and ADS Courses, we elaborate in the VLE (virtual learning environment) didactic materials that guarantee the stimulation for the development of self-regulation strategies and we understand how this student learning process took place. As a methodology, we applied a semi-structured questionnaire inserted in the VLE so that we could analyze the students' self-regulatory skills. There were two moments, the same questionnaire being applied at the beginning of the classes and at the end. With this, we identified that the students who participated in our research showed significant changes in their understanding of self-regulation, as well as reported that they developed new habits and changed their academic and personal lives. This could be analyzed in the data collected and during the development of the students and the discipline.

Keywords: Self-regulation of learning, Educational Technologies, Learning strategies.

1 INTRODUCTION

In distance education (DE), the innovative elements of practice that are introduced through the physical separation between the teacher and the student, as well as the use of modern technology, create an educational environment characterized by learning autonomy and active engagement. This means that the student, in order to facilitate his/her own learning, manage the learning process and achieve academic success, is required to monitor, control and modify his/her own action through self-assessment of his/her cognitive skills and behaviors (PRETI, 2005).

Learning autonomy is considered an important factor for academic success in distance education. Learning in distance education presents challenges. Lack of self-regulation skills is a significant reason for the increased dropout rate in online courses. This may be due, in part, to students not recognizing the effort and organization required to succeed in this type of modality (BELLONI, 2015).

Success in distance learning correlates positively with learners' ability to self-regulate and direct their own learning efforts. As a critical factor affecting learning performance in distance education, self-regulated learning has attracted considerable interest. Self-regulated learners can manage their learning activities efficiently, but researchers indicate that learners have difficulties in promoting self-regulated learning (SRL). Thus, providing support to facilitate the process of self-regulated learning becomes extremely important.

For Zimmerman (1989) self-regulation is the competence of the individual to self-manage thoughts, feelings and actions that are planned and cyclically adapted for the attainment of personal goals and objectives. Self-regulated learning emphasizes the role of learners in setting goals and strategies, dynamically approaching task planning and execution, and acknowledging and reflecting on perceptions and their influences alongside the learning task. Self-regulated learners can be defined as proactive in their efforts to learn, because they are aware of their strengths and limitations and because they are guided by personally set goals and task-related strategies. These learners monitor their behavior in terms of their goals and reflect on their increasing effectiveness. This increases their self-satisfaction and motivation to continue to improve their learning methods. Because of their superior motivation and adaptive learning methods, self-regulated students are not only more likely to succeed academically, but also to view their future optimistically (ZIMMERMAN, 2002).

The literature has pointed out a permanent need for the promotion and insertion of educational proposals using learning strategies, aiming to foster the development of self-regulation through new technologies that enable the realization of individual activities and provide collaborative, interactive and flexible teaching applied to distance learning (SIMÃO, 2004) (ZIMMERMAN; SCHUNK, 2011).

Our intention in this proposal is to continue the research carried out in 2019/2020. The results indicated that the Pedagogy students of the 8th period showed signs of using self-regulation strategies. The students of the 1st period had results lower than expected regarding the strategies of self-regulation of learning. With this, our problem originated, in which the students of the 1st period, if they were stimulated to the development of self-regulation strategies at the beginning of their course, could present better pedagogical and learning development? In search of possible answers, we highlight the following questions: a) Can the elaboration of a learning trail based on a self-regulation perspective influence the development of students regarding the internalization of their university autonomy? b)

Can the Pedagogy and ADS courses contribute to the development of self-regulation strategies for learning by offering self-regulatory activities in the VLE (Virtual Learning Environment)?

This research presents academic relevance that can guide not only the functioning of the courses, but, our study is based on several theorists such as: (BOEKAERTS, 1996; BOEKAERTS & CORNO, 2005; BOEKAERTS, PINTRICH & ZEIDNER, 2000; CORNO, 2001; LOPES DA SILVA et al, 2004; PINTRICH,2000; ROSÁRIO, 2004; SCHUNK, 2005; VEIGA SIMÃO, LOPES DA SILVA & SÁ, 2007; VEIGA SIMÃO, 2002; ZIMMERMAN, 1998, 2000, 2008).

When we analyze the aspects that promote the development of self-regulation, we see how we have gaps. This fact is visible when we check the learning trail proposals in which students are exposed. With this we question whether in fact we have a supposedly ideal environment, elaborated with a content based on self-regulation, can influence the development of strategies for the use of self-regulation with the adoption of a regulable behavior.

For Zimmerman (1989) self-regulation is the competence of the individual to self-manage thoughts, feelings and actions that are planned and cyclically adapted for the attainment of personal goals and objectives. Self-regulated learning emphasizes the role of learners in setting goals and strategies, dynamically approaching task planning and execution, and acknowledging and reflecting on perceptions and their influences alongside the learning task. Self-regulated learners can be defined as proactive in their efforts to learn, because they are aware of their strengths and limitations and because they are guided by personally set goals and task-related strategies. These learners monitor their behavior in terms of their goals and reflect on their increasing effectiveness. This increases their self-satisfaction and motivation to continue to improve their learning methods. Because of their superior motivation and adaptive learning methods, self-regulated students are not only more likely to succeed academically, but also to view their future optimistically (ZIMMERMAN, 2002).

2 MATERIALS AND METHODS

In our research, we carried out a previous registration in which we had 700 students. We chose to draw lots after choosing the appropriate profiles and 100 students were counted. The students were inserted in the VLE in an interactive classroom designed according to self-regulatory perspectives. We held orientation web conferences for participating students, prepared 04 learning guides and inserted various materials to stimulate strategy development. Several activities were applied: we applied 02 questionnaires made available to students in the VLE. The first application was carried out at the beginning of classes and the second after the end of the room.

3 RESULTS AND DISCUSSIONS

As results, we initially identified that the participating students had difficulty understanding what self-regulation of learning would be. With this we verified that besides not understanding the term they had difficulty in seeing themselves as a regulable individual. From the first presentation web it was visible that the main doubt would be how this knowledge would help them in their routine. This being the initial concern.

In the continuity of application of activities, web conferences and interaction with tutors, students show great interest in the theme. This occurred during the webs, because the teachers used several didactic strategies of interaction with the students.

To categorize the results, we elected the following premises: a) self-assessment of student performance; b) study planning as an academic activity; c) evaluation process; d) use of physical or digital teaching resources; e) annotation of class content; f) concentration in the study environment; g) strategies for memorization of the topic studied; h) review of class content.

When we asked about self-assessment and student awareness of overcoming difficulties 31.9% stated that they always self-assess and 29% that they do this sometimes. The remaining students do not perform the action.

Regarding the category that deals with "I try to make a plan before starting a study or academic activity", 4.3% never plan; 18.8¨a few times, 21.7% often and 27.5% always.As for the test or evaluation activity 5.8% never study before the test; 8.7% a few times, 20.3% sometimes, 36.2% often and 29% always study in advance.

The search for physical or digital resources can be visualized according to the analysis: 2.7% never resort, 21.7% a few times, 26.1% often and 15.9% always resort. With this we verify that there is low demand for resources that could enhance students' learning.

The writing about the class showed that the students still have the habit of writing the narration of the teachers' classes, being: 2.9% never write; 13% few times. 30.4% sometimes write, 21.7% often and 31.9% always write the classes or web conferences they participate in.

The concentration of the students had as indicators: 4.3% rarely seek an environment without distraction to study, 13% sometimes seek, 21.7% often and 60.9% always seek a quiet space without distractions. We saw with this that most students feel the need to have a calmer and quieter space to study.

To memorize the subjects we saw that 10.1% never use strategies that help them remember the content, 18.8% a few times, 23.2% sometimes, 26.1% often use strategies and 21.7% always use strategies to memorize the subjects. With this it is evident that many use strategies that help them remember the study content.

The search for support was also an interesting data, since 2.9% never seek help from teachers or colleagues, 11.6% a few times, 24.6% sometimes seek help, 17.4% often and 43.5% always seek help. It is interesting to note that most students understand the need to seek support. It is evident that these students are developing the principles of self-regulation. The fact that they know their difficulties and how to solve them is an outstanding fact.

In view of the above results, we understand that the students in fact demonstrate an important level of development and that it could be evaluated as a result of the experience lived by them in the VLE in an environment prepared to stimulate their self-regulation strategies.

4 CONCLUSION

In this study we cannot finalize it without pointing out indications that need to be investigated. We note that there was a development of the students surveyed. This was evidenced in their participation in the webs, interaction with tutors, responses to challenges and feedback received.

The theme addressed is relevant and needs further research. We conclude that we have achieved the intended objectives and understand that when the learning room follows a pedagogical didactic organization, students will be able to expand their learning and development of their self-regulation of learning.

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Sustainability pathways and practices

https://doi.org/10.56238/ptoketheeducati-075

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ABSTRACT
Sustainability is on the global agenda of major nations concerned with the survival of humanity. It becomes relevant to understand and solve the problems faced by human and non-human beings in order to improve the quality of life and well-being of all. Sustainability issues are present in the lives of citizens who sometimes do not realize their importance. However, it gains space in the world as a way to mitigate the environmental problems that the human being himself causes to the planetary environment. The literature shows that the concepts of sustainability are under construction. This article sought to reflect on the need for sustainability practices for the survival of planet Earth. It is important to recognize that sustainability practices are connected in several dimensions to find the balance and its full functioning as the ecological, social, economic, technological and other dimensions. These dimensions deal with how sustainability can assist in the various relationships with the human being.

Keywords: Sustainability, Development, Environmental problems.

1 INTRODUCTION

The practice of sustainability is a concept that has been discussed in recent decades in our society, the rulers and public authorities and the United Nations - UN, has worked to implement in our society the practice of sustainability and preservation of the planet. The aforementioned practice consists of a set of habits and actions that respect the environment and planet earth, is a way to preserve and care for the present and the future in an ecological and balanced way.

The concept of sustainability emerged as a response to growing concerns about human impact on the environment and society. In this way, it seeks ways to preserve and care for current and future generations, in order to guarantee the right provided for in the Federal Constitution that cites the importance of quality of life for all.

The term sustainability can infer the meanings of maintaining or preserving. In this way, safeguarding all beings to have a more sustainable life, being essential for the planet and for the ecology of our world. Exploiting natural resources with awareness is also a form of sustainability. According to João (2002), the reduction in the consumption of natural resources is a great challenge for the survival of human beings, in addition to contributing to the well-being of the planet. Research shows that if we do not preserve or adopt measures and actions of sustainability in everyday life, the planet will suffer serious consequences that could jeopardize the future of humanity, since the degradation of the environment, the atmosphere, natural water resources, fertile soil signals the danger alert on earth.

With this it is necessary to understand the concept of sustainability and preservation of the environment and the planet in general. There are several ways to practice sustainability, whether in everyday life, in commerce, in agribusiness, in companies. When you adopt a sustainable way of life, you preserve not only the environment, but all natural resources.

This work aimed to reflect on the importance of sustainability for the planet and its practices for improving the quality of life and well-being of human and non-human beings. The exploratory method was used with a qualitative and bibliographic research approach.

2 THE IMPORTANCE OF SUSTAINABILITY FOR THE PLANET

For Buainain (2006, p.47), the idea of sustainability has a "strong environmental content and a clear appeal to the preservation and recovery of ecosystems and natural resources". In this sense, it is worth emphasizing that the sustainable culture of preservation of the environment and all natural resources are essential for a healthy future and for life on the planet to be full, free of pollution and degradation that harm all human and non-human beings.

Meadows, Meadows and Randers(1992), define sustainability as a development technique that results in the improvement and quality of life while minimizing negative environmental impacts. That

is, maintaining an environment conducive to preservation and sustainability helps in several aspects. Thus, working sustainability in global aspect is of paramount importance to publicize and to raise awareness of the benefits of a sustainable life, and the risk that humanity suffers in devastating the planet.

It is necessary that the entire population mobilizes for changes in habits in daily behaviors, because sustainability is the pillar of human life, it is a way of taking care of the planet and future lives, but this relationship is far from being consolidated.

Sustainable development aims to preserve the social and environmental environment from the impacts of ecosystem degradation and to generate economic growth by eradicating poverty and social inequality.

Everyday human actions directly influence the ideas and principles for economic and environmental development, namely: reuse of materials, conservation of natural resources and fewer pollutants.

Economic, environmental and social sustainability are the three fundamental pillars for the progress of sustainable development, aiming at collective work to achieve a better quality of life. However, an opposite reality is experienced worldwide and Brazil is a reflection of this situation.

Climate change has also been affecting our lives drastically day by day, which has become a major wake-up call. According to the UN, action needs to be taken or serious consequences will occur.

With sustainable development, there is an opportunity to change this reality and reduce negative impacts, through the innovation of the industry as a whole, in the field of health, education, renewable energies, actions against climate change, drinking water and basic sanitation. For example: separating waste for recycling, saving electricity, reusing packaging, reducing the consumption of plastic products, using biodegradable products, saving water consumption and it is also up to industries to work in a less polluting and more sustainable way.

In Brazil, there are manual works for sustainable development that promote jobs, culturally known as handicrafts. It is a practice of preserving the environment, what could be discarded becomes something reusable and the same occurs with different materials. Thus, it is a conscious way to preserve, make art and promote sustainability.

As mentioned, sustainable development aims to preserve the social and environmental environment from the impacts of ecosystem degradation and generate economic growth by eradicating poverty and social inequality. For this, sustainability practices must permeate people's lives in an attempt to minimize the devastating actions of human beings.

In this panorama, Iaquinto (2018) describes several dimensions of sustainability to understand them in human relations, such as, for example, economic and social cited below.

2.1 ECOLOGICAL OR ENVIRONMENTAL DIMENSION

This dimension seeks the preservation of the environment collectively and not only individually (Anjos; Ubaldo, 2015), to understand the importance of creating conditions to make life on the planet viable (Póvoas, 2015). Sachs (1993) comments that the ecological dimension will be put into practice as long as there is a reduction in the amount of waste and pollution; and compliance with rules for adequate environmental protection, among other situations.

2.2 ECONOMIC DIMENSION

A balance is sought between the production of goods and services and the distribution of wealth (Póvoas, 2015). For Freitas (2012), sustainability has the responsibility to create a new economy with revised categories and behaviors to allow the emergence of long-term opportunities and a competent system of incentives, aiming at the good relationship between the economy and sustainability.

2.3 SOCIAL DIMENSION

This dimension includes the protection of cultural diversity and the guarantee of full exercise and combating social exclusion (Póvoas, 2015). According to Sachs (1993, p. 25), the social dimension aims at "a civilization of "being", in which there is greater equity in the distribution of "having" and income, in order to substantially improve the rights and conditions of broad masses of the population and to reduce the gap between living standards of the affluent and the non-affluent". The social dimension aims to ensure greater equity in income distribution, employment opportunities for all and equal access to social resources and services (Mendes, 2009).

2.4 TECHNOLOGY DIMENSION

The technological dimension of sustainability addresses the various paths of technology to solve the numerous environmental problems often caused by human action, through science (Iaquinto, 2018). Ferrer and Cruz (2017, p. 41) comment that technology can act in sustainability "through paths that only science can offer, adopting a new energy model based on clean technologies, producing without waste and reversing some of the harmful effects already caused [...]".

2.5 SPATIAL OR TERRITORIAL DIMENSION

It is based on more balanced rural-urban spaces with a better territorial distribution, including economic activities (Sachs, 1993). For Mendes (2009, p. 52), the dimension also seeks "improvements in the urban environment; overcoming interregional disparities and elaborating environmentally safe strategies for ecologically fragile areas to ensure the conservation of biodiversity and eco-development". Iaquinto (2018, p. 169) comments that through the territorial dimension, sustainability

"also manifests itself in the distribution of areas occupied by human beings, as well as the organization of these spaces, with the scope of creating rules for better conservation and recovery of the environment in each space [...]".

2.6 CULTURAL DIMENSION

Its objectives are "to promote, preserve and disseminate the history, traditions and regional values, always following their transformations and, of course, guaranteeing the entire population access to information and knowledge" (Mendes, 2009, p. 55) aiming at investments in the construction, renovation or restoration of cultural equipment. For Silva, Souza and Leal (2012, p. 36), the cultural dimension of sustainability "contributes to instructing the quality of life by exercising cultural citizenship, and the opportunity to exercise this role must be made available to the whole society in an equal way, so that everyone has access to this guarantee".

2.7 ETHICAL DIMENSION

According to Iaquinto (2018, p. 172), "the concept of ethics is extremely broad and complex to categorize, due to the abstraction regarding the multiplicity of meanings created according to the understanding of each individual". In this way, the ethical dimension suggests that all beings have "an intersubjective and natural connection, from which follows the empathic solidarity as a universalizable duty to leave the positive legacy on the face of the earth, based on the correct Darwinian understanding of natural selection" (Freitas, 2012, p. 67). It is perceived that sustainability does not have its perspective limited only to the environment, but also covers the individuals who interact with this complex, analyzing them from the perspective of the characteristics inherent to each person. In view of this, it follows that the human being will only treat the environment with the dignity due to him when he is understood as part of this whole system (Iaquinto, 2018).

2.8 PSYCHOLOGICAL DIMENSION

For Iaquinto (2018), sustainability in the psychological dimension is used to designate the study of the human being in its relations with the other dimensions, such as cultural, social, political and economic. In view of this, "the psychological dimension is indispensable for the understanding and comprehension of sustainability, because, through psychology, one can verify and ascertain the relationship of the human being with the environment" (Mendes, 2009, p.52).

3 SUSTAINABILITY PRACTICES AND THEIR CONTRIBUTIONS

For Natalli et. al (2020, p. 352) "Sustainability is the way human beings should act towards nature in order to preserve its resources for future generations". The central idea is that economic and social development should occur in a way that preserves natural resources and ensures quality of life for present and future generations. With growing awareness of the negative impacts of unbridled development on the environment and society, sustainable practices are emerging as key solutions to ensure a viable future.

Some of the main sustainability practices adopted in different areas range from the conservation of natural resources to corporate social responsibility. Borin, Pimentel and Amâncio (2008, p. 295) conceptualize sustainable practices as follows:

> Sustainable social practices refer to the organization's management practices aimed at improving the quality of life of employees and the community. [...] Sustainable environmental practices refer to the organization's management practices aimed at preserving environmental quality and preventing environmental impacts. [...] Sustainable economic practices refer to the organization's managerial practices to achieve good economic performance.

The conservation of natural resources plays a key role in sustainability practices. The responsible and sustainable use of resources such as water, air, soil, flora and fauna is essential to ensure the preservation of the environment in the search for the best way to maintain and conserve natural resources (Munaretto; Aguiar; Vieira, 2017). To this end, practices such as the efficient use of water, the protection of natural habitats, the conservation of biodiversity and the promotion of sustainable agricultural practices are adopted.

Efficient use of water involves reducing consumption, reusing and collecting rainwater, and more efficient irrigation technologies. Protection of natural habitats is carried out through the creation of conservation areas, national parks and nature reserves, ensuring the preservation of important ecosystems. Biodiversity conservation seeks to protect the variety of species and ecosystems, preventing extinction and environmental degradation. Sustainable agricultural practices that involve the use of techniques that reduce the use of pesticides protect the soil, promote crop rotation and encourage organic farming (Borin; Pimentel; Amâncio, 2008).

Another important aspect of sustainability practices is energy efficiency and the reduction of greenhouse gas emissions. Excessive energy consumption and reliance on non-renewable sources contribute significantly to climate change and other environmental problems. To address this challenge, sustainable practices are adopted to reduce energy consumption and promote clean and renewable energy sources. In this context Araújo et al. (2022, p. 3) highlight that,

> Currently, the world faces a water crisis, due to the scarcity of rainfall and the lack of rapid action by governments, so the diversification of the energy matrix at the global level is of fundamental importance to meet energy demands, considering that the construction of new hydroelectric plants can cause numerous environmental impacts, since they cause changes in

the ecosystem, rivers and even the extinction of animals, also affecting the lives of the local population. In this scenario, it is necessary to have a better understanding of renewable sources, their main characteristics in relation to environmental, social factors and technological trends regarding the diversification of energy matrices.

Energy efficiency seeks to use energy more efficiently, avoid waste and optimize consumption. This can be achieved through the adoption of energy-efficient technologies such as LED light bulbs, energy-saving appliances and efficient heating and cooling systems. In addition, implementing energy conservation practices such as switching off unused equipment, improving thermal insulation in buildings and using public transport, bicycles or electric cars also contribute to reducing energy consumption.

The transition to renewable energy sources plays a crucial role in reducing greenhouse gas emissions. Practices in the use of solar, wind, hydropower and biomass help to decrease dependence on fossil fuels and mitigate the environmental impacts associated with their extraction and burning. Investments in research and development of renewable technologies, as well as the creation of public policies, incentives for their adherence are essential to promote a more sustainable energy matrix. For Araújo et al. (2022, p. 11) "a significant improvement is expected for the coming decades, aiming to overcome the current limitations of the renewable energy industry, since this is a promising market.

Proper waste management is another key practice in sustainability. Increasing waste production poses a significant challenge to environmental degradation, requiring sustainable approaches to reduce the amount of waste generated and promote recycling and reuse of materials. Proper waste separation is the first step towards efficient management. Through the implementation of separate collection systems, it is possible to separate recyclable waste, organic waste and hazardous waste, directing them to appropriate recycling, composting or safe disposal processes.

As a solution, recycling is an essential practice to reduce the extraction of natural resources and the emission of pollutants. By transforming waste into new products or materials, recycling contributes to reducing the demand for raw materials. Encouraging and facilitating recycling through separate collection programs, installation of collection points and raising public awareness are important strategies.

Natalli et. al (2020) found that sustainability practices on rural properties show that selective waste collection and green manure practices contribute to the maintenance of permanent preservation areas and the legal reserve. These are important actions for the conservation of natural resources and ensuring the adequacy of legislation.

In addition to recycling, the reuse of materials plays a key role in sustainable waste management. Promoting the reuse of products and packaging, whether through repairing, sharing or refurbishing, reduces the need for manufacturing new items and unnecessary disposal. Composting organic waste is another important practice for sustainable waste management. By turning food and

garden waste into organic fertilizer, composting avoids greenhouse gas emissions in landfills and provides a valuable resource for agriculture.

Corporate Social Responsibility (CSR) is an essential component of sustainability practices. Companies play an important role in promoting sustainable development through their responsible business policies and practices. It involves all stakeholders, including employees, suppliers, customers, local communities and the environment. Companies are encouraged to adopt policies that promote social equity, respect human rights, provide fair and safe working conditions, and combat corruption while minimizing their environmental impact.

CSR also includes voluntary actions to support local communities, such as social projects, partnerships with non-governmental organizations, and investments in infrastructure and education. By acting in a socially responsible manner, companies contribute to sustainable economic development and to the well-being of the communities in which they operate. According to Andrade (2023 p. 6) "if business decisions are based only on the economic factor aiming at profit, leaving aside the environmental and social, they may jeopardize the balanced environment and/or harm some social fact".

As important as effective sustainability practices, investment in education and awareness raising is crucial to promote sustainable practices in all areas of society. Disseminating information on sustainability and raising awareness about environmental impacts are essential to engage people and encourage behavioral changes. Environmental education plays an important role in shaping conscious individuals who are empowered to make sustainable decisions. It can be incorporated into school curricula, as well as in awareness campaigns and educational events. Through education, people can understand the importance of sustainability, learn about individual actions they can take and become agents of change in their communities.

In the public sector, raising awareness is also key to promoting the adoption of sustainable practices. Campaigns can address issues such as conservation of natural resources, reduction of consumption, recycling, energy efficiency, and adequate transportation for sustainable projects. In addition, the media plays an important role in disseminating information on sustainability and broadening the dialog with the public. It is worth mentioning that research represents advances in studies for good sustainable practices.

A Brazilian project named "Bem Diverso" was selected as an example of good sustainable practices by the United Nations (UN), according to the Sustainable Development Goals (SDGs), i.e.

> the call sought to highlight examples of good practices, including those that could be replicated or scaled up by others around the world in implementing the 2030 Agenda and that would help accelerate the planet's recovery from the novel coronavirus pandemic (UN, 2021, p. 1).

This project is a partnership between Embrapa and the United Nations Development Program (UNDP), which has economic and environmental conservation objectives aimed at sustainability. It is a collective work so that traditional populations and small farmers play a fundamental role in the conservation of the Caatinga, Cerrado and Amazon biomes.

As mentioned earlier, sustainability practices play a vital role in building a sustainable future. By embracing natural resource conservation, energy efficiency, proper waste management, Corporate Social Responsibility, education and awareness raising, we contribute to environmental preservation, social equity and long-term economic prosperity. It is essential that governments, businesses, non-governmental organizations and individuals work together to implement these practices and promote sustainability across all sectors of society. Through collaborative efforts and concrete actions, it will be possible to address the environmental and social challenges facing the world. By adopting sustainable practices it will be feasible to build a better future for present and future generations, where harmony between human development and the preservation of the planet is achieved, motivated by collective, conscious, balanced and resilient effort.

4 CONSIDERATIONS

The work sought to reflect on the need for sustainability practices for the survival of planet Earth.

It is perceived the importance of knowing and experiencing sustainability practices in the daily behaviors and attitudes of individuals.

The environmental crisis has affected all the inhabitants of the planet, that is, human and non-human beings. It is noticed that the concept of sustainable development has evolved throughout the twentieth and early twenty-first centuries, by treating it in several aspects, and not only in the economic one as it occurred for decades.

Sustainability, nowadays, is committed to political, social, technological, economic issues, among other dimensions, aiming to minimize the damage occurred in nature, the reduction in the consumption of matter and energy, as well as improving the quality of life of the planetary community.

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Young women in technical professional education: Motivations, challenges and future projects

https://doi.org/10.56238/ptoketheeducati-076

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ABSTRACT
This article addresses the perspectives of three students from the Technical Courses in Buildings, Mechanics and Informatics of an institution of the Federal Network of Professional and Technological Education. Due to their specificities and because they are mostly male careers, theories of gender in EFA and the sexual division of labor supported the critical analysis of the discourses of these young women. The New High School and the National Common Curriculum Base (BNCC) advocate the development of the Life Project at School, aiming, among other functions, to guide the choice of "training itineraries" and favor the personalization of student learning. In the case of Secondary Technical Education (EPTNM) in the integrated modality, students must attend the training itinerary of the general disciplines of the BNCC (Portuguese and Mathematics), together with some other chosen itinerary, compulsorily associated with Technical and Professional Training. However, in addition to fulfilling a legal obligation, knowing the real life projects of young people from EPTNM becomes essential for understanding their motivations, experiences and expectations, in relation to their professional training, the world of work and the continuity of studies. Thus, the results obtained are expected to raise reflections on the relevance of EFA in the lives of young people, taking into account the gender difference, and to promote the debate on public policies for the access and permanence of young people in technical courses.

Keywords: Vocational and Technological Education, Middle Level Vocational Education, Life Projects, Youth, Gender and Vocational Education.

1 INTRODUCTION

This article presents, in the perspectives of three young women students of the Technical Professional Education of Middle Level of a public school of the Federal Network of Professional and

Technological Education, their motivations for the choice of the technical course, their challenges and obstacles to attend them - in view of their female condition, and their future projects in relation to the world of work and the continuity of studies. Their real names were replaced by the fictitious names of Bell, Frida and Marie, in a tribute to the writer and feminist of the American black movement, Bell Hooks; Frida Kahlo, a Mexican artist and feminist; and Rose Marie Muraro, Brazilian writer and feminist, respectively.

Starting from a brief exposition on Professional Education in Brazil, the female participation in this teaching modality – with data and studies already developed – and in the light of the theme "future projects", the category "youths" is approached in the female in order to problematize how the technical professional education of medium level is experienced by the students.

From the analysis of their reports in a critical perspective, having as theoretical assumptions the sexual division of labor of the French Sociology of Labor, it is possible to affirm that this educational follow-up has been increasingly the stage of the presence of women. Although aware of the structural machismo that prevails in the technical and technological areas and in the institutions of professional training, the choices of these young women have been conscious, their objectives clear and their projects for professional and academic life, coherent and focused.

It is expected with the results obtained to raise reflections about the relevance of Technical Professional Education in the lives of young people, taking into account gender differences, and to promote the debate on public policies for the access and permanence of women in technical courses.

2 YOUTH AND VOCATIONAL EDUCATION

Professional education in Brazil, historically, according to Ciavatta and Ramos (2011), Küenzer (2000), Cunha (2005), Frigotto (2004), among others, was marked by duality, in which its structure was based on the differences in educational paths offered to the children of the elites and to the working class. For those a propaedeutic education was offered that prepared and stimulated access to higher education and work opportunities at command and management levels; for the working class, professional education of technical and instrumental training for a rapid insertion in the labor market in more precarious professions. Thus, this teaching modality was for many years associated with representations that associated it with low educational quality and cultural poverty (CUNHA, 2005).

For Moura (2007, p.06),

> professional education in Brazil has, therefore, its origin within a welfare perspective with the objective of "supporting orphans and other lucky disadvantages", that is, to attend to those who did not have satisfactory social conditions, so that they did not continue to practice actions that were against the order of good customs. (MOURA, 2007, p. 06).

However, recent studies show that from the point of view of young people in today's society is increasingly widespread the understanding that vocational training is a fast, necessary and intermediate path that gives them professional qualification, both for entry into the labor market and for adult life (ATLAS DA JUVENTUDE, 2021)

For the Ministry of Education,

> professional and technological education (EPT) is an educational modality provided for in the Law of Guidelines and Bases of National Education No. 9,394/1996 (LDBEN) with the primary purpose of preparing "for the exercise of professions", contributing so that the citizen can insert himself and act in the world of work and in life in society. To this end, it covers qualification courses, technical and technological qualification, and postgraduate courses, organized in order to provide the continuous and articulated use of studies. (BRAZIL, 1996)

However, technical vocational training is no longer a guarantee of work as in the past. Studies by Pochmann (2007 p. 11) that deal with issues related to the work expectations of young Brazilians, when comparing the percentages of young people who attend school and those who are already inserted in the labor market, show that the optimism of young Brazilians in relation to their expectations of success in entering the formal labor market has disappeared.

Also for Leão and Nonato (2014, p. 23), the insertion of young people in professional life has been characterized by the context of social inequality and unemployment, precarious work and lack of protection. One must, then, think of work for young people from the perspective of their needs and desires; "One cannot think of youth work without a social protection network that guarantees the fulfillment of their demands and the preservation of their physical and moral integrity."

For Silva and Lehfeld (2019), the current moment is paradoxical in guaranteeing access, stability (in the sense of non-unemployment), qualification and dignity of young people in the world of work. Changes in the legal basis have provided young people with more time to study, but post-training placements are still not enough to guarantee quality jobs and income to this population, which seeks first the opportunity of insertion and, later, of ascension in the socio-occupational spaces.

According to the National Institute of Educational Studies and Research Anísio Teixeira (INEP, 2023), 23% of the total population of Brazil are between 10 and 24 years old, - approximately 48.5 million people - which make up the largest generation of young people in the history of the country. This demographic bonus, in which a high proportion of people are of potentially productive age, however has failed to improve economic development, given the high number of unemployed young people in the country. The current ideological discourse is that there is a lack of adequate professional training for young people as a possibility of their qualified insertion in the world of work. If the lack of a solid school education for work is an old problem in Brazil, the situation has worsened during the recent years of the Corona virus SARS-Covid 19 pandemic, in which the average unemployment rate in 2020 among people aged 18 to 24 reached 29.8%, the highest ever recorded in the country's history.

Thus, analyzing the micro-data of the National Household Sample Survey (PNAD, 2023), the indicators of occupational quality (which combine factors such as salary, duration and types of work) show that, for young people with training in Technical Professional Education (EPT), the chances of insertion in the formal labor market are substantially higher than for those graduated in propedeutic high school (although lower than those graduated in higher education). "They indicate that EPT graduates have good application in the labor market and the profit is mainly in formality, wages and routine activities," explains Camargo (2023). This time, vocational training courses play an important role and become a necessary option for young people to get their first job, as warned by the National Service of Industrial Apprenticeship (SENAI, 2016). Technical vocational training is perceived by young people as a good way to start their career, to be well accepted by companies and to better prepare for the job market.

3 WOMEN IN VOCATIONAL EDUCATION

For Louro (2003), the categories established by Western societies created a pattern of family example that predominated for centuries, being natural the world of the woman in the home, performing the chores of the house, and the man the external work, salaried, providing the home with what is necessary to support the family. In this way, society has instituted rules, standards and measures of the model of man, who lives in the public universe, and designates the profile of the woman to welcome all the precisions of her private world in the home. These distinctions between the sexes for centuries have dictated how male and female subjects should be constituted, who have to be domesticated, educated, taught, and adapted to follow standards stipulated by society.

In this pattern, the Brazilian family formation shows a history of women assuming exclusively domestic tasks - which are not considered work. Added to this are the gender stereotypes that associate women with fine motor skills, thoroughness and attention, always associated with care and innate and natural aptitudes, related to frailty and weakness. Thus, an image of the woman caregiver is consolidated and this figure does not cease to appear when the woman assumes a paid job or seeks a professional qualification. The functions in which characteristics such as sensitivity, patience and delicacy are valued, considered inherent to women, end up being delegated more to them, which leads to their exclusion from functions that demand decision, individuality and rationality (QUIRINO, 2011).

Thus, in order to dedicate themselves exclusively to domestic work, no professional training was necessary for women, who were already born with the "gift" of caring.

Thus, at the beginning of modern history, schools were attended only by the male children of the wealthiest families, the aristocracy or the nascent bourgeoisie. Women married very young and took on domestic responsibilities. Thus, school education reinforces a process of separation between

adults in training, thus creating a hierarchical order based on the relations between genders and the stages of life (GRACIOLI, 2006).

However, in a historical leap in this movement of segregation of women from the productive and educational spaces, in Brazil, today, even in the face of a scenario of economic, social and educational inequalities, women have been conquering spaces in the most varied spheres of social life. "Whether in politics, economics, the world of work, education or in the most diverse areas of activity, there are no spaces where they have not been able to reach and prove their capacity" (PEREIRA and ANJOS, 2020, p.4). However, "even in the face of so many advances in the journey of inclusion of women in the economic-social context and more specifically in the world of work, the remnants of a past of submission still leave marks and influence the conception of the social role of women" (Id. Ibd.).

When it comes specifically to Professional Education as a public policy, it is intended to promote the realization of two fundamental rights, enshrined in the Federal Constitution of Brazil: the right to education and the right to work. This teaching modality aims at the insertion of the individual in the world of work through technical training and, although directed to the preparation for the exercise of a technical profession, it must be understood as providing the integral formation of these individuals.

Corroborating the assertion of this female advancement in society and in the world of work, according to data from the School Census, in 2022, women were the majority throughout Brazil. One million and two hundred thousand women entered technical courses that year, which corresponds to 58% of the total enrolled.

However, when the school reproduces and naturalizes, without due reflection, the behaviors constructed from a conception that there are professional qualifications for women and others for men, it is contributing decisively to the perpetuation of the model of sexual division of labor.

Thus, the distribution of women enrolled in the technological axes of environment and health and educational and social development, in proportion, is three times higher in relation to men. In the axes of food production and tourism, hospitality and leisure, the number of women is twice the number of men enrolled. On the other hand, the presence of women in courses of the control axes and industrial processes is more timid, in which 84% of those enrolled are men; military area, with 28% women; information and communication, with 36% female. From the numbers presented it is possible to observe that the culturally accepted perception that certain professions are intended for men, and others for women, has an influence on the profile of entry into technical courses.

Thus, "[...] despite the existence of legislation guaranteeing equality in treatment for both sexes, the segmentation of jobs expresses inequalities in gender relations and constructs female "ghettos" of work" (SEGNINI, 1998, p. 15).

4 WITH THE WORD, THE YOUNG WOMEN, SUBJECTS OF THE RESEARCH

Bell, Frida and Marie are three young students of the third year of the Technical Courses in Informatics, Mechanics and Buildings, respectively, in a school of the Federal Network of Professional and Technological Education, located in the Metropolitan Region of Belo Horizonte, State of Minas Gerais.

Transgressing *the status quo* that relegates them to certain professions and areas of activity specific to the female gender, such as those of the technological axes of environment and health and educational and social development, they entered technical courses mostly male in the axes of control and industrial processes and information and communication. What motivated them to pursue such areas? What do they intend in their future? What are your life projects in relation to work and the continuity of studies? What obstacles and challenges have you overcome to remain and be successful in completing your chosen courses? These questions permeated the semi-structured interviews conducted with them in the first half of 2023.

At the opportune moment in which the New High School and the National Common Curricular Base (BNCC) underwent changes and advocate the development of the School Life Project, aiming, among other functions, to guide the choice of "formative itineraries" and to favor the personalization of student learning, such issues become even more relevant. After all, when it comes to the Technical Education of Secondary Level (EPTNM) in the integrated modality, the students must meet the formative itinerary of the general disciplines of BNCC (Portuguese and Mathematics), along with some other itinerary chosen, compulsorily associated, to the Technical and Professional Training.

However, in addition to complying with a legal obligation, knowing the real life projects of young people from EPTNM becomes essential for understanding their motivations, experiences and expectations, in relation to their professional training, the world of work and the continuity of studies. Especially women, subjects of this research, who are in the phase of completion of the courses. Taking stock of their choices and future projects was a rich and fruitful moment for these young women.

Because of their specificities and because they are mostly male careers, the theories of gender in the EPT and the sexual division of labor supported the critical analyses of the discourses of these young women.

4.1 BELL

Bell is 17 years old, self-declaring herself black, comes from the most precarious social layer of the three interviewees. Daughter of working parents, who studied until high school, had access to the technical course in this institution highly competitive by Law No. 12,711/2012, also called the Law of Racial Quotas. Throughout the technical course was contemplated with the aid of the social scholarships offered by the institution. What made it possible for her to move, feed and stay the course:

> If it were not for the help of the scholarship I would not be able to take the course. Although the value of transportation, food and material used was free, my parents would not be able to afford it. My father is a bricklayer, he works on his own and my mother is a canteen in a municipal school. They earn very little and I still have two more younger brothers (Bell, 2023).

Asked why she chose the Computer Technician Course, Bell was emphatic in her answer: "It is the area that generates the most jobs today. And we even have the chance to work for a foreign company in the *home office system*."

The choice of the institution is due to the gratuity and quality of the education offered. "It's a very good school, besides being free. Leaving here I get an easy job just because I studied you here," he says. About his future project, Bell has grandiose dreams and awareness of the difficulties he has faced and will still face:

> Since I started the course it has been very difficult. Everyone thinks that computer science is just for men, that girls won't be able to handle it. In my class there are only four girls and more than twenty boys. And on top of that, I'm poor and black, right? All against me... Even the teachers didn't put much faith in me, they thought I was going to quit in the first year. I saw it in the way they looked at me, in the difficulty I had to do the group work. She was always the last one chosen... After I graduate, I will work by day and continue to study at night. I'm going to do Computer Science or Computer Engineering. Maybe it's the distance... If I can't go to college, I'll do other improvement courses in the area to keep up-to-date. But I can't go another so many years without working and helping around the house. I need to work... But I will not stop studying or abandon the area of computer science. Loved... I found myself in the area (Bell, 2023)

Bell's discourse highlights several elements already present in some research on young people from poorer popular strata who seek in mid-level professional education a qualification for faster insertion in the world of work, in order to be able to help with household expenses. For Dayrell (2007) most young people from low-income families attend public schools in search of a project or some goal beyond high school, in which they need to make choices between several paths - professional qualification, work, higher education or any other. However, due to the quality training received at the institution, which goes beyond technical knowledge, they are able to project their future in the continuity of studies at higher level and plan a professional ascension that takes them out of the social class in which they find themselves, because,

> The democratization of access to higher education, particularly for low-income youth, began to gain space on the agenda of Brazilian governments and society, triggering public policies for the expansion and internalization of vacancies, as well as affirmative action aimed at the most excluded social groups. (TREVISOL and NIEROTKA, 2016, p.23)

As emphasized by Burnier (2003), the world of work is then constituted as a fundamental and transformative element for the construction of the projects of the working class, just as the vocational school plays a very important role in the achievement of these projects.

And when it comes to a life project or a future project, Leão, Dayrell and Reis (2011, p. 1071) conceptualize them as every action of the individual in an attempt to "choose one among the possible futures, transforming the desires and fantasies that give it substance into goals that can be pursued, thus representing an orientation, a course of life." The project category acts as a mediation between the individual and the context, involving both individual dreams, desires, needs and anxieties as well as the values, *ethos* and worldview of the groups in which the individual(s) circulate; it stands out as an important research tool in order to capture and analyze the world views of the subjects in their changes and permanences (BURNIER, 2003. p. 32).

When talking about the obstacles and challenges, interviewee Bell addresses all sorts of prejudices that surround her (and are supposed to surround her throughout her life), whether it's class, race, or gender. Lima (2013) associates them with the metaphor of the crystal labyrinth, described as barriers or traps that assail women in their professional careers, slowness or stagnation in the career/area of activity, pace of gain, recognition or even withdrawal from a certain profession.

Olinto (2011) also addresses that throughout their professional trajectory women face challenges and barriers imposed by societies through stereotypes - formed from beliefs, values and attitudes - that consider the skills between men and women, factors influencing choices and decisions, even while still young. Thus, women often emerge in the so-called horizontal segregation and trace their projects or make their choices different from those outlined by men (OLINTO, 2011).

Bell, however, manages to be faithful to her choice for the professional area and does not intend to change areas in Higher Education, thus breaking a gender paradigm very present in women's professional choices.

4.2 FRIDA

Frida calls herself parda, is also 17 years old and is completing the Technical Course in Mechanics. His mother is a civil servant and has a degree in the humanities. His father studied until elementary school and works on his own.

Frida claims that the choice of school is due to the quality of education offered by the institution, and the choice of the course at the insistence of her father, who is a mechanic and has a small auto repair shop on the ground floor of his residence.

> My father insisted that I do mechanics. It has nothing to do with me, but he wants me to graduate and go work with him in the workshop. I'm not really going to... I want to go to college and study fashion. I love clothes, shoes, those things... I never thought mechanics were a woman's thing, but he insisted and I didn't want to disappoint. But working in the workshop, I'm not going to go at all. Since I'm already going to be 18, if he continues with this, I'll leave the house. If I need to, I get a job in a store and go to school at night. But I want to study fashion and open a sewing atelier, design my models, my clothes, work with it (Frida, 2023).

Although it is a legitimate desire to change professional area and dedicate oneself to a so-called feminine profession, Frida reinforces the gender stereotype that segregates women into more appropriate professions and them, as an extension of domestic work. Sewing, taking care of clothes and the feminine look is something inherent to the feminization of professions, which Yannoulas (2013) refers to the transformations of certain types of occupations or professions, linked to social and symbolic practices, in a given time or culture. Possibly influenced by family, society, the media or school, many young women elaborate their life projects, judging themselves more apt to certain activities to the detriment of others, or choose their careers segmented by gender, based on what they believe may be more suitable for them.

Hirata and Kérgoat (2007) call this phenomenon as one of the organizing principles of the sexual division of labor: the principle of separation, in which there are men's jobs and women's jobs and one cannot, or should perform the work of the other, thus bringing a cleavage in the professions and the separation of male and female workers in watertight compartments, naturalized by the natural differentiation of genders.

About the obstacles and challenges experienced during the course, Frida clarifies that "the course has many more men and the teachers don't care, if we can't carry the pieces, if we're going to get dirty... They treat us like men and if we complain they still make fun of: 'oh, I didn't want to come do mechanics, so hold on'. They're executioners."

In this sense, Lopes (2016) states that the academic environment reproduces the discourses of segregation of women rooted in society. To the extent that some courses are mostly occupied by male students and others with a higher female concentration, these young women had to overcome challenges to assert themselves in the technological courses considered suitable only for men and live daily what Bourdieu (1989) calls "symbolic violence". Evidenced in the simple way of speaking or acting of the dominator, sometimes it is imperceptible and it may be that the victim does not even realize that it is violence.

4.3 MARIE

Marie declares herself white, is upper middle class, her parents both have graduate level training and are graduates of the same school she attends. According to the interviewee, the choice of the Technical Course in Buildings is due to an old desire of Marie, who feels very attracted to architectural design and identifies with the profession.

> Since I was little I always loved drawing and mathematics. One day in ninth grade there was an event at my school about professions and the speaker told me that I should study architecture. Then I asked my mother about this profession and she explained it to me. He told me about Niemayer and gave me several books about him. I was in love right off the bat. Then she took me to see Brasilia and explained everything about the architecture there. I said at the time: I'm going to be an architect! As she and my father studied here I asked if I had architecture

> at the technical level. Since I didn't have it, I chose buildings because it's the closest to the profession I chose. Now I'm already taking a course for ENEM and I'm going to do Architecture at UFMG. I don't want to work as a technician, but what I learned in the course will help me a lot when I open my architecture office. I will have it easier than architects who have not taken a technical course (Marie, 2023).

Regarding difficulties and obstacles in the course of the course, Marie states that "many colleagues asked why I did not choose accommodation or nursing that are more appropriate courses for women", reinforcing once again, gender stereotypes and the feminization of the professions.

It is evident in Marie's words an active participation and investment of parents in their formation, both in the choice of school and course. It can be inferred, as Bourdieu and Passeron (1992, p. 63) recall, that family socialization does not fail to contribute to the acquisition of cultural dispositions that are not the product of a "miracle of predestination." Thus, Marie's future project of not working in the technical area, graduating in Architecture and opening her own office meets what theorists enlighten about the education of the ruling classes, who see in higher education the shortest path to positions of command and management or to entrepreneurship, and technical courses only a springboard to higher education.

At this point, as Golbspan (2020, p.54) warns,

> It is important to understand the representations about youth as social constructions, that is, not as intrinsic and essential characteristics of all young people, but as discourses with which young people are confronted and to which they produce changing and original responses in their daily lives. This is true for how they deal with future plans, but it is also true for diversified characteristics, [...] which can be intersected with other belongings that these subjects have. This idea of intersection of dynamics, therefore, helps to explain why these protagonists of the school need to be interpreted not as only students and students, nor as only young people, but at the intersection of these forms of belonging.

5 CONCLUDING

It is important to emphasize the relevance of giving voice to young people when the theme is life projects or future projects of young people in relation to work and continuing education after high school. The discourses of the three young women interviewed in this research, although they cannot be generalized to all young students of Professional Education, allow the understanding of several elements that permeate the relationship of young students and EPT.

It is evident in the choices of these young women the influence of the family regarding the chosen course, the "fame" of the institution in the quality of the education offered to get a formal job quickly after the completion of the course or as a stepping stone to higher education.

It is also evident how much the categories class, race and gender influence the professional choices of these young women, especially with regard to their insertion in the labor market and the continuity of their studies. Young people from economically disadvantaged popular strata see in the technical course the shortest way to qualification and insertion in the formal labor market; the need to

work to help the family as something urgent; the realization of higher education courses at a distance or at night as a consequence of this need, and even the realization of free courses of improvement as an option of continuing education, in the impossibility of attending an undergraduate course. For the more affluent young women, in addition to financial capital, the social and cultural capital of their parents are factors of influence and investment in their choices and future projects.

However, gender oppression pervades all social classes since women's choice of hegemonically masculine courses still appears as a subversion to the *status quo* that determines specific professional areas and careers for women, as an extension of domestic tasks. From this gender prejudice, symbolic violence manifests itself through looks, questions and affirmations about the courses that these girls should choose and the place they should occupy in professional education and in the world of work.

In this sense, studies with young people in academic and professional spaces are salutary and necessary in order to provide new discussions and ways to mitigate discrimination and devaluation of women's work in relation to men's work before the societies and within the walls of the schools themselves. Giving time and voice to young people can bring significant changes in the provision of professional education and in the conduct of public policies for access to technical professional education for young people, as well as enable reflections necessary for the reduction of inequalities between men and women in Professional Education and in the world of work.

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SEVEN
publicações acadêmicas

Educating through (Re)connection: Contributions of contemplative sciences and meditative practices for a new mindset in education

Crossref doi
https://doi.org/10.56238/ptoketheeducati-077

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ABSTRACT
Deep and meaningful learning experiences are a privilege of human beings and nowadays, we live in a complex, rich and full of learning opportunities. Education is evolving in many ways, and new generations of youngsters are writing new paths to the future of humankind but still, we need to reconnect and restore the human-nature severance which has been occurring in the last decades, promoting a sustainable mindset at all levels of education and using transdisciplinary and innovative approaches. In this paper, using literature review and essayistic reasoning, influenced by future research methods, we envision a possibility of contemplative science and meditative practices at the core of this fundamental shift in education. We will analyse the potential of meditation as a whole, with some focus on the recently construct research by science called nature-based mindfulness, as a way to dilute the Human/Nature dichotomy and promote a global mindset and sustainable and argue that this should be a unifying path for all professionals at all educational levels and in all educational interventions, formal, non-formal or informal. We finish proposing guidelines for integration of contemplative sciences and meditative practices connected to existent frameworks of sustainable mindset.

Keywords: Education, Mindset, Sustainablility, Meditation, Contemplative sciences.

1 INTRODUCTION[1]

> By connecting with the world more than human, we can go as far as we want with our minds and our senses. We can pay attention to the world of animals, plants, fungi, microbes, forests, oceans, the climate, Gaia, the sun, the solar system, the Milky Way, and countless galaxies beyond our own. We can reach the source from which all of nature comes (Sheldrake, 2018, Chapter 8).

In this so often called VUCA world (volatility, uncertainty, complexity, and ambiguity) a new way of thinking and implementing educational interventions is imperative. We are educating and

[1] Master Jorge Moreira is also a PhD candidate (PhD Candidate; PhD Researcher), with financing FCT UI/BD/150982/2021

forming the human beings of the future, and therefore, the workers of the future and, consequently, the societies of the future.

In this article, we defend, basing, that contemplative sciences and meditative practices may contain the formula for a shift in the way of educating the humans of the future for the society of the future, a society with an ecosystemic vision of the whole, in which all beings are in harmony. connection, regardless of the country, culture and scientific area in which they are educating.

Each individual, when he is born, submits to the human condition, to the condition of learning, whether in his relationship with others, with the world that surrounds him, or as a product of the culture in which he is inserted, or as a producer of culture.

A process of construction of one's own and in which it is built by others, in the unfinished and indispensable movement that is Education.

As an asset of a society, a member of a family, of an already existing structure, but with the capacity for a new interpretation provided with meaning and uniqueness. Therefore, it acts in the bosom where it is inserted as a 'social subject' as referred to by Bourdieu (1989) or as a "son of man" according to Charlot (1997), the human condition that makes it a subject closely linked to others, inhabitants of the world and transformers of that same world.

Currently, with the legacy of the twentieth century, we are witnessing transformations that have led us to changes of paradigms, of ways of being and of living and, somehow, we have moved away from Nature and the consciousness of inhabiting a space with many other beings. Nature has always played a central role in human life. After all we are Nature, theologically and scientifically.

Nature is apprehended as the divine work or divinity in itself (Moreira, 2019). Holistic science, like ecology, replaces the human being in interaction and interrelationship with the other natural elements.

Thus, we are a knot in the web of life "an ancient idea that has been used by poets, philosophers and mystics throughout the ages to convey the sense of entanglement and interdependence of all phenomena" (Capra, 1996, pp. 34–35).

We know that we have arisen from Nature, that it provides us with the vital services, that we have evolved within it, and with its help we can continue on the evolutionary path towards something surprisingly unheard of, if we still have the dexterity to save ourselves from the suicide caused by our neglect of it.

However, perhaps in the last century, it is as if the human being had 'detached' himself from nature and created the human-nature opposition, as if humans did not belong to the ecosystem or, in some way, wanted to be sovereign or owner of it.

The ecological crisis, which includes the climate crisis, already has significant impacts on Nature and Humanity, e.g., loss of habitats and biodiversity, contamination of environments, ocean

acidification, polar melting, extreme weather events, prolonged droughts, famine, damage to infrastructure and the economy. The scientific community leaves serious warnings about the future, displaying scenarios of climate and socio-ecological chaos, if there is not a significant change in the course of policies and practices that impact the Environment (IPBES, 2019; IPCC, 2022; Ripple et al., 2017).

In the effort to change this course, there has emerged at the highest level (e.g., ONGA, EU, UN) the urgency to implement solutions that bring the Human closer to Nature, aspiring to sustainable, regenerative and healthy forms of relationship, e.g., UNEP (2021).

In this article, from a review of the literature and from an essayistic, critical and, at the same time, aggregator of multiple approaches and sciences, we launch proposals based on meditative practices and contemplative sciences for a reconnection with the ecosystem, solutions for possible practices with children and adults, and the richness that informal and transversal practices as a contribution to a connection and conscious education.

We will analyze the potential of meditation as a whole, with some focus on meditation in Nature in general and, in a more scientifically researched way - nature-based mindfulness- , as a way to dilute the Human/Nature dichotomy and promote a global mindset and sustainable and argue that this should be a unifying path for all professionals at all educational levels and in all educational interventions, formal, non-formal or informal.

1.1 THE UNIVERSE AS A WHOLE AND THE CONNECTION OF THE HUMAN WITH NATURE

To have a human rapprochement with Nature it is necessary to realize what we are talking about when we refer to Nature and contact with Nature. In the first case, the concept Nature, presents in a broad perspective,

the spatial and temporal unity of the cosmos, as well as fecundity and birth, potentiality and existence, the visible and the invisible, the beginning and the end, the eternal and the perennial, the manifestation and the forces behind it, matter and spirit, harmony and chaos, beauty and greatness, Food and renewal, raw material and wild (wild) nature, the source of all energies and consciousness (Moreira, 2019).

In short, it is the cosmos itself, and on Earth, it is all that exists, 'Gaia', the microorganisms up to the garbage produced by humans. Nonetheless the conception of Nature is used today more as a general reference to the domain of wild animals and plants, as well as rocks, forests, mountains, rivers, lakes, glaciers, oceans, atmosphere, soils, ecosystems, and other natural elements. "In essences not altered by the human being" (Emerson, 2001, p. 16).

In the second case, contact with Nature is defined as a stable state of consciousness that comprises cognitive, affective, and empirical symbiotic traits that reflect, through consistent attitudes

and behaviors, a sustained awareness of the interrelationship between the self and the rest of nature (Zylstra et al., 2014).

Those who frequently contact Nature are not oblivious to the experience of immersion and the panoply of benefits that surrounds them and enters through the body, causing certain sensations, emotions and thoughts to emerge that transports them to deep feelings and consciousnesses that the vulgarity of the tasks in the city removes.

Often, feelings of well-being, of positive emotions, of feeling that one is alive, in relation of kinship with other lives more than human and of belonging to something greater than us, which is Nature, are reported. This contact allows us to awaken to a deeper reality, that we are part of this world, being a support for a more intentional, rewarding and meaningful life (Zylstra et al., 2014).

MacKerron and Mourato (2013), shows that happiness levels are higher in natural environments.

Frumkin et al. (2017) presents us with a compilation of several studies that present physical and psychological benefits of contact with Nature and that is found in a complementary and adapted form in Table 1.

Table 1. List of some of the scientific research which documents the benfits of Exposure to Nature According to Frumkin et al. (2017)

Health/wellness benefits	References
Stress reduction	(Berto 2014; Fan et al., 2011; Nielsen & Hansen 2007; Stigsdotter et al. 2010; van den Berg & Custers 2011; van den Berg et al., 2010; Ward Thompson et al., 2016)
Improved sleep quality	(Astell-Burt et al., 2013; Grigsby-Toussaint et al., 2015; Morita et al., 2011)
Reduction of depression	(Astell-Burt et al., 2014c; Beyer et al., 2014; Cohen-Cline et al., 2015; Gascon et al., 2015; Kim et al., 2009; Maas et al., 2009b; McEachan et al., 2016; Nutsford et al., 2013; Sturm & Cohen 2014; Taylor et al., 2015; White et al., 2013)
Reduced anxiety	(Beyer et al., 2014; Bratman et al. 2015a; Maas et al. 2009b; Nutsford et al. 2013; Song et al. 2013; Song et al. 2015)
Greater happiness, well-being and life satisfaction	(Ambrey 2016; Fleming et al. 2016; Larson et al. 2016; MacKerron & Mourato 2013; Van Herzele & de Vries 2012; White et al., 2013)
Reduction of aggressive behaviors	(Bogar & Beyer 2016; Branas et al. 2011; Kuo & Sullivan 2001a, b; Troy et al. 2012; Younan et al. 2016)
Reduction of ADHD symptoms – attention deficit hyperactivity disorder	(Amoly et al., 2014; Faber Taylor et al., 2001; Faber Taylor & Kuo 2009; Faber Taylor & Kuo 2011; Kuo & Faber Taylor 2004; Markevych et al. 2014b; van den Berg & van den Berg 2011)
Increased prosocial behavior and social relationships	(Broyles et al., 2011; Dadvand et al., 2016; de Vries et al., 2013; Fan et al., 2011; Holtan et al., 2015; Home et al., 2012; Piff et al., 2015; Sullivan et al., 2004)
Low blood pressure	(Duncan et al., 2014; Markevych et al., 2014a; Shanahan et al., 2016);
Improvement of postoperative recovery	(Park & Mattson 2008; Park & Mattson 2009; Ulrich 1984)
Improvement in childbirth	(Dzhambov et al. 2014)
Improvement of heart failure	(Mao et al., 2017)

Improvement of children's cognitive and motor development	(Fjørtoft 2001; Kellert 2005)
Improved pain control	(Diette et al. 2003; Lechtzin et al. 2010; Han et al. 2016)
Reduction of obesity	(Bell et al. 2008; Cleland et al. 2008; P. Dadvand et al. 2014a; Lachowycz & Jones 2011; Sanders et al. 2015; Stark et al. 2014)
Reduction of diabetes	(Astell-Burt et al. 2014a; Bodicoat et al. 2014; Brown et al. 2016; Thiering et al. 2016)
Improved vision	(French et al. 2013; Guggenheim et al. 2012; He et al. 2015)
Improvement of the immune system	(Li et al. 2006; Li et al. 2008a; Li et al. 2008b; Li et al. 2010; Li & Kawada 2011)
Improvement of the general state of health in adults	(Brown et al. 2016; de Vries et al. 2003; Kardan et al. 2015; Maas et al. 2006; Maas et al. 2009b; Stigsdotter et al. 2010; Wheeler et al. 2015)
Improvement of the general condition in people who have survived cancer	(Ray & Jakubec 2014)
Improvement of the general condition of children	(Kim et al. 2016)
Reduction of mortality	(Coutts et al. 2010; Gascon et al. 2016b; Hu et al. 2008; James et al. 2016; Takano et al. 2002; Villeneuve et al. 2012)
Improvement in the conditions of patients suffering from asthma and allergies	(Andrusaityte et al. 2016; Dadvand et al. 2014a; Fuertes et al. 2014; Fuertes et al. 2016; Lovasi et al. 2013; Lovasi et al. 2008; Ruokolainen et al. 2015)

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In children, prolonged contact with natural environments profoundly and positively affects their development, reduces attention deficit disorders, improves confidence, cognition and self-control (Assadourian, 2017).

We speak of a return to origin, as beings that emerge from nature, in communion with the notion of "Earth-Homeland" as Morin tells us. And, therefore, the emergence of (re)learning to "be terrestrial", to understand and behave intrinsically the "anthropological consciousness" that deals with the recognition of unity within diversity; of "ecological consciousness" as cohabitants of the biosphere, recognizing this same complementary link in an egalitarian relationship and not of superiority; the "earthly civic consciousness" that refers to responsibility and solidarity with the children of the Earth; of the "spiritual awareness of the human condition" that encompasses the capacity for thought "and that allows us, at the same time, to intercriticize, self-criticize and to understand" (Morin, 2002:81).

It seems, in some way, to lead us to a long-term conception of the effects of education according to this perspective, in which the current compartmentalized visions unite for the increase of reflection and understanding, leading to a conscious multidimensionality and questioning about our presence here, as an individual in a society, as a being of Nature and in Nature.

Não raras vezes é possível observar a atenção tão naturalmente presente nas crianças em atividades ao ar livre, de contacto com plantas e animais, na curiosidade e necessidade de aprender e apreender realidades distintas das suas. Our aim here is to propose to remember this process, in an intentional and conscious way, in children and adults, so that, in the long term, citizens of the society of the future have been educated in this vision of the cultivation of 'whole attention' through of

meditative practices, so that they can take this lens to all areas of their lives (so brief that they are, that somehow it becomes an insult to the universe to live them without attention and in full distraction).

Several works present interesting proposals to explain the effect that contact with Nature has on the human being. Biophilia – which can be translated as the love of life – is the human impulse to associate with other forms of life, such as a kind of innate emotional affiliation with Nature (Wilson, 1984).

For the authors, this has biological, adaptive and dependency explanations to the natural environment. The conservationist Aldo Leopold refers to a consciousness (developed in contact with Nature) that looks at other living beings as "traveling companions of other creatures in the odyssey of evolution" (Leopold, 2008, p. 112).

Other researchers allude to some affinities with certain habitats (e.g. savanna and forest), because these have provided better conditions of survival, reproduction and well-being to our ancestors (Falk & Balling, 2010; Han, 2007; Orians & Heerwagen, 1992). There is also the fact that in the soil there are some microorganisms, such as bacteria *Mycobacterium vaccae,* which stimulates the production of serotonin, having a relaxing effect and a feeling of happiness (Lowry et al., 2007). In addition, many natural environments are rich in plant-derived volatile organic compounds and negative ions that have benefits for physical and mental health (Franco et al., 2017).

There is also a spiritual perspective, which perceives Nature as sacred (Vaughan-lee, 2013a). Whatever the explanation, there are some therapies that use animals, plants and natural environments in their treatment.

For example, autistic children present good therapeutic results when submitted to therapies that involve contact with some species of animals (Katcher, 2002). In Japan there is a practice of 'forest bathing', the *Shinrin-Yoku*, with many studies that demonstrate its various valences, with a special focus on stress reduction (Hansen et al., 2017).

Lately we have received several reports of doctors prescribing contact with Nature as a way to treat their patients (e.g. Dockrill, 2018).

If the simple practice of contact with nature already reports immense benefits, the combination of the practice of controlling attention and its intentional self-regulation (this being the broadest and broadest definition of meditative practice), reports many other benefits which we will refer later on in this paper.

2 EDUCATIN FOR THE RECONECTION AND ECO-REGENERATION

We reflected on the power of simple exposure to nature, which is well documented in scientific research (Djernis et al, 2019). The authors to it further and conducted a Systematic review and meta-analysis on the effects of nature-based mindfulness, in research involving, in total, 2990 participants

and concluded that the overall combined psychological, physiological, and interpersonal effects were statistically significant and Moderation analyses showed that natural environments characterized as forests/wild nature obtained larger numerical effects than environments characterized as gardens/parks, as did informal mindfulness compared with formal mindfulness .

However, with a few rare pedagogical exceptions, the school has moved away from Nature – classrooms closed in four walls, absence of natural environments on school campuses and the teaching of natural elements is done through a virtual screen, away from sensory reality.

In a complementary way, education has focused on technoscientific knowledge, alienated from a comprehensive ethics and ecological reality, and promoted the idea that Nature is a set of resources to be indefinitely exploited and transformed into goods, feeding an extractive economic logic, whose paradigm of efficiency and infinite growth contrasts with the reality of a living and finite planet (Moreira et al., 2020).

The proof of this is the finding of a general empathy with the natural world that children have when entering school and the utilitarian, anthropocentric and 'speciesist' posture when they leave it and insert themselves as adults in the labor market or as leaders of companies and politicians (Moreira, 2019).

Furthermore, ‘Speciesism’, being is the human-held belief that all other animal species are inferior, specially by humans (maybe one day, it will be adopted by another specie?), involves teaching children since small age, that we deserve to kill animals and that we have the right to do it because we are superior. ‘Speciesistic’ thinking as invaded all levels of Education.

Trained as "hunters", in the words of the sociologist Zygmunt Bauman (2007), we live in Liquid Times, in which we either become part of the 'hunt' or run the risk of being excluded from it, when embarked upon and entangled in seemingly utopian hopes, when imbued with perspectives different from those other than competition, the 'having' to be, the producing to mean.

This idea of having to 'do something' or 'produce something' in order to 'be someone' invaded education. Contemplative leisure is despised by most. Creative and creative leisure is teased by many. We don’t educate citizens, we educate and train blind, acritical, human workers…

Throughout the school cycle, students are trained to play roles in society, without developing the reflective and ethical capacity, the spirit of critical thinking, the ability to understand the complexity of the phenomena with which they interact (Moreira et al., 2020). To aggravate the problem, the language of the curricula, even those of environmental education, suffered a general instrumentalization, which further distances the student from the ecological reality and from any empathic content that the original language may contain, e.g. the rivers began to be designated by water resources, Nature by natural capital, the forest by fuel or wood.

So what is the purpose of education? If in the past the main objective was the school massification, nowadays, is it not time to take the next step, towards an education centered on being, starting from individuality to the whole and not the other way around? With an awareness of the whole, of the sharing of life, of the world, of resources? Starting from the example of Maslow's pyramid, it is possible to make an analogy with regard to educational needs:

Figure 1. A proposal of a new pyramid for educating for a mindset of conexion through the lens of the complete Abraham Maslow's pyramid and inspired by Urie Bronfenbrenner Bioecological Theory

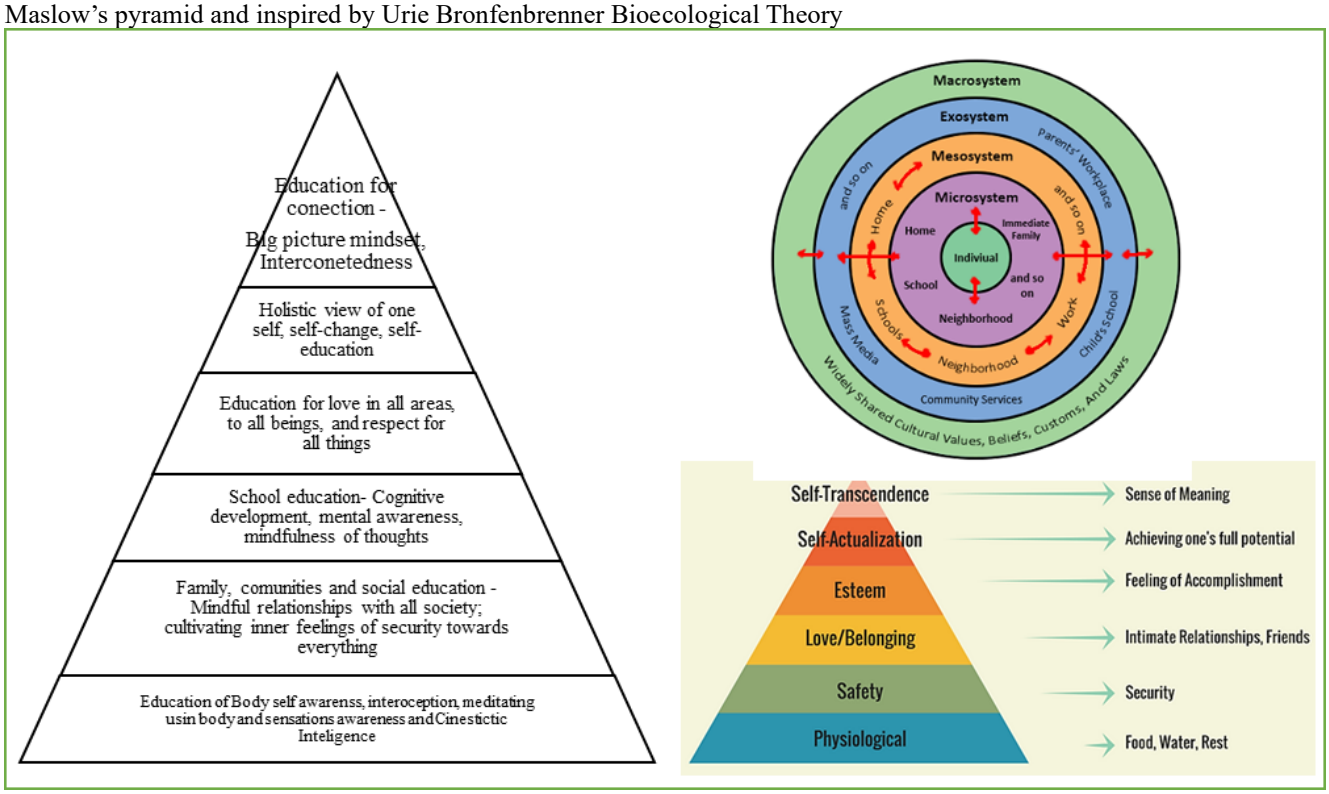


Figure 1 presents a first draft of reinterpretation of this research team (the pyramid on the left) , kind of our own Ecosophy, since we are trying to is substantiate a philosophy of ecological harmony or equilibrium (acompannied withMaslow's Original Pyramid on the right bottom corner and Bronfenbrenner's View on th top left corner).

À semelhança da pirâmide de Maslow (1960), the 'real' latest version which included 6 dimensions, well explored by Koltko-Rivera (2006) and we melted the ideas of Urie Bronfenbrenner (1979) and is bioecological view.

In Maslow's Pyramid, we find a classical framework which explains that we grow from basic needs satisfaction to superior needs. This seems the perfect moment in human history to grow to self-trancendence.

By transposing this conception to the specific need for new mindsets for education, we understand as a basic need in the life of each child the importance of affective relationships within the family, since these constitute the basis of the formation of the individual and dictate, most of the time,

the relationship with oneself, the vision of oneself in the world. Family affective relationships influence all others throughout life.

It advances to the relationship with others, outside the family, in which the child knows himself in the interaction with peers, with other adults, with a view to the development of social capacities, acceptance and relationship with difference.

School education allows general knowledge from the development of analytical thinking. However, if there is no balance in the two previous phases, the work of mental and social development can be compromised and consequently in the relationship with knowledge. The process of learning involves a set of factors that can be conditioned by the non-satisfaction of strong and secure affective bonds.

Educating for and with awareness implies that adults pass this example on to the children with whom they interact. The child is still developing the maturation of the brain, so there are feelings and ideas that they can not fully express in words, as well as, they also learn much more from behavioral examples of adults who have as reference, far beyond verbal communication: *'how* they see me is how I see myself'.

To educate for and with awareness (the new currents of *Mindful Parenting* are growing strongly in the scientific community) is to respect above all the essence and the proper development of the child. This consciousness of the individual as unique and unparalleled, projects itself in the relationship with others, with other forms of life, in the connection with nature, with the world.

If there is the consciousness of the whole, there is also connection, an unavoidable axiom of the consciousness of human life, since intrinsic values such as empathy, solidarity, education for peace and the common good, values such as self-responsibility, the ability to act, the capacity for critical thinking are developed.

Knowing that the process of education unfolds throughout life, the years of primordial formation of the individual reveal themselves as essential to any relationship with knowledge during adult life.

And this relationship with knowledge is closely related to the vision of oneself in the world and of the world, in the relationship with life, in a condition perpetuated by openness (or not) to new perspectives on the human condition, on education.

Conscious adults educate conscious children, these grow, replicate and improve their own intrinsic values, thus creating a new cycle of education for connection and with connection, aimed at the integral Being, for the whole. The human being is already born to BE and needs to have the necessary conditions to continue to develop this sense of BEING, from an education that promotes connection and consciousness.

However, the adult remains a learner. At work, throughout life, in your life design. He himself has to educate himself as his own educator, open-minded, with an overview, big-picture vision, always in open to all levels of the ecosystem until he reaches the Humance. To transcend, for Maslow, was to be able to find purpose and meaning, in harmony with everything and everyone.

The current director of the OECD's Directorate for Education and Skills, Andreas Schleicher, is critical of the hegemonic education system focused on the transmission of academic knowledge at the expense of fundamental human characteristics. For Schleicher it is essential that Education provides tools for:

Thinking about truth, mastery of human knowledge and learning; on the beautiful, mastery of creativity, aesthetics and design; on the good, the domain of ethics; the just, the domain of political and civic life; the sustainable, domain of the health of nature and physics. These are just a few examples. The social and emotional skills that help us live and work together are increasingly important for success at work and in life. These are the skills needed to set goals, work as a team, and manage emotions.

They play an essential role in all stages of life. Along with cognitive and learning abilities, it is important for students to develop strong social and emotional skills, which will help them balance and define their personality. This can include character traits such as perseverance, empathy, resilience, mindfulness, ethics, courage, or leadership (Schleicher cited by Carriço, 2017).

Conventional education reproduces the values of society and the main political, cultural, sociological, axiological and epistemological trends, weaving a technical-scientific narrative with immense inaccuracies, centered on the current economic model and scarce of the ethical dimension of ecological reality (Moreira et al., 2020).

The importance of education for the awareness of environmental protection, for sustainability, for the awareness of integration in the whole as a contribution to a vision of education of the Being and of a new Humanity is already beginning to be mentioned.

The organic and systemic vision of the web of life, the spiritual connection, an intrinsic characteristic of the human being, the search for the divine. That is why in various anthropological studies the practice of spirituality in different forms is verified throughout human evolution. Even in tribes distant from each other, without any contact, it is possible to observe a constant search for this connection to the divine, as well as a deep connection to nature and its natural phenomena. And that deeply interconnects everything. Intuition, emotions and contact with Nature are usually absent in school. This scenario reflects the weaknesses and gaps of hegemonic teaching and calls into question the essence of humanity itself. At the same time, an education where a vision of a superior man and separated from Nature and that is dedicated to competition predominates, potentiates ego and anthropocentric individuals, which reflects the current social system.

It is necessary to break this unsustainable cycle, providing Education with strategies that bring the human being closer to the natural world towards the effective regeneration of (our) Nature. But also to encourage and enhance self-knowledge, self-management, empathy, solidarity, conscious knowledge. That is, tools that allow this rapprochement with the natural world, concisely and meaningfully . Mindfulness practice can be an excellent tool in this regard.

3 CONTEMPLATIVE SCIENCES AND MEDITATIVE PRACTICES

Dorjee (2016) in a complete and compreehensive paper, debates the definition of contemplative sciences and its fast growing research field.

Dorjee (2016) proposes a broad definition “It is proposed that contemplative science is an interdisciplinary study of the metacognitive self-regulatory capacity of the mind and associated modes of existential awareness modulated by motivational/intentional and contextual factos” (p.3).

AS we can see in Figure 2, the author designs the main ideas around Contemplative Sciences.

Then, inside the multiplicity of contemplative Sciences, we can find many types of meditative practices, including minfdulness meditation, which we will discuss next.

Cebolla et al (2019) also talks in Positive contemplative sciences .

Although it might seem hard to define meditation, we choose our favorite definition, a mix of many authors and ideas, and the the one which allows us to be broadest we can be: meditation is intentional self-regulation of one’s attention. That´s it. To be in control, in possession, and to be able to consciously guide one’s attention, intencionally.

Dorjee (2016), goes further in figure 1 and documents the several systems involved in contemplative Sciences.

Figure 2. Core systems and processes modified by contemplative training according to Dorjee (2016)

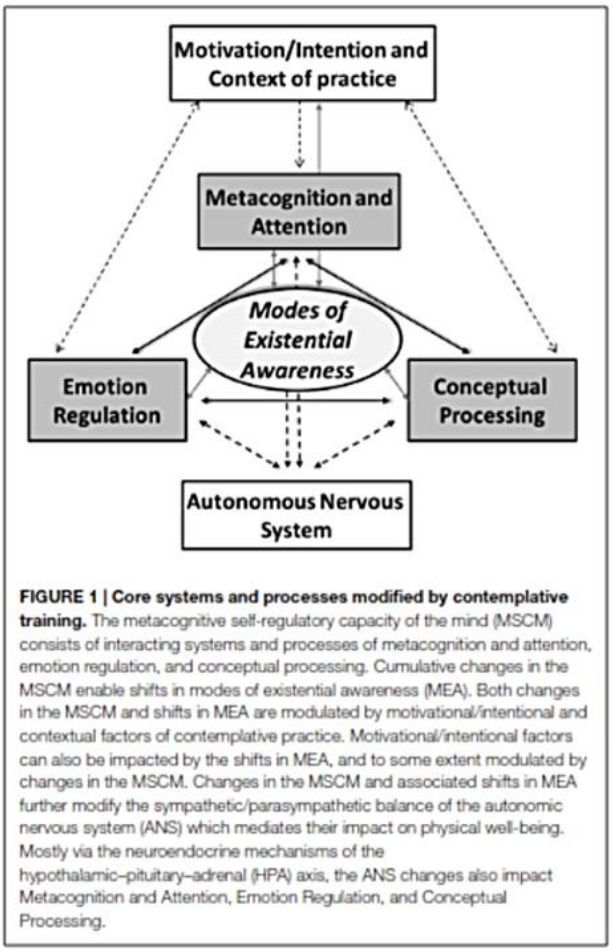


FIGURE 1 | Core systems and processes modified by contemplative training. The metacognitive self-regulatory capacity of the mind (MSCM) consists of interacting systems and processes of metacognition and attention, emotion regulation, and conceptual processing. Cumulative changes in the MSCM enable shifts in modes of existential awareness (MEA). Both changes in the MSCM and shifts in MEA are modulated by motivational/intentional and contextual factors of contemplative practice. Motivational/intentional factors can also be impacted by the shifts in MEA, and to some extent modulated by changes in the MSCM. Changes in the MSCM and associated shifts in MEA further modify the sympathetic/parasympathetic balance of the autonomic nervous system (ANS) which mediates their impact on physical well-being. Mostly via the neuroendocrine mechanisms of the hypothalamic–pituitary–adrenal (HPA) axis, the ANS changes also impact Metacognition and Attention, Emotion Regulation, and Conceptual Processing.

But the science of meditation is an enormous field of experiences and research and it is a challenge to overcome myths and wrong ideas (mainly from the western world) and build a comprehensive taxonomy.

Several taxonomies of meditation have been created and research in recent years including a model from Nash and Newberg (2023). The complexity of meditation is massive, since is it possible to meditate with almost everything you can focus your attention on.

In previous works, we envisioned the optimization of meditative practices on organizational and workplace contexts (Araujo et al, 2023), where adults keep long-life learning, and we reviewed the effects of meditation programmes in early school stages (Filipe et al, 2021), but in this paper, we aim to expand the work and bring a framework into all areas and levels of education.

Regarding *Mindfulness* meditation in particular, it is a type of meditation which, according to author Jon Kabat Zin, is "to pay attention, on purpose, to the present and without judgment, to the

unfolding of the experience moment by moment[2]“ (Kabat Zin cited by Goleman & Davidson, 2017, p. 58).

Scientific research on mindfulness meditation is one of the types that has produced the most scientific publications in recent decades, thanks to standardized programs, easy replication and, to some extent, being 'de-ritualized' and accessible to anyone after a short time of training.

However, it should be noted at the outset that it is only one type and that it does not represent the huge panoply of existing meditative options.

Currently, many of the meditative practices, which include *minfulness*, already present scientific evidence in many areas, and as a whole it is academically known within the contemplative sciences. Many of these practices come to us today through certain religious traditions, such as Buddhism.

In this tradition there are two major types of *Mindfulness* – centering and decentralizing meditation. The first, also known as *Samatha*, uses only one element as a stimulus and the goal is not to deviate from it (Elysium Health, 2018).

In turn, the decentralizive, also known as *Vipassana*, presuppose the focus on different stimuli that arise at the time of practice. However, the goal is not to stay too long focused on the same stimulus, in a logic of "take it and leave it". The strategy for freeing yourself from a persistent thought is to focus on the breath. In an ultimate state, the goal is to calm the mind to the point of not focusing on thoughts, but on voidness. *Mindfulness* of *emptiness* is to practice mindfulness in the void (Shonin et al., 2015).

Many philosophical traditions have had underlying assumptions and practices that meet meditation. If we go back in time, albeit very briefly and simply, we will see that Socrates, the Greek philosopher, who was born in the year 400 BC, was an advocate of an art or activity aimed at taking care of the health of the soul.

Stoicism, which originated 300 BC in Athens, aimed to think of ways of being in life that fit with meaning and tranquility. For the Stoics "Some things 'depend on us,' or are entirely under our control, while other things are not." (Fideler, 2022, p. 22). Accepting certain events and realities is a presupposition. However, how we feel and react to these aspects is up to us.

Such as Siddhartha Gautama (who became ‘the’ Buddha, since we all can become budas, because we all have budhahood in us, -in the original sanscrit ‘*Tathagata Dharma* ‘), He left his palace to face reality, confronting less positive situations inherent in life (Hesse, 1998), the Stoics were also well aware that moments of crisis would happen during their lives.

In addition to the awareness of this inevitability, they saw these moments as opportunities to improve as people. The Stoics were pro-social philosophers, who understood well the integration of

[2] Tradução livre, do original «paying attention, on purpose, in the present, and non-judgementally, to the unfolding of experience moment by moment» (Goleman & Davidson, 2018, p.58).

the human with the world and realized very well how much the world was a part of them and vice versa.

More recently, existentialism, a philosophical current that was born in the nineteenth century, relativizes the human, since this "at first is nothing: only later will it be something and it will be what he makes of himself." (Sartre, 1970, p. 3). In this perspective lies also the idea that the Human is not only responsible for himself, but also for all others. As Sartre advocated on the subject, "nothing can be good for us without being good for others." (1970, p. 4).

The idea that all the decisions that are made by a certain person, as well as the way that same person acts, has an influence, not only for him, but also for everyone who shares the world with him. The use of meditation *Mindfulness* as a cognitive and behavioral therapeutic technique (Vandenberghe & Sousa, 2006) It thus has an important role in the world of the individual and in the social, as well as in the environmental sphere, as we will see later.

Despite the complexity and limitation of studying these practices (which is already beginning to be covered by taxonomies and aggregations, as we have already seen), which should not be seen as an escape and/or solution to all problems, many of their benefits are scientifically proven, namely reversal of the effects of stress on the amygdala and improved concentration (Goleman & Davidson, 2017).

In general, meditative practices can be a tool of excellence to promote the encounter with the Self, calm the mind and body and foster a good relationship with oneself and with the world. The more time you dedicate to practicing *mindfulness*, the bigger and better your results will be. With just a few minutes a day you can get benefits and it is perhaps one of the most important messages to convey, in order to democratize your practice and not perpetuate the erroneous idea that it takes a lot of resources, such as time and money, to be able to benefit from it.

4 BODY, MIND, PRACTICE, ETHICS AND NATURE IN THE PRACTICE OF YOGA

Approximately 5,000 BCE, in India's Indus Valley, archaeologists have revealed images of humans in meditative postures but it is likely that these practices originated much earlier, indicating that meditative experience has been valued by human beings for millennia (Church, 2022). The Yoguic 'science' and philosophy is documented as the first meditative practice in human history (Araujo et al, 2023)

The origin of Yoga is lost in time, and the oldest proof of its existence dates back to the Indus Valley civilization (Basavaraddi, 2015; Picozzi, 2009). Its importance calls the most diverse testimonies, e.g. "By its breadth and depth, by its respectable time of existence, by its doctrine and its method, which include every phase of life, it promises possibilities never dreamed of" (Young cited by Yogananda, 2008, p. 257).

The Sanskrit word literally means union, today commonly attributed to the junction of the body with the mind, but which in its original form (Eastern philosophy) meant the union or harmony of the human with the divine through the practice of meditation (Blavatsky, 1991).

However, in the *Yoga-Sutras* from Patanjali, Yoga means the inhibition of changes in the mind (Taimni, 1961). In this form of *Raja Yoga*, which has several stages, the ultimate goal is to bring out a more awakened consciousness, which can observe the limitations of the mind, with its continuous fluctuations and fragmented apprehension of the world, and look at a deeper reality that is Nature (of life). Therefore, Yoga is one of the oldest meditation practices, often referred to as the 'Science of Yoga', since its various forms are deeply experienced, studied and practiced (although it has recently reached the sieve of the scientific method, but the first scientific article published in a scientific journal that addresses meditation is about yoga and dates from 1961 by the authors Wengerand and Bagchi).

In other words:

It is an applied science, a set of coordinated laws put into play to obtain a certain result. Yoga employs the laws of psychology that serve to develop the "totality of human consciousness on all planes and rationally applies these laws to a particular case." (Besant, 1995, p. 18).

The best known Yoga in the West is the *Hatha Yoga*, which focuses on the exploration and control of the body as a means of acquiring physical, emotional and mental balance. It is the beginning of a long road to achieving 'unity'. Before this can occur, it will be necessary to practice *asana, pranayama, mudra, bandha, shatkarma* and meditation (Saraswati, 2008). We will address some practices that relate to the present work.

The *asanas* They are bodily postures, through which it is possible to explore the body, the breath, the mind and higher states of consciousness. "[The practitioners of *hatha* Yoga] discovered that by developing mind control through these practices they were able to control the mind and energy[3]" (Saraswati, 2008, p. 9). Many of the *Asanas* they reflect animal movements, a fact that became coined in their name. For example, the posture of the cat, the cow, the fish, etc. Through observation, the *rixis*[4] They realized how animals lived in harmony with their bodies and their environment, and were inspired by them. This data is very important, since contemporaneity is guided by the disconnection with ourselves and with Nature, and Yoga can help to overcome these problems.

Or *Pranayama*, focuses on the *Prana*, which according to Eastern philosophy is "the vital energy, ... [which] permeates the whole body, through flow patterns, designated *Nadis*, which are responsible for maintaining all cellular activity[5]" (Saraswati, 2008, p. 10). If the channels of vitality

[3] Tradução livre, do original «They found that developing control of the mind through these practices enabled them to control mind and energy» (Saraswati, p. 9).
[4] Rixis (Richis, Richis) literally 'revelators', are holy or enlightened sages, inspired singers or poets, to whom the Vedic hymns have been revealed (Blavatsky, 1991).
[5] Tradução livre, do original «vital energy, (…) pervades the whole body, following flow patterns, called *nadis*, which are responsible for maintaining all individual cellular activity» (Saraswati, p. 10).

Nadis are not totally clear, Prana currents do not flow smoothly in them, and can cause various types of nervous disorders (Taimni, 1961).

Still for the author, this condition can be removed by practicing the *Nadi Suddhi*, which is one of the breathing exercises for the purification of *nadis*. If this exercise is practiced correctly for long periods, in parallel with the regime required of the yogi, "the physical body becomes light and full of vitality and the mind relaxed and restful[6]" (Taimni, 1961, p. 84). Therefore, some breathing techniques play a crucial role not only for the vitality of the physical body, but also for the relaxation of the mind, which is an important stage for meditation. In addition to the *nadi suddhi,* Yoga has other breathing exercises, which influence mental states conducive to meditation, such as *ujjayi,* a slow, deep, long breathing practice (Kaminoff, 2007).

Another central issue in Yoga is its ethics *Yama*, well defined of the *Yogas Sutras* of Patanjali. The first principle, designated *ahimsa is central to this work, since it refers to nonviolence. However, this principle does not stop in the human sphere, but embraces all living creatures, not intentionally inflicting on them any injury, suffering or pain, by means of words, thoughts or actions (Taimni, 1961). Behind this principle lies another important concept in Yoga, which is the Oneness of Life.*

Thus, the practitioner of Yoga should not inflict any kind of violence on other beings or Nature in general, since he identifies with this all-embracing life, including himself.

Or Yoga offers a means for the individual to find their own way to connect with their true self (Saraswati, 2008). On the other hand, for the author, this personal self is an illusion, since in Yoga there is union of the individual consciousness with the universal consciousness.

The deepest Self is a Self that encompasses all life, human and beyond human. To be aware of the integration of our being with all other beings and that everything is connected, and should not, therefore, be perceived and experienced in a fractional way.

All these reflective aspects of the self, of the deep self-knowledge of the self and of the brain and the body, are and always will be at the core of the goals of meditative practices.

In addition to ahimsa, we find other ethical principles that deserve mention: satya, which corresponds to the adoption of actions, thoughts and words that always respect the truth; *asteya*, which focuses on the non-appropriation of another's property; *bramacharya,* oriented to the search for the essential in life *and aparigraha*, which cultivates moderation and detachment.

If we used each of these principles, we could design mindfulness-based educational interventions geared toward connecting with the ecosystem. One of the most immediate, with which we can quickly imagine a meditation for reconnection, is actually *Ahimsa*, as violence (at all levels, whether individual or macro) against the ecosystem has reached extreme points these days.

[6] Tradução livre, do original « the physical body becomes light and full of vitality and the mind calm and restful» (Taimni, 1961, p. 84).

4.1 MEDITATIVE PRACTICES AND NATURE-BASED MINDFULNESS AS A WAY OUT FOR THE ECO-CRISIS

Theories and evidence confirm what many of us feel when we are in Nature: an inexhaustible source of happiness and well-being. However, we will only be able to have access to this source if we reverse the absurd war that the hegemonic society wages against Nature, which according to the philosopher Paulo Borges, is the result of a distortion or obscuration of consciousness (Gonçalves & Moreira, 2018).

To analyze this question, Rimanoczy & Llamazares proposes a revision of our paradigm in order to identify the problem (2021). For these authors, the planetary emergence requires a revision of our perception of ourselves, others and ecosystems, since working at the level of mentality enhances resources and accelerates change.

However, the The mindset required to achieve sustainability is quite complex. In a study initiated by Rimanoczy and which continues to be developed with other co-authors, twelve principles emerged to restore the ecological balance, called the 12 Pillars of the Sustainable Mindset (Rimanoczy, 2020), which offer a framework with which it is possible to access, explore, review, verify and develop key aspects that constitute the mentality (Rimanoczy & Llamazares, 2021), framework to which we will comeback at the end os this papers, when we presente some specific practical proposals.

These twelve Principles are organized into four areas: Ecological World Vision – includes the Ecoliteracy Principles and My Contribution; Systems Perspective – includes the Principles of Long-Term Thinking, Cyclic Flow, Both+E and Interconnection; Emotional Intelligence – includes the Principles of Self-Awareness, Reflection and Creative Innovation; and Spiritual Intelligence – includes the Principles of Oneness with Nature, Purpose, and Mindfulness.

On this last Principle, the authors refer that contemplative practices have been associated with socio-environmental activism and a sense of interconnection and unity with everything that exists. And since the processes are interconnected, let's focus the approach on this Principle, interlacing with the others.

When Zen Buddhist monk Thich Nhat Hanh was asked what needed to be done to save our world, he replied: "What we need to do most is hear within us the sound of the Earth crying." (Nhat, Hanh cited by Vaughan-lee, 2013, p. Introdução 1ª ed.). By his lineage, Nhat Hanh had as his life practice meditation, with a special focus on *Mindfulness* a psychological process and mode of consciousness that is evoked when attention is intentionally regulated (Bishop et al., 2004), the awareness that emerges from paying attention to the present moment (Kabat-Zinn, 2003), with an open attitude, of non-judgment and acceptance (Djernis et al., 2019). With this technique Nhat Hanh realized that his interior was not separated from the world (perceived as) outside and that all phenomena were interconnected:

If you are a poet, you will clearly see that there is a cloud floating on this sheet of paper. Without a cloud, there will be no rain; without rain, trees cannot grow; And without trees, we can't make paper. (...) Looking even deeper, we can see that we are also in it. (...) The sheet of paper is part of our perception. Your mind is here and mine too. So we can say that everything is here on this sheet of paper. (...) "To be" is to between. You can't just be you, alone. You have to be with all the other things. (Nhat Hanh, 1991, pp. 95–96).

This *mindful* around a sheet of paper gave rise to the concept of between-being[7], which understands the world, its phenomena, entities, objects, matter, mind and energy as intertwined and interdependent elements of Nature. Each element exists because all the others also exist.

How Targeted and Regular Mental Practice Can Alter Brain Structure (Neuroplasticity) (Valk et al., 2017), then, the *Mindfulness*, in addition to bringing out a set of qualities cultivated by the practice of meditation (Kabat-Zinn, 2003), can deepen perceptions and change long-established attitudes and behaviors. The monk and researcher Matthieu Ricard used to say: "change the mind, change the brain" (e.g., Ricard, 2007).

One might add: change your brain with your mind, change the reality of your life, and inspire the world around you (Moreira, 2019), since second Goswami et al., consciousness itself creates reality (2015). Thus, the *Mindfulness*, as a mode of consciousness, can be an excellent tool to reflect on our way of seeing and being in the world and, above all, to deconstruct our neuronal connections that lead us to have unsustainable attitudes and behaviors, creating a new brain structure that makes us (re)approach to Nature, so necessary to combat the ecological crisis, as proclaimed by the above-mentioned institutions, which are equipped with scientific reports at the highest level.

In turn, the *Mindfulness* practiced in Nature has better results if it is carried out in a space of Wild Nature (Djernis et al., 2019). In addition, Yoga can also enhance its qualities.

Won't this rapprochement with nature have effects only when it is shaped by the instituted? That is, we defend a practice of individual consciousness, important undoubtedly in its genesis, but if it does not happen in a macro sphere, how many generations will be necessary for a change of vision and educational paradigm?

As Edgar Morin points out, the complex conception of the human race involves the triad of individual-society-species. We are the product of interactions and we produce the interactions that form society, these constructs are inseparable, they feed each other and it is "within this complex triad (that) immerses consciousness", in the anthropo-ethical vision of education of the future and for the future, while "consciousness and planetary citizenship", "work for the humanization of humanity, effect the double conduction of the planet: obey life, guide life." It is about moving towards an "individual consciousness beyond individuality". (2002:114)

[7] From the English *Interbeing*, also translated to Portuguese as *interbeing*

As we have seen above in the definition referring to contact with Nature, this is in full tune with *mindfulness,* realized/focused on the natural world, since both are states of consciousness that reflect the interrelationship between the human individual and the surrounding Nature. Therefore, both the concept of contact with Nature and *mindfulness* in Nature are very close to the concept of ecological consciousness:

In general terms, ecological consciousness is understood as the reflection of the psyche on the various relations of man with nature, which mediates his behavior in the "natural world" and expresses the axiological position of the subject of consciousness in relation to the natural world. And, studies show that environmental awareness is a complex mental education, which includes cognitive, regulatory, emotional, ethical, among other aspects (Panov, 2013, p. 380).

Under the prism of deep ecology, which is an ecocentric environmental ethic, it can be affirmed that ecological consciousness *is the mindful* in/of Nature , since it is the quality that stands out from deep reflection in/of Nature. Thus, *mindfulness* in Nature puts us in deeper contact with the natural world, making ecological awareness grow.

O Nature-based mindfulness tem conhecido muitos desenvovlimentos mas também fusões como é o caso da abordagem de Church et al (2022) a que os autores denominaram 'Ecomeditation'. EcoMeditation consists of stress-reduction skills, specifically mindfulness, heart coherence, EFT, and neurofeedback. In several research, participants attend a full-day virtual workshop and completed assessments before and immediately after the session. After a one-day EcoMeditation workshop, results indicated that participants experiencea significant reduction in anxiety, depression, PTSD, and pain, along with an increase in happiness, flow states and transcendent experiences. At 3-months follow-up, significant decrease in anxiety, depression, and pain between pretest and posttest, as well as pretest and follow-up.

In the same research, authors state that, furthermore, the results also revealed a significant increase in flow states, happiness, and transcendent experiences between pretest and posttest, as well as pretest and follow-up. Decreased PTSD symptoms were evident over the 3-month period between pretest and follow-up.

Therefore, the need for symbiosis between mindfulness practice associated with practices of knowledge expansion, teaching and training. Currently, the education and training sectors are being encouraged by the European Union for the ecological transition and for the strengthening of skills regarding sustainability behaviours in their students.

From the promotion of behaviors and attitudes that aim at a more sustainable life, with the reduction of consumption and an awareness of the impact of individual and collective action in favor of the environment. However, these guidelines are still in a theoretical sphere, are not implemented as educational practices and systematic features of EU policies (2021).

Mindfulness, if it is carried out (with focus) in a natural environment, has the potential to expand consciousness from an egocentric self – formed by the dispositions of a competitive society alienated from Nature – to an ecological Self – awakened to the reality of life. The term "ecological self" was coined by the philosopher Arne Naess to describe the ability of the human being to identify with other living beings, expanding and deepening his self to include microorganisms, trees, animals, forests, rivers, mountains or even the Earth itself (Naess, 2005). The maturity of this ecological consciousness, the fruit of a personal ecosophy, which includes mindfulness in relation to life and contact with Nature, leads to self-realization – the perception of the realization of the "I-in-I", in which the Self symbolizes the organic totality that exists in the world (Sessions & Devall, 2004, p. 87).

This is a practice in tune with the Yogic meditative tradition, as we have already seen. In turn, for the authors, self-realization leads to an "oceanic feeling" of realization of the potentialities of life (p. 96-97), contained in the immeasurable lightness of an inner fulfillment that many humans feel before the sea or in another place of rapturous wild beauty. There is a joy that grows as our consciousness grows and we relate to the world and other beings: "You are much bigger, deeper, more generous and capable of greater dignity and joy than you think! A wealth of non-competitive joys is open to you!" (Naess, 1987, p. 40).

For deep ecologists, who work on their ecosophy, this identification with all life leads to an innate defense of Nature. Defending society, a species, a river or the Earth thus becomes the defense of oneself. Therefore, the disconnection that hegemonic society has in relation to Nature is mainly a problem of consciousness (Zylstra et al., 2014). Hence, contact with Nature, together with meditative techniques within it, including the practice of Yoga, is a central aggregate for the resolution of ecological problems.

It is necessary a reorganization of knowledge, that is, of the scale of priorities with regard to the formation of the individual. Should not the human condition, as well as the earthly condition, be primordial and object of study in teaching? Consciousness does not develop without access to information and knowledge. It's like trying to plant seeds without land. Knowledge is the land where the seed will germinate to make way for the plant (consciousness), which grows from the sun and water (mindfulness practice) and from the nutrients of the earth (knowledge).

Being in contact with nature can involve many different things. We can go from a formal practice of meditation, with the intention of only being, observing, non-judgment (which can be especially difficult for the little ones by their own nature of movement and response to stimuli) to a practice of care, such as agriculture, gardens, knowledge of species; even from frequent walks, breathing fresh air.

A large part of the population lives in cities and many do not have direct contact with the observation of a plant growing, the planting of food, contact with animals. This lack of knowledge

inevitably leads to a disconnection of the individual from his place in nature and, consequently, with his own nature and identity. This separation distorts the notion of essence that guides each individual, the feeling of belonging and connection to the Earth.

Therefore the importance and urgent need to (re)learn to be and to be as inhabitants of the planet.

Simple practices of breathing in the classroom, of contemplation of silence, of simple observation, of knowing how to stop and stay to BE, can have a strong impact on the development of emotional self-management, along with activities that promote emotional literacy for a greater knowledge of oneself, created and adapted to the different phases and ages. It is urgent that in the school curricula are present regular activities of emotional management, meditative practices, connection with nature and contemplative sciences, self-knowledge and ecological knowledge and sustainable behaviors.

The effects and benefits that these practices would bring to society in the long term are still immeasurable, we can foresee them in the optimistic understanding of constituting themselves as a way to go in the holistic formation of the individual in education for the future. But only by acting in the present does it become possible to prepare the future and it is in pedagogy that these contours are achieved to promote social change, by its format of education for all, thus overturning social inequalities with regard to education for connection and holistic knowledge that is intended to be for all.

Being in contact with nature can involve many different things. We can go from a formal practice of meditation, with the intention of only being, observing, non-judgment (which can be especially difficult for the little ones by their own nature of movement and response to stimuli) to a practice of care, such as agriculture, gardens, knowledge of species; to even from frequent walks, the breathing of fresh air. Simple practices of planting vegetables for example, the observation of their growth, care and their biology, can lead to a greater awareness in the consumption of these foods, in the change of eating habits, to a change of behavior with regard to consumerism.

A large part of the population lives in cities and many do not have direct contact with the observation of a plant growing, the planting of food, contact with animals. This lack of knowledge inevitably leads to a disconnection of the individual from his place in nature and, consequently, with his own nature and identity. This separation distorts the notion of essence that guides each individual, the feeling of belonging and connection to the Earth.

Therefore the importance and urgent need to (re)learn to be and to be as inhabitants of the planet.

5 FINAL CONSIDERATIONS AND PROPOSALS

Calls for society to reconnect with nature in order to bring greater sensitivity and alleviate environmental problems are commonplace in scientific literature and environmental discourse. On the other hand, this contact is also an important factor in human health and the various cultures that have used natural environments as sacred spaces, for well-being, healing and even spiritual awakening are lost in time.

Among these dimensions there is the environmental ethics that contemporary philosophy has brought to the fore, but which many of the spiritual and religious traditions of the East have already integrated. Yoga, which emerges in a culture alongside Buddhism, Jainism and Hinduism/Brahmanism, also integrates an ecological ethic, that of non-violence, which can be employed to help slow the pace of habitat destruction and the extermination of species around the planet. ("The Routledge Handbook of Religion and Ecology", 2017)

How are we educating our children? Is the education system prepared for new paradigms? Is there an openness to innovation? How many generations will it take to "educate the conscience?" Is it possible to reach a consensus on meditative and contemplative practices free of religious dogma?

Today we already have scientific data that supports the importance of Nature in our lives. However, an anthropocentric conception of Nature, leveraged in religious, philosophical and scientific concepts out of step with organic reality, made a society grow that began to look at Nature as an inert machine at its mercy and separated from itself. This caused a departure from the hegemonic society of Nature.

To entangle the situation, a consumerist and competitive economy was created that unbridled exploitation of Nature and an Education that reflects this whole paradigm. Perhaps there is a lack of "hearing within us the sound of the Earth crying", and it is urgent to enhance and develop strategies and educational tools that promote a sustainable Education for a society in balance with Planet Earth, that call for a (re)connection and a greater awareness in a purpose of evolution of ecological and sustainable Humanity. This is where the *Mindfulness*because it requires "an exceedingly vigilant mind; and whence meditation is the understanding of the totality of life, in which there is no longer any kind of fragmentation." (Krishnamurti, 2006, pp. 102–103).

Mindfulness in Nature enhances the best of both worlds – it brings us closer to the natural world, to know it and to get to know ourselves better. It is a privileged way to combat the ecological crisis, towards more sustainable or regenerative living practices.

That is, the ecological Self in the restoration of (our) Nature, to leave a better world than the one we found, for our children, for the children of our children and if we want to continue to have a planet to live on, where we can satisfy our needs and those who will still come, it is urgent to change

directions, innovate conceptions, change visions and paradigms, rethink education strategies, whether in pedagogy or andragogy.

As Moreira says:

"To defend Nature, we must love it;

To love Nature, we need to know it;

To know Nature, we need to awaken to its true nature;

To awaken to its true nature, we need to find it within us."

(Moreira, 2019, p.22).

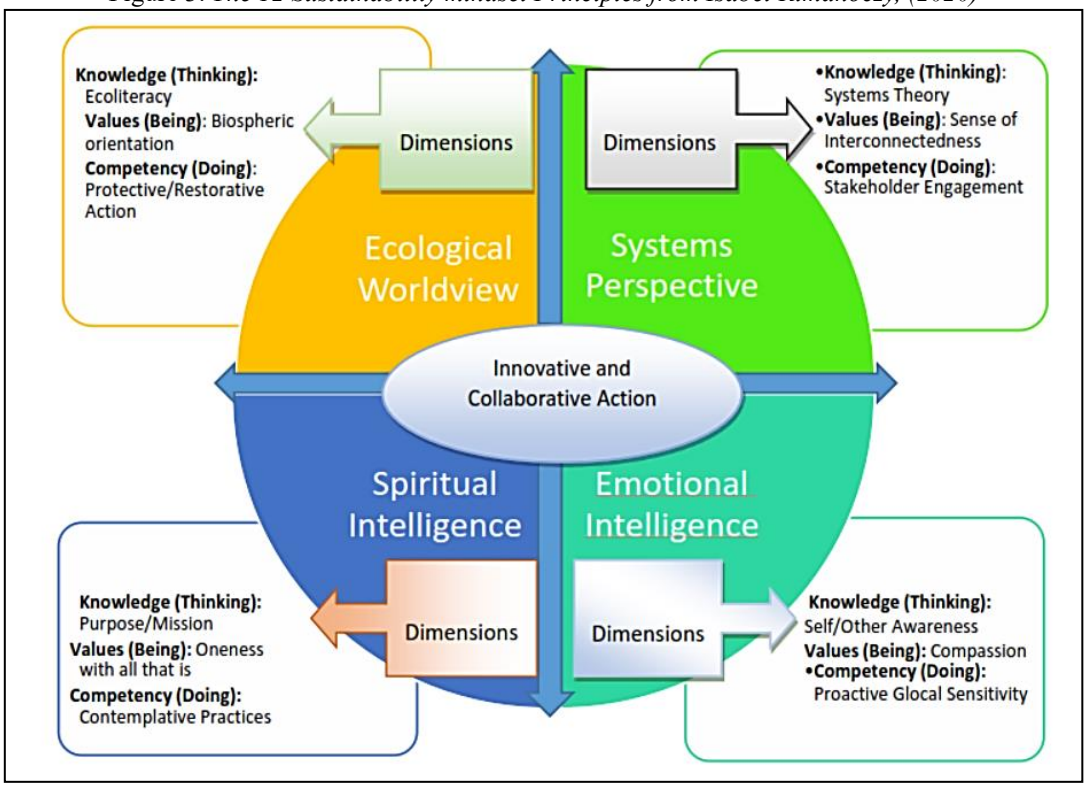
Biophilia is innate to us and contemplative practices can enhance this kind of awareness, especially when practiced in a natural environment. In addition, it is necessary to educate for this mindset in consciousness from day one, when we receive a new human being on the planet. Parents, families, schools, organizations, companies and communities, have to unite as educators and, in this paper, we argue that this sense of connection can be achieved by the operationalization and normalization of meditative practices in all contexts where humans learn because...:

> "Humankind has begun to awaken to the interconnections between planet, people, and prosperity, and is beginning to recognize that our alterations to the biosphere result in climate change, desertification, and species loss, and how greater income disparity creates social unrest. As society undergoes fundamental changes, they trigger shifts in educational paradigms as well" (Mitchell, Kassel & Rimanoczy, 2018, p.31)

Given all this reflections, and our pyramid proposal in Figure 1, we go further and substantiate that it is possible to merge the ideas we present in figure 1 and figure 3, in which we depicted Rimaniczy (2020) 12 principles of sustainability mindset.

Using these frameworks, we can design meditation programs throughout all levels os eductaion, which promote this skills and mindset.

Figure 3. *The 12 Sustainability mindset Principles from Isabel Rimanoczy, (2020)*



NOTE: This imagem was retrieved from the paper of Mitchell, Kassel and Rimanoczy (2018)

Every principle of the 12 , framed within the 4 dimensions are able to be operacionalized using meditation and used in Education.

Our next challenge, for a next chapter, is to operacionalize the meditation practices in detail, but overall, the dimension spiritual inteligence is obvious since the first use of all meditation practices was no wellbeing , or stress management, but conexion to divine counsciouness and altered states of mind (even without religions involved, since Yoguic Phylosopgy original is a system and a life style with no religion conections. The hundred of religions appeared after that).

Emotional intelligence, a skill and competence which boom in the latest decades, very much projected by Daniel Goleman (1995), higlhy influence by previous works, namely Howard Gardner's theory of 7 Multiple Intelligences (1983), reframed to 9 intelligences in 2000, falls right into mindfulness meditations of emoticons.

Ecological Views and Systems perspective Dimensions fall directly into practicing METTA-KARUNA meditation, love , compassion and benevolence to all beings and to oneself, studies nowadays by many scientific researchers, for example Neff and Shapiro (2019), although compassion and benevolence meditation also has a long history in particular in tibetan Buddhism.

Inside each one of the 4 dimensions are 3 principles, which composes the framework of the 12 principles of sustainable mindset developed by Rimanoczy (2018), and, in this paper we defend that each one can be developed by the multiplicity of practices contained in the contemplative Sciences domain, and so , next research will develop and deepen this plea, and ideally we will creating

checklists, guidelines and other types of products so that, educators of all levels and all scientific áreas, either in formal Education or non-formal or informal, might implement them in the future.

in a final reflection tone, In a Daniel Goleman and Richard Davidson's book - which we consider the founding fathers of scientific research in meditation in the west- authors state that we are on the verge of proving the possibility of Altered Traits (the title of the book from 2017). According to the authors review of hundreds of papers, meditation is proven to improved Focus and Attention, Reduced Stress and Anxiety: Stress and anxiety, Enhanced Memory and Retention, increased Self-Awareness, Enhanced Emotional Regulation and Improved Creativity and Problem-Solving, which are some of most important pillars in learning and Education. IF the practice of meditation changes our own personality traits, and improves all these aspects, that seems to be an ideal application to change the way we educate and change Education practices forever, and the perfect model to reconnect human beings to nature, to the ecosystem and to a new sustainability mindset.

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SEVEN
publicações acadêmicas

Subjects and contexts in a self-sustaining systemic game: An analysis of psychosocial profiles of response to different patterns of status inconsistency that compromise development

Crossref doi
https://doi.org/10.56238/ptoketheeducati-078

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ABSTRACT

The study is part of an investigation in which we address interrelationships between personality and socio-cultural subsystems, starting from a general hypothesis of semi-dependence and semi-autonomy and in an attempt to reveal "patterns" of different psychological responses in their relationship with contextual conditions. It was preceded by another , whose objectives were to observe the behavioral effects against two central patterns: low ethnic status / acquired high in education and low in the occupational; higher / acquired high social status (university) and relatively low in the occupational . The hypotheses were: a) the greater the neuroticism or emotional lack of control, the greater the psychosomatic manifestations; b) Subjects of higher social extraction, but who acquire medium or low relative occupational status (status inconsistency), would make their conflicts more evident through somatization, compared to those from the lower strata (intropunitive response). The latter would project their conflict "outwards", that is, towards the structures (extropunitive response); aspect in which we stop in the study that follows. The findings, among others, showed that greater neuroticism is associated with greater somatization, corroborating findings from northern countries.
The sample of the present work was constituted by university women for two reasons: in them these "patterns" could emerge, according to the profile of status inconsistency, since they were a privileged strip of structural underemployment and, therefore, having reached the higher education level, they would suffer from a marked imbalance of status because they could not position themselves in the world of work at a corresponding level. These two different patterns of psychosocial response according to the status inconsistency profile involve: a) the combination of high ascribed status with low acquired status (occupational), which results in intropunitive responses (somatization, self-blame, stress); The reverse "pattern" – status ascribed low/acquired high (educational line) – entails, on the other hand, extroppunishment (nonconformity, rebellion). As far as we are concerned, what was glimpsed in the literature was confirmed. Both psychosocial responses are risky in Argentina, where the percentage of women who, although having a medium-low origin status, reach university but fail to insert themselves satisfactorily into the world of work in a structural framework, not always propitious, increases. The findings were corroborated in research carried out to this day.

Keywords: Psychosocial responses, Intropunition, Extropunition, University students, Inconsistency.

1 INTRODUCTION

The purpose of this study is to elucidate a common problem in contexts of underdevelopment: that of the inconsistency of status in university students in recent decades, including the problem of female graduates.

It was a variable/dimension addressed, among many others, in quantitative-qualitative research -central and peripheral- carried out by the author and which constitute the only studies of its kind in the world.

The central investigations had as populations the following:

-The first study refers to the research developed in *extenso in* this article. We worked with a sample of university graduates from the National University of Cuyo (UNCuyo) (1980-1993, 18 careers). The research is developed in the first doctoral thesis, UCA, 3 vol. (Aparicio, 1995). The findings are corroborated in the following investigations[1].

-The second was conducted with university graduates of the National Technological University (UTN), (1987-2002). (Aparicio, 2003)[2].

-The third study was conducted with dropouts, N = 447 (Latiesa, 1992; Aparicio, 1995, 1998 d; 2008, 2014 to, 2016 among other publications)[3].

-The fourth was carried out with delayed university subjects from the UNCuyo (1980-2002) ([4] Aparicio 2009 a and b. Also, Aparicio, 1972; Frisch, 1972; Jarousse, 1984; Aparicio, 1991a, 1991b; Cariola & Cerri, 1989 a and b; Ceri, 1983; Evans, 1984; Aparicio, 2012; 2016 a and b).

-The fifth study was carried out with a population of doctors from the Cnam (Conservatoire des Arts et Métiers, Paris) and the UNCuyo, FFyL in 2009, although in its retrospective face it began around 2004. This is a Franco-Argentine comparative research. The same, with the pertinent adaptations, is then carried out between the UCuyo and l'Université de Rouen[5].

All these investigations had as an enveloping factor the Quality of the university system in relation to the productive sector or world of work, analyzed from different complementary variables and with different populations/samples (cf. synthesis works: Aparicio, 2003, 2005/2009, 2008, 2009 a and b 2012, 2015 (a and b), 2016 b), among others).

2 BRIEF THEORETICAL FRAMEWORK

2.1 SOMETHING ABOUT STATUS INCONSISTENCY

Let's outline some axes of the so-called "Study 1", basic research that we address here.

[1] He obtains the Prize of the FUNC (UNCuyo Foundation) (Aparicio, 1994 a, b, c, d; 1997).
[2] It gave rise to the second doctoral thesis, Sorbonne, Université René Descartes, Paris V (2005/2009), which obtains -as in the other cases- the highest mention.
[3] He obtains the Prize of the SPU (Secretariat of University Policies, Argentina).
[4] It is selected as the best project by competition
[5] The first, obtains the Marie de Paris Prize, 2009 (Aparicio & Cros, 2015. See also all articles published in English on the web of science from 2015 onwards relating to PhD trajectories.

In it we perform a pre-test of some hypotheses developed in other contexts (Comrey & Newmayer, 1965; Benoit & Smullyan, Jackson, 1962; Jackson & Burke, 1965; Jackson & Curtis, 1972; Lensky, 1954; Hollignshead & Redlich, 1958) and, in Latin America (Heintz, 1965, 1968 and 1970), from the theory of structural stresses[6].

The original is the methodology and the population with which we worked: *women-graduates* of the National University of Cuyo (UNCuyo, Mendoza-Argentina).

This is an exploratory study, which already realizes its limitations, in which we analyze especially the psychosocial aspects derived from structural stagnation in young people who have reached the highest educational level (university).

The research is framed, on the other hand, in a broader project that aimed to clarify the personal, pedagogical-institutional and structural constraints of academic and socio-professional achievement and failure, in the light of a holistic model. This model crystallizes in 2005[7] (2nd doctoral thesis at Sorbonne, published in 2009) and in 2007 a and b (2 HDR or ex Tesis d'Etat, in Education and Psychology; respectively at the Universities Paris X, Nanterre and Lille 3, France). See also Aparicio 2008, 2014; 2009 A and B; 2015 A and B; 2016 A and B.

Here we address only one angle of the problem, deepening the relationship *Psychosocial system-structure and development*. Specifically, we analyze *the different profiles of psychological response in relation to the position in the market and the sociological situation of university women.* The psychosocial response, in this framework, is considered not as a conditioning factor but as a *effect* of a certain level of achievement or failure.

The question -already important at the time of the study- it seems relevant to us today because more and more university women are being and structural stagnation is increasingly accused. This allowed us to predict a high rate of inconsistency between educational and occupational status in them for the following years, as was found in the subsequent central investigations that we outline here (Part II).

However, despite being the typical picture of underdeveloped contexts, it has not deserved the attention of politicians, economists and, in general., of those who have the power of decision. The analysis is usually resolved at the "macro" or "meso-institutional" level, forgetting the expected

[6] Only "founding fathers" and works of the author that gave rise to theses and/or received special awards are cited.

[7] The model, already in germ in the first investigation, crystallizes in 2005, thesis of Sorbonne and I call it *"dialogue homme-monde*". In 2019, having already advanced in the systemic conception and its processes of "allez-retours", I call it *"La complexité en action*" at the Colloque sur la Complexité, Lille, France, 2010, Conference d'ouverture avec Edgar Morin. Finally, to show the self-sustaining effect with both positive and negative effects, title the pre-theory as "*The Three Dimensional Spiral of Sense*", presented in 2008 in Sherbrooke, Canada and published in 2012 and in 2015 a and b, in India.

responses at the "micro" level that, by reverting to the system, only reaffirm structural rigidization (Aparicio, 2005/2009; 2015 a and b, 2016)[8].

Raise the problem and tentatively answer some questions for the first time in our context and from first-hand data, was the alternative that was offered to us and in this, perhaps, lies our contribution. At times when the "person is in danger", it is good to look from the structures to the subject and think that social reality is not exhausted, much less, in the figures. Psychosocial responses await and the price, seen as social psychologists and educators, seems too high to be neglected.

2.2 LET'S DWELL FOR A MOMENT ON STATUS INCONSISTENCY.

In principle, status inconsistency occurs when the status of the subject occupies a different rank; that is, when the subject has, for example, high ethnic status (origin) and low educational status; or, to take another case, high educational status and low occupational status. The core goes through *imbalance*. Moreover, it is typical of situations of change, underdevelopment and transition; situations in which the subject having achieved certain achievements in a plane, can not be located in positions congruent with it. Heintz argues that, in non-developed countries, educational status is always ahead of economic and occupational status, which causes a serious gap due to its consequences[9].

The latter vary according to *Profiles*. To be with the theorized, when a high status of origin and low acquired status (occupational) converge, the usual response is intropunitive; On the other hand, the combination of low status and high acquired (university education), generates responses of revolutionary nonconformity or another type of violent response.

Now, and this is the important thing, given the situation in Latin America. in the decade of the '90s and, in particular, of Argentina, marked by stagnation, unemployment, rigidization of the market, high levels of anomie, etc., the most typical profile was the last; Profile that continues to be observed today[10]. That is: there are more subjects who, having a status of low origin, are reaching a relatively high acquired status through the educational or political route – the traditional channels of social ascent. And these subjects who "arrived" by the path of education, find the doors closed to the exit (underemployment, unemployment, etc.). (Carabaña, 1987).

In what concerns us here, we are interested in observing, on the one hand, the answers found in university students who had just been inserted in those years, in the occupational world (position in

[8] Many other publications, related to the author's theory called *The Three Dimensional Spiral of Sense* – published in India in 2015 although it was in germ since the 90s – can be consulted at link CONICET: https://www.conicet.gov.ar/new_scp/detalle.php?keywords=&id=20428&capitulos=yes).
[9] It can be consulted from P. Heintz (1970), especially, "Towards a paradigm ...., op. cit.
[10] See CarciofI, 1980 and 1994; Aparicio 1981 b, 1994 a,b,c,d; 1985 to; 1993 to; Clinard, 1967; Chazel, 1967; Bowers, 1984; Carabaña, 1987; ECLAC, 1989; Bertoni & Cano, 1990).

the market-occupational status), having reached the highest educational level and having a basic social situation as well as, particularly, the responses revealed in the face of this situation.[11].

On the other hand, to analyze how this situation currently presents itself in our country in a scenario in which the central variables are highly compromised.

Hence, we present this analysis in two parts: the first -entitled The inconsistency "floating in our midst" in the *decade of the '80s-'90-; the second entitled The inconsistency "floating in our midst" currently.* In order to brevity and having already developed the theoretical pillars, in this second part, we offer a tighter synthesis taking the variables-axis of the two profiles addressed and others related to the demographic issue and related (economically active population, EAP, employment and unemployment rates, intra-generational mobility,...), to the education and employment system - differentiating in men and women when we have reliable data- in a conflictive structural framework in the country.

2.3 PART ONE: THE INCONSISTENCY "FLOATING" IN OUR ENVIRONMENT IN THE DECADE OF THE '80S-'90S

In previous studies, the problem emerged for a global population, not graduates, at such disturbing levels that we decided to delve into it.[12]. In fact, the incongruity of status appeared to mark differently the three generations considered: that of respondents, their parents and grandparents.

In the Reference research In this study, with a low educational level it was possible mobility, socioeconomic ascent although never ethnic! The incongruity then went through the relationship of status of origin / economic status because a low "ethnic" range was combined with possibilities of economic growth, a line that particularly interested immigrants willing to "become America"[13].

In the second generation, that of parents Of the respondents, the problem became less evident, keeping a greater relationship the educational level with the socioeconomic position and, strictly, occupational.

In the generation of respondents or young people, finally, incongruity re-emerged with shocking nuances compared to that of their parents and grandparents. But this time the "roles had been reversed": with a high education or greater than that of his predecessors it was no longer possible to ascend, "to make a place according to the academic training" in the occupational plane. To the conquest

[11] On vocational integration see CEREQ, Centre d'Études et des Recherches sur les Qualifications, France - several references for the decade initially addressed; Herrans González, 1992; for Argentina, INDEC. In the local figures we stop below.
[12] See Aparicio, 1981, 1984 b, 1984 c, 1985 g, 1988 c. We worked with a population of 5,129 cases of UTN students. The INDEC allowed to investigate the key aspects for this investigation because it considers it of national interest.
[13] Large European immigration in Argentina, https://es.m.wikipedia.org/wiki/Gran_inmigración_europea_en_Argentina#

in the educational domain was coupled a structural stagnation, increasingly notorious, becoming the most pronounced problem among subjects with high educational levels[14].

This situation worried us as a phenomenon but also because of its psychosocial consonances and having noticed that – by the same definition of inconsistency – it is more serious where the distances between status that should be at the same level are greater, we decided to start exhaustive studies with *university students*. They were aimed at an integrated self-evaluation of the University, without neglecting the market because as an institution it has a function to fulfill and its impact and relevance are measured in relation to the context[15].

In these lines we will therefore limit ourselves to offering a perspective of the *woman* graduated in relation to their position in the world of work, which reveals the degree of inconsistency between educational/occupational ranges and associated responses.

2.4 I EDUCATION / OCCUPATION IN FIGURES

Let's see, very succinctly, how the problem of the Education/Employment gap emerges globally and among our graduates (Aparicio 1984b, c, d; 1985 b, c, d, g; 1988a, and b).

Let's start by outlining the harsh occupational reality that Argentines faced at that time; a situation that is close to the current one.

1. Economically Active Population (EAP)[16]: is, by definition, the group of people who want to work in the labour market. In Argentina, this group represented approximately 40 per cent of the total population. It is divided between those who are employed and those who are unemployed, the latter representing "involuntary unemployment in the economy", which climbed to 12.2 per cent in October 1994 and 18.8 per cent in May 1995.[17] having decreased somewhat in July 1997.

[14] Regarding the current problem, see Pablo DALLE, 2016, UBA. It analyzes the weight of social mobility in the popular classes. In 2015, DALLE, offers a study on intergenerational mobility. The Mendoza Stock Exchange, for its part, publishes a magazine with a title: What happened to the Argentine middle class in the last 5 years? There he explains that the fall of the Argentine middle class has been taking place for several decades with ups and downs. The situation for 2016 is presented because "between 2012 and 2015, obscurantism reigned," he says. Mobility shows a deep deterioration in the last 5 years because "inflation grew above income". This impacted both the informal and formal sectors. "9% of the population belonged to the upper class and 11% to the lower middle class, which is the segment considered most vulnerable to falling into poverty. In the 2nd half of 2021, social mobility was downward: the most important social segment, 41%, was the low segment, with almost 12 million considered poor. The middle class fell to 41% of the population. The upper class also shrank (5%) and the lower middle class grew (12%); grew not because of the effect of improvement but because of the fall of the middle class" (...) "In short, the Argentine middle class expelled 1.2 million people in the last 5 years and 12 million Argentines, I am considered poor."

[15] A detailed analysis in Sander, 1990, op. cit.

[16] Current population of men and women
22 821 279. Current male population (48.9%)
23 830 998.Current female population (51.1%)
-There are 100 women for every 95 men - LA NACION
https://www.lanacion.com.ar/sociedad/hay-100-mujeres-por-cada-95-hombres-nid1402693/
- Home | Argentina.gob.ar. Unemployment rate among men and women. https://www.argentina.gob.ar/

[17] See Sturzenegger, A. (1995). "Confronting unemployment" in News, June 11.

This economic unemployment includes, in modern states three groups: macroeconomic or Keynesian unemployment, frictional and structural, the latter also being identified as "technological unemployment". Such unemployment is, therefore, what worries us here, although the country's problems - referred until recently to frictional and structural unemployment - were being added to macroeconomic unemployment due to the fall in levels of productive activity.[18].

This is not the time to theorize about these types but only to retain that -beyond the many forms that structural unemployment can take- represents the "*Decoupling between the skills offered by the workforce and those demanded by the productive sector*", a typical process, moreover, of situations of change, especially technological.

And, as is evident, such *imbalance* typical of structural unemployment, *generates and translates into an inconsistency of ranks* (here, educational / labor) that touches not only university students but, also and acutely, other categories and subjects of higher ages, not being easy to solve because it requires retraining and training -things for which our system does not seem too prepared-.

As far as we are concerned, the problem was evident among university students *"displaced" in the market* or, if you prefer, in the *disarticulation of the University / demands of society and the productive sector.* Unemployment or structural underemployment touched, therefore, closely to the problem of the graduate (Aparicio, 2004)[19]

3 BUT WHAT HAPPENED BETWEEN *OUR* GRADUATES?

Here we find almost no unemployment[20] but underemployment, coupled with a location in the market *not always in line with expectations* which offers a profession and a very high concentration at the tertiary level.

Extending this consideration to university women, underemployment would be added to the *Underutilization* of human resources due to a real imbalance in the allocation of posts[21]. In other words,

[18] As for the *"macroeconomic"*, it would originate in "... Processes of falling levels of economic activity in a country, and a characteristic of it is that, in such cases, there is unemployment both of the labor factor and of the capital sector (machines, facilities). *"Frictional"* unemployment is related to processes of change in the economy. These changes mean that while certain sectors, regions or companies are expanding their levels of activity, others are reducing them and, consequently, reducing their employment levels. The movement of this unemployed labour force to expanding sectors, regions or enterprises can be a slow and difficult process, and it is this circumstance that inevitably determines a certain level of frictional unemployment. In A. Sturzenegger, op. cit.

[19] Current figures: see ODSA-UCA. 2018-2019. Program. Agenda for equity. See Structural stagnation and related aspects.

[20] Women who are looking for work are grouped in our environment in at least three sectors: 1) those who seek their first job after secondary school and encounter the lack of training, 2) those who have established a household and wish to contribute to it economically for various reasons (dismissal of the spouse, education of children, etc.) and 3) the one who having worked for some time has been fired and feels conflicted by it because she wants to continue working and has the tools to do so. In "The role of women in the labour market". Los Andes, Year CXIII, No. 38.170, June 19, 1995, p. 16.

[21] Current data on women's employment, underutilized. See:

- Women in the World of Work - Argentina.gob.ar. https://www.argentina.gob.ar › files

The employment rate for women remains approximately 25.5 percentage points lower than for men. Many women continue to find themselves in the informal labour market. In fact, globally, almost 40% of women in paid work do not contribute to social protection.

-Work is the place where women are most discriminated against. Clarín, December 8, 2016

here the incidence of the structural problem in the "inconsistency of status" becomes more worrisome. *A greater distance between the range occupied in the educational line and in the occupational line is consolidated* (Heintz, 1970, Bertaux, 1977; Baudelot, Benoliel, Cukrowicz & Establet, 1981).[22]

3.To this is addedThere was another problem: such inconsistency tended to assert itself in a framework of *Increase in female enrolment in universities*[23] *and the fight for a greater presence in the labour market* For various reasons: need for higher household income, separations, emancipation, male unemployment and higher education attained[24].

The former - the explosion of university students and, especially, women - is evident in national and international statistics (Coombs, 1971; Coleman, 1966; Passeron, 1982 and 1983; Rajneri, 1990;

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https://www.clarin.com/sociedad/trabajo-lugar-discrimina-mujer_0_B1g4NwRiPQl.html?gclid=Cj0KCQjwnrmlBhDHARIsADJ5b_n9ZiKmya_LHetNf1hb1597lK-6HNnr07_SNwNz-saZuJSv2gW9_QgaAtGuEALw_wc
A UN report and studies carried out in the country say so. Let's recover some figures. They suffer more from unemployment and only occupy 34.2% of hierarchical positions. They are also relegated to science and trade unions.

It reads: 65% of those who occupy managerial positions are men against 34% of women (according to UNDP and CONICET); 25.2% of those who study at the University (between 20 and 24 years old) are men against 21.6% of women. According to the latest data from the Ministry of Labour, 30.7 per cent of men are in the black and 37.7 per cent of women, a difference that is largely due to domestic service. The report on Gender Equity in Argentina, published in 2004 by FLACSO, concluded that economic recognition of women's work had not been achieved.
-Women occupy 30% of managerial positions in Argentina - El Cronista, April 4, 2022. https://www.cronista.com/negocios/las-mujeres-ocupan-el-30-de-los-puestos-directivos-en-la-argentina/
-INDEC, Statistical Dossier, 112th International Women's Day, 32 p., March 2023. It reads: Although they have higher levels of education, they do not achieve a level of participation in the labour market similar to that of men. The organization of the world of work tends to promote the labor insertion of women in sectors linked to care and in positions of lower hierarchy. In turn, when they manage to insert, they present higher levels of hourly underemployment and unemployment, and lower levels of income, comparatively. Women are exposed to different types of inequalities that are intertwined, which translates into accumulation of disadvantages: those with higher levels of education or better positioned in the income structure have more resources to achieve their autonomy; while women who are worse positioned in the social structure are exposed to greater obstacles."
- The large differences between men and women in the labour market. X-ray of inequalities between men and women. March 9, 2019. https://www.pagina12.com.ar/179291-radiografia-de-la-desigualdad-de-genero. It reads: 36 percent of women work in black. Among the unemployed, they outnumber men by 2.6 per cent and, if they work, they earn 25 per cent less.

-Home | Argentina.gob.ar. Unemployment rate among men and women. https://www.argentina.gob.ar/

[22] See Heintz, P. (1970). *Towards a sociological paradigm of development with special reference to Latin America.* Bs. As., Institute.

[23] At present:
-Women are already 61.6% of university graduation. Mercado Magazine. https://mercado.com.ar/mercado-plus/las-mujeres-ya-son-el-616-de-la-graduacion-universitaria/
-Women outnumber men by more than 10% in the number of students and graduates at all university levels | Argentina.gob.ar. March 8, 2021 https://www.argentina.gob.ar/noticias/las-mujeres-superan-en-mas-del-10-los-varones-en-cantidad-de-estudiantes-y-en-egresadas-en
-- 8M: Education presented report on women's participation in the Argentine University System | Argentina.gob.ar - Wednesday, March 8, 2023 https://www.argentina.gob.ar/noticias/8m-educacion-presento-informe-sobre-participacion-de-las-mujeres-en-el-sistema#:~:text=En%20el%20estudiantado%2C%20las%20mujeres,60%25%20en%20las%20tres%20categor%C3%ADas

[24] In fact, the demographic change we are witnessing must be taken into account. In 1995, in Mendoza, 51% of the population was female and 49% male. At the country level, the same trend was observed. Los Andes, June 19, 1995, p. 16. Currently, the total population is 46,044,703 (year 2022), of which 22,072,046 are males and 23,690,491 are females. That is, the trend persists (cf. indec.gob.ar). There are more women than men. Currently, the activity rate is 48.3%, the employment rate is 45.0%, the unemployment rate is 6.9% and the underemployment rate is 9.4% (INDEC: www.indec.gob.ar. On the page: data.worldbank. org, comparing figures between 1990 and 2022).
-There are 100 women for every 95 men - LA NACION https://www.lanacion.com.ar/sociedad/hay-100-mujeres-por-cada-95-hombres-nid1402693/

Touraine, 1965, OECD, 1983, 1984, 1985, 1986)[25]. Also in the context of our University. In this study, moreover, an interesting fact emerges when linking the educational level of the graduate vs. the same level for her mother. The increase of university women is, here, notorious and much more marked than that observed for the same relationship between male graduates[26]. There was, therefore, upward mobility because neither their grandmothers nor their mothers, in their vast majority, were.

The second – an increasingly evident search by women for a place in the world of work – emerges clearly in the figures. At the provincial level, for the period in question (1980-1992), one third of the EAP (35.4 per cent) is female (EPH). "Since 1985, there has been an increase in the net EAP rate of women aged 15 and older, who were in the labor force or wanted to work. That figure rose from 29.7 percent in 1985 to 37.1 percent in 1992." In terms of the absorption of women in the market, the services sector ranks first (from 58.1% in 1984 to 70% in 1992).

This seen in the global population. Let us now visualize the situation between our *Graduates*, generational "inconsistency" and "differences"[27].

Going down to the concrete plan of our study: What happened among our graduates?Are there differences in occupational categorization with respect to those of their mothers having also reached the university level?Do they state that they have improved their employment situation compared to that of their mothers? How many are out of work or underemployed?

Let's take a brief look at it.

- In the 18 careers analyzed, without exception, graduates reported being globally "Better off" than their mothers when they have not reached higher education (*intergenerational* labor mobility).[28] However, when comparing the employment situation among those with mothers who already have university degrees, 37% said they were in a "Similar" situation and 50% were in a worse situation[29]. The fact clearly reflects the structural stagnation.
- According to the occupational qualification, most mothers of university students who perform jobs included under the category "Professional" fall into the category "Qualified" followed by the categories "Professional" and "Semi-Qualified" (in that order). In this sense, there would be effective intergenerational mobility in the labour market.
- With regard to the Occupational Category and Branch of Activity, there is an interesting mobility by careers that, in some way, reflects the macro variations that have occurred in

[25] Currently:
OECD (2021). Education at a Glance OECD Indicators 2021 Spanish report. Ministry of Education and Vocational Training. 180 p.
OECD. *Education at a glance* (2019). Indicators. Education and Glance. Indicators. *2019: OECD Indicators*, OECD. Publishing.doi: 10.1787/f8d7880d-en
[26] See the relationship Career/Mother's Education in the author's work "Social mobility and Education in our context", table N° 36.
[27]Large European immigration in Argentina, https://es.m.wikipedia.org/wiki/Gran_inmigración_europea_en_Argentina#
[28] See by the author Higher Education and Employment (1995), vol. III, table No. 90.
[29] The detail *in Social mobility and Education in our context*, author's thesis, table N°25.

the country, highlighting the progressive concentration in the "services" area, a fact that has serious connotations at different levels.

- In terms of occupational insertion, 86% of women have worked since obtaining the degree "all the time" against 83% of men, "half" 10% against 12% of men and only "a third" of the time the remaining 3% for both categories. Unemployment and underemployment appear at similar levels for men and women and relatively low with respect to the overall problems offered by the context[30].

Such is the objective situation, in figures -if possible- of our graduates. There is no doubt, in light of the data, that women He was reaching higher educational levels and working in significant percentages at the time of conducting the research. On this question, we can ask: Are there currently relatively more women university students?[31]

But, more than the figures, we are interested here in other issues. Including:Is the position according to your training?Did the university qualify you for professional practice? Is there a relationship between the training and / or training provided and what is demanded by the employer at the time of insertion? Is the company willing to provide the missing training? Who primarily employs women? How many women are employed by big business? What are the emerging psychosocial responses to the situation?

And it is here, as recorded in the study, where the "claims" begin: the possibility of transferring knowledge to the world of work is low, the university continues with its encyclopedism, which does not cover what is demanded by the employer at the time of insertion, the offer of specialization is poor, the tools and methodology are a place to cover, There are very few companies willing or able to fill these "academic gaps", etc.[32].

But these claims were "even", that is, directed at institutions in equal proportion by men and women with incredibly similar numbers. The data is of interest to those who still support the male-female division at the level of thought and valuation.

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[30] Other interrelations with structural and diverse variables in Higher Education and Employment, op. cit.

[31] -Market. Women are already 61.6% of university graduation
https://mercado.com.ar/mercado-plus/las-mujeres-ya-son-el-616-de-la-graduacion-universitaria/
-Women are already 61.6% of university graduation. Mercado Magazine.
https://mercado.com.ar/mercado-plus/las-mujeres-ya-son-el-616-de-la-graduacion-universitaria/
-Women outnumber men by more than 10% in the number of students and graduates at all university levels | Argentina.gob.ar- March 8, 2021
https://www.argentina.gob.ar/noticias/las-mujeres-superan-en-mas-del-10-los-varones-en-cantidad-de-estudiantes-y-en-egresadas-en
- 8M: Education presented report on women's participation in the Argentine University System | Argentina.gob.ar - Wednesday, March 8, 2023
https://www.argentina.gob.ar/noticias/8m-educacion-presento-informe-sobre-participacion-de-las-mujeres-en-el-sistema#:~:text=En%20el%20estudiantado%2C%20las%20mujeres,60%25%20en%20las%20tres%20categor%C3%ADas
-Ministry of Economy. Gender gaps in Argentina.

[32] The self-perception that the graduate has of the University was observed through several items. See Aparicio, 1995, vol. II and III de Educación Superior and..., op. cit.

FinallyIs the graduate satisfied with her work? What psychosocial connotations are linked to the job position? Are there significant differences in it between men and women in our environment? Are women discriminated against?What happens in terms of income?What companies absorb them?What do they expect from this world of work and what do they find at the time of concrete insertion? The question is important because it is not without derivations.

And what happens today? Do you get paid less? Does it reach Leadership Positions less? Is she discriminated against? We have made this situation explicit above (cf. quotations). Let's stop One minute.

4 JOB PLACEMENT AND PSYCHOSOCIAL CONSONANCES

In principle, and before penetrating the strictly psychosocial face, it should be noted that the position in the market of university men and women was much more similar than we would have imagined, not to mention the evaluations issued, where there are practically no percentage differences between men and women for the categories worked.

However, where there is a difference - even if it is not statistically significant - it puts women at a disadvantage (Gadrey, 1992), registering a similar situation today: women always appear worse positioned in the market (cf. quotes above)

Considering that there were many variables at play[33], we refer for an analysis of the results that show the real location in the market to another communication. We will stop here, because it is central in these lines, in some psychological-social aspects.

Methodologically, the approach was possible thanks to the tillage in the plane *qualitative* (process analysis), complementary here to the quantitative[34].

Among the many processes observed in the face of job achievement according to gender, we mention: job selection factors, objective difficulties, self-perceptions, expectations, aspirations, pessimism of perspective, millenarianism, anomie, belief in progress, valuation of the title, labor obstacles, professional development factors, prejudices, habits, etc.

These same aspects, it should be noted, were observed in the following studies with university graduates, dropouts, retarded and doctors.

[33] Among them: 1.Manual/Non-manual task; 2. Related/Non-Related Work; 3. Work, Time and Hours (before and after graduation); 4. Industry (pre- and post-graduation), 5. Branch of activity of the father and mother; 6. Occupational qualification in the three generational lines; 7. Occupational categorization, 8. Contracting modality, 9. Collective bargaining agreement, 10. Other sources of own income; 11. Current income; 12, Expected income; 13. Full time work, etc. The variables at play that show the actual location in the market were many. For this reason we refer to Aparicio, 1st doctoral thesis, UCA (1995) and to the communication "University women in the employment market: situation and challenges for the nineties in a framework of equal opportunities". *Third Continental Congress of American Women*, Mar del Plata, November, 1995.

[34] The methodology (convergent validation, multimethod), was one of the original aspects of the study, can be analyzed in detail in Higher Education ..., op. cit., volume I, Chapter II.

The answers, as we said, showed close profiles for men and women[35]. However, there are more noticeable distances in two planes: *Expectations and Revenue*, which "touch" the psychosocial from the backyard angle of discrimination (Hyman, 1953; Lipset & Bendix, 1953; Boudon, 1970, 1973,1977; McClelland, 1961).

The problem deserves to be analyzed because it appears doubly in our graduates from the perspective of inconsistency. Indeed, both the difference in income and expectations -variables that yield very similar results in the studies that followed this one- contribute to the formation of two different profiles of inconsistency: high educational level / lower relative economic level, on the one hand; and low ethnic status / high educational level coupled with high expectations, on the other, if we think that they come, precisely, from the most disadvantaged social strata.

Let's start with the inconsistency that is generated from the *revenue* differentials perceived by women to then highlight some of the psychological responses linked to the employment situation[36].

4.1 SALARY AND DISCRIMINATION

The most marked difference in the context of our study and corroborated in others, was found in the "income" aspect (where the differences led statistically to the rejection of the null hypothesis).

Just as we point out similarities in other aspects, we must emphasize here that wage discrimination is a fact that generates rejection and nonconformity on the part of graduates.

Moreover, such wage discrimination - observed here at graduate level - reproduces discrimination that seems to us to be even more marked in the global population.[37]

In our study, on the other hand, men and women worked the same time of the career and practically the same time since they received the title, although among women there would be a higher percentage of underemployment attending to the lower number of weekly hours of work[38]. But - and here's the difference - as we move up the pay scale, the percentage of women is lower.

4.2 PSYCHOSOCIAL RESPONSES

The differences also emerge in the psychosocial face itself although not with statistically significant values. In any case, this being a work that aims to overcome the mere quantitative analysis

[35] Synthesizing some aspects: there were no differences between men and women in terms of hindering factors at work or between the factors that favor location, they valued in a similar way the University as a factor that improves labor insertion although the perception of women was somewhat more negative, they glimpsed equal possibilities of promotion or promotion, of professional growth and sought, as a priority, self-realization. They even have similar perceptions regarding the factors prioritized by the employer at the time of insertion, they do not differ in the appreciation of the current mobility channels, etc. However, the graduates are more pessimistic about the future of work and were more concerned about this aspect than about the socio-political situation, which captured the attention of men.

[36] Currently, studies show that, at the same position, women earn less.

[37] See FORNERO, L. & CLARAMUNT, N. (1994). Publication of the Fac. of C. Economic, UNCuyo. According to the authors, men's incomes are 51% higher than women's.

[38] For the respective tables, see Higher Education and Employment, op. cit., volume III. There are discriminated income by sex, origin, career and a multiplicity of variables.

of the phenomenon, the confluence of variables in a somewhat more negative sense for women interests us and seems important because behind the picture (in the way of conditioning factors) or following it (in the mode of effects) - there are psychosocial responses that are not conducive from the personal and societal angle.

And it is precisely in these different psychological responses to the structural situation, in which we want to stop as the last nucleus of our analysis and concern.

But first we must recover some facts, without which the phenomenon to be analyzed – the behavioral consequences of inconsistency of status in graduates- would be incomplete.

We have already referred at the beginning to the different profiles of inconsistency and associated responses in the theory.

Let's see now in what sense they appear in our study with *Graduates* Some of the nuclear elements that make up the different *patterns, patterns* focusing on factors of different kinds: the situation of origin (base variable); expectations (psychosocial factor), location in the market (structural component) and career followed (pedagogical-institutional component).

Synthesizing them: women come from lower social strata, they arrive -nevertheless- to the university but (among many other factors) the preference for soft sciences translates into a worse occupational situation once graduated.[39]. With this, the initial expectations, more marked than among men, are diluted under the structural reality. Being their levels of fulfillment higher than those achieved by their mothers, they are not enough to cover their hopes.

Nonconformity had to emerge. The serious thing is that this "anomic" nonconformity – typical of socially disadvantaged subjects – has connotations.

5 ON INCONSISTENT STATUS AND RESPONSE PROFILES

5.1 "PATTERNS" AND RESPONSES TO INCONGRUITY

The problem was already analyzed in other studies of our previous[40]. Here we will visualize it in the graduate woman.

Two would be the response profiles to the inconsistency in the theory. Let's remember: The profile given by high / acquired status medium or low (relatively) would be followed by intropunitive responses (self-blame, stress), which would be evident in higher levels of somatization.

[39] -In Argentina, 6 out of 10 university students are women. But of these, only 25% study Engineering and Applied Sciences. CIPPEC.
https://www.cippec.org/textual/casi-6-de-cada-10-estudiantes-universitarios-son-mujeres-pero-de-ellas-solo-el-25-estudian-ingenieria-y-ciencias-aplicadas/

[40] It can be seen from the author 1984g, 1985 a, 1992 d, 1994 d, among others.

The opposite profile – low status / high acquired – would be followed by a response extropunitive and ideological (rebellion, revolutionary violence or, in more attenuated forms, socio-political nonconformism, anomie, etc.).

In accordance with these *patterns, patterns* One would then expect resonances of an intropunitive type, predominantly among the highest and rejection strata. *ad extra* among the lowest.

If we now look back at the results of our research and observe the direction in which the variables at stake here are nucleated - a high percentage of university women, mostly from the middle-lower strata and who live under a context of underdevelopment - we soon notice that the *Nonconformity and extropunive responses* would be the most expected according to the hypothesized.

In other words, the majority of our population -constituted by women graduates- would fall into what we consider here as the second profile of inconsistency (low assigned status / high acquired). However, this nonconformity is accompanied by other ingredients that are interesting to consider.

5.2 NONCONFORMISM OR ANOMIC NONCONFORMISM?

Let us dwell for a moment on nonconformism because it is not a univocal notion.

Under the terms they hide different phenomena, which have been subject by writers from very different theoretical angles and historical moments.

We don't want Deepen the subject. Let us only remember that conformism – in the classical sense – was one of the preferred topics of the Frankfurt School. It entails in the core a weak personality (me) and a superego strong in normativity, whose expression finds channel in ethnocentrism, prejudice, discrimination, displaced aggressiveness (Greemblum & Pearlin, 1953; Bendix & Lipset, 1953).

The other conformism, certainly much less known, is the one that particularly interests us here. This is 'psychiatric' conformism, which overlaps with the *anomic nonconformity*or, typical of socially more disadvantaged strata in a situation of transition.

It is the conformism that emerges in underdeveloped countries where, as an endemic evil, anomie grows because the distances between the legitimized goals and the means to achieve them become more marked and impossible to touch.

And much more flourishes even under situations of structural stagnation, such as the one we Argentines currently suffer. Today many professionals emigrate in search of a future[41].

[41] For current migration, see: Migrant women. Proportion: Women migrate more. https://www.argentina.gob.ar/noticias/hay-una-mayor-female-representation-in-the-population-of-migrant-workers-0.

Recent emigration
https://chequeado.com/el-explicador/que-datos-hay-sobre-la-emigracion-argentina-reciente/

https://www.perfil.com/noticias/ actuality/condemned-to-success-la-unica-salida-es-ezeiza-mitos-y-verdades-sobre los-jovenes-que-se-quieren-ir-del-pais.phtml

Is Ezeiza the only way out?: only 5% of young people dream of emigrating

Heintz, a sociologist at the Bariloche Foundation, was the one who, from the theory of structural tensions, defined the picture at length.[42].

Psychologically it differs from classical conformism because here we would find ourselves before a self that remains weak but, to take up its terms, the Superego is strong "in strength" -forgive the redundancy- but poor in guidelines, in normativity. The picture is manifested in the shift of aggressiveness towards the weakest groups (women, children, etc.).

Now then *among our Graduates We have spoken not of conformism but of Nonconformity but to which are added the ingredients of a more marked anomie* than among males. This would allow us to speak of a *Anomic nonconformism.*

In fact, a more marked nonconformity converges with a greater pessimism of perspective, a weaker belief in personal progress and societal, less support and somewhat weaker hopes.

But what interests us here are the *Consequences of the syndrome.* This can be associated, basically, with two responses: the first is paralyzing, withdrawal, daydreaming, isolation and less optimism. The second discovers the aggressiveness and discontent displaced outwards. The expression is then rebellion, activism, the generalized disacceptance of the social canons of the world of the elderly.

Can there be a confluence -if possible- of both types of response under the same syndrome? We think so, and this is anomic nonconformism.

Looking: our graduates have struggled to finish their university studies because, we said, they counted in greater proportion than men with unfavorable socioeconomic circumstances. It was logical in this context to expect that *they would not blame themselves for the relative socio-professional failure but attribute it to the structures. But in doing so, and here is the decisive thing, they place the source of control outside*, where fate, chance, luck have the greatest weight and this, *instead of increasing the proclivity towards change and the willingness of the means for it, may well lead to a paralyzing response, in a withdrawal in the face of circumstances.*

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https://www.iprofesional.com/management/366027-la-unica-salida-es-ezeiza-solo-5-de-los-jovenes-suena-emigrar

[42] The author characterizes the painting from an angle not only psychological but also sociological.
Anomie today:
Profile. Jaime Duran Barba. 18 March 2023
https://www.perfil.com/noticias/columnistas/la-anomia-nos-inunda-por-jaime-duran-barba.phtml
He talks about Durhkeim and Merton. Deviant behaviors, departure from norms and the pursuit of pleasure
Hernandez, A.M. *Anomie, a characteristic that describes Argentine Society*. Río Cuarto - 06/12/2018
-Sidicaro, R. (2015). The Argentine anomies. Gino Germani Institute. UBA. *CECYP research notes*, (26)
http://www.scielo.org.ar/scielo.php?script=sci_arttext&pid=S1851-98142015000200007
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-Benbenaste et al. (2008). *Psychology of anomie: degree of perception in university students***.** *XV Research Conference and Fourth Meeting of Researchers in Psychology of Mercosur*. UBA.
Cabot, D. 80% of ARG lives outside the law. The Nation
https://www.lanacion.com.ar/economia/para-el-80-de-los-argentinos-la-argentina-vive-fuera-de-la-ley-nid1836935/

The painting, by the way, has **Consequences not only personal** but societal. In this sense, with A. Moffat, we could say in the face of the circumstances of the moment, "the person is in danger". The social psychologist says "When we talk about the unemployed person, we think that the loss is concentrated in the salary they did not earn. But... More serious is the depersonalization produced by the fall of the loss of the social role he occupied from his work. People bond with others through what we do. Our perception of the world is armed from our craft and by losing our job, we lose ourselves (Jahoda, 1987; Moffat, 1995).

Another great loss is that of the project of the future, always linked to progress in our trade. From these symptoms a psychological picture is configured that initially is a ***paralyzing reactive depression***, his world is disarmed and he becomes a feared social character: the unemployed. But in a second stage, after being a pariah-labor gives rise to a large amount of ***latent aggression***, feeling fundamentally unfair dismissal and lack of social protection to which he is condemned." And if unemployment increased and touched the great "critical mass, the reaction would already be a chain turning insecurity into a 'contagious and collective' element."[43].

We're not sure, like Moffat argues that a paralyzing response is then transformed into an aggressive one or that this is always the direction. Our studies show at least two aspects of response when attending not only to the psychological but also to basic sociological conditions. One of them would be paralyzing and the other would lead to blatant activism.

The configuration found among the graduates invites us to believe that perhaps the most frequent effect may be the first because despite talking about nonconformity (slope extropunitive response), we have seen that it hides a psychiatric-anomic conformism, which basically leads to bending to what constricts.

Both responses reveal to us a deep crisis, a crisis that would deepen if women did not find answers in the environment that correspond to their high expectations.

But whatever it was, it would be, in any case, dangerous for a country that intends to take off because structures without people simply are not.

To Final reflection mode:

Results of international studies show that among those who suffer problems in the employment area, the response is more typical. intropunitive (Jahoda, 1987) being the revolutionary fervor, on the other hand, more widespread among the unemployed or underemployed who attend university.

However, the possibility of this response -warned by us in previous research- represents a warning for decision-makers and could have, in the long or medium plane, serious political consequences of psychosocial roots, although still for some the weight of the psychological is little credible. Says Jahoda -referring to what happened in Marienthal- that his "eternal unemployed" had

[43] MOFFAT, A., "The Person in Danger" in News, July 21, 1995.

lent ideological adherence to the first who offered them work because, faced with this lack, ideological commitment no longer made sense in their lives (Ibidem).

By the way, under the complex problem it will be necessary to compute the Central role played by expectations and, to be more precise, expectations that were frustrated. It is known that structural changes are modifying situations and, sometimes, between what is expected and what is found once the path called University has been traveled, there is a deep gap.

The problem is, precisely, that the conjunction of high aspirations and low level of realization is a privileged "broth" for conflict because frustration will be greater where there were greater aspirations. where more risk was taken, where there was greater effort and commitment, where high capacities already demonstrated were put into play (McClelland, 1961; García Rodríguez, 1963; Feather & Davenport, 1982).

Specifically, faced with the situation that shows a disarticulation of Higher Education / Employment and affects, among many other dimensions, the psychosocial one, it will be necessary to review what relationship they have -in our framework and today- the unemployment rates and real employment conditions with the indicators of social pathology.

Jahoda It says in this regard that "... there is no systematic evidence to show that the process of adaptation to the current situation will result in resignation and apathy, as happened then (alluding to the Great Depression). Given the lower degree of physical deprivation and the higher level of aspirations of our day, it is conceivable that many unemployed - individually or in groups - will make attempts - constructive or destructive - to deal with their frustration in a more active way" (1987: 123). And, on the other side, it reads "... (it is expected) the revolt organized from the extreme right or the extreme left" because, to the desperation of the unemployed is added the strength of those who take advantage of such a situation! Frustration ends, then, often producing social outbursts or disturbances in an attempt to get decision-makers to pay all the attention that the problem requires (1987: 137).

The problem, moreover, has already been analyzed in the context of several investigations by us and the findings will come dangerously close to what is theorized.

Of In any case, the tolerance to frustration will depend on the personality; it will also depend on it to turn it on itself or on its most immediate contexts (family, work) (cf. Heintz, 1970).

The truth is that the **Unmet needs always have their consequences** (delinquency in its different expressions, alcoholism, psychiatric evasion, drugs). And the situation of "unemployed" or "dissatisfied employee" could be offered as a propitious field in this line because these deviant or "anomic" responses are nothing but the way to cover the lack of identity, social objectives, status and regular activity, to cover the absence in the social world, a world outside of which it is difficult to live a social being by nature. aspects all the more emptied the more critical the employment situation is.

With an eye on the reinforcement of identity and the desired national development, finally, it is

good to retain that all these responses, anomic in the end, end up isolating the individual, strengthening his personal tendencies and the focus on his own conflicts. The consequence is clear: the weakening of solidarity, the basic bond of a society.

The question, grave, it cannot continue to be covered by patchwork solutions and political gain in the short term. The psychosocial, despite being forgotten -consciously or unconsciously- can make the foundations of a society, paradoxically, democratized, open.

6 PART II: The Inconsistency "Floating in Our Middle" Today

It is not necessary to point out that, for each item or important aspect, they have been made by making the references that correspond to our days. In order to brevity, let's focus on some axis-variables.

Recall that we have worked in this research with conditioning variables - social status, educational status and occupational status - and with effect variables: the two patterns of psychosocial response to the observed status inconsistency, of different types according to the reference period, the Intrapunitive and extropunitive.

In the aforementioned studies, which have their specific objectives and hypotheses, we have been controlling over time some variables/indicators that seemed relevant to us. The findings, for which we refer to the central publication of each research and Many other related ones, reveal that - despite the time elapsed- the global scenario as well as for each sector or population addressed, is not much more positive. Let us dwell for a moment on some of the axis aspects.

If we start from the profiles of psychosocial response to the inconsistency or imbalance observed, we have pointed out that there are two profiles that result in the turn against oneself (self-blame) or against the structures.

Anthropopunishment – we have developed it – is a form of response that impacts Mental Health[44]. Many graduates today are touched by pessimism of perspective, falling expectations and the loss of clear goals and precise projects. Others seek in "other" worlds/contexts and even in other professions, the fulfillment for having a broken identity, for having ascended through the entrance door – arrived at the university with effort and even more in the relatively lower layers – but not finding then, through the exit door, a job according to the diploma, well paid. A position where there are no differences between men and women in positions of leadership or responsibility, without submission / alignment in the name of safeguarding the identity of companies or harassment - a widespread form among women employees - or other forms of discrimination that threaten dignity.

[44] In specific bibliography, cf. Health and Classes, Class Neurosis, Anxiety and Class and many other cited articles.

To this are added the difficulties for labor insertion and, even more, for promotion (Dubar, 1994), which usually lead to Burnout (Freudenberguer, Maslach, Pines, among the founding fathers) or, even, loneliness in the era of networks[45].

Faced with the stage, how do they respond? With illness (teachers' medical leave,...); with depression, because the higher the expectations, the easier it is to fall into depression if the goal is not achieved (Garcia Rodriguez, Jahoda, Seligman, McClelland,...).

Another answer is the desire to flee, to escape, to seek new horizons, contexts. Emigration Every day Ezeiza sees many trained professionals leave with a remarkable level of excellence. Before, our port was the gateway to the second largest emigration in the world, after the United States. UU during the last century. Currently, resigned to not seeing a change crystallize or motivated by an expected change in another country or continent (although it does not always lead to achievement), they leave.

As for the second profile, Extropunition, nonconformity or anomic, psychiatric conformism, ends up subjecting what is rejected (we have already referred to literature on the subject). Today a very high percentage of subjects who live outside the norms due to socialization problems and violent responses of different types towards structures and subjects, including women...

This increase in anomie also implies a lack of credibility and trust in politicians as well as the loss of the core values that give a unifying philosophy to life (Allport, Heintz, Hyman, Bendix, Boudon, among the founding fathers).

From the point of view of employment, the current figures (OECD, UNESCO, INDEC for Argentina, SPU, Ministry of Education, scientific articles of recent years, links to newspapers of political scientists and specialists in education and work ...), show tendencies to a frank decline in macro national-structural aspects (stagnation, structural / technological and frictional unemployment, unemployment ...). High levels of conflict are also emerging. Inequalities in leadership, remuneration, etc. remain. Many years have passed but little seems to have changed.

Seen from the subject and from the university institutions, the figures of university failure have been maintained since 1995 (Causes of Desertion in National Universities Award, SPU, received by the author) in the same percentages after almost 30 years. The delay in studies increases. The aforementioned news shows that it is difficult to insert oneself in the university but, also, to maintain. In 5th year those who have more advantaged positions are left.

Imbalance and anomie emerge, then, from different aspects.

[45] See CONICET link for articles by the author. Also, a synthesis of the author's research related to health, in Aparicio 2015 a and b). All this threatens health.

On the other hand, the devaluation of diplomas is felt or experienced in different ways. A problem that in developed countries is already shown in the 80s, accompanied by the democratization of education and the explosion of enrollment (cf. articles by the author, links to newspapers, scientific publications of reference), begins to be felt in Argentina more in the '90s. The serious thing is that, having spent 35 years, little has been solved to open ourselves to innovation and forms of study and employment that allow subjects to perform themselves, increasing the quality of university institutions / labor organizations and, in the end, the quality of the macro system; systemically self-sustaining systems or spheres (Aparicio 2015 a and b). The interdependence and semi-autonomy of the social, cultural and micro-individual system place us in front of a great challenge if we aspire to get out of the imbalance and look to development.

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22 821 279. Current male population (48.9%)
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There are 100 women for every 95 men - LA NACION
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INCREASE IN FEMALE ENROLMENT IN UNIVERSITIES

Market. Women are already 61.6% of university graduation
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Women are already 61.6% of university graduation. Mercado Magazine.
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Ministry of Economy. Gender gaps in Argentina.

THEY EARN LITTLE BECAUSE THEY CHOOSE SOFT SCIENCES

In Argentina, 6 out of 10 university students are women. But of these, only 25% study Engineering and Applied Sciences. CIPPEC.
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HIGHER EDUCATION, MOBILITY AND INEQUALITIES

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THE POOR FIND IT HARDER

The Nation. Soledad Vallejos. University: students with lower incomes not only find it harder to access, but also to graduate. 20 january 202209:44
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ANOMIE

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POVERTY AND MENTAL ILLNESS. NEUROSIS

One in 5 university students has had suicidal ideation and half depression and anxiety - Infobae
https://www.infobae.com/espana/agencias/2023/07/07/uno-de-cada-5-universitarios-ha-tenido-ideacion-suicida-y-la-mitad-depresion-y-ansiedad/

MENTAL HEALTH AND WORKING CLASS

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https://www.pagina12.com.ar/diario/dialogos/subnotas/243558-67524-2014-04-07.html?mobile=1
Vincent de Gaujelac, sociologist, professor of Sociology at the Faculty of Social Sciences of the University of Paris-Diderot, author of about twenty books. The latest, published in Argentina by the publishing house Del Nuevo Extremo, is a reissue of *Neurosis de clase. Social trajectory and identity conflicts*. There he develops the concept of class neurosis, which "defines the main characteristics of psychological conflicts linked to social declassification." The term is ambiguous at the theoretical level, because it tends to associate a clinical notion and a sociological notion that do not have a direct link with each other: classes are not neurotic, neuroses do not depend on social classes. However, we have kept it because it has a particular resonance in people whose psychological conflicts are linked to a declassification. In the subjectivity of these people there is a close link between their social trajectory and the psychic difficulties they face", defines De Gaujelac.
Murillo, M. & Azaretto,C. (2017). *Class neurosis.* UBA. Research Yearbook, vol. XXIV, pp. 173-178, 2017. https://www.redalyc.org/journal/3691/369155966049/html/

WHERE THERE IS MORE ANXIETY: IN THE UPPER OR LOWER STRATA?

In most studies it has been observed that in adults and adolescents belonging to low socioeconomic strata is associated with increased risk of mental disorders

MENTAL HEALTH AND WOMEN

Argentine Study of Epidemiology in Mental Health (2018). It was noted that women were 85% more likely than men to suffer from anxiety disorders.12 Jan 2023

They say that depression impacts more on women than men
https://www.lavoz.com.ar/ciudadanos/aseguran-que-la-depresion-impacta-mas-en-mujeres-que-en-hombres/#:
A combination of biological, social, psychological, and environmental factors explain differences in the prevalence of depression between men and women

MIGRATION

Migrant women. Proportion: Women migrate more.
https://www.argentina.gob.ar/noticias/hay-una-mayor-representacion-femenina-en-la-poblacion-de-trabajadores-migrantes-0.

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Is Ezeiza the only way out?: only 5% of young people dream of emigrating
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SEVEN
publicações acadêmicas

Health in the school environment: Some reflections about

https://doi.org/10.56238/ptoketheeducati-079

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ABSTRACT
The present work addressed theoretical bibliographic studies on the theme of health education and its interfaces in health promotion. The results showed that one of the main ways in which education professionals can promote health is through awareness and dissemination of accurate information on topics related to the subject. This can occur in interdisciplinary pedagogical projects, where students learn the importance of health in everyday life through the curricular components of mathematics, science, physical education, geography and the others. Therefore, educators can also play an active role in identifying and referring students who need additional support, watching for signs of physical or emotional health problems and working together with other professionals such as doctors, psychologists and social workers to ensure that students receive the necessary support. Based on the theoretical framework presented, we reflect on possibilities for expanding care at school. The role of educators is fundamental for the integral development of students, not only in the academic aspect, but also in the search for quality of life and the formation of healthy habits. The school is an environment where health promotion and disease prevention needs to be a mission, as it concentrates a large number of children and adolescents, who represent the future of the nation.

Keywords: Health education, Health in education, Health at school.

1 INTRODUCTION

Health is considered an essential condition for people's well-being and quality of life. Often, the responsibility for knowledge and actions related to this topic is attributed to traditional services such as clinics and hospitals, but there is a growing understanding that health promotion needs to start from childhood in school and in the community. Thus, the role of the school institution, represented mainly by education professionals, is of great importance in promoting health among students.

The National Curriculum Parameters consider the concept of health to be complex and subjective, since it can take on different meanings according to cultural, social and even personal factors. However, they consider that educational institutions are able to efficiently address all the diversity present in this theme. "In other words, what society understands by health is always present in the classroom and in the school environment." (Brazil, 1997, p. 15).

In this context, it is up to education professionals, in addition to practicing healthy habits that are models of behavior and promoting, together with the responsible bodies and institutions that provide traditional services, actions and strategies aimed at preventing diseases and improving the quality of life. The aim is to prevent the emergence of diseases or adverse health conditions by raising awareness of risk factors and adopting practices that are beneficial to human life.

These professionals can have an impact on the health of children and young people due to the time spent together made available by the educational process. Thus, they become responsible for creating a balanced and safe school environment where students can learn and develop fully. In addition, they have the ability to influence students' behaviors and attitudes, promoting healthy choices and encouraging the adoption of appropriate behaviors.

In order to reflect on health in the school environment, this work dealt with a theoretical and bibliographic study through the qualitative research method. It sought information on websites, scientific articles and official documents on health at school, as well as health projects at school.

2 HEALTH EDUCATION

Buss (2001) emphasizes the importance of information and practices related to health in the early years of the school process, as this is a decisive phase of human development, where habits are formed.

One of the main ways in which education professionals can promote health is through raising awareness and disseminating accurate information on topics related to the subject. This can occur in physical education classes, where students learn the importance of regular physical activity, and lectures on nutrition and balanced eating. Topics such as personal hygiene, disease prevention, mental health and sexuality can also be addressed, providing students with the necessary awareness to make decisions that contribute to their health.

In addition, these professionals can encourage students to adopt important habits such as regular exercise, balanced diet and sleep, which needs to be sufficient in quantity and quality to invigorate the body and mind. It is worth emphasizing, again, the importance of example. By adopting these behaviors in their own lives, education professionals demonstrate to students that health is a priority and that these practices are relevant to overall well-being.

Educators can also play an active role in identifying and referring learners who need additional support. To do so, they should watch for signs of physical or emotional health problems and work together with other professionals such as doctors, psychologists and social workers to ensure that learners receive the necessary support.

Education workers are also committed to creating an inclusive and welcoming environment for all, regardless of health condition. It is part of their role to collaborate with families and health professionals to ensure that students with special needs have an appropriate environment and services that enable their full participation in school life.

For those who play such a crucial role, it is also necessary to have a deep knowledge of the school community and the whole context that surrounds it. Pedrosa (2006) considers that the definition of strategies to work on health at school requires study and planning, as it is necessary to ensure that the proposals are appropriate to the reality of the students. Otherwise, it can become a mere manual of unattainable rules and not promote the formation of the desired behaviors.

As mentioned, the role of educators is fundamental for the integral development of students, not only in the academic aspect, but also in the search for quality of life and the formation of healthy habits. The school is an environment where health promotion and disease prevention needs to be a mission, as it concentrates a large number of children and adolescents, who represent the future of the nation. For this goal to be achieved efficiently, the integration of public health policies at school is indispensable.

The implementation of public health policies at school involves the union of efforts between several sectors. Coordinated actions between government spheres can provide joint strategies to ensure access to health services, promote awareness on the subject and create an environment favorable to the physical and emotional development of students.

One of the main ways of integrating public health policies in schools is through the work of health professionals within the school environment. Doctors, nurses, psychologists, nutritionists, among others, could work together with school professionals to develop health promotion actions. These actions can cover aspects such as periodic medical examinations, vaccination, physical and sports activities, nutritional guidance, prevention of drug and alcohol use, sex education and others.

This work would also involve promoting a culture of health and well-being within the school community. This can be done by including health-related content in school curricula, conducting

educational campaigns, creating healthy and welcoming spaces, training teachers to deal with health issues, among other strategies.

The joint efforts generate benefits for both students and the entire school community. By promoting health and preventing diseases, it contributes to the improvement of students' academic performance, to the reduction of school absenteeism and to the formation of more conscious and responsible citizens with their own lives.

It is important to emphasize that this integration cannot be a commitment restricted to the school. It is essential that there is an effective articulation between the government sphere and the different sectors of society, such as health, education, family and community so that the actions are effective and achieve positive results.

The integration of public health policies in schools is an essential strategy to promote health and prevent diseases among students. This integration involves the work of health professionals in the school environment, the promotion of a culture of health and well-being and the articulation between the different sectors of society. Investing in this integration is fundamental for building the future and the healthy development of generations to come.

3 HEALTH AT SCHOOL

The topic of health at school is extremely important and relevant today. Understanding and promoting students' health is not only limited to the physical aspect, but also involves emotional, social and cognitive well-being. A holistic approach to school health is fundamental to create an environment conducive to learning and healthy development of students.

First and foremost, it is critical that schools are safe and healthy places for all pupils, as pupils spend much of their time there. This involves ensuring that the physical infrastructure is in good condition, with adequate classrooms, spaces for physical and recreational activities, as well as ensuring the hygiene and cleanliness of the facilities. Pleasant and safe physical environments contribute to the prevention of accidents and illnesses, promoting the general well-being of all students, without discrimination.

In addition, health promotion at school should include the implementation of health education programs. Students should receive information on healthy eating, the importance of physical activity, personal hygiene, disease prevention, mental health and responsible sexuality, mutual respect, social responsibility and contraception. These programs should be developed in a comprehensive manner, involving the participation of teachers, health professionals and even the students themselves and their families, through projects and practical activities.

The theme Health in the National Curriculum Parameters (PCNs) is considered a "[...] state of complete physical, mental and social well-being [...]" (Brazil, 1997, p. 63). The health of a population

is closely related to its quality of life. The school can fulfill its social function of preparing individuals for citizen life and thus contribute to improving the quality of life through important information for the well-being of the population.

Although this theme can be worked within the content of the Natural Sciences discipline, the PCNs present Health as a cross-cutting theme. The theme can permeate all areas of knowledge. This document records the importance of school education in the process of socialization of health-related knowledge, since education is considered one of the most significant factors for health promotion. By educating for health, in a contextualized and systematic way, the teacher and the school community contribute decisively to the formation of citizens capable of acting in favor of improving personal and collective health levels (Brazil, 1997). It is worth remembering that: "School alone will not lead students to acquire health. It can and should, however, provide elements that enable them to lead a healthy life". (Brazil, 1997, p.66)

The school also plays an important role in supporting students' socio-emotional development. It is essential that students feel emotionally safe and supported so that they can focus on the learning process. Promoting healthy relationships between students, teachers and school staff is key to the smooth running of school activities. The implementation of bullying prevention programs, inclusion and the encouragement of empathy and peaceful conflict resolution are some of the strategies that can be adopted to strengthen the emotional well-being of students.

In addition, it is important that the school is attentive to the cognitive aspects of the health of students and school staff. This involves encouraging critical thinking, creativity and the development of socio-emotional skills such as resilience and perseverance. The promotion of a stimulating learning environment, with trained and motivated teachers, as well as innovative teaching methods, contributes to the intellectual and cognitive development of students in general.

It is observed that the school should establish partnerships with parents and guardians, as well as with community health professionals to ensure a comprehensive approach to the health of students and all school professionals. The active participation of the family and the community in the educational process is fundamental to strengthen the ties between the school and the surroundings, promoting health in an integrated manner.

In summary, the concept of health at school goes beyond the absence of physical illness. It involves creating a safe and healthy environment for all who live there, promoting healthy habits, emotional support and cognitive development of students. Taking a holistic approach to school health contributes to the holistic education of students and prepares them for a healthy and successful life.

4 HEALTH AT SCHOOL FOR PUPILS' DEVELOPMENT

Education is one of the essential pillars for social development and building a healthy and productive society. However, health plays an essential role in this process, as healthy students are able to learn, develop and reach their full potential. Thus, "health should be seen as a resource for living, not as the goal of living [...] it is a positive concept, which emphasizes social and personal resources as well as physical capabilities" (Brazil, 2002, p. 19-20).

It is perceived that students who are in good health have a greater capacity for concentration, energy and endurance to face academic activities. The absence of health problems, such as chronic diseases, malnutrition or obesity, allows students to be present at school on a regular basis and actively participate in school activities. In addition, proper nutrition and regular physical activity contribute to students' brain and cognitive development, improving their memory, reasoning and learning abilities.

In addition to physical health, emotional and mental health also play a crucial role in students' development. School can be a challenging and stressful environment for many students, and it is important that they have access to adequate emotional support. Through mental health programs in schools, students can learn skills to manage stress, cope with negative emotions and develop resilience. The emotional support provided by the school creates a safe and nurturing environment, promoting students' psychological well-being and, consequently, improvements in academic performance.

Another aspect to note is that the school plays an important role in promoting healthy lifestyle habits and health education. By providing useful information and guidance on health, schools empower students to make informed decisions. This information is crucial for students to become autonomous and responsible adults, able to take care of themselves and contribute to a healthy society.

School health is not limited to students, but also encompasses the entire school community, including teachers, staff and family members. It is essential that the school establishes partnerships with health professionals, such as nurses and psychologists, nutritionists and others, to offer comprehensive and integrated support to all involved in this process. The creation of a safe and healthy physical environment, with adequate spaces for physical activities, healthy eating and accident prevention, are essential aspects to promote the health of all those involved in the educational process.

One of the most widespread conceptions of education and health is developed through formal teaching-learning situations, functioning as aggregates to the spaces of health practices. Health Education is a social practice, whose process contributes to the formation of people's critical awareness of their health problems, based on their reality, and stimulates the search for solutions and organization for effective individual and collective action aimed at the well-being of all.

The predominant model of health care in Brazilian society (structure, processes and relationships) is based on a political-pedagogical project, explicit or not, which tends to reproduce the

way Brazilian society is structured, as well as the social relationships and labor relations that are characteristic of them.

According to the National Curriculum Guidelines, the pedagogical proposal or pedagogical political project of a school is the planning responsible for guiding the actions of an educational institution, also defining the goals to be achieved through the process of learning and development of students.

The role of the school is to prepare its students for the most diverse social demands. It can be said, then, that Education and Health are two faces of the same process, interdependent and co-constructive. The school has the social function of forming citizens.

The Ministry of Health defines Health Education as an educational process of building health knowledge that aims at the thematic appropriation by the population (Brasil, 2009). It is a set of sector practices that contributes to increasing people's autonomy in their care and in the debate with professionals and managers in order to achieve health care according to their needs (Brasil, 2006; Falkenberg et al, 2014).

The beginning of the 20th century was marked by an important historical moment in the construction of conceptions and practices of education and health. At that time, hygiene was the basis for a field of knowledge that related to and explained health problems. According to Arouca (2003), hygiene ends up reducing the solution of health problems to the application of hygienic measures, which are based on the conditions of existence.

Health education campaigns democratize access to quality information and help raise awareness among the population about behaviors that are essential for quality of life (Zello, 2021). An articulation that must occur between public, private entities, health professionals, schools and society in general. Each one has its role, considering the reality in which they live.

In this sense, an articulated and collective construction that involves the three segments of groups in education practices is of paramount importance: health professionals who are those professionals who go beyond curative practices only; managers who support and favor the performance of these professionals; and the population, who needs to be open to knowledge and stay informed to increase their autonomy in care, individually and collectively, as within their families and circle of friends (Oliveira, 2020).

Health Education aims at popular health education. This means that it values the knowledge, the prior knowledge of the population and not only the scientific knowledge (Falkenberg et al, 2014).

It is essential to expand Health Education by creating opportunities for all people to become informed and change their awareness about the subject. Disseminating information and stimulating prevention, this is the reality that is sought within communities.

In the search for integral health, education assumes a very important significance, contributing to the orientation of practical and more effective actions. At school, the work must be oriented towards educating with meaning, educating with participation, educating for creativity, joy and hope.

In this perspective, Health Education can be focused on specific topics, such as sexuality, chronic diseases, obesity, sedentary lifestyle, drug use, among others. One of the most efficient health education actions in Brazil is the National Campaign to Combat Smoking. The control of smoking as a public disease was stipulated according to Federal Law 7.488, which establishes August 29 of each year as the "D-Day to combat the use of cigarettes and other forms of smoking".

It is emphasized that more informed and aware individuals take better care of their health and, as a consequence, lead a more balanced life. This helps to reduce the number of citizens with chronic diseases and other health problems in Brazil, significantly reducing the impact on the SUS (Public Health System) budget **(**Zello, 2021**).**

The term Health Education is a parallel between the areas of Education and Health, with Education having the pedagogical methods to transform behaviors and Health the knowledge capable of intervening on health promotion challenges for the general population (ProDoctor, 2020).

In schools, there are programs that help maintain health for the betterment of the school community. As an example, the School Health Program (PSE) is reported.

5 SCHOOL HEALTH PROGRAM (PSE)

Regarding health programs, the Mais Educação project is mentioned, which is part of one of the instruments of the Education Development Plan (PDE). A project that was created from the Interministerial Ordinance No. 17/2007 (Brazil, 2007) and its exercise was regulated by Decree 7.083/10. The Ministry of Education, with the aim of full-time education for students in public schools in state and municipal networks, expanded the workload to provide students with an environment conducive to quality learning.

The proposed activities of the program are in various fields of learning such as pedagogical accompaniment for those who have not obtained satisfactory learning, environmental education, sport and leisure, human rights, health promotion, communication and use of the media, experiences in the field of nature and economic education.

The proposal to extend the daily time young people spend in public schools needs to be analyzed in terms of economic and administrative feasibility. It is also necessary to discuss which pedagogical activities will be used in the additional hours.

In Brazilian society, "the current justifications for extending school time are based on authoritarian or welfare conceptions as well as democratic conceptions" (Cavaliere, 2009, p. 51). Regarding the More Education Program (PME), "The image of managers is that, for many families,

the PME means protection and reception of children who could be left helpless to their own fate in their communities." (Soares; Brandolin; Amaral, 2017, p. 1069).

The programs created by the federal, state or municipal spheres are roadmaps, planning policies aimed at solving some problem. In the case of the School Health Program (PSE), under Presidential Decree No. 6,286 of December 5, 2007 (Brazil, 2007), it is a federal plan to integrate and articulate health and education. The PSE is concerned with contributing to the comprehensive education of students through health promotion, prevention and care actions, with a view to addressing the vulnerabilities that compromise the full development of children and young people in the public school system (Brasil, 2007).

The target audience of the program are children, adolescents and young people who are enrolled in basic education in Brazilian public schools. These subjects represent groups that are undergoing intense constructions, such as identity.

It is observed that uniting health and education means taking care, for example, of the mental health of students with the care of professionals from the Family Health Teams, being a need recognized by 80% of young people between 11 and 19 years old, according to data from the Research Institute - IPEC. In this same survey, another importance of the PSE is noted: reducing school dropout rates, whose problem was aggravated by the pandemic.

Sensitive to school dropout issues, the PSE cites the concern to "contribute to the construction of a social care system, focusing on the promotion of citizenship and human rights" (Brazil, 2007, p. 03).

Another important point is the concern to "strengthen community participation in basic education and health policies, in the three spheres of government." (Brasil, 2007, p.03). In this action, according to Environmental Psychology, important aspects can be worked with those involved. One of them is the "appropriation", in which the individual will feel part of interacting with the environment from their reflections, desires and desires for changes that can start at school and replicate in the surroundings (Bandeira, Bomfim, Sales. 2012).

6 CONSIDERATIONS

For health promotion, health education is an important tool that involves theoretical and philosophical characteristics. The characteristics guide the practices of all health professionals aiming at a work convergent to the principles of health promotion.

Activities for health promotion need to give importance to the development of personal and social skills of participants in a dialogical and liberating way. With this, the people involved in the process of health promotion in schools should act in consultations, technical procedures, nursing care actions, care rooms and others, making it possible to establish dialog and respect for life.

The work also recognizes the importance of the Health at School Program (PSE) that reaches various activities in the school environment such as pedagogical monitoring for those who have not obtained satisfactory learning, environmental education, sports and leisure, human rights, health promotion, communication and use of media, experiences in the field of nature and economic education. These activities are supported by education professionals and can be developed through pedagogical projects.

It is necessary to comment that the participation of the community is fundamental for the success of health projects at school because of the interest in the well-being and quality of life of students, teachers, parents and guardians.

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Environmental education in the school context: Practices and projects in focus

https://doi.org/10.56238/ptoketheeducati-080

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ABSTRACT
The present work addresses didactic aspects of environmental education in schools through bibliographical research. It aims to investigate the theme of environmental education in the environmental context reflecting on their practices and interdisciplinary projects such as school gardens. The importance of the participation of the school community in the teaching of environmental education is perceived as much as the concern with environmental issues. It begins by rescuing the history of environmental education in Brazil, followed by a brief report of possible practices in the school context. Then, the environmental education projects in schools are analyzed, specifically exemplifying school gardens. Research shows that the school faces a great challenge to adapt innovative pedagogical proposals on environmental education in an interdisciplinary perspective in traditional curricular models centered on hierarchies. Even so, studies on environmental education are growing every year in schools, showing the great interest in changing habits and behaviors. In this way, it is credited with improvements in the personal and collective well-being of individuals, and for a better quality of life. The work contributes with motivating information for the implementation of pedagogical projects in environmental education.

Keywords: Environmental education, Pedagogical projects, School gardens.

1 INTRODUCTION

The current scenario about the environment does not have a positive aspect due to several factors: degradation, deforestation, fires, excessive pollution, among others. Therefore, it is essential to include in the curricula of educational institutions, practices and concepts on environmental education to minimize existing environmental problems through education.

Talking about environmental issues in schools is not just teaching about not throwing garbage on the floor or separating it for selective collection. It is necessary to work on raising awareness about how unthoughtful human actions impact the lives of individuals, bringing social, financial, cultural, political and environmental losses.

The environmental changes observed throughout the globe over the years, whether natural or caused by predatory human action, have raised discussions and debates in academia and the public sphere about the relationship between human beings and the environment. In this scenario, the theme of environmental education becomes especially relevant.

For this, it is necessary to understand the performance of themes related to environmental education in schools that act in pedagogical activities. It is demonstrated that when a way of life close to nature is adopted, not only the environment is preserved, but personal and collective well-being is built.

This work conducted a literature review through the qualitative research method in relation to environmental education with a focus on school.

2 ENVIRONMENTAL EDUCATION IN THE SCHOOL CONTEXT

Environmental education is able to promote changes in human behavior by helping to build new habits in order to ensure a sustainable future, promising a better quality of life and aiming at the survival of biodiversity as a whole.

> Every day that passes the environmental issue has been considered as a fact that needs to be worked with the whole society and especially in schools, because children well informed about environmental problems will be adults more concerned about the environment, in addition to what they will be transmitters of the knowledge they obtained at school on environmental issues in their home, family and neighborhood. (Medeiros, 2011, p. 2)

In Brazil, from 1999, the National Environmental Education Policy came into force, regulated through Law No. 9795, published on April 27, 1999, with the aim of relating educational practices to environmental conservation. In 2012, the National Curriculum Guidelines were created through Resolution No. 02, with the main objective of working on the theme in all segments of education, from early childhood education to higher education institutions. (Brazil, 2012)

Environmental issues encompass serious consequences and among them are the increase in the consumption of natural resources due to uncontrolled population growth. Excessive consumption

contributes to water pollution in the Brazilian territory, generating a greater amount of garbage, large emission of polluting gases, among others. As a result, disasters and imbalances in the environmental area have intensified, with humans being one of the main causes of this transformation (Assis, 2022).

In the same way that the individual contributes negatively to environmental disasters, new strategies for the recovery of spaces can be developed through work in schools. The role of the educator and others involved in the teaching and learning process comes into play.

> They will develop, in and out of school, with the support of families and other social actors and organizations, educational strategies that contribute to the formation of values, with special attention to the incorporation of democratic principles; human rights; gender issues; peace; tolerant coexistence; respect for the environment and natural resources. (Summit of the Americas, 1998).

The theme can be worked on in an interdisciplinary way, developing critical thinking in students, broadening their view of the environment and its influence on society, bringing up the feeling of belonging and accountability in the face of the environmental situation.

Environmental education based on sound principles enables students to apply learning in their daily lives, allowing them to become responsible and proactive in the various communities to which they belong. Changing behaviors and attitudes towards the environment will possibly allow students to become critical, reflective and informed citizens. This will lead them to value the place where they live and to build the necessary skills for problem solving, communication of ideas and decisions about processes, events and various important issues about the environment.

In this perspective, it is important that educators are fully aware of their role in the instruction of students from the beginning of their training process as emphasized by the National Curriculum Guidelines for Environmental Education (Brazil, 2012):

> Art. 11 The socio-environmental dimension should be included in the curricula of initial and continuing training of education professionals, considering awareness and respect for the country's multi-ethnic and multicultural diversity.
> Sole paragraph. Teachers in activity should receive additional training in their areas of expertise, in order to meet in a manner relevant to the fulfillment of the principles and objectives of Environmental Education. (Brazil, 2012, p.3)

The teacher can be the link between the school community and educational practices focused on environmental issues. Their performance may be the beginning of awakening the interest of students in the search for alternatives and strategies in favor of the environment. Together with the various resources at their fingertips, the educator will be able to make their students disseminate all the content covered in school institutions, bringing benefits to all those involved with the learning process, as well as to the environment around them.

It is considered essential to encourage practical environmental education, based on principles such as awareness, information sharing and commitment to improving environmental processes. The

school is one of the promising environments for the formation of citizens aware of their actions and co-responsible for the preservation of the environment.

3 ENVIRONMENTAL EDUCATION PRACTICES IN SCHOOLS.

Grun (1996, p. 21) states that "Environmental education has emerged as an almost unquestionable necessity for the simple reason that there is no environment in modern education. Everything happens as if we were educated and educated outside the environment." Thus, citizens must be educated to live in the environment and it is essential to encourage them to make rational use of the resources offered by the planet.

In view of this situation, it is necessary to invest in public policies and in raising awareness and mobilizing the population.According to Currie (2006, p.186):

> Formal and non-formal education should consolidate knowledge about environmental issues through a continuous educational practice, starting from a local reality to achieve planetary awareness, ensuring an integrative relationship between man and nature, stimulating solidarity, equality, and respect for human rights (Currie, 2006, p.186).

The Brazilian legal system provides for the regulation of Environmental Education, especially in the provisions contained in Law No. 9,795 of 1999, which also establishes the National Environmental Education Policy. The first article of the law delimits the concept of Environmental Education:

> Environmental education is understood as the processes through which the individual and the community build social values, knowledge, skills, attitudes and competencies aimed at the conservation of the environment, a good of common use of the people, essential to a healthy quality of life and its sustainability (Brazil, 1999).

It is hoped that humanity will understand the importance of being part of efforts to reduce environmental impact, which will enable the preservation of the environment. The sooner we are aware of the importance of the environmental system of the entire world population and that how much we are responsible to live in harmony with an ecosystem in balance,.

Environmental education in schools is one of the possibilities to promote pro-environmental activities, making students aware of the importance of environmental preservation and encouraging them to adopt responsible attitudes towards the environment. According to Berne (2004, p.30),

> Without this reality, environmental education would have no reason to exist. However, more important than mastering information about a river or ecosystem in the region is to use the local environment as a motivator (Berne, 2004, p.30).

It is expected that when teachers provide students with contact with the reality of their own community and show the breadth of all human actions, they will possibly understand about the balance

with the environment. This attitude will contribute to reflections and actions on the importance of preserving the environment and will stimulate their active participation in the search for solutions to environmental problems.

By teaching environmental education practices, schools help pupils develop sustainable attitudes, such as reducing consumption of natural resources, recycling and the conscious use of water and energy. They also provide knowledge about the importance of preserving biodiversity and teach pupils about the richness of ecosystems and the need to protect endangered species.

In preservation actions, the teacher can give students the opportunity to connect with nature, whether through outdoor activities, visits to nature reserves or school gardens, which contributes to their emotional and mental well-being. There is also the possibility to encourage students to get involved in community projects and actions related to the environment, promoting civic participation and a sense of belonging to the community.

In addition, environmental education can also be carried out in various ways, such as selective waste collection and recycling, lectures and debates on relevant environmental topics, research projects on the environment, among others. These activities can help students better understand the concepts of sustainability and environmental preservation and also encourage the development of socio-emotional skills such as cooperation, responsibility and respect for others.

Through various activities, approaches, methods, projects and actions, the teacher can provide students with the need for global interdependence. In this way, students can understand that individual and collective actions have a global impact, enabling students to develop a sense of responsibility towards other countries, cultures and ecosystems. As Morin (2000, p. 166) says, "[...] it is a matter of always seeking the relationship of inseparability and inter-retro-action between the phenomenon and its context, and of every context with the planetary context [...]",

It is essential to emphasize that environmental education should not be conceived as an isolated subject in the school curriculum, but rather as a cross-cutting integration of all subjects. This will allow students to understand that environmental preservation is a theme that permeates all areas of knowledge. The statement is in line with one of the fundamental principles of environmental education (Brazil, 1999), which emphasizes the humanistic, holistic, democratic and participatory approach.

Another aspect to address is the training of education professionals in environmental education, as it is perceived as important to continue to disseminate knowledge and help students develop skills that make them more aware of the world in which they live. Continuous training also enables professionals to seek alternatives to solve environmental problems and contribute to improvements in this area.

All actions aimed at environmental education are of paramount importance, as they can provide students with: awareness of the importance of the environment, development of sustainable attitudes,

promotion of responsible citizenship, preservation of biodiversity, connection with nature, reduction of environmental impact, health education, stimulation of innovation in order to seek sustainable solutions to environmental challenges, such as the development of clean technologies and the creation of sustainability projects.

4 ENVIRONMENTAL EDUCATION PROJECTS AT SCHOOL

According to Minc (1985), the post-war world left humanity with the idea that progress in the economy would be paramount even at the cost of a considerable impact on the environment, with an idea that natural resources were infinite.

According to Carvalho (2008), to compensate for the situation of devastation in the environment that unfolds in the world, Environmental Education (EA) arises to awaken in people the environmental impact. This fact occurred because of the incessant search for wealth and excessive consumption of the population.

According to Rempel et.al. (2011), in view of all the problems faced by the planet with the tireless exploitation of mineral resources, scholars (Neto; Sena; Saraiva, 2020) realized the need to develop awareness work for the preservation of the environment in the school space. The school locus is a place where opinions are formed to form critical beings capable of changing unfavorable situations for humanity.

Environmental education as a right of all in the country, should be implemented in all public and private educational institutions and developed in interdisciplinary, helping students to dedicate themselves to help preserve the environment.

According to Oliveira (2009), the problem of the environment must be faced together with several areas of knowledge so that it creates the necessary strength to solve problems, and involves students in the awareness of promoting sustainability in nature. From this, it is necessary the emergence of educational actions in schools as educational projects.

Dialoguing with Sorrentino and Nascimento (2009), the authors mention that articulations are necessary to develop actions in environmental education based on the concepts of ethics, sustainability, diversity, social mobilization and interdisciplinary practices. It is suggested that these actions be performed within the school environment that has an important role in protecting against unbridled economic growth, as well as deforestation, water contamination, desertification, extinction of fauna and flora loss of biodiversity, social exploitation, among other global problems. It is perceived that all negative situations lead to the annihilation of cultures in view of the globalization process.

Environmental education needs to be developed in the midst of a task force and in a space that involves society in a critical stance. This promotes that individuals become aware that sustainability depends on a collective effort, with an increasing approximation of human care with the world:

> Because of its breadth and because it requires in-depth changes, the educational project of environmental education is certainly difficult to realize. It requires the involvement of the entire educational society: schools, museums, parks, municipalities, community organizations, companies, etc. It is up to each actor to define their educational "niche" in environmental education, depending on the particular context of their intervention, the target group they are addressing and the resources available to them: it is a question of choosing objectives and strategies in a timely and realistic manner, without forgetting, however, the range of other possible objectives and strategies (Sauvé, 2005, p.319).

Inserting environmental education in the school's political-pedagogical project tends to be an impactful way to create a culture of bringing the world closer to environmental care (Brasil, 2012). It is a way to involve as many people as possible with the environmental issue and present projects that can serve as positive actions for sustainability. Today, environmental education as interdisciplinary projects at school is seen as necessary knowledge for global survival.

According to Pott and Estrela (2017) the implementation of projects is the main means of developing environmental education in the school environment. It brings the possibility of the student developing critical sense and environmental awareness to help directly in combating erroneous attitudes taken in the past and that have repercussions in the present. With this, solutions are sought that reduce environmental impacts to prevent future damage to the environment.

The first National Conference on the Environment (CNMA) (Brazil, 2003) with the theme "Let's take care of Brazil", sought to involve children, teachers and the school community in a discussion with global and local socio-environmental issues with the themes of care for water, living beings, food and school. This initiative praised the environment, as it integrated a large number of schools in this involvement in the search for sustainability.

5 SCHOOL GARDEN AS A PRACTICE IN ENVIRONMENTAL EDUCATION

In Brazil, the inclusion of environmental issues in education took place only in 1999 when Law No. 9,795 on Environmental Education (EA) was enacted. This law establishes the obligation of Environmental Education at all levels and modalities of education that has as its duty the construction of social values, knowledge and skills aimed at the conservation of the environment (Brazil, 1999).

By virtue of Law No. 9.795/1999, environmental education in school builds within the official, educational parameters and in its reality, school gardens.

According to Evangelista and Soares (2011), it is common to observe students of various levels of schooling, demonstrate problems in learning and discussing about environmental education issues, since they do not understand the reason for its realization.

With this, it is recurrent for schools to have their spaces filled with gardens, where human beings learn the correlation of the product of the market or the fair, with the one that every day is on the family table, with the practice of cultivation and management in their learning.

Nowadays, when asking a child where the fruits, vegetables and in general our food comes from, the answer will certainly be from the supermarket. This is due to the lack of relationship between our well-being and nature, as people currently live in a mechanized way (Bezerra, 2007).

The gardens created in school environments promote an advance in the integration of the school community, where teachers and students work in a dynamic of research and execution of practices and experiences. In addition, the kitchen staff helps to include these products in the daily snack. Still, some children use these products at home with their families.

According to Morgado and Santos (2008), the garden inserted in the school environment can contribute significantly to the integral formation of the student. It encompasses different areas of knowledge throughout the teaching-learning process, through vast pedagogical applications with real situations, involving environmental and food education.

The school garden is a reality where everyone learns and contributes in the dynamics of preservation and cultivation of food, its use and especially in the preservation of spaces and healthy eating. In the literature, "the school garden is a pedagogical instrument that enables active, integrated learning and allows the rescue of ethical, social, cultural and environmental values, enabling sustainable practices" (Cavallero, 2020, p. 299).

It is perceived that the vegetable garden at school enables the integration of students in social life, as well as in strengthening family life and in the domain of preserving the space in which they live. The values are thought in the collective and the result comes from the common good.

The idea that the garden is a space for exchanges can point to the possibility of building a learning environment for the school community as a whole, in which skills and abilities, values and attitudes can be worked on, under the most diverse aspects of knowledge, which in fact is a role that the school can fulfill (Libâneo, 2007).

According to Cribb (2007), the garden promotes values, good attitudes, helps collective work, transforms thoughts, develops creativity, alerts to care and responsibility with others.

It is noted that the creation of the school garden represents for the school community a rich open-air research bed, where research and practice are consolidated in the acquisition of knowledge in several areas.

A school garden promotes the rescue of land cultivation, reflection on the importance of organic food consumption, environmental preservation, interaction between school communities and interdisciplinarity (Santos et al, 2012).

It is observed that the apprentice when touching the earth creates a bond of belonging, which acquires maturity and responsibility with the environment assuming a commitment to take care of the common home, that is, the planet earth. In this context, it develops the skills of integration and debate, where it creates with the other an appropriation of this theme.

It is important to emphasize that actions within school spaces, based on environmental education, enable a new food culture, making them aware of the importance of food, the hygiene of these foods, the nutritional value. Above all, it awakens in the school community a critical analysis of advertisements for poorly nutritious food products, leading them to consume healthier ones (Pimenta; Rodrigues, 2011).

Nourishing themselves by discovering the possibility of a nutrient-rich diet, learners and researchers take possession of the power to reject what no longer makes sense in food. They appropriate correct ways of sanitizing, reusing food as a whole.

To the same extent, the activities developed in this space promote the insertion of Environmental Education through the recognition of the importance of caring for the environment by carrying out activities that promote reuse, recycling, and sustainable management that, when added together, can lead to a healthier quality of life (Santos, A.; Santos, R., 2014).

With actions in environmental education the school has shown good results with school garden projects when they are worked on from the early grades.

Krasilchik (2000) states that practical classes in teaching serve different functions for different conceptions of the role of the school and the form of learning. These issues are consonant with the role of the school, or in rescuing the role of the school as a producer of knowledge, in the development of skills and abilities, which also value the environmental dimension (Libâneo, 2007).

Madeiros et al. (2011, p. 15) cite that "A place where all individuals care about cleanliness, disposing of garbage in the correct container for reuse of the same for the world". Becoming aware of this reality, the students take home the value and importance of separating the garbage in their respective places and even those parts of the food that would go to waste now have a new destination, that is to use in daily food or as compost, creating habits of reuse.

As the garden is a place of research, integration and coexistence, it is perceived that it is fundamental as a resource for the development of skills where all participants have the opportunity to expose their knowledge in the construction of projects and in the production of personal and collective sustainability to rescue values and create bonds.

6 CONSIDERATIONS

Environmental education topics have become an integral part of the curriculum in many schools around the world. The need to create school environments that motivate students to become aware and informed about environmental education has become more frequent. However, its realization becomes complex for several reasons such as political issues.

The work sought to reflect on the need for practices in environmental education such as the cultivation of school gardens that bring young students closer to nature.

In this context, the school faces a great challenge to adapt the curricular models centered on hierarchies that permeate the pedagogical proposals in an interdisciplinary perspective.

However, it should be noted that studies on environmental education are growing every year, showing the great interest in changing habits and behaviors. In this way, it is credited with improvements in the personal and collective well-being of individuals, and for a better quality of life.

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SEVEN
publicações acadêmicas

The theory and practice relation in the teaching of philosophy: A look at philosophical knowledge in public high schools

Crossref doi
https://doi.org/10.56238/ptoketheeducati-081

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ABSTRACT
This objective scientific article critically analyze the theory and practice relationships in the study of Philosophy in the School of Public Schools. Therefore, we use two state public schools that functioned as research objects. From these observational "locus" we seek to reconstitute the optics of teachers and students and find out how this educational process is carried out concretely in social practice. This analysis was based on the paradigm of critical science supported the theoretical framework of Materialism - history, according to which theory and practice are related dialectically. We hope that the results obtained in the research can contribute to support a proposal for pedagogical action that includes the principle of dialectic between theory and practice in the teaching of Philosophy in Public Schools.

Keywords: Philosophy, High school, Public school, Relationship Theory x Practice.

1 INTRODUCTION

This scientific article aims to analyze the relationship between Theory and Practice of Philosophy Teaching in High School to highlight in pedagogical and dialectical relations a philosophical educational formation. In this sense, it is about how Philosophy is understood and how it interferes in the lives of high school students, as well as the way teachers relate to the discipline.

Its elaboration fulfills several objectives, among others we highlight mainly the institutional need that we have to present a work produced from a scientific research, which should serve as a partial requirement for obtaining a degree in Philosophy at the State University of Pará - UEPA. We also add that the elaboration of this article meets the pedagogical need and at the same time, insofar as the revisiting in the theoretical literature of the various authors of the philosophical field has provided us with a level of deepening indispensable in our pedagogical learning, broadening our theoretical horizons on the studies of Philosophy and its dialectical transposition in the area of education.

The arguments of the analysis process on the subject were paradigmatized by the theoretical approach of Historical Materialism which shall serve as a reference in our study.

On the other hand, it is also important to analyze the relationship of teachers with the theme, since this is directly linked to the student's learning or not with the discipline. How does the school deal with the problems of its context? How are the teachers of the school in question developing their

pedagogical work in the midst of everyday problems? How have philosophy teachers approached discussions in their classes that make students understand their role and how they can contribute to citizenship?

Questions like these will be part of the research process that will be carried out in the development of this work to know the reality worked, that is, the theory and practice of teaching Philosophy in high school, since it is perceived the lack of Philosophy teachers trained in the area, having that teachers of other disciplines teach the discipline Philosophy, hindering the relationship that students need to have with the philosophical teaching and learning. On the other hand, there is the problem of lack of commitment to the teaching of Philosophy due to the greater importance given to other disciplines to the detriment of the first that through its questions about life tends to show the cracks in society.

This article is structured in 4 main chapters. The first chapter discusses the methodological procedures used in the research. In the second, we present the theoretical foundation of this study based on the Historical Materialism of Marx and Engels.

In the third chapter we characterize the school reality studied with reference to the State Schools Professor Delgado Leão and Desembargador Osvaldo Brito de Farias, the first located in the Municipality of Cachoeira do Arari and the second in São Caetano de Odivelas, both in this State of Pará. In the fourth chapter, which constitutes a nucleating chapter of new knowledge, analyzing the theory and practice in the teaching of Philosophy in High School of Public Schools from the perspective of teachers and students.

Finally, the "guise" of conclusion where we present our final considerations on the results obtained in this study, hoping that these can serve to deepen the debate around the issue and at the same time, provide elements to subsidize a proposal for pedagogical action on the relationship between theory and practice in the teaching of Philosophy that takes as a basis the Marxist Engelsian theoretical framework on the subject.

2 METHODOLOGICAL PATH OF THE RESEARCH

The process of analyzing the data and information on the subject that served as raw material for this scientific article is paradigmatized by the theoretical approach of Historical Materialism, which constitutes the reference method on which the thought of Marx and Engels, the main anchors of this study, is based.

The historical materialist approach gives precedence to the internal material contradictions of the problem under investigation, from which its essential links are revealed.

Historical Materialism was first introduced into the scientific field by the German philosophers and historians Karl Marx (1818 - 1883) and Friedrich Engels (1820 - 1895) according to whom the

different philosophical forms of men are determined by the economic infrastructure of production, noting that the history of all societies in the past is the history of class struggles.

Thus, science, philosophy, religion, education, the arts and all other manifestations of the spirit are determined by the mode of production of each society in its different historical moments.

Although Historical Materialism has numerous internal theoretical trends, we will use in this study the essential ideas of Marxian historical materialism, that is, which was founded by the fathers of Marxist thought, whose maximum exponents are: Marx and Engels.

Thus, we consider Historical Materialism in its orthodox matrix formulated by Karl Marx and Friedrich Engels, delving deeper into this theoretical tendency of Materialism to base our analysis process on the "findings" of the research.

The logical methods that we employ in the arguments of the analytical discourse are based on dialectical logic with emphasis on the dialectic of contradiction that is at the basis of historical materialist thought, according to which we start from an affirmative premise (thesis) to in a second moment deny it (antithesis) and finally in a third moment we build its double negation (synthesis), which constitutes its qualitatively superior moment of overcoming.

Both theory and practice are indispensable, however, they are in an organically dialectical relationship, that is, two distinct moments of the process insofar as they contribute to the formation of applicability of theory in the concrete life of the teaching - learning process of Philosophy in High School. In fact, every theory is a theorized practice, just as every practice is illuminated by theory to the extent that it enables and contributes to the dialectical movement of the teaching - learning process of Philosophy by the subjects directly involved in the educational process.

In order to learn the various specific dimensions of the investigated object, we employ the methods of materialistic, historical, comparative, sociological and hermeneutic procedures, because we believe that these provided us with greater epistemological conditions to analyze the relationship between theory and practice of the study of Philosophy in High School in its various multidimensional aspects.

This study is characterized as a bibliographic and field research. As bibliographic we consulted reference works on the subject, as well as those of a secondary nature, whose authors also deal with the subject we address in this article. In order to deepen the theoretical level of the study, we also carried out documentary research, accessing on Internet sites, various texts that deal with the problem studied. As a field, we prepared a questionnaire with 3 (three) questions to interview teachers of the discipline Philosophy and students of two public high schools located in different municipalities of this State of Pará.

This study is also characterized as an "ex-post-facto" research, insofar as the object investigated has already occurred, thus, we verify the process in contemporaneity, evidencing that our study deals

with concrete facts of the relationship between theory and practice of the study of Philosophy in High School that are already processed in Public Schools that offer this modality of education.

Regarding the research techniques applied, we emphasize that to extract the main theses and essential ideas of the bibliographic works consulted, we employ the technique of "Analytical Fichamento", which according to one of the most prominent Brazilian sociologists and researchers, refers to this technique, emphasizing that:

> The analytical fichamento constitutes an appropriate technique of research when it is necessary to extract and understand the main ideas of the theoretical authors consulted, besides that it also allows us a critical-interpretative analysis of the bibliographic texts, so I used this technique in my studies. (FERNANDES, 1961: P. 13)

Regarding the documentary research carried out, we used the technique of "Expanded Summary" to appropriate the ideas-force contained in the documents consulted, which in our case were master's dissertations; doctoral theses; PCNs on the teaching of Philosophy and; other official documents relevant to the subject treated.

Finally, we emphasize that the preparation of this article faced some challenges, which in our case were: the lack of bibliographic collection on Philosophy in the Central Library of UEPA; inexistence of a specific sectoral library for the Philosophy Course in that institution and; inexistence of a PARFOR scholarship policy for the purchase of technical books. These difficulties were somewhat circumvented by reproducing some works from the collection of the Research Group "Society, Science and Ideology - SOCID".

On the other hand, we emphasize, however, that the elaboration of this article also contributed to our theoretical and practical learning at the same time. From the theoretical point of view, it allowed us to carry out a review of the philosophical literature that favored the deepening of the theory related to the subject addressed.

From a practical point of view, this article was an important training in the area of research and, at the same time, in the methodological practice of how to prepare a scientific article, according to the academic-scientific parameters of the ABNT technical-bibliographic standards. As well as a small essay in field research using the questionnaire technique in the interview with a small sample of teachers and students from two Public High Schools to ensure solidity in the research carried out.

Finally, both the difficulties faced and the possibilities achieved are two moments in the process of knowledge production, and as such, should be considered as two faces of the dialectical movement of construction of philosophical knowledge. Therefore, we hope that this article can somehow contribute to the deepening of the debate on the subject developed and, at the same time, provide those interested with elements, albeit preliminary, to the elaboration of a proposal for pedagogical action that primarily contemplates the basic theoretical assumptions of a Critical Philosophy for High School.

3 THEORETICAL FOUNDATION: THE RELATIONSHIP BETWEEN THEORY AND PRACTICE IN SCIENTIFIC DISCOURSE

3.1 DIALOGUING WITH THEORY:

The term "philosophy" is translated to mean "lover of wisdom". Thus, it arises from the discovery of the knowledge of the world and reality that ceases to be only thought by a supernatural and mythological idea formed by a symbolic and figurative idea to be built on the basis of reality founded on the thinking subject, that is, through people who present a more reflective discernment about the understanding of life and the social world through an active, reflective and socially transformative questioning.

Since the emergence of philosophy in Classical Greece were already intended to integral formation of the human being. The way in which the act of philosophizing was practiced was characterized by an educational task in order to enlighten its listeners and also society, in order to participate more in that lived context. For Chauí (2000: P. 28), "(...) philosophy (...) started from the affirmation that reality or being exist in themselves and that as such they can be known by reason".

Discussing the theme of the relations that involve theory and practice for an educational formation is a particular aspect of a broad and complex problem. In this sense, one must think like Plato (428-348 BC) and Aristotle (384-322 BC) about the role of theoretical knowledge for a formation in which man learns to be good and virtuous. In this way, the analysis will focus on the theory and practice of teaching philosophy as a support for education, not only of purely theoretical knowledge, without commitment to reality, but as a proposal to change life, from the light of knowledge, that is, from a humanizing philosophy that contributes to the formation of citizenship through consciously critical and politicized subjects, true administrators of what historical destinies in which:

> (...) the pedagogical practice, when considered only as a pre-established and standardized teaching, becomes a mechanical activity, ritualistic, repetitive, without criticism, evaluation, or seeds of new life, essentially sterile, always producing the same fruits with the same problems, both for students, as for the teacher and the school. (MASETTO, 2003: P. 5).

Thus, the philosophical reflection that arises in the theoretical field of education enables the teacher to explain in an existential way the concreteness of his community, ensuring a clearer understanding of the meaning of the human condition in the world. In this sense, the performance of effective practice is the possession of applied theory, showing that both, that is, theory and practice are two moments of the same teaching-learning process in the field of Philosophy.

In the "problematize" aspect, Philosophy has a very important role in philosophically discussing the problems presented by society, as in the case of drugs and other social problems that affect current humanity, and the issues of reality should be worked on. How to work philosophically? How is reality being formed? The reality of social tensions is perceived in this context. On the one

hand, one lives what is imposed by society and on the other hand one perceives this reality, but does not relate to philosophical theory, which is why there seems to be a dichotomy between theory and practice, in this way:

> This means that philosophizing with the student's daily life from music, newspapers, people, in short with the cultural universe of the young person, does not mean abandoning or losing sight of the philosophical text - academic - but, on the contrary, by these strategies consciously introduce it as a reference for philosophical reflection (NOVAES, 2014: P. 28).

Thus, it is fundamental that the philosophy student goes through the experience of (re) critical thinking, however, it is necessary that they critically read philosophical texts in the perspective of engaging with the universe of philosophy.

> It is now, therefore, to suggest some guidelines on the use of the philosophical text in the classroom, how to proceed to a philosophical reading of it, considering the need for this practice to become organic and systematic in the Philosophy classes of the Brazilian public school, particularly high school. (NOVAES, 2009: P. 38)

To this end, students are induced in their philosophical reflections to the field of understanding in the educational process in their future integral formation, as politicized subjects and builders of a more socially just and humanizing society.

In the light of the theoretical approach of Historical Materialism, the relationship between theory and practice in the teaching of any area of knowledge, as in the case of philosophical knowledge, constitutes a process of social and pedagogical construction between the historical subjects involved in educational training, which in the case of High School, are more directly both students and teachers, who in Public Schools establish teaching-learning relationships in the study of Philosophy.

According to Marx (1818-1883) and Engels (1820-1895), these two complementary and antagonistic moments at the same time, like two sides of the same "coin", form a structural unity of the diverse, so there is no theory without practice; just as there is no practice without theory. In this sense, for the founders of Historical Materialism, every theory is the historical product of multiple and concrete practical determinations, which means that every theory is based on a practice or many practices that have been purified until they rise to the category of a scientific theory. However, Marx (1844) warned in his "Economic-Philosophical Manuscripts" and, more specifically in his third manuscript, a work that he left unfinished, that true scientific theory is not a simple product of a mechanical practice, because this is mere activism, but the result of a philosophical-political reflective moment of a disalienated practice, that is, revolutionary and, therefore, socially transforming the dominant structures of authoritarian society. Transposing didactically this criticism of Marxian Materialism to our problem, that is, the relationship between theory and practice in the teaching of Philosophy. It is verified that this teaching should be pedagogically taught with the formative purpose

of creating this dialectical structural unity, that is, taught from the perspective of a critical humanizing Philosophy, concerned with the political disalienation of the students, forming them as citizens socially transforming the dominant structures of the society in which they live and, at the same time, active subjects of their historical destinies, that is, self-emancipated and politically humanized in search of a social world based on justice, not only legally formal, but above all, real and self-managing, in which everyone is equal not simply before the Law, but in the practice of concrete social life. Only in this way, through a philosophy of revolutionary praxis, will we be able to glimpse a revolutionary relationship between theory and practice in the teaching of philosophy, concerned with the formation of the new "man" in all dimensions of life.

To this end, a pedagogical process should be sought that teaches philosophical theory through a political reading of the social world of the students, awakening them to face the challenging problems of their community and how to solve them through creative and innovative alternatives, formulated by themselves.

4 CHARACTERIZATION OF THE STUDIED SCHOOL REALITY: THE STATE HIGH SCHOOLS PROFESSOR DELGADO LEÃO AND DESEMBARGADOR OSVALDO BRITO DE FARIAS.

The **State School of Elementary and Secondary Education Professor Delgado Leão**, School-Headquarters in the municipality of Cachoeira do Arari, Marajó, is the oldest public educational institution in this municipality. Founded on May 9, 1953 in the administration of State Governor Alexandre Zacarias de Assunção and Municipal Mayor Lucídio Gonçalves da Silva. However, it was born much earlier, in 1936 when it was part of the Cachoeira School Group with the merger of the old isolated schools in the city, among which was that of Professor Chiquinho, nickname of Professor Francisco Delgado Leão who took over as Director of that group and from which comes the current name of the School.

It has 06 (six) classrooms with 04 (four) ceiling fans in each room, 01 teachers' room, 01 secretariat, 01 boardroom, 01 pantry, 02 (two) male bathrooms, 02 (two) female and 01 (one) for employees. Also a computer lab, a multidisciplinary lab and a library.

It receives a clientele of approximately 1,000 (one thousand) students, at the Elementary and Secondary levels and Youth and Adult Education that are divided between the morning, afternoon and evening shifts, as well as having classes in the rural area in the attached schools.

Currently the staff consists of 14 teachers, 01 secretary, 04 watchmen, 09 servants, 03 lunch ladies, 05 administrative assistants, 01 director and 01 vice-director. The Philosophy teaching staff consists of two teachers with a background in Social Sciences.

It intends according to its Pedagogical Political Project, elaborated since 2007 and revised every two years, to be an institution that not only privileges systematized knowledge, but the knowledge acquired by students in their relations with the various social groups. With this contributing to the citizen formation of the student. Its pedagogical proposal is the Critical-Social Pedagogy of Contents, because it understands that school curricula need to be linked to the daily lives of students. The evaluation is continuous, favoring the qualitative aspects that are transformed into notes aiming at promotion, following the guidelines of the State Department of Education of Pará.

It has an Action Plan, where the PPP proposals are planned to be implemented by the School Community. It is based on Democratic Management, with the participation of the School Council, Class Councils and Class Representatives. The management of School Transportation and School Feeding is the responsibility of the City Hall through the Municipal Department of Education.

The **State School of Elementary and Secondary Education Desembargador Osvaldo Brito de Farias** was founded on August 18, 1972, under the management of Governor Fernando Guilhon. The school is located in the municipality of São Caetano de Odivelas, located in the northeast of Pará, salty region, crossed from north to south by the Mojuim River, this one, bathing the seat of the municipality 110kms away from the capital in a straight line.

The school had as its first director Mrs. Eliza Pinheiro Monteiro (in memory), after her death a new director was appointed to assume the position, due to the non-acceptance of the new director, on August 25, 1997, the school is set on fire, after this episode the school was renovated and reopened, assuming the direction of Mrs. Regina Celi de Almeida. Currently the school is located at Rua Visconde de Souza Franco s / n, in the Pepeua neighborhood.

It operates in its own building (renovated), built in masonry, contains 11 classrooms with 04 (four) ceiling fans in each room, 01 teachers' room, 01 secretariat, 01 boardroom, 01 pantry and 01 large area where the cafeteria works, 03 (three) male bathrooms, 04 (four) female. The school also has a computer laboratory and a multidisciplinary laboratory. The latter is not in operation.

They are enrolled in that school the amount of 1,800 (one thousand eight hundred) students, which are divided between the morning, afternoon and evening shifts, the students are mostly from the rural area, which to get to school rely on school transportation, it should be noted that in rural communities, only the Elementary School works.

Currently, the staff consists of 33 teachers, 02 secretaries, 02 security guards, 03 porters, 04 administrative assistants, 02 Education Specialists, 01 principal and 01 vice principal.

The philosophy of the school is situated within the paradigm experienced by contemporary society that consists of meeting the student in a constant process of change and has as challenges to modify values and work, content according to the reality of the student and society. Therefore, for the school, education is an act of love that aims to make possible the intellectual and moral growth of the

student, which leads to having as motto "Knowledge, Love and Peace" which is indispensable in the construction of an educational proposal, which promotes from the knowledge the knowledge capable of driving to achieve a more participatory and inclusive society, according to the Pedagogical Project.

In addition to Programs and Projects, the school holds events, commemorative dates, also acting in the provision of social services such as mutirões in partnership with the Health Department among others.

Both have teaching resources, such as TV, DVD, CD, data show, computers, internet, in addition to books. And they are maintained with resources from the Federal Government and resources from some events held in and by schools.

5 THE RELATIONSHIP BETWEEN THEORY AND PRACTICE IN THE TEACHING OF PHILOSOPHY IN SECONDARY EDUCATION IN PUBLIC SCHOOLS SAMPLE

All philosophy teachers from the two public schools mentioned in the previous chapter of this article, and 12 (twelve) students, 6 (six) from one school and 6 (six) from the other.

TECHNIQUE: Questionnaire containing 3 (three) questions with the same themes for both teachers and students.

The analysis of the answers obtained in the interviews was made as the most important part of the work. Relating this analysis to what was proposed, which is the relationship between theory and practice in the teaching of philosophy

5.1 THE TEACHERS' PERSPECTIVE

Participants: 2 (two) teachers of the Philosophy subject;

Id:

P1- Full Professor in Social Sciences;

P2- Full Professor of Geography

When conducting the research, it was noticed that teachers felt some difficulties in answering the questions presented (attached questionnaire), which were:

1- What is the relationship between theory and practice in the teaching of philosophy that you teach in high school?

2- What are the difficulties of teaching practical philosophy at school?

3- How should philosophy be taught in secondary school?

Analyzing question 1, the relationship between theory and practice in the teaching of Philosophy, we realize that the interviewee P1 recognizes Philosophy as a practice of life, confirming that nothing escapes philosophical reflection and in his pedagogical practice says to relate the contents

with the facts of both the distant reality of the student, as well as a reality closer to him, contributing to "build" a conscious human being capable of formalizing his own conclusions.

The second interviewee (P2) says that it is the partnership that the teacher creates with the student, the culmination to break the barriers between those who "teach" and those who "learn", in other words, both are part of the same process, teach and learn at the same time.

In the second question about the difficulties of teaching a practical Philosophy at school, P1 points out four main difficulties, the first is the deficiency of didactic and pedagogical resources that the teacher can use to teach a more dynamic class, pointing out the lack of attitude / political will to structure schools with such resources, mainly technological, such as internet access to all students, which would already be of great value to make classes less uninteresting. The lack of continuing training for teachers is, according to the interviewee, the second greatest difficulty, as he says: "college does not teach us how to teach, the teacher 'builds' himself at his own risk". The third difficulty concerns precisely the student's great lack of interest in the discipline and the contents studied, being the very coexistence and valorization of their cultural heritage, based on the knowledge of common sense and religion that "guide" the student's life in society, making them accommodated, thus not showing interest in philosophical knowledge. The fourth difficulty is functional illiteracy, which is seen by the interviewee as a "very serious situation", because the student arrives at high school "reading and writing very badly", with many difficulties of interpretation, he cannot also interpret the "reality around him".

P2 says that the difficulties may vary according to each teacher, however, the place where the student lives is not practiced the act of reflection.

In the third question, of how Philosophy should be taught in high school, P1 says that by the current moment itself, the student should learn making use of the many technological resources, and with the school graced with such resources they could give "shows" classes, not boring. Also, needing to do better and give the best of themselves, contributing to the integral formation of the student as a human being constituted of multiple aspects. Thus, being a transforming agent of reality, breaking with everything that paralyzes not seeing in the practice of teaching only a job, lacking commitment to the quality of education.

P2 agrees to "work with practical examples" of the student's reality, as the community becomes this "starting point".

5.2 THE STUDENTS' PERSPECTIVE

Participants: 12 (twelve) high school students (1st, 2nd and 3rd year);

Identification: A1/A2/A3/A4/A5/A6/A7/A8/A9/A10/A11/A12.

Questions:

1- What is the relationship between theory and practice in the teaching of philosophy that you study in high school?

2- What are the difficulties of studying practical philosophy at school?

3- How should philosophy be studied in high school?

Analyzing the answers related to the relationship between theory and practice in the teaching of Philosophy, we observe that A3, A5 and A6 say that in pedagogical practice, teachers teach students to think, explaining the importance of Philosophy for social life, makes them think about their actions, however, the "whys" of things are taught only theoretically in the classroom and these same "things" are even understood. However, A3 and A4 say that outside the classroom the act of thinking is no longer taken into account, the student does nothing of what he "learned", for example, in what can serve for his life and for his daily life.

A1 says that the method used by the teacher in his pedagogical practice ends up being observed the practical part when it is glimpsed by the many exercises and activities, being able to be more dynamic, therefore, in the observation made by A7 and A8 the relationship with practice is very difficult, being easy to be spoken by the teacher in the classroom, because in the interviewee's speech, "speaking and then acting is not an easy thing to accomplish", because the greatest difficulty is the promotion of changes.

As a result of these statements, A2, A7, A9, A10 and A11 confirm the non-existence of a practice in the teaching of Philosophy, therefore no relationship between theory and practice, "the teacher passes on only what is in the textbook" and fails to pass on "knowledge", theories are always "bigger" than practice, without any relationship with everyday life. Thus, A12 comes to say that Philosophy is a very "boring" discipline, perhaps because it cannot, according to him, "say what we need to hear in practice".

In the second question, of the difficulties of studying a practical Philosophy at school A1, A9 and A11, say that the greatest difficulty is of understanding, the student does not understand and for many reasons does not ask or request a new explanation from the teacher.

A3, A4, A6 and A12 point to the situation that many schools do not have a Philosophy teacher, with specific training, in this case the Graduate, but almost always the teacher who teaches the subject has another training, thus, often, the understanding by the students is out of phase, due to the teacher having difficulty understanding the philosophical contents. Thus, A5 and A6, note that Philosophy is seen as a non-important discipline, ending up "unnoticed" by the school. Therefore, A3, A11 and A12 notice that students end up not realizing what philosophical knowledge has to do with "the world out there", adding this to the lack of teaching resources, loses the "stimulus" to study.

A2, A7 and A8 note that difficulties arise, firstly because Philosophy studies the "social facts", in the student's speech, being exercised through "ideas", and schools have certain care in the

transmission of philosophical knowledge, and the act of thinking has always historically bothered and, in the student's saying: "politics believes that philosophizing will form people", so it is better to deal with people accommodated with what is being convenient than with the "new", so Philosophy requires a lot of reading.

In the third question, on how Philosophy should be studied in high school A1 and A6 signal that it should be more theoretical in the sense of deepening and consistency in the contents studied, having a teacher "willing to teach", taught more and passing less work.

While A7 and A8 say they lack only "ideas" that can motivate students, many dynamics, internet access, research aimed at showing the importance of Philosophy for the cultural growth of a people.

A9 says that Philosophy should "be studied in a more elaborate way", it is perceived the need for a formalized planning, with competences and skills, thus making it "easier" to understand. Thus, according to A9 and A10, when this elaborate form that will point out other ways of working philosophical knowledge is not perceived, students become demotivated and end up not liking the discipline. Also analyzing A11 in his statement that he should give more importance to Philosophy as it gives importance to other disciplines, after all they all contribute to the growth of the student.

A12 reinforces the need for Philosophy to work according to the student's social reality, to work on issues related to Brazilian society and that are suddenly part of a reality very close to him, such as social problems, such as violence in all its extension, drugs, which plague the various environments frequented by children and adolescents and, therefore, schools and students.

Summarizing the analysis, it is observed in the answers given the perception of reality by teachers, to a certain extent concerned with the critical formation of the student, but that a constant philosophical discussion about the problems presented beyond the walls of the classroom has not yet been established that Novaes (2014) comes to say that philosophizing is precisely absorbing the daily life experienced by the student, with all the resources that his environment offers, his "cultural universe", the philosophical reference, in the exercise of reflecting on the problems that arise in society.

Also, according to Marx (1844), when it is proposed to discuss theory and practice in the teaching of Philosophy, it is intended a Philosophy concerned with the political "disalienation" of the student to make him transformer of his own reality.

Thus, the relationship between philosophy and education, according to Chauí (2000), demands the formation of attitudes and positions of the student within society, so that education can then build in this being, now humanized, a conscious view of its reality.

6 FINAL CONSIDERATIONS

The teaching of Philosophy in High School takes place as a philosophical experience from the understanding and overcoming planned by the teacher of the dichotomies presented by society, which the student almost always does not participate, only suffers influences of the controlling alienation by the means it presents. Therefore, it is necessary to sensitize, problematize, investigate and conceptualize it in a didactic perspective of easy understanding, but of a transforming nature. It is not enough just to make theoretical approaches without understanding the other points of view, it is important that there is awareness and transformative practices to achieve profound changes in society. Points out Chauí (2000, p. 31) "We give meaning to the world, we transform things (...) without the world, we have no way of knowing or acting".

The relations of Philosophy with education, in general terms, are connections that occur as a process in which young people begin to form attitudes and social, intellectual positions with human nature. In this sense, education begins to build, in this social subject, a broader and more sensitive worldview of the reality in which (with) lives.

Henceforth, the theoretical understanding that is acquired from the knowledge of Philosophy, society and man himself constitutes a fundamental process that this subject seeks in the student the reflection of the world in which he lives. Education in the school process needs a critical philosophy, since most of the major problems faced in the field of education are mostly real problems, which a revolutionary philosophy can contribute to face them in contemporary times.

Considering that education proposes to offer a satisfactory and full of happiness life condition, it is necessary to realize that the target of this struggle is the man himself and that the challenge is to be able to educate the other from what one has of knowledge. As Tardif (2000), mentions that knowledge always aims to achieve something and even more, that everyone has a knowledge to accomplish something. In this way, knowledge is at the same time social, teaching, disciplinary, experiential that are important to direct its existential variety. Therefore, the philosophy teacher in his educational practice must define critical theories by applying them to education.

Thus, historically, it is said that Philosophy and the practice of philosophizing are characterized in an educational action that goes through philosophical thoughts provided by theories developed in human and pedagogical education, conditioned by sociopolitical and cultural contexts. Therefore, reflection and critical thinking about the educational process contribute to the philosophical knowledge of the subjects who will be researched regarding the formation of values that will be present during their training and the production of educational knowledge.

When one thinks of the teaching of Philosophy in High School historically speaking within the context of Brazilian education, it has existed since the colonial period, however, many obstacles are perceived regarding the formation of this subject in a curricular matrix, including the advent of Law

No. 5,692/71 (Law of Guidelines of National Education), considering its teaching as optional of curricular designs, which ends up contributing to the possible extinction of the same of the curricula in this period.

This is how it is referred to at the time:

> In the period that Philosophy was partially or completely absent, secondary education underwent major changes in relation to the previous period coinciding with the 1971 reform, witnessing a growing process of massification, by which Secondary Education significantly expanded its range of action, starting to receive less privileged social strata that previously had no access to it. This quantitative expansion was accompanied by a decline in the quality of education, perhaps unprecedented in the country's educational history (RODRIGO, 2009: P. 8).

The pedagogical practice of high school teachers who teach the discipline Philosophy needs to start from a didactic that does not make the teaching of Philosophy simply operational, starting from techniques and procedures, but rather a philosophical didactic, where the form of action is different from subject to subject, therefore, each teacher has a particular way of working a subject or discipline. However, it is necessary not to fail to glimpse the criticality that the student needs to have regarding the knowledge passed on in the texts of the various philosophers and scholars of Philosophy.

Having a critical look at the teaching of Philosophy in high school taught in public schools was the intention of this article, because Philosophy has not yet managed to have the importance it really needs in the curricula to be forming organic subjects, therefore, transformers of their social reality.

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ANNEX

TABLE SHOWING RESPONSES:

TEACHERS (P):

QUESTION 1 - What is the relationship between theory and practice in the teaching of philosophy that you teach in high school?

P1 I start from the assumption that Philosophy is much more than a subject in the school curriculum, I try to show my students that Philosophy is a life practice, which must and can be constantly applied in their daily lives. In addition, I try to show that nothing escapes philosophical reflection, everything must be debated, questioned and put to the test through this reflection, so that an integral and conscious human being can be "built" that the possibilities do not end at the horizon line and that it can always be crossed. From this, I seek, whenever possible, to exemplify, contextualize historically and correlate the content with facts that occurred in the world, in Brazil and especially, in the closest reality, the marajoara. In this way the student can "grope" the content from the real and produce their own arguments / conclusions.

P2 This relationship is present in the partnership that the teacher creates with the student in the classroom. Both teacher and student can develop a friendly relationship, breaking the barriers of who teaches and who learns.

QUESTION 2 - What are the difficulties of delivering practical philosophy in school?

P1 The difficulties are several, I highlight the structural and resource deficiency of schools, the lack of continuing training for teachers, the student's lack of interest in something that was not presented to him in previous stages of his life and the very serious issue of functional illiteracy that unfortunately affects a large number of people. In relation to structural and resource deficiency, I think it is a lack of political will/attitude, because of this the classes are considered uninteresting because they cannot work with basic tools such as the internet, for example. With regard to continuing education, college does not teach us how to teach, the teacher builds himself at his own risk, in daily practice in the classroom. As for the disinterest of the student, it is difficult to show the importance of critical and philosophical thinking to someone who has always been guided only and exclusively by common sense/religion, by the cultural tradition where questioning, inquiring, doubting is considered "boring" behavior, in this sense, Philosophy swims against the tide and this is extremely difficult when there is no mobilization of all the actors involved in the educational process. With regard to functional illiteracy, a large number of students arrive at high school reading and writing very poorly without being able to interpret a text well, perhaps the reality around them, having to teach reading and writing in high school disagrees with the whole discourse regarding basic education.

P2 The difficulties exist, but it varies according to the coexistence that each student has from the coexistence in his home or in his community, because the place where one lives often has no reflection and this makes it difficult to reflect on the teaching of Philosophy.

QUESTION 3 - How should philosophy be taught in secondary education?

P1 I believe that each time requires specific tools, currently what is more interesting for young people? I believe that learning using technological resources, in the world of shows, classes are only considered interesting when they become shows. I believe that regardless of anything, it is up to the teacher to do his best and do his best to contribute to the formation of a human being in its multiple aspects, this is done by most teachers, but many still see teaching only as a job, which earns him a salary. There is still a lack of commitment to the quality of the educational process and to breaking the status quo.

P2 Philosophy teaching would have a great advance if it worked with practical examples of life, so the student would understand better. That is why the community and the place where he lives is the starting point for this discussion.

STUDENTS (A):

QUESTION 1- What is the relationship between theory and practice in the teaching of philosophy that you study at secondary school?

A1 The relationship in the way it is passed on to us is not good, but it is not bad either. The method used by the teacher is practical, with many exercises and activities from the book during the class. Philosophy classes should be more dynamic with dialogues, expression of opinions, texts and presentation of works.

A2 The theory is good, it helps a lot in high school. We do not have practice in Philosophy.

A3 In Philosophy classes the teacher influences the student to think about why everything exists and what is done, but outside the classroom we no longer want to philosophize, just act without worrying about the consequences.

A4 In Philosophy classes the teacher explains why Philosophy is important in human life, why we philosophize and what Philosophy is for, but when the student leaves school he does nothing of what he learned in class and leaves everything aside without caring what it can do for him.

A5 Philosophy class has a great influence on human life because it makes us think about our actions and helps us to understand things and act without worrying.

A6 In theory, teachers try very hard to teach the why of things, in this case, they teach us to philosophize, they teach us to understand things, subjects, but in practice we do not act as well as we should. We act without thinking and this is not always good, we always want to act in a way that only leads to bad consequences.

A7 In a way, between theory and practice we can say that there is no relationship, the way of talking about Philosophy by the teacher can be very clear, but for the students it becomes difficult. Practicing philosophy turns out to be a big problem for students, speaking and acting are not easy things to accomplish, so I find no relationship between the two issues.

A8 Philosophically thinking and speaking everything seems to be very easy to be accomplished. We idealize the solutions to problems so quickly, we criticize what is in speech, however, when we experience daily experiences we feel such difficulty in promoting changes. One of the reasons is the fact that we live in an eclectic, modern society, where individualism often predominates and not the collective, thus reflecting in the school. Theorizing is easy and practicing is not an isolated act.

A9 Between theory and practice in high school philosophy, both practice and theory are very different, where almost always in both things the teacher fails to pass on the information from the book, the knowledge to the class.

A10 There is no relationship between theory and practice in the classroom, the teacher only goes over what is in the textbook.

A11 Theories are always greater than practice, there is no relationship between what is shown by the teacher in the classroom and the events of everyday life, our homes, the street, society in general.

A12 to begin with, Philosophy is a very boring subject, which cannot say what we need to hear when talking about practice.

QUESTION 2- What are the difficulties of studying practical philosophy at school?

A1 The difficulty is often in understanding, not because of the lack of explanation, but because of the crowded classroom, the noise ends up making the teacher stop explaining.

A2 The difficulties of studying practical philosophy at school are because philosophy studies social facts.

A3 In most schools there are no teachers to teach philosophy. Students understand what teachers teach, but they don't put it into practice because they don't know what it has to do with the world outside.

A4 The biggest difficulty is the lack of a teacher specialized in Philosophy, because because they are not trained in the area they do not know how to give a good explanation to the students and thus they do not have a good understanding of the subject discussed in class.

A5 Philosophy is not seen as an important subject because the teacher has little workload, so it ends up unnoticed in school practice.

A6 Some teachers are not trained to teach what they should, in this case the subject, so in the school I study I realize that Philosophy does not have much importance for my colleagues.

A7 Philosophy is a subject that is only exercised through ideas, reasons and thoughts. Most schools do not adequately convey these characteristics to students, thus making it more difficult. Schools often end up isolating the idea of Philosophy, because the policy believes that philosophizing will transform people with new ideas and new ways of thinking, thus gaining a rivalry.

A8 Generally there are people who do not want the new, are tied to comfort, pose difficulties because it is also a discipline that needs constant reading, to know the theory of philosophers who throughout history have become martyrs in the philosophical world.

A9 The difficulties of studying a practical philosophy at school lie in the fact that often the student does not understand and the teacher cares to repeat what was passed on and the student does not ask the teacher or ask him to explain again.

A10 The teacher needs to improve his way of teaching, he needs to participate in courses to be able to pass on the subjects with greater tranquility and security.

A11 We do not feel stimulated to study and Philosophy classes require students to read a lot, but we cannot understand the contents of the book.

A12 Teachers have many difficulties, even because schools are without many resources and they are discouraged to teach their classes.

QUESTION 3- How should philosophy be studied in secondary school?

A1 It should be more theoretical so that we have a good understanding of the subject.

A2 Well, there should be a specific way to study philosophy in high school. It is difficult because we only study in the book, doing activities, this helps, but it is not enough for us to really know Philosophy. Nowadays there have to be several other ways to learn about philosophy.

A3 I think that Philosophy should be taught by more specialized teachers, because in some schools teachers from other areas who teach Philosophy do not know how to teach very well because they are not trained in Philosophy.

A4 There should be teachers trained in the subject so that students have a good understanding of the subject, generating curiosity and willingness to learn and know more and more.

A5 In all schools, philosophy teachers should be trained and teach the subject they are trained in, so that students would pay attention to everything they would pass on and understand everything that was taught.

A6 It could be given by more specialized teachers with a desire to teach, because usually they pass more work and teach less what they should teach.

A7 The way of teaching is great, what is missing in all this is to carry out ideas that can, through various means, motivate students for the education of Philosophy, that is, organize projects that make people identify more, or even find themselves with new ways of thinking transmitted through Philosophy.

A8 With enough dynamics, with access to the internet, with research where they were portrayed how important Philosophy is in the cultural growth of a people. It would be essential for all students to value these learning moments.

A9 Philosophy in high school should be studied in a more elaborate way, in a way that is easier to understand, because most students do not like philosophy.

A10 The teaching of the subjects could be done in another way, not only reading, reading and reading, to do work, but that could show other examples without being those of the book.

A11 Philosophy should be given more importance than other subjects such as mathematics and Portuguese, as they are all important for the student's growth as a person.

A12 It needs to be worked according to the reality of the student and the society where he lives, where the good and bad things are, especially today with so much violence, misery and drugs of all kinds circulating many times inside the school.

SEVEN
publicações acadêmicas

The teaching of the disciplines of financial mathematics and institution of public and private law during and after the pandemic in the course of accounting FEAC- UFAL

Crossref doi
https://doi.org/10.56238/ptoketheeducati-082

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ABSTRACT
On March 11, more than 128 countries identified the presence of the virus (Covid-19) as a pandemic, due to the severity of the disease and the exponential geographical contamination. As it spread, the threat of an economic recession materialized, where educators had to focus on the task of teaching remotely. Highlight the impacts of COVID-19 in the disciplines of Financial Mathematics and Institution of Public and Private Law of the Accounting course, FEAC – UFAL. The methodology adopted was through material already published, such as books, articles, periodicals, Internet, etc. This topic can help in pondering some aspects: During and after the pandemic were their dropouts in the school semester? What is the prospect of adopting active technology in case the crisis is repeated? How to promote the reception of the student of the face-to-face graduation of FEAC by virtuality? In view of the above, as a conclusion, it is observed that the data raise a special attention in the educational context for hybrid education. There is still resistance to the use of digital technologies in the classroom. However, it is necessary to always be willing to learn whether in the technological, interdisciplinary, social-emotional, scientific sphere, based on the dialogue between professor, student, and higher management of a Higher Education Institution.

Keywords: Information and Communication Technology (ICT), Covid-19, Evasion, Web Conferenc-ing.

1 INTRODUCTION

1.1 CONTEXTUALIZATION OF THE THEME

At the end of December 2019, the World Health Organization (WHO) was warned about high cases of pneumonia in the city of Wuhan of China. At the time investigated a type of coronavirus that had not been recognized before in humans.

On January 7, 2019, Chinese authorities proved that they had pointed to a new type of coronavirus. Subsequently, on January 30, the WHO declared that the outbreak of this virus (Covid-19) constituted a public health emergency of international importance.

On February 6, Law No. 13979 was enacted to address the public health emergency, which aims to "protect the community."

Immediately, on March 11, more than 180 countries identified the presence of the virus as a pandemic, due to the severity of the disease and the exponential geographical contamination.

The Crescent In advance of disease contamination, several government authorities have been adopting various strategies, with the intention of reducing the pace of disease progression (Kraemer et al., 2020).

Given the addressed, COVID-19 is transmitted from being to being, by sneezing, coughing, accompanied by any and all minimal contact through the mouth, nose or eyes, as well as through contaminated objects and surfaces (WHO, 2020b).

The first measure adopted, among the strategies it was social distancing, avoiding crowds in order to maintain at least six feet of distance between people.

Events were also banned, despite some relaxations according to the color range classified due to the high number of people infected. (Kings-Son & Fifth, 2020).

Oliveira (2020) highlights on the recommendation that people suspected of having the virus, remain in quarantine for fourteen days, as this is the incubation period of SARS-CoV-2, that is, the time for the virus to manifest itself in the individual's body.

Thus, several impacts in the scope of the economy and social relations were presented, as well as uncertainties and implications in various spheres, among them, in the scope of the education.

In view of what was addressed, initially there was a suspension**, of classes, for an indefinite period of face-to-face activities**, by order of the Ministry of Education, as an attempt to reduce the risk of contagion and spread of the coronavirus.

The use of web conferencing as a tool in distance education is not new, however, it is necessary to have more discussion on the subject, in the classroom, regarding the access regimes of both the student and the hiring of the teacher.

Ujvari (2011) draws attention to the fact that it is no longer possible to understand epidemics without covering the speed of population displacements, which must be taken into account in the speed of the control measures implemented, that is, due to transmissible diseases.

Leaving this reality of isolation more latent by emphasizing the spread by the geographical mobility of epidemics through infected individuals: epidemics, local, become pandemics, generalized geographically without containment measures.

Maia and Matar (2009) state that student and teacher interaction is only positive when there is complicity.

Thus, for web conferencing to be more effective, it is necessary to develop "strategies and skills to keep the focus on the discussion and stimulate the participation of all" (DOTTA et al, 2013)

Gomes et al (2013) states "the best classes are those that have movement, action, that know how to break the monotony". In this sense, it is important to evaluate the class, a step that can be done later.

Given the context addressed, the delimitation of the research takes place through the guiding question, that is, this theme can help in the weighting of some aspects:

During and after the pandemic, were there dropouts in the academic semester related to the disciplines of Financial Mathematics and Institution of Public and Private Law (IDPP) for the accounting course? What is the prospect of adopting active technology in case the crisis is repeated?

1.2 GOALS

To better delimit the theme for a better understanding, it is necessary to define the general and specific objectives of this research.

1.2.1 General Objective

Highlight the impacts of COVID-19 in the disciplines of Financial Mathematics and Institution of Public and Private Law of the Accounting course, FEAC – UFAL.

1.2.2 Specific Objectives

- Motivate the participation of students in virtual learning environments.
- Stimulate communication tools in the disciplines of calculus and law.
- Assess Learning in times of quarantine.

1.3 JUSTIFICATION

Remote learning **disseminates the real-time communication of classes through technologies.** The idea is that the teacher and students of a given discipline have interactions, at the same times that the classes would take place in the face-to-face model.

Thus, the teaching method applied in the pandemic resembles distance education only in terms of a construction of knowledge mediated by technology, but it is differentiated by virtue of following the principles used in face-to-face education.

The justification of this research is given by the fact that online classes, associated with a hybrid model may be a new strategy (in the medium and long term) in the teaching of the face-to-face modality, enabling a new method of virtuality in the current educational scenario.

Faced with these questions: How to promote the reception of the student of the face-to-face graduation of FEAC by virtuality?

Thus, the research reveals its relevance not only by contributing with the pertinent knowledge on the theme of active methodologies, but also by aggregating reports of the students' experience.

2 THEORETICAL CONSIDERATIONS

2.1 TEACHING LEARNING

According to Rosário et al. (2008, p.116), the term self-regulation of learning gained its peak in the 80s of the twentieth century, emphasizing the emerging autonomy and responsibility of students in the conduct of their studies. According to this author, self-regulation can be defined as an "active process in which subjects establish the objectives that guide their learning by trying to monitor, regulate and control their cognitions, motivation and behaviors in order to achieve them" (Rosário, 2005, p.37).

There are several ways to develop the teaching and learning activity. There are cases where this action is in a group, to have a great interaction between the participants, thus addressing the main themes in order to meet all students.

However, as there are different forms of learning, according to Perrenoud (2016) all students have the right to have an individual teaching, if it is noticed that the form of learning used by the teacher is not reaching its objectives with any student.

The student, when reviewing the content to teach, thus improving their own knowledge by receiving guidance from the teacher of the discipline and therefore, allows students to enjoy the possibility of resolving conceptual doubts and solving exercises, as well as direct contact with someone who understands it more directly (Molero & Fernández, 1995).

According to Molero and Fernández (1995), learning among students is constituted in an education system in which the partners teach and learn each other, that is, one student teaches the other with a work proposal in which everyone participates by discussing and reflecting together on certain content.

Duran and Vidal (2007) highlight that there needs to be an investment in prior qualification for students, offering clarifications if necessary for the good performance of such function; organize systematic supervision by the professors and advisors, especially in activities related to teaching; thus providing opportunities for reflections on the change of conception with practice.

However, care must be taken not to believe that this is an easy teaching modality, because it consists of a practice that requires monitoring by the teacher, care in the training of students, and commitment of the Educational Institution to do a quality work.

With the evolution of technology, virtual learning environments are gaining more and more spaces, as well as social networks, no longer only an entertainment channel but also a space used for learning.

In this sense, Ira Maciel (2008) highlights the possibility that virtual learning environments should contribute to extinguish distance learning, highlighting some items: organization of the environment; interfaces that are easy for students to handle; attractive environment; resource offerings for individual and group learning; access to bibliographic sources; interactive communication

(asynchronous and synchronous); existence of space for personal presentations, distinct options of evaluative actions; enable conditions for the responsible person to monitor and evaluate the student.

The interaction, the language of the material adopted, it is also necessary to remember the autonomy that the student must have for a better construction, motivate him to the responsibility in the teaching-learning process, leading it, organizing it, cites Struchiner (2008).

Thus, in the constructivist environment, the learner must be the producer of knowledge, monitoring together with the teacher his learning process, substantiating each answer, forgetting the traditional method of what is right or wrong.

Fernandes (2011) warns that in the virtual learning environment teaching is based on the socio-constructivist conception in which the student is seen as a builder of knowledge.

Rodrigues et al (2020) cite that with advances in technology, the student can be closer to each other through the application "WhatsApp" thus generating better results for the classes. Another fact that deserves to be highlighted is that in the first week of class, although distant, this technology made most students feel safe and their planning of activities, was being created together with the teacher guiding the discipline.

2.2 EDUCATIONAL POLICIES IN THE PANDEMIC

VITORINO and HOLLNAGEL (2020) highlight that: "in March 2019, the covid-19 pandemic was made official in Brazil, accompanied by decrees (created by federal, state and municipal agencies), which regulated conducts to be followed as a contingency plan to restrict the contagion of the disease."

The alternative adopted was to leverage remote teaching for educational institutions.

CARVALHO and ARAÚJO (2020) state that, in the same way that the remote as an alternative "enabled" access to classes, a marked fragility was highlighted in the classes referring: to the teaching and learning process that caused a very high school dropout.

In Brazil, several educational policies were created that reflected the characteristics of our legal system in which gradually, public and private institutions of Higher Education were assuming several protocols of suspension of classes, initially, in favor of social isolation, correlated with the political-administrative decisions of each Brazilian state.

Of the protocols created several studies are related:

- Theme addressed by the Organization for Economic Cooperation and Development (OECD), of the authors, Reimers and Schleicher (2020), who suggest groups for the construction of standards and indexes to be able to understand the national and global responses related, mainly, to Education, as well as to think about monitoring and future investigations.

The authors highlight the new legal and administrative concepts to support political actions in education in relation to the regulation of remote work for the implementation of Emergency Remote Teaching (ERE).

REIMERS and SCHLEICHER (2020) cite about the importance of didactic-pedagogical issues, of how the curriculum will be adapted. In this way there is a concern of how the classes will be built in the remote model and adapted in the period of isolation.

Universities have also been forced to rethink their activities. It was no different at UFAL (Federal University of Alagoas), where a deficit of one semester due to the necessary adjustments, suspending classes, in a first phase.

In the second moment there was a study and, in this way, an exceptional academic period was created.

Thus, HODGES et al. (2020) highlight that the multiple activities and Face-to-Face Education, saw the demand for the use and support of Non-Face-to-Face Education increase in a way for which they were not prepared.

The institutions that responded quickly, in a massive way, theoretical methodological practices of remote teaching, at the undergraduate levels were the Private Institutions.

As for the reality that existed before the pandemic, table 1 depicts the estimates of people in higher education.

How many would be, in 2018, unable to follow remote teaching-learning activities because they do not have home access to the internet with minimum quality to access.

Table 1 – Profile of undergraduate students without home access to broadband or 3G/4G internet – Brazil 2018, by color/race, type of institution, location of the student's home and income

Frequentavam uma graduação	Mulheres negras ou indígenas	Mulheres brancas ou amarelas	Homens negros ou indígenas	Homens brancos ou amarelos	TOTAL
Por tipo de IES					
Públicas	**543.518**	**518.762**	**507.100**	**479.801**	**2.049.181**
Sem internet em casa	21.776	11.911	20.520	5.960	60.167
Privadas	**1.623.700**	**1.750.394**	**1.179.541**	**1.285.216**	**5.838.851**
Sem internet em casa	41.330	21.965	19.025	12.560	94.880
Por região de localização do domicílio					
Norte	**296.425**	**102.371**	**232.356**	**68.540**	**699.692**
Sem internet em casa	13.109	2.421	8.675	1.321	25.526
Nordeste	**717.213**	**317.981**	**545.132**	**256.472**	**1.836.798**
Sem internet em casa	31.343	10.321	20.189	7.018	68.871
Sudeste	**777.571**	**1.102.920**	**621.500**	**860.667**	**3.362.658**
Sem internet em casa	10.230	10.602	6.674	3.625	31.131
Sul	**134.347**	**581.693**	**107.684**	**447.750**	**1.271.474**
Sem internet em casa	3.558	7.378	761	5.304	17.001
Centro-Oeste	**241.661**	**164.191**	**179.970**	**131.589**	**717.411**
Sem internet em casa	4.867	3.153	3.245	1.252	12.517
Por situação do domicílio (urbana ou rural)					
Urbana	**2.042.489**	**2.172.412**	**1.610.166**	**1.700.711**	**7.525.778**
Sem internet em casa	40.840	26.031	22.688	14.790	104.349
Rural	**124.729**	**96.744**	**76.475**	**64.307**	**362.255**
Sem internet em casa	22.267	7.844	16.856	3.730	50.697
Por faixa de rendimento domiciliar *per capita*					
Baixa renda (até 1,5 SM)	**1.490.957**	**1.111.100**	**973.760**	**702.596**	**4.278.413**
Sem internet em casa	58.081	23.028	35.258	10.550	126.917

SM: salários mínimos

Source: Castioni et al (2021)

Nascimento et al. (2020) reveal that the solution, through the availability of chips, would solve the problem for more than 60% of undergraduate students without home access to the internet.

Many, however, would still need places with availability of internet signal, because in their homes does not even reach cellular mobile network signal.

Castioni et al (2021) highlighted that for students, the register that each federal university maintains of its beneficiaries of the National Student Assistance Program (Pnaes).

In this sense, the resources programmed for the PNAES (R$ 1.038 billion in the General Budget of the Union for 2020), according to Siga Brasil, (BRASIL, 2020b) can be used for digital inclusion, according to § 1 of article 3 of Decree No. 7,234/2010, which provides for the Program.

In July 2020, four months after the outbreak of the pandemic, MEC announced an emergency contract, through the National Education and Research Network (RNP), of a mobile data package for students in a condition of socioeconomic vulnerability (RNP, 2020).

3 METHODOLOGY

3.1 TYPE OF RESEARCH REGARDING PROCEDURES

This research is a study characterized as an Integrative Literature Review (RIL), which according to Silva et al, (2020) enables the identification, synthesis and execution of a broad analysis in the literature about a specific theme.

3.2 BIBLIOGRAPHIC RESEARCH

It will be elaborated through material already published, such as books, articles, periodicals, Internet, etc. You can say that this category of research is a type of bibliographic review, or bibliographic survey.

In this sense, Gil (2007, p. 44) explains that the most characteristic examples of this type of research are investigations on ideologies or those that propose to analyze the various positions on a problem.

3.3 FIELD RESEARCH

Also considered field research because it will be carried out an analysis of student dropout through data collection by academic pages.

The case study, for this research, is approached by numerous authors, such as Yin (2005) who defends the idea that a "case" is configured as something defined, even if it is on a more abstract plane, that is, the situation in question: the decision to conduct home studies in the face of the closure of universities due to the coronavirus pandemic.

3.4 POPULATION AND SAMPLE

The population that will be studied in this research will be the students of the undergraduate courses of Accounting of FEAC-UFAL of the disciplines of financial mathematics and IDPP.

The time space used will be composed of the year 2021 and 2022 (period of validity of the research).

This period was established to better accompany the agents involved before, during and after the pandemic.

In view of the above, the following steps will be used:

- Delimitation of the theme and construction of the guiding question of the research;
- Survey of publications in selected databases;
- Inclusion, critical analysis of findings and synthesis of literature review (Souza et al., 2010).

In order to ensure the necessary ethical care, Resolution 510, of April 7, 2016, of the National Health Council (BRASIL, 2016), which provides for ethics in research in Human and Social Sciences, was taken into account.

Or Article 1 in its Sole Paragraph, item II, states that research using publicly accessible information will not be registered nor evaluated by the CONEP system, which exempts the present investigation from such analysis.

In the face of all the above, In order to guarantee the anonymity of the participants, the names of the professors who prepared the activities presented on an electronic site in the public domain will be omitted.

4 ANALYSIS OF RESULTS

In order to motivate the participation of students in virtual learning environments, the following strategies were developed:

Discipline of Financial Mathematics and IDPP

- The professor found it somewhat difficult to motivate students in the discipline of financial mathematics, since the interaction at the time of performing the calculations was often impaired, either for technological reasons or by the student's own performance.

The students did not answer the call. The same was highlighted in the evaluations.

As a stimulus it was necessary to improve remote classes valuing the student-teacher connection. The reception of the teacher is very important, because it overcomes the absence of physical contact, and in this sense the teaching was mediated through daily situations, video resources, films with the purpose of enriching the content of financial mathematics.

- As for the PPDI, the interaction was more prominent.

Insecurity, both food and professional, loss of family members and friends and emotional fragility generated by the pandemic were strongly highlighted in the students, where many were afraid to interact, felt uncomfortable because they were isolated, due to lack of condition of electronic material, as well as lack of access to the internet. This absence was filled after the edict to provide chip to the students.

With blended learning, students have greater control over their own learning. This is because they are no longer restricted to the workload of face-to-face classes to absorb content about the disciplines.

Another specific objective was to stimulate communication tools in the disciplines of calculus and law. In this sense, the most used tools were: WhatsApp, social network, social device, videos recorded by the teacher, you tube, etc. The environment used in the virtual classroom was google meet.

UFAL promoted courses for teachers, at various levels, to use virtual environments, such as moodle.

And finally it was to assess learning in times of quarantine. (Less than 35 students) Integration is still compromised.

Table 1 – Students enrolled in the research disciplines

Enrolled	Remote	Classroom
IDPP	< 33 students enrolled	➢ 50 students enrolled
MAT FIN	< 33 students enrolled	➢ 45 students enrolled

Source: Prepared by the author

Table 1 shows that at the remote moment there was resistance on the part of the students to enter the disciplines, due to the criteria already discussed previously.

Table 2 shows the participation of students in the disciplines. It is important to highlight that in the remote environment both in IDPP and in financial mathematics, participation was minimal, and that in the classroom there is a better debate on legal issues, as well as a greater involvement in the calculations constructed.

Table 2 – Participation of students in the research disciplines

Participation	Remote	Classroom
IDPP	< 10 students	➢ 30 students
MAT FIN	< 6 students enrolled	➢ 30 students enrolled

Source: Prepared by the author

In table 3 it is highlighted that the attendance in classes, in the remote is much higher than in face-to-face teaching, this is the case, that many students accessed the class in the work environment, in public transport, etc. What can not be done in the traditional modality (face-to-face).

Table 3 – Attendance in the classes of the research disciplines

Presence	Remote	Classroom
IDPP	90%	75%
MAT FIN	90%	70%

Source: Prepared by the author

In table 4 the performance in remote teaching is higher than in face-to-face teaching. What has not necessarily been a better learning, since the control of the evaluations in the remote model is impaired.

Table 4 – Students' performance in the research disciplines

Yield	Remote	Face
IDPP	97%	93%
MAT FIN	97%	93%

Source: Prepared by the author

5 FINAL CONSIDERATIONS

Inclusion in higher education education is everyone's right, BEFORE, DURING and AFTER the pandemic. The objectives of this scientific research have all been achieved.

Thus, it was observed that remote teaching, adopted in the midst of the pandemic, due to COVID 19, has led to numerous changes for the educational scenario in Brazil.

Some topics were put on the agenda, for example: the use of technologies as allies in the classroom, the high inequalities of access to digital technologies, whether by access to the internet and/or electronic material and the valorization of the teacher, increasingly forgotten, especially in private institutions.

It is important to emphasize that, after this pandemic period, Brazilian education will never return to what it was before.

Regardless of the high inequalities present in our society, whether in Alagoas or in Brazil, remote and face-to-face teaching set precedents for a new look: a hybrid education. Wave are highlighted new formats in learning.

In the same way that teachers had to adapt to new ways of teaching, different teaching and assessment tools, weaknesses in the infrastructure, work overload, students also had to readapt to the focus of learning, new plans aimed at the organization of studies were fundamental to adapt to the new digital world experienced.

Thus, it brings a greater mastery over the subject itself, by virtue of not being stuck to the moments witnessed and being able to absorb the contents gradually.

Given all the above, the guiding questions of this research were: During and after the pandemic there was a drop out in the academic semester referring to the disciplines of Financial Mathematics and Institution of Public and Private Law (IDPP) for the accounting course? The dropout of more than 40% occurred during the pandemic and in the PLE (Exceptional Academic Period).

After the pandemic, that number was greatly reduced. What is the prospect of adopting active technology in case the crisis is prolonged? Hybrid teaching will be an alternative using up to 40% remote according to the new guidelines of the Ministry of Education, although it is still a topic of discussion at UFAL.

It is possible to adopt the best parts of the teaching models: remote, face-to-face and hybrid to achieve a single goal: to improve student learning to always ensure a quality education.

However, it is worth mentioning that students tend to learn better when books are printed, that is, print is more effective to fix the narratives. The e-book represents a deficit in the quality of learning, where screens can most often affect the assimilation of reading.

Physical contact with the book is more motivating, weight, page turning, smell, than the digital e-book. It is necessary to rethink public educational policies and ensure motivation for students by providing more appropriate and innovative materials and methodologies.

In this sense, in view of the three realities, the data raise a special attention in the educational sphere for hybrid teaching. There is still resistance to the use of digital technologies in the classroom.

However, it is necessary to always be willing for learning whether in the technological, interdisciplinary, social-emotional, scientific sphere, based on the dialogue between professor, student, and higher management of a Higher Education Institution.

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SEVEN
publicações acadêmicas

Use of the gamified digital platform Classcraft® as a strategy for the teaching of cell biology in higher education

Crossref doi
https://doi.org/10.56238/ptoketheeducati-083

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ABSTRACT
Due to the health context experienced by the COVID-19 Pandemic, in the years 2020 and 2021, digital platforms as well as virtual learning environments, Google Meet and Google Classroom, were the main communication tools between students and the teacher. In this scenario, advances in the use of digital and multimedia tools have contributed to the construction of a range of possibilities for the teaching-learning process. Linked to this, the use of gamified digital platforms can make a more stimulating and pleasurable task, causing greater engagement, interaction, and emotions, in addition to favoring the inclusion of technologies in the teaching-learning process. The education-focused gamified digital platform Classcraft® offers an approach that engages students by combining elements of role-playing games with the educational environment, creating an immersive and interactive experience.
Thus, this study aims to analyze the use of the gamified digital platform, Classcraft®, as a strategy for the teaching-learning process of the students of the first period in the discipline of Body, Movement and Biological Knowledge offered to the Physical Education courses of the Bachelor's and Licentiate modalities of the Federal University of Espírito Santo in the academic semester 2022/2. For data collection and analysis, three forms were applied throughout the semester with the objective of describing the profile of players of the analyzed classes, evaluating the use of the digital platform regarding usability and player experience, as well as investigating the perception of students in relation to the methodology used.
The results of the present study reveal that the use of the gamified platform Classcraft® in higher education provided a positive experience to students, stimulating their engagement, learning and reflections. However, we have identified some areas that can be improved in the use of this platform. These findings are a starting point to further improve the implementation of gamification strategies, contributing to the advancement of education in higher education.

Keywords: Digital platforms, Gamification, Teaching-Learning Strategies, Higher Education, Technologies.

1 INTRODUCTION

It is remarkable that the social, economic, technological, cultural, and political transformations of recent years have impacted numerous areas of society. Therefore, education is also a product of these transformations, as well as higher education institutions, with all their processes and subjects that constitute it, as well as the teaching-student-knowledge relations and teaching practices.

Thus, much is debated about the role of the student and the teacher in the teaching-learning process. For a long time, the protagonist of this process was concentrated on the teacher, who in this context, assumes the role of holder of all knowledge. This pattern, still frequent in the educational environment, even if functional, no longer follows the demands of modern society. In this sense, an innovative education is sought, in which the focus is on learning, evidencing the protagonist of the student (Moran, 2004), by rethinking the space of the classroom and including access to new technologies as well as the use of virtual learning environments, makes the content more accessible to new generations.

With the advancement of technologies, it is noted that social relations, increasingly, are conditioned to technological tools such as social networks and communities in messaging applications. Through the eyes of Castells in his work "The Network Society", published at the turn of the century (1999), the author denounces that the society of which we are part has developed under the logic of networks. In this perspective, two centuries later, the term "platform society" created to describe the role that digital platforms have occupied in society has been consolidated (Belli and Zingales, 2020). A very clear example are the social networks and search engines, such as Whatsapp, Instagram, Twitter, TikTok and Google that have revolutionized the forms of communication and search for information.

As for the educational environment, it is evident the progress over the years in relation to the access and acquisition of technological resources for educational institutions, such as computers, projectors, among other equipment. However, this is still resistant to the inclusion of technological resources in its methodological procedures.

However, in the context of the COVID-19 Pandemic in the years 2020 and 2021, the digital environment has become the only possible alternative to continue teaching. Control measures adopted to curb the spread of the virus, such as social distancing, have affected numerous sectors of society, including the education sector. On March 17, 2020, the Ministry of Education (MEC), authorized by Ordinance No. 343, that face-to-face classrooms be replaced by digital means, in federal universities and in private institutions of higher education adopting "remote teaching". For the establishment of this teaching modality by the Federal University of Espírito Santo (UFES), the central administration together with the academic community and the Council for Teaching, Research and Extension (CEPE), approved on August 18 Resolution No. 30/2020, which regulated and implemented the Temporary Emergency Remote Teaching-Learning (EARTE) in September 2020.

At this time, digital platforms such as Virtual Learning Environment (VLE / UFES), Google Meet and Google Classroom were the main communication tools between students and the teacher. And despite concerns about access to technological tools and instruction for the use of digital resources, these changes, even if emergency, in the approach to the teaching-learning process have made it possible, if not essential, to explore the digital environment.

The pandemic evidenced the lack of inclusion of Information and Communication Technologies (ICTs) in the educational routine and. on the other hand, the activities in the remote environment provided advances in the use of these tools, a process that contributes to expand the possibilities for the teaching-learning process. To recognize the space that technologies occupy in society, in general, is to recognize what skills and competencies need to be stimulated in the educational environment, such as autonomy, criticality and problem-solving capacity.

It is important to mention that digital platforms for teaching are already widely used in Distance Education (EaD), understood as an educational modality that can occur through technological resources and has spatial and/or temporal flexibility. From this perspective, with the growing development of digital technologies, distance education has occupied contexts such as training courses, technical courses, language courses, in addition to higher education.

It is evident that only the use of ICTs, multimedia resources and virtual environments do not guarantee learning, which depends intrinsically on motivation, as addressed by Deci and Ryan (1985, 2002) when they propose the Self-Determination Theory (TA). This theory points out that motivation is *a continuum* between the reward and the challenge proposed by a given activity, being the support for growth, psychological integrity and social cohesion. In this same field, the psychologist Mihaly Csikszentmihalyi, through his work "Flow: The Psychology of Optimal Experience" published in 1990, shows that by experiencing an engaging and immersive experience the individual can reach a plateau of satisfaction that the author defines as *flow* or flow state, which would be the balance between pleasure when developing a challenging task and the skills to develop it. This becomes clearer by observing the mechanics of games, whether digital games or not, during the game players when in a state of flux do not notice the passage of time. So, would it be possible to awaken this state of flow during the learning process?

It is known that the practice of playing is intrinsic to the human being, and is an activity that triggers the state of flow, as well as reaches the level of motivation sufficient to cause a change of state. In this context, when playing, the player needs to explore their best skills and competencies that vary from player to player.

Therefore, according to Marczewski (2014), there are six categories that are based on the behavior and preferences of players, such as: players motivated by dominance, those who like to look for challenges to be overcome, these are called Archiver. Already, players who want to break the rules

and force a change be it positive or negative are called Disruptor. While players who are motivated by creating things and exploring the system are called Free Spirit. The Philanthropist, are motivated by a collective purpose and do not stick to the reward, while the Players, are motivated by the rewards and do what is necessary to obtain it. Those who are motivated by the relationships the system can provide are called Socialisers. On the other hand, each player can identify with one or more typologies, so Marczewski (2014) created a series of twenty-four questions that make it possible to identify the type of player predominant in each profile observed.

In addition, it is possible to notice that each game, in addition to having skills to overcome the challenges proposed, has its own characteristics, such as card games, digital games, board games. Thus, Werbach and Hunter (2012) pointed out that the elements that make up a game can be classified into three dimensions with regard to the level of abstraction: dynamics, considered the highest level of abstraction of game elements, are defined by the author as the themes around which games will be developed, such as the narrative of a story in role-playing games. The second category is the mechanics, which are characterized as the tools that determine more specific actions of the players, such as the possibility of the player to collect items along a course. The components, third category, refer to the most concrete elements of the game, these will be visualized and used in the game interface, such as avatars and ranking. It is possible to combine these three dimensions including the amount of elements according to the degree of freedom that is desired for the player, objective of the game or according to the player profile that is intended to be achieved.

Therefore, the elements of games can be applied in various contexts, which is already quite common in areas such as education, marketing, training people and work environments. This method is known as Gamification, translated from the English Gamification , conceptualized by the British programmer Nick Pelling, in 2003, refers to the use of elements, mechanisms, dynamics and techniques of games in contexts that are not games (Navarro, 2013). Lopes (2015), adds that:

> "... Gamification can be defined as a strategy of interaction between people and even companies conducted in a measurable, interactive and engaging way, using the elements of games in non-playful situations. Therefore, gamification is used to create or enhance a user's experience in front of a product or task, arousing positive emotions, exploring personal skills, rewarding and motivating people."

These gimmicks can then stimulate engagement, interaction, feelings, and emotions that differ from everyday life. Therefore, it is possible to make a task more stimulating and pleasurable by combining the use of ICTs in the educational environment with gamification.

As an example, Khan Academy, a gamified digital platform applied to teaching, uses gamification in subjects such as mathematics, science and programming offering challenges and rewards as students advance in their studies. Duolingo, in turn, uses game elements to make language learning more appealing, offering levels, scores, and challenges to motivate students to practice and

progress in their proficiency. Both models presented are centered on the theory of Flow, characterizing the efficiency of the model in keeping students in an environment in constant discovery and with visible evolution of the learning process. As we move into the twenty-first century, we can expect to see a continued increase in the use of gamified elements in education, harnessing the benefits of digital technologies and the Internet to provide more effective and rewarding learning experiences.

Another example is the gamified digital platform, Classcraft®, the focus of this chapter, focused on education through an approach that combines elements of role-playing games with the educational environment, creating an immersive and interactive experience. By accessing the platform, educators have the flexibility to tailor the platform to the needs of their classroom and the specific content they are teaching. Access to Classcraft® can be accomplished by entering your address in the web browser (https://www.classcraft.com/pt/) and performing a simple login. The platform is designed to be accessible on both desktop and mobile devices, facilitating teacher-student interaction. This offers features such as custom avatars, maps, ranking, rewards system, store, in addition to the forum that was used for questions and most important announcements (CLASSCRAFT, 2023).

However, it is worth highlighting some academic studies on the Classcraft® platform to evaluate its effects and benefits on elementary education, exploring the use of the platform and its impacts on student behavior, engagement, and academic performance. In this way, Sanchez et al (2017), based on results of experiments conducted in France and Quebec, highlight the importance of considering the students' experience, rather than the game itself, when implementing gamification strategies using the Classcraft® platform. That is, to create a reflective learning environment, in which the interactions and the meaning of the activities are transformed into a non-essentialist view of a game, generating a metaphor that promotes the creation of a playful environment that stimulates engagement and reflection in students.

Moreira et al. (2022), demonstrated that the use of the Clascraft® platform as an engagement strategy, promoted motivation in students and increased their involvement in the context of the discipline of Software Quality, noted that by adopting gamification, students could be better prepared to face the frequent challenges encountered in software development, contributing to better academic performance in this specific area.

Thus, the present study aims to analyze the use of the gamified digital platform, Classcraft®, as a motivational strategy for the teaching-learning process of the contents of cell biology and histology in the Physical Education courses of UFES.

2 METHODOLOGY

This is a qualitative-quantitative study of a descriptive nature elaborated through a teaching project associated with the discipline Body Movement and Biological Knowledge, taught to the

students of the first period of the Undergraduate course in Physical Education in the modalities Bachelor and Licentiate of the Federal University of Espírito Santo (UFES). The main objective of the discipline is to discuss the structural and molecular aspects of the cell in addition to the structures and functionality of human tissues. This work was developed from the approval of the teaching project by the Pro-Rectory of Undergraduate Studies (PROGRAD/UFES), the data collected in this study refer to the semester of 2022/2 with the participation of 77 students enrolled in the discipline, among the undergraduate and bachelor's degree courses.

2.1 STRUCTURING OF THE DISCIPLINE: BODY, MOVEMENT AND BIOLOGICAL KNOWLEDGE

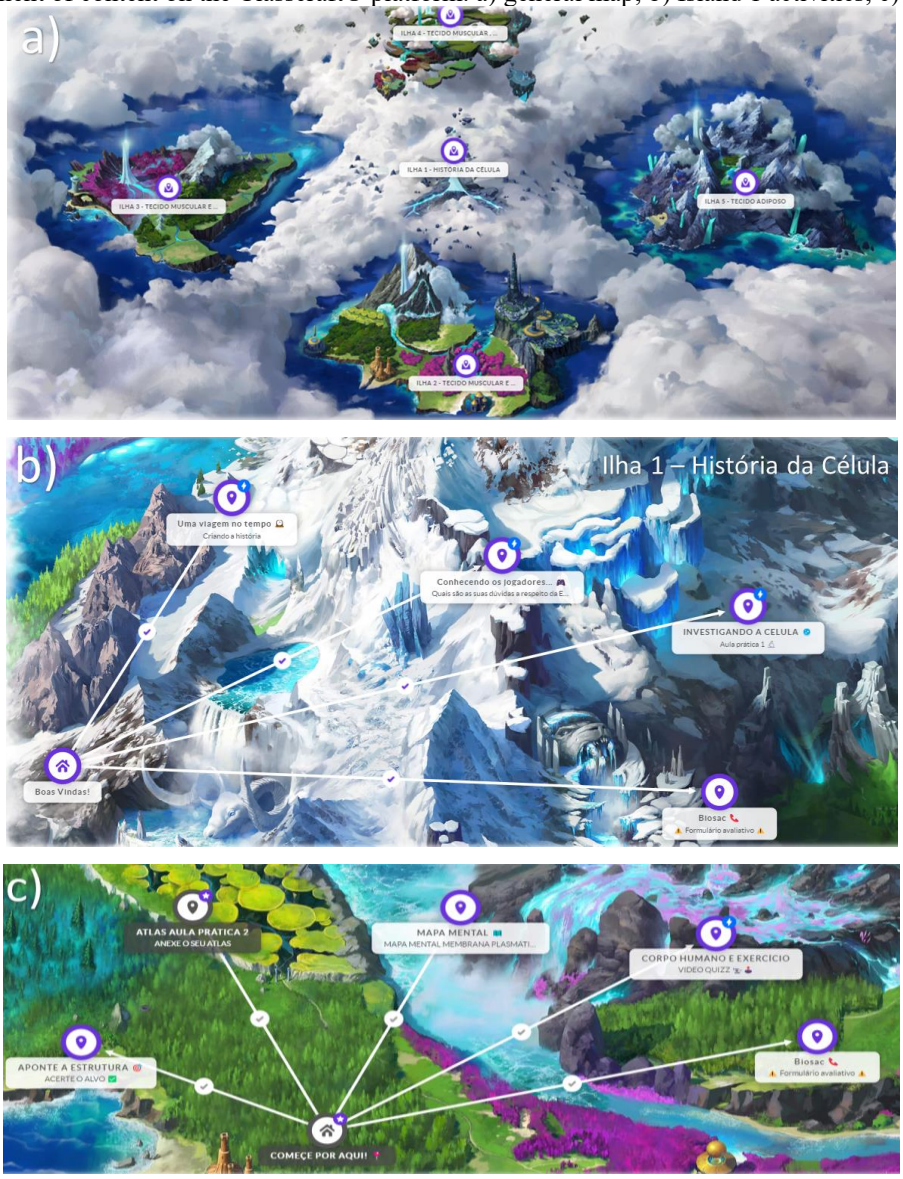
The subject, mandatory for all students of Physical Education courses at UFES, has 60 hours of semester workload. For the learning evaluation process, according to the UFES regiment, the student is considered approved in the discipline with seventy percent (70%) of use of the content of the evaluations scheduled at the end of the presentation of the Cytology and Histology blocks. The content taught in the classes, the asynchronous activities, the complementary material and the bibliographical references used in the discipline were described in the teaching plans and all the material was made available through the Classcraft ® digital platform. This is free to use and offers users gameplay through RPG (role play games), fostering the commitment and collaboration of the team. The presentation of the discipline on the Classcraft® platform, was initiated through a narrative that allowed students to understand the contents to be studied, the cells, cellular components and tissues in association with their characteristics and functionalities in the human body, The title of the story: A Journey to the Cells of Human Movement.

2.2 PLANNING OF ACTIVITIES

The activities of the discipline, practical and theoretical classes, were developed in an integrated way to the use of the digital platform. The teaching plan of the discipline was the tool used to guide the teaching-learning process that was presented and distributed as follows:

a) The content made available on the digital platform was associated with the layout of the discipline and was presented to create an immersive and engaging experience, using thematic islands that refer to a fictional world. These islands represent the different locations where the contents of the subjects are allocated, providing students with a sense of exploration and progression in the learning environment. Islands are usually divided into different areas or sections, corresponding to the different topics or content units of the discipline. Students can navigate between the islands and explore the areas corresponding to the specific contents, these were divided into five sequential islands and were in line with the topics addressed in the classroom (Figure 1).

Figure 1: Arrangement of content on the Classcraft® platform. a) general map; b) Island 1 activities; c) Island activities 2.



b) Different online activities were elaborated and inserted in the Classcraft® platform based on the free domain criteria, among them the Quizz application and programs/websites used for the creation/editing/display of graphic presentations (Educaplay, PowerPoint and Canva). The activities were used as a tool for review, deepening of the content and/or evaluation, with voluntary participation, with extra scores to the students.

2.3 DATA COLLECTION AND ANALYSIS

Mattar and Ramos (2019), Cislaghi (2008) and Feitosa *et al* (2014) agree that the use of digital technologies in the teaching-learning process can lead to greater motivation and involvement of students in their activities, on the other hand it is necessary to monitor indicators that enable a systematic collection of data the evaluation and correlation of these phenomena. In this sense, three forms were developed and applied throughout the semester to describe the profile of the class, evaluate

the use of the gamified digital platform Classcraft® and measure the perception of students through the proposed methodology.

2.3.1 Player Types

To identify the predominant player profile in the classes and to survey demographic data (gender and age group), an online questionnaire was applied with voluntary participation at the beginning of the school semester entitled: "What type of player are you?" this was elaborated through the Google form.

Based on the methodology proposed by Marczweski (2014), the form was described by twenty-four questions with five alternative answers that vary between the level of agreement (Strongly disagree, Disagree, Neither agree nor disagree, Agree and Totally agree) according to a Likert scale (5 points). For each student it is possible to identify a predominant type of player and the secondary ones, therefore, to determine the profile of the predominant player in the classes, only the answers "I totally agree" for each question were considered and it was decided to consider the values of relative frequency, for the presentation of the results.

2.3.2 Evaluation forms: BioSac

In the middle of the 2022/2 academic semester, students were invited to participate in an evaluation of usability and gaming experience on the Classcraft® platform (PINELLE, 2009 and NECKE, 2010). This evaluation was carried out in person and voluntarily, using a form entitled BioSac containing open and closed questions to describe the experience with the use of the platform. The closed questions were formulated based on a double alternative scale (agree or disagree) of answer.

Qualitative data were requested from the students through the description of three keywords that were related to the students' experience of using the platform.

2.3.3 Methodological Evaluation of the Discipline

At the end of the 2022/02 academic semester, students were invited to answer the form, voluntarily, referring to the methodological evaluation through qualitative data through open questions, where they could express their opinions, describe their experiences in addition to giving suggestions, criticisms and make comments for the improvement of the gamification methodology.

This combination of descriptive analysis of quantitative data and interpretive analysis of qualitative data allows to obtain a more comprehensive understanding of the use of gamification as a tool of the teaching-learning process of cell biology and histology in higher education.

The presentation of the results expressed in percentage and relative frequency, allows the overview of the patterns and trends present in the quantitative data collected. While the qualitative

data, present content analysis with the objective of identifying themes, patterns and emerging categories in the open answers of the participants.

3 FINDINGS

3.1 SAMPLE

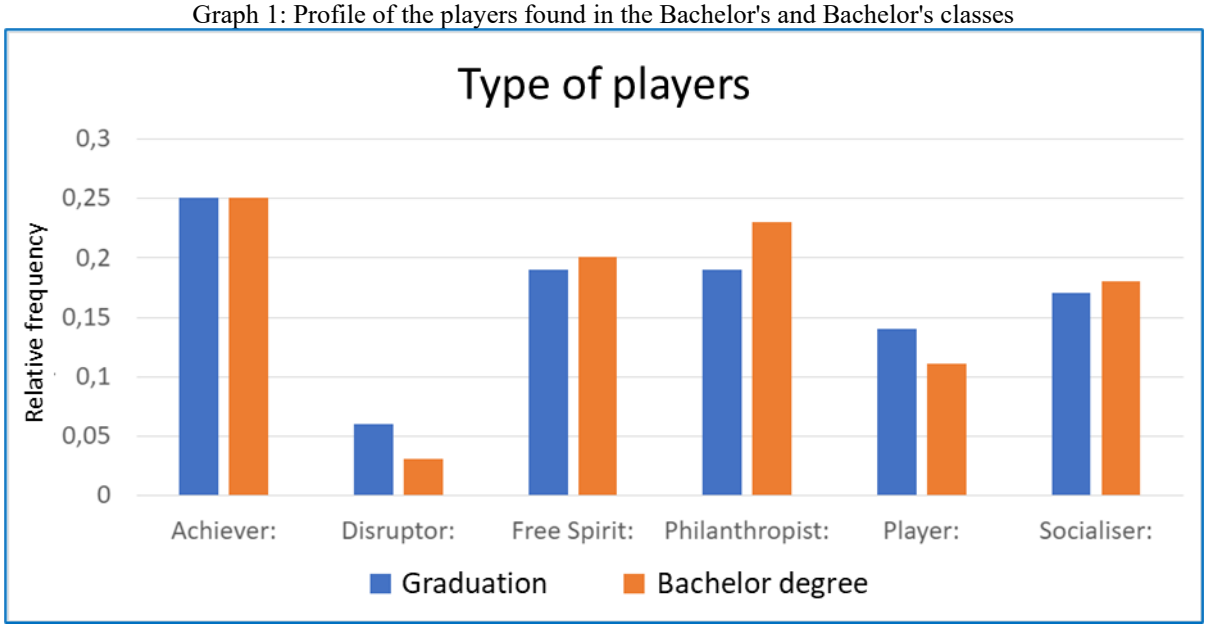
The results presented refer to the undergraduate and bachelor's degree classes of the Physical Education course of the Federal University of Espírito Santo enrolled in the discipline Body, Movement and Biological Knowledge in the academic semester of 2022/2. In total, 77 students were enrolled in the discipline between the two courses, bachelor's degree (n=37) and licentiate (n=40), respectively. However, it is important to note that the number of participants who answered the questionnaire was different between the bachelor's (n=34) and licentiate (n=27) courses.

Regarding the profile of the students of the bachelor's and licentiate courses, regarding gender, we observed that 58.8% and 48% are male and 41.2% and 51.9% female, respectively. And in relation to the age group we obtained the following distribution in the bachelor's degree course, 52.9% between 16-20 years and 29.4% between 20-25 years, while 17.7% have an age group equal to or greater than 26 years. In the undergraduate course, 51.9% between 16-20 years, 33.3% between 20-25 years, while 14.8% age group equal to or greater than 26 years.

3.2 TYPES OF PLAYERS

The results regarding the analysis of the profile of the players are presented as values of relative frequency (fr), thus allowing the distribution and classification of the profiles among the students of the bachelor's and licentiate courses, respectively, Archiver (0.25 and 0.26), Free Spirit (0.19 and 0.20), Philanthropist (0.19 and 0.22), Socializer (0.17 and 0.19), Player (0.14 and 0.11) and Disruptor (0.06 and 0.02) (Graph 1), We did not observe in the statistics, a significant difference between the profiles of the players of the students of the bachelor's and licentiate courses.

Graph 1: Profile of the players found in the Bachelor's and Bachelor's classes



3.3 *BIOSAC*

In table 1, we can observe the distribution of the percentages that characterize the criteria of usability and experience of the player in the Classcraft® platform, based on the responses of the students of the bachelor's and bachelor's degree courses. Regarding usability, about 75% of the students of both courses recognized that the deadlines for delivery of the proposed activities were sufficient, and they found the platform easy to use due to its intuitive layout. However, it is noteworthy that only 21.7% of the students of the bachelor's degree course and 28.6% of the students of the undergraduate course used important features of the platform, which consolidate its gamification proposal, these features include game elements such as avatars, diamonds and the platform forum.

Regarding the experience of students in the use of the Classcraft® platform, it is observed approximately 50% of the students of both courses, bachelor's and licentiate, highlighted that the problems found in the platform were not solved through the forum, thus corroborating the results presented in the usability criterion. It is also worth mentioning that approximately 60 to 80% of the students of both courses perceive their own progress during the use of the platform.

Table 1: Responses to the Biosac form regarding usability and player experience while using the platform. *forum=chat chat used to ask questions and announce important announcements.

Distribution of percentages			
		Biosac	
Criteria	Questions	Graduation	Bachelor degree
Usability	The deadlines for fulfilling the proposed activities are sufficient to carry them out	71,4	82,6
	Have you used the platform's forum?	52,4	47,8
	Are the functions and layout of the platform intuitive and easy to use?	73,1	75,0
	Have you ever used your avatar's diamonds?	28,6	21,7
Player experience	If you have used the forum, has your problem been resolved?	57,1	52,2
	Is the language used on the platform clear?	95,2	82,6
	Are you satisfied with the monitors' feedback?	85,7	73,9
	Do you identify your progress on the platform?	66,7	69,6
	In your opinion, is the platform a promising path for the discipline?	76,2	87,0
	Do you feel more motivated when performing the activities?	61,9	73,9

Regarding the qualitative analysis, students were asked to inform through three keywords the overview of their experience with the Classcraft® platform. The most cited words among the students of both courses, bachelor's and licentiate, were: Learning (10), Interesting (9), Legal (5), Knowledge (5), Challenging (3), Curiosity (3) and Learning (3).

3.4 DISCIPLINE ASSESSMENT

Regarding the evaluation of the discipline, a total of 40 responses were received that represent the variety of opinions of the students about the methodology adopted in the discipline of Body, Movement and Biological Knowledge. They highlight the positive aspects of the practical approach, the integration between theory and practice, the motivation provided by gamification, suggestions for improvements in resources and support, as well as additional comments on the expansion of knowledge and reflections promoted by the discipline. The answers were categorized and to illustrate the methodology adopted, random responses were selected from each category.

A) Positive points

Student 1: "... I really enjoyed it and learned a lot from the dynamics..."

Abulo 2: "... I liked the methodology of the discipline, gamification helps in learning, stimulating and instigating the student in the matter ...",

Student 3: "... The activities during the semester were the great positive point of the discipline, they made us, the students, try a little harder to study and learn the contents presented in the classes...".

B) Suggestions for improvements

Student 1: "... the Classcraft was a bit tricky, I found it hard to use..."

Student 2: "... I found the Classcraft platform confusing and needs improvement..."

Student 3: "... the Classcraft platform was innovative, but very confusing..."

C) Additional comments:

Student 1: "... experience unlike all other disciplines..."

Student 2: "... satisfactory experience with the contents and form of teaching..."

Student 3: "... good experience, I learned a lot from the contents and the way the teacher explained..."

4 DISCUSSION

Active methodologies are teaching strategies that place students at the center of the learning process, allowing them to actively participate in the construction of knowledge. These approaches are flexible, interconnected and hybrid, adapting to the needs and characteristics of students. In a connected and digital world, active methodologies manifest themselves through hybrid teaching models, combining different approaches. This combination of active methodologies with flexible and hybrid models brings significant contributions to the design of contemporary educational solutions for today's students. (Yaegashi, 2017). For Haguenauer (2005), teaching methods can be associated with an increase in creativity and intelligence of students and, therefore, it is necessary to modernize education to accompany the transformations that contribute and innovate the teaching-learning process in the academic sphere.

Given the need to promote a discussion with emphasis on these tools and their impact on education, it is justified to conduct studies that can quantify the values of this change and the applicability of new methodologies. According to Pedrosa (2011), the application of active methodologies leads the student to reflect on his work process and to transform his reality, benefiting it, considering that it awakens in him the critical sense and the search for changes in his relationship with himself, with the user and with the general community allowing him to realize that the new learning is a necessary and significant instrument to expand his possibilities and paths.

In this context, the results obtained in the present study corroborate with Landers and Callan (2014), that the gamification methodology can be one of the ways to promote this role with greater enthusiasm and motivation for active participation in the process of construction and collaboration in their learning process. Like other authors, they found positive results in terms of student motivation and satisfaction with the learning experience and highlighted that the use of gamification can promote

a positive impact in different areas of higher education, including improving student motivation, engagement and performance.

However, it is necessary that this approach is planned in an attractive way, but that it also contemplates the needs of the educational context to which it refers (Silva, (2019). In this sense, several aspects can be examined through the application of game elements, such as: usability (Pinelle, 2009), gameplay (Mohamed and Jaafar, 2010) and the player's own experience (Necke, 2010). Still, according to Necke, 2010, the player experience can be evaluated through several tools, including interviews, qualitative questionnaires and by gameplay heuristic method. According to Mohamed and Jaafar, 2010, it is seen that heuristic evaluation is commonly used, where the product or system is still in the process of development. Therefore, this tool makes it possible to map the usability and experience with the product in relation to the use of software being games or not, in order to improve the efficiency of the same.

To contribute to the discussion about the use of gamification as a motivational factor associated with digital technological resources in education, the results regarding the use of the platform were categorized into usability and player experience. Gamification and the use of digital resources are considered two approaches with ascending prominence in the education of the XXI century, providing new connections in the form of the teaching and learning process. According to the results obtained, about 65% of the students stated that they feel more motivated during the teaching-learning process, in addition to seeing their own progress when using the gamified digital platform Classcraft®. Therefore, applying elements and dynamics of games in educational contexts, makes the learning process more engaging and motivating and by associating digital technological resources such as the platforms and / or applications used in teaching, can show a significant impact on the way students communicate and access information.

Remote learning has accelerated the constant use of new technologies, accentuated interactions between teachers and students through video conferences, digital platforms and online communication groups. This process was experienced at EARTE/UFES, with the transition to remote teaching and the increased use of digital technologies, as well as the insertion of new approaches that have been explored in higher education. Pereira *et al*. (2021), investigated the implementation of remote teaching in the university context during the COVID-19 pandemic, highlighted that in addition to the adaptation of teachers to new technologies, digital resources promote the active participation of students, such as discussion forums and collaborative activities, seeking to maintain quality and interactivity in educational practices.

Johnson *et al*. (2016), highlights another important role that digital technological resources offer, the personalization of teaching, enabling a more individualized learning for each student, according to their pace and learning style and allows the teacher to improve their techniques and

interventions in the process without leaving aside the alignment to the pedagogical objectives and considering the characteristics and needs of the students.

Regarding the use of the platform, the results of this study indicate that approximately 55% of the students used tools such as the platform forum and about 75% of the students agree that the term of the activities was sufficient for their realization, as well as 55% of the students who resorted to the forum for doubts, these were resolved. Another important point of the results of this study concerns the characteristics such as the profile of the player that also influence the adherence and engagement of this proposed methodology. The results indicate uniformity regarding the profiles of players found in the studied classes. Hassan et al.*; 2019 and Klock* et al., 2020 showed that it is relevant to personalize the learning experience, and explored the relationship between students' player profile and their performance in a gamified environment. The results revealed that different types of players presented different preferences and behaviors during the learning process. However, there is no consensus in the literature about this direct relationship and effectiveness in the engagement process. According to Andrade (2018), it is not possible to state that personalized gamification provides greater engagement than non-personalized gamification, but the results suggest that users who stay longer in the system have greater engagement in a personalized environment. Thus, understanding the profile of the player can help educators in adapting gamification strategies, offering appropriate challenges and personalized stimuli for each student.

According to Brusilovsky (1996), in an individualized model that considers the objectives, preferences and knowledge of each player, the adaptation and interaction according to their specific needs is facilitated. It is essential to recognize that each player has a unique profile, which influences their way of presentation and use of resources, allowing to identify the most relevant information for each profile.

The use of digital technologies by current generations has been widely documented (Habowski, 2019; Habowsky, 2020; Grinspun, 2016) and point out that young people are increasingly immersed in digital environments, using mobile devices and participating in online communities. In this context, electronic games have played a significant role, as they offer an attractive and familiar language for young people, arousing their interest and involvement. This preference for the language of games in the learning process has also been the subject of recent studies. Kebritchi et al. (2017), have shown that gamification in education can increase student motivation, improve engagement and promote a more dynamic and interactive learning environment. Through elements such as challenges, rewards, and progression, educational games offer a playful and effective approach to teaching and learning. On the other hand, one of the limitations found in the application of the proposed methodology was the use of reward resources provided by the platform, only 25% of the students used the diamonds. Finally, it is important to mention that the open answers contribute to evaluate the application of the

proposed methodology and elucidate a more effective way to later use this platform, providing the necessary feedback to improve the effectiveness of the proposed methodology.

5 FINAL CONSIDERATIONS

Based on the results presented, it can be concluded that the use of the gamified digital platform, Classcraft®, had positive impacts on the experience of first-period students of the bachelor's and bachelor's degree courses in Physical Education of the Federal University of Espírito Santo, stimulating engagement, motivation, learning and reflections. However, the work also points out that improvements are needed in the exploitation of the resources available on the platform and in the resolution of identified problems. These results may provide subsidies for future investigations and improvements in the implementation of gamification strategies in higher education.

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SEVEN
publicações acadêmicas

Psycho-oncology practice: Interventions regarding the emotional vulnerability of cancer patients

Crossref doi
https://doi.org/10.56238/ptoketheeducati-084

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ABSTRACT

Psycho-Oncology is a field of psychology that acts in psychological care providing the development, treatment and rehabilitation of cancer patients, aiming to soften the processes and coping with the disease, both of patients and for family members and staff, so the objective of this study was to understand the practice of hospital psychology in the oncology service, and the psychologist's interventions for the patient in emotional vulnerability to cope with the disease, thus, the literature review was used as a methodology, through searches on the academic Google platform and library of the Unigran Capital University Center, from 2000 to 2020. The results obtained were that the psychologist's performance in psycho-oncology is to promote a better quality of life in cancer patients and also to promote awareness, change of thinking, welcoming, group exchanges, with the subjectivity of each patient. Where he found that the important thing is not to promote forms of intervention but to promote better quality of life of the patient, so that he has a better adherence to treatment. It was concluded that the psychologist in oncology is of paramount importance due to its form of reception, intervention, humanization and care of the patient, his family and the team. Promoting a better quality of life, whether in the healing or palliative process.

Keywords: Psycho-oncology, Oncology, Mental vulnerability, Cancer, Psychology.

1 INTRODUCTION

Psychology is a field of science that studies human behaviors and their mental processes, where the subjectivity of the subject is used as truth in its relationship between the environment, the psychic and the social, being a subject in its biopsychosocial totality (BOCK, 2009; KLEINMAN, 2015).

This science has a vast field amenable to various approaches (psychoanalysis, behavior analysis, gestalt, behaviorism, among others) and performances (school psychology, neuropsychology, hospital psychology, clinical psychology, among others), where the present article turned to the area of hospital psychology, with specificity in the field of Psycho-Oncology (BOCK, 2009; KLEINMAN, 2015).

Psycho-Oncology is an interdisciplinary field of health that provides care to

psychological, regarding the development, treatment and rehabilitation of patients affected with cancer, aiming to soften the coping processes related to the treatment of the disease, among which being in prolonged periods of aggressive pharmacological therapy, with its side effects, and in invasive

medical procedures being potentially painful (COSTA JUNIOR, 2001).

The practice of psycho-oncology is due to a set of several factors, where the work is not only with the sick patient, but together with family members and the multiprofessional team, being a work of care organization for the sick patient and family members, the study and research of psychological variables that affect the patient, family and team (RODRIGUEZ et al., 2020).

Therefore, how does the psychologist act in the face of the needs of cancer patients?

The psychologist can promote diverse therapeutic strategies, aimed at the psychological well-being of the patient and family, being them improved or created for each patient in their uniqueness, together with the delimitations in which the patients are.

The psychologist may propose support groups aimed at better understanding about the disease, what emotional confrontations the sick patient feels and how it is to be in the process of illness, understanding that the process of illness for Camon et al. (2011) "be in contact with the possibility of the disease; live with the pathologies that until then existed only as mere possibilities, without effective chance of becoming reality ", where there is a loss of productivity and vigor of the patient, thus having an emotional damage, so that emotional changes determine the course of physical recovery, taking into account the severity of the disease, age, metabolic changes, imminence of death, age and personality structure of the patient and his life history (FILGUEIRAS et al... 2010), 2010).

Therefore, the objective of this study was to understand the practice of hospital psychology in the oncology service, and the interventions of the Psychologist for the patient in emotional vulnerability to face the disease.

2 MATERIAL AND METHODS

The present article sought its objective and used as a methodology the literature review and for this, used as a search platform Google academic and the library of the Unigran Capital University Center, with the descriptors: psycho oncology, oncology mental vulnerability, cancer and psychology, thus selected, the Portuguese language with the period of publication of the articles between the years 2000 to 2020.

It was a work developed during the discipline of Hospital Psychology of the Psychology Course of the University Center in the year 2022 taught by Professor Dr. Débora Teixeira.

Then the present article brings its results obtained, its analysis and its exposure of data collected in a descriptive way.

3 RESULTS AND DISCUSSION

According to Teixeira et al., (2010) "Cancer is a disease that presents a process of disordered growth of abnormal cells in different parts of the body (except the heart) and its development affects both children and adults".

Upon receiving the diagnosis of cancer, the person goes through several changes in their lifestyle, such as fears, anxieties and insecurities. Thus, the diagnosis of the disease is faced with many uncertainties about life expectancy and future plans, so the area of psycho-oncology is focused on the confrontations, issues and emotional dynamics of patients affected by cancer, helping them with their new reality, with the adaptations to the treatment, softening the impacts of the disease on the affectivity and mood of the patient and his family, with this perspective, working with the family, the psychologist aims to strengthen the affective bonds between family and patient, seeking methods that will facilitate dialogue, giving training so that emotions and experiences are shared (SCANNAVINO et al., 2013; FONSECA et al., 2016; PIO et al., 2020).

The cancer patient inevitably may think about death, because many of these patients show feelings of self-despise, lack of self-love and confidence, so the role of the hospital psychologist in this dynamic, goes through the confrontations of these behaviors and beliefs, because for there to be coping it is necessary to change these behaviors and thoughts, proposing decision-making strategies, search for social and emotional support, make use of relaxation techniques and meditation to provide stress relief and anxiety (LANGE, 2008).

For Rudnicki et al., (2014) the psychologist's job is to investigate the influential factors and the most appropriate psychotherapeutic strategies to improve the patient's quality of life during treatment.

While for Cruz et al. (2018) the "incorporation of subjectivity in cancer treatments has been increasingly adopted", where it is being adopted at Memorial Sloan-Kettering Cancer Center, a reference cancer hospital in New York, which is being the pioneer in bringing the patient's subjectivity, where he has an active voice in his process, making each service differentiated.

Psychology has its space to work with palliative patients, constituting resilience and psychic strengthening, aiming at focusing on quality of life, making the process occur in a way that reduces suffering, so for Cruz et al., (2018) "initial process of psychological care oriented to oncology is interested in reducing discomfort and developing greater resilience during the care that the patient receives, whether curative or palliative".

The hospital psychologist who works with cancer patients, acts in order to rescue the essence of life of this patient, which was interrupted during the process of coping with the disease, using welcoming and humanistic approaches with attention focused both on the patient and his family. In this way, the psychologist in the hospital works as a psychological intermediary, with the objective of providing a better understanding in the patient/professional/family dynamics, being of paramount

importance for this functioning, that hospitals and institutions can count on the presence of professionals qualified and trained to deal with and consider the oncological patient, regarding their physical, psychic and social limitations, aiming as far as possible a better quality of life during the confrontation of the disease (CAMON et al., 2011).

According to Rodriguez (2020), cognitive-behavioral techniques help to identify patients' core beliefs and behaviors, allowing the psychologist to promote interventions in the resignification of these beliefs and behaviors, which may include fear of death, or demotivation regarding coping with the disease.

Thus, the importance of psychologists' interventions with patients who are in a situation of vulnerability, because it is a chronic disease, which moves patients and their families, and may lead to worsening in the condition, due to the shaken emotional (RODRIGUEZ, 2020).

Soon the role of the psychologist is focused on smoothing these psychological demands, assisting in treatment, enabling a quality of life during the process.

4 FINAL CONSIDERATIONS

It is concluded that the objective of this article was to understand the practice of hospital psychology in the oncology service, and the interventions of the psychologist for the patient in emotional vulnerability to cope with the disease, where the area of psycho-oncology is of paramount importance in this dynamic serving not only the patient, but as family members and the team. The performance of the psychologist in oncology is present in patient care, using reception, active listening, demystification of the disease, intervening in the process, making the patient, the family and the team aware, promoting humanization, realizing the influences that the patient has, strengthening bonds, creating means of dialogues in which the patient allows himself to express his emotions, thus rescuing the essence of the patient who was lost at the time of diagnosis, providing better adherence to treatment and as far as possible a better quality of life during the coping process.

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Alternative control of gastrointestinal worms in cattle: Nematophagous fungi and herbal medicines

https://doi.org/10.56238/ptoketheeducati-085

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ABSTRACT
Cattle farming is of paramount importance to the national economy, being represented by 214 million animals. Helminths are a major obstacle to animal production and represent one third of the parasitic diseases that affect cattle. The main form of control of this pathology is from the use of chemotherapy drugs, however, the easy access of the producer to anthelmintics, combined with the lack of adequate professional guidance, has led to the indiscriminate use of these drugs and, consequently, the increase of parasitic resistance. Due to this growth, the emergence of promising alternative control strategies for worms has been observed, such as biological control using nematophagous fungi, as well as the use of herbal medicines.

Keywords: Livestock, Gastrointestinal nematodes, Ruminants, Alternative control.

1 INTRODUCTION

Cattle farming is of paramount importance to the national economy, providing the highest income among the five largest agricultural production chains, and is represented by 214 million animals (ABIEC, 2020). Brazil is the second largest beef producer in the world and has the second largest herd in world distribution, being responsible for the production of approximately 44.5% of the world beef market (FORMIGONI, 2017; MAIA; MATOS, 2020). Furthermore, gastrointestinal helminthiases are a major obstacle for producers, as they have a negative impact on productivity (BULLEN et al., 2016).

In dairy cattle farming, the potential loss generated by gastrointestinal helminths is around 1,870.48 million reais per year, while in beef cattle farming, the losses caused by helminths are estimated at 5,237.49 million reais (GRISI et al., 2014).

Helminthiases account for a third of parasitic diseases and affect different sites in the digestive tract of cattle. The species Trichostrongylus axei, the genus Haemonchus sp and Ostertagia sp

parasitize the small intestine. The genus Oesophagostomun sp and the species Trichuris discolor have tropisms for the large intestine (COSTA; SIMÕES; RIET-CORREA, 2009; DAS NEVES et al., 2014).

The use of anthelmintics is the main form of control, to the detriment of alternatives. The main chemical groups used to control these parasites are: benzimidazole, imidazothiazoles, macrocyclic lactones, (SALGADO, SANTOS, 2016). It has been noted that indiscriminate use, lack of rotation of pharmacological bases, use of underdoses or overdoses, lead to the selection of nematodes resistant to the active ingredients used (BULLEN et al., 2016; NIXON et al., 2020; GILLEARD et al, 2021).

With the growing increase in nematodes resistant to the main pharmacological bases, resistance has been considered one of the main problems within the cattle production system (KAPLAN, 2020).

Alternative control strategies for gastrointestinal nematodes have emerged on a non-pharmacological basis. There is evidence of biological control using nematophagous fungi, as well as the use of herbal medicines and the promotion of more specific management to control these parasites (GILLEARD et al., 2021).

Therefore, this review will take a broad look at the subject, citing the main helminths diagnosed in cattle and the drugs traditionally used, as well as their mode of action and the current problem of resistance to these drugs, pointing out alternative treatments to get around this problem established in cattle farming.

1.1 MAIN HELMINTHS DIAGNOSED IN CATTLE

Mixed helminthiases account for almost a third of all diseases involving parasites in cattle. It is clear that the damage caused to animals by this infection in adults mostly goes unnoticed by farmers, precisely because of their acquired resistance and resilience to infection. On the other hand, in younger animals up to two years of age, helminthiases become significant (COSTA; SIMÕES; RIET-CORREA, 2009; BORGES et al., 2013; GRISI et al., 2014).

Verminoses affect different sites in the digestive tract of cattle. The species *Trichostrongylus axei*, the genus *Haemonchus sp and Ostertagia sp* parasitize the small intestine. The genus *Oesophagostomun sp* and the species *Trichuris discolor* have tropisms for the large intestine. Helminthiases are multiple parasitic infections, with some species being more pathogenic than others (DAS NEVES et al., 2014; MAIA; MATOS, 2020).

Parasitic diseases, caused by endoparasites, cause a significant drop in productivity in cattle farming. In dairy farming, the damage is more obvious than in beef cattle, with diarrhea and increased mortality. However, in beef cattle, these diseases are not clearly present and remain subclinical (STROMBERG et al., 2012; FERRAZ et al., 2018).

1.2 ECONOMIC DAMAGE CAUSED BY HELMINTHIASES IN THE COUNTRY

One of the main causes of reduced productivity is infection by gastrointestinal nematodes. In dairy farming, the potential loss generated by helminthiases is around R$1,870.48 million per year (OLIVEIRA et al., 2017; GRISI et al., 2014).

On the other hand, in beef cattle farming, the losses caused by helminths in the states of the north, northeast and central-west regions amount to 5,237.49 million reais. With the sum of the values, the annual deficit from gastrointestinal helminth infection is around 7,107.917 million reais (GRISI et al., 2014).

In a study by Villa-Mancera and Reynoso-Palomar (2019), it was found that the economic losses caused by gastrointestinal nematode infection are greater in tropical climates, with losses of 11.3% and 18.1% in milk production compared to dry and temperate climates, respectively.

The factors that directly interfere with the full exercise of livestock farming are gastrointestinal nematode infections, which occupy a prominent place in the productivity of cattle and are one of the main causes of economic losses around the world. The category most affected is animals up to two years old (MOLENTO et al., 2013; BORGES et al., 2013; OLIVEIRA, 2017).

According to the National Union of the Animal Health Products Industry (SIDAN, 2018), Brazil invested 76 million dollars in the purchase of bovine antiparasitic drugs in 2017. However, antiparasitic treatment is carried out incorrectly, through the excessive and disorganized use of drugs, facilitating the development of resistance (BULLEN et al., 2016), which increases production costs and does not achieve the desired objectives.

1.3 CONVENTIONAL CONTROL

The administration of anthelmintics to animals is the most common form of control used on farms to combat worms (BRESCIANI et al., 2017; FOX, 2018). The excellent broad-spectrum efficacy, good tolerability and low cost have led to the long-term use of pharmacological-based chemical control (LANUSSE; ALVAREZ; LIFSCHITZ, 2014).

The main chemical groups used to control gastrointestinal parasites in cattle are: benzimidazoles, imidazothiazoles and macrocyclic lactones (SALGADO, SANTOS, 2016). Among these, the most widely used are from the macrocyclic lactones group: Avermectins (ivermectin, doramectin, abamectin) and Milbemycin (moxidectin).

Macrocyclic lactones emerged in the early 1980s, leading to a major revolution in the world antiparasitic market. Hypotheses have arisen about their effect, which has not been fully clarified. The first hypothesis formulated to explain their action is that they act as agonists of gamma amino buritic acid (GABA), increasing the permeability of chlorine ions, promoting muscle paralysis in the parasite (MELLIN et al., 1983; TURNER; SCHAEFFER, 1989; FURLONG; MARTINS, 2000).

The imidazothiazole group acts as nicotinic cholinergic agonists in the neuromuscular coordination of parasites. They penetrate the parasite through the cuticle, binding to acetylcholinergic neurotransmitter receptors, producing their activation, leading to the accumulation of acetylcholine in the synaptic cleft and consequently, the parasite shows hyperexcitability and spastic paralysis (MARTIN, 1993).

Benzimidazoles belong to a central group of benzimidazoles, in which a large number of molecules have been synthesized and divided into four groups: thiazole benzimidazoles, methylcarbomate benzimidazoles, probenzimidazoles and halogenated benzimidazoles. Among these, the most commonly used in cattle are the methylcarbomate benzimidazoles, the main representative of which is albendazole. The mechanism of this class of drug is highly specific, since it binds to the β subunit of tubulin, promoting its polymerization and preventing this structure from carrying out its cellular activities, resulting in the degeneration of the parasite (KOHLER, 2001).

Furthermore, with the inappropriate use of existing active ingredients, leading to therapeutic failures, evidenced by inadequate integration between management strategies and chemotherapy, incorrect use of anthelmintics due to insufficient knowledge of their pharmacological characteristics, insufficient understanding of the relationship between properties and various factors related to the host that can lead to changes in pharmacokinetic behavior and a decrease in the antiparasitic efficacy of the chosen drug (LANUSSE; ALVAREZ; LIFSCHITZ, 2014), the use of alternative methods for the control and treatment of worms is growing.

1.4 PARASITE RESISTANCE IN RUMINANTS

The use of anthelmintics is the main form of control of gastrointestinal nematodes to the detriment of alternatives, resulting in the selection of resistant parasites (NIXON et al., 2020; GILLEARD et al., 2021). Control is achieved by applying a broad-spectrum drug to the entire herd, eliminating susceptible nematodes and leaving those with resistant genotypes (HODGKINSON et al., 2019).

The increasing use of these drugs, with underdoses, incorrect diagnoses and the lack of rotation of pharmacological bases have led to an increase in nematode resistance to these drugs. Resistance has been considered one of the main problems within the cattle production system (FIEL et al., 2001; KAPLAN, 2020; CANTON, 2021).

Commonly associated with economic losses and subclinical infections, gastrointestinal nematode infections are endemic, but they do not represent a major trade embargo, nor do they play an important role in public animal health regulatory policies, with producers' control restricted to the application of medication by the farmers themselves (CHARLIER et al, 2020).

1.5 ALTERNATIVE CONTROL FOR GASTROINTESTINAL HELMINTHIASES IN CATTLE

1.5.1 Herbal Medicines

Phytotherapics are considered an important alternative for parasite control and can reduce the economic and environmental impacts of using conventional producers. The use of these substances in conventional systems can extend the useful life of chemical products. Herbal medicines have associations of different active ingredients, which can make parasite resistance a slower process (VIEIRA; CAVALCANTE, 1999; ROEL, 2002; CATTO et al., 2009).

Plants with secondary metabolites such as tannins can exert direct anthelmintic activity by interfering with the natural cycle of helminths. Among plants rich in secondary metabolites, leguminous forage plants from the Fabacea family stand out. The activities of tannins *in vitro* were characterized by a reduction in hatching, development and motility of larvae and adults. In vivo, they caused a reduction in eggs per gram of feces (OPG) and a reduction in the level of parasite infestation (HOSTE et al., 2006; MAX et al., 2009; JOSHI et al., 2011).

Allium Sativum L, popularly known as garlic, originated in Asia and is widely cultivated throughout the world, belonging to the Liliaceae family (SANTOS et al., 1999). A study carried out by Parra et al (2014) found that different garlic solutions partially controlled gastrointestinal nematodes. The solutions obtained by aqueous extraction are more suitable due to their ease of administration, the lower rejection of the product by the animals and the results obtained. In all the groups treated with the herbal medicine, there was partial control of the different helminth genera.

The *Musa spp* banana tree grows in humid tropical and subtropical regions and belongs to the Musaceae family. Kakimori et al (2019) showed in their study that the hydroalcoholic of banana bracts had anthelmintic potential for cattle, as well as significant antioxidant activity. Furthermore, according to Gregory et al (2017), Musa spp. has anthelmintic properties, as the treatment completely inhibited larval hatchability of *Trichostrongylus colubriformis* in vitro at two consecutive times.

1.5.2 Fungi

The use of biological agents that act on nematode eggs and larvae as an alternative for sanitizing pastures has been intensified in recent years (GRAMINHA et al., 2005).

Biological control using nematophagous fungi has the potential to become an important alternative for controlling gastrointestinal nematodes in ruminants (ARAÚJO et al., 2004). They act by breaking the life cycle of helminths, capturing infective larval stages before they migrate from the feces to the pasture or soil, where they are ingested by the animals (DAI et al., 2017; OLIVEIRA et al, 2017). Biological control has no effect on the internal stages of the parasite, but concentrates its action on the intermediate host and free-living stages, reducing the source of infection to the host (MOTA et al., 2003).

Nematophagous fungi have different mechanisms of action when used in consortium, which can lead to synergism in the biological control of helminths (VIEIRA et al., 2019). They have the ability to produce modified hyphae, known as traps, which serve as adhesive or non-adhesive capture devices. The mechanism of action is through the traps, which bind to and digest both adult nematodes and larvae by means of an enzymatic or mechanical process (ELIAS et al., 2018; SAXENA, 2018). Among predatory fungi, the genera *Arthrobotrys, Monacrosporium* and *Duddingtonia* have been identified as viable alternatives for the biological control of nematodes in ruminants and other domestic animals (FONTENOT et al., 2003; ARAÚJO et al., 2006).

It was observed that *Arthrobotys cladodes* and *Pochonia chlamydosporia*, when cultivated together in laboratory conditions, showed greater nematicidal activity than when used separately (OLIVEIRA et al., 2017). Pelletized formulations containing these fungi have a larvicidal effect, since the number of L3 helminths (infective form) recovered is lower compared to cattle that have been administered non-fungal pellets (VIEIRA et al., 2020).

In the study carried out by Arroyo-Balán et al (2021), strains of a nematophagous fungus were used to evaluate their predatory capacity against nematodes in vitro and to provide information on their use in biological control for infectious ruminant larvae. After analysis, it was observed that strains of the fungus *Arthrobotrys oligospora* have a high predatory capacity against *Haemonchus contortus*.

The fungus *Duddingtonia flagrans* has been shown to be viable in the environmental control of gastrointestinal nematode larvae, promoting a significant reduction in the animals' OPG, increasing their weight gain and significantly reducing pasture contamination (DE OLIVIERA et al., 2021).

The main form of administration of this class of fungi is orally at short intervals, which makes it difficult to manage in production systems that do not promote daily supplementation (WALLER et al., 2004).

2 FINAL CONSIDERATIONS

Parasite control programs based on current pharmacological bases have become less effective when compared to previous decades, since parasite resistance is exacerbated. This is due to the excessive and erroneous use of the main chemical groups used to control gastrointestinal helminths.

Alternative methods for the control of worms, although promising, show limitations for their use on a larger scale. However, these methods offer prospects for less dependence on chemotherapy in the control of nematodes. The use of methods that are already applicable in consortium with anthelmintics aims to reduce the use of these chemotherapics and satisfactory results have been observed.

Despite the progress made in research into nematophagous fungi and herbal medicines, some obstacles stand in the way of their full use, such as effective dosage, large-scale production and

potential environmental risks, especially those impacting on well-being. It is hoped that these technological advances will reach rural production on a large scale, bringing with them the economic, environmental and public health benefits of using alternative control methods to chemotherapy for gastrointestinal nematodes in ruminants.

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