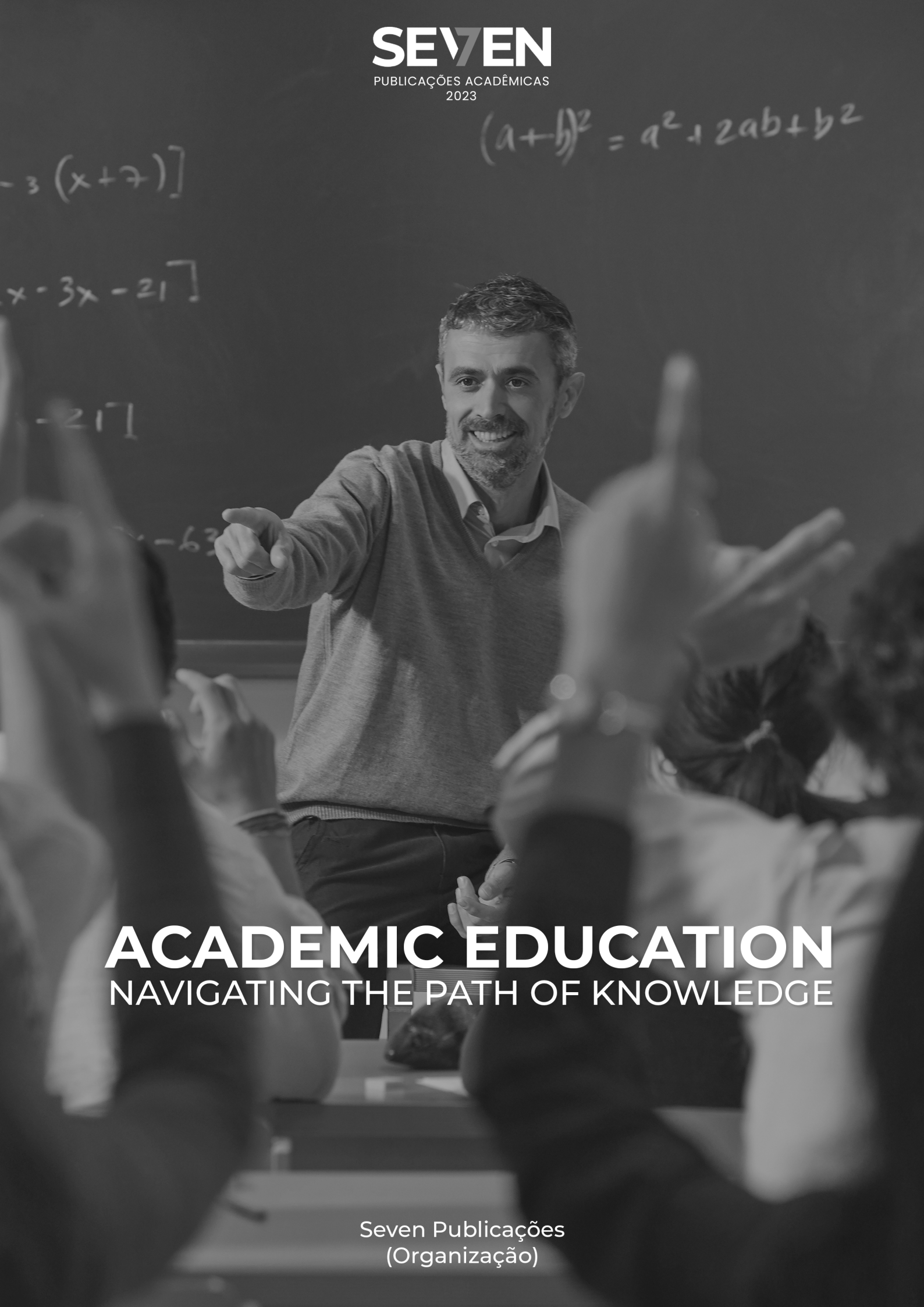
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The importance of interdisciplinary work during undergraduate nursing studies

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ABSTRACT
Undergraduate nursing courses are seeking, through interdisciplinary work, the training of professionals capable of promoting the integral health of human beings. This process of (re)construction of knowledge places the student at the center of the teaching-learning process. Thus, the objective of this study was to evaluate the perception of nurses in relation to the interdisciplinary work carried out in undergraduate courses, as academics and, today, as professionals. We opted for a descriptive field research, carried out with a questionnaire, applied through the Facebook social network of the Meta® group to 96 nurses who performed interdisciplinary work throughout their undergraduate studies. The result of the research showed that there was a change in the interviewees' perception of the importance of work during the course and after graduation. Of those surveyed, 70% said they did not consider work important at the beginning of the course, while 88% said they understood the importance of it after graduation. Exactly 76% of the nurses interviewed considered interdisciplinary work more difficult than other jobs and 59% claimed that they would not have done the work if it had not been a curricular requirement. Despite the complexity, the curricular requirement enabled the students to have the interdisciplinary experience necessary for professional life, since 83% of the interviewees recognized the importance of the work for the profession. Thus, the interdisciplinary work applied during undergraduate nursing, despite the challenges, changed the perspective of nurses in relation to knowledge, making them critical, reflective professionals, capable of working as a team, promoting integral health and exercising citizenship.

Keywords: Interdisciplinarity, Nursing, Teaching and learning.

1 INTRODUCTION

In the twentieth century, science moved towards specializations, but today it presents the opposite movement, through interdisciplinarity, a path of integration of knowledge (POMBO, 2004). Interdisciplinarity "seeks the totality of knowledge, respecting the specificity of the disciplines" (FAZENDA, 2012, p.87). This is a new attitude towards the issue of knowledge (FAZENDA, 2001).

In higher education, interdisciplinarity emerged as a way to enable the development of critical-reflective knowledge with the challenge of training professionals better prepared for the job market. In

the area of nursing, the National Curriculum Guidelines emphasize the need for integrated education with a generalist profile, based on scientific rigor (BRASIL, 2001; SANTOS, 2003). These guidelines determine that theory and practice permeate all nursing education, highlighting the integrated and interdisciplinary nature of its structuring (GALINDOI; GOLDENBERG, 2008).

This work is justified because it deals with a contemporary theme, which has undergone (re)constructions to be put into practice in higher education institutions. However, as in any process of change, the discomfort and complaints of the agents involved are inevitable. Are academics prepared to understand and accept interdisciplinary work? In order to evaluate this process of change, we opted for a field research with nurses who performed interdisciplinary work during their undergraduate studies at a nursing school in the interior of Minas Gerais. Among the various possible questions pertinent to the theme, the following question was guided: What is the opinion of nurses about the interdisciplinary work carried out during graduation, from the perspective of students and, today, as professionals?

Thus, the objective of this study was to evaluate, through a questionnaire, the perception of nurses in relation to the interdisciplinary work carried out in the undergraduate course, as academics and, today, as professionals.

2 THEORETICAL FRAMEWORK

2.1 INTERDISCIPLINARITY

Interdisciplinarity emerged in Europe in the 1960s, from student movements that demanded a new status of education, with the breaking of the fragmentation of teaching (FAZENDA, 2012). In the 1970s, the movement arrived in Brazil, revealing its main theorists in the area, Hilton Japiassú and Ivani Fazenda. These two researchers influenced practically all bibliographic production on the subject in the country.

The 1970s were fundamentally marked by the search for terminological clarification of the word interdisciplinarity, although there is still no consensus on its definition (FAZENDA, 2012). The definitions of interdisciplinarity range from the simple cooperation of disciplines, to the reciprocal exchange of knowledge. According to Japiassú (1976, apud FAZENDA, 2012), the prefix 'inter' means exchange or reciprocity, while the term 'discipline' means instruction or science. Therefore, interdisciplinarity can be understood as an act of exchange between various areas of knowledge.

However, more important than defining interdisciplinarity, because the very act of defining establishes barriers, is to reflect on the attitudes that constitute interdisciplinarity, such as humility in the face of the limits of knowledge (TRINDADE, 2008). It is a new attitude, a win-win exchange: students, teachers and society.

It is important to highlight that the term interdisciplinarity is found in the middle of the words multidisciplinarity and transdisciplinarity. Pombo (2004) considers that multidisciplinarity is the minimum pole of integration, involving the juxtaposition of disciplines, without worrying about interconnecting them. Transdisciplinarity, on the other hand, is the maximum pole, presupposing the sharing of fundamentals, when the cooperation between the various subjects is such that it is no longer possible to separate them. Interdisciplinarity, therefore, is defined in the multiple possible variations between the two poles, with the aim of defragmenting knowledge.

It can be seen, therefore, that not only the term interdisciplinarity is polysemic, but also the initiatives to apply this concept. Lenoir (1998) points out that interdisciplinarity can be classified based on four purposes: scientific, scholarly, professional and practical. Each purpose is organized based on the objectives we wish to achieve, both in terms of research and teaching, and their applicability in the context of the classroom.

In school interdisciplinarity, the perspective is educational, therefore, the notions, purposes, skills and competencies aim, above all, at the learning process, respecting the student and his knowledge (FAZENDA, 2008). Regardless of how it will be applied in an educational institution, interdisciplinarity aims at dialogue between disciplines, the integration of knowledge, and the purpose of finding unity in the diversity of knowledge (FAZENDA, 2001).

2.2 INTERDISCIPLINARY WORK

The interdisciplinary initiatives are as varied as the concept of the theme itself. Each interdisciplinary action has a theoretical-practical status that depends on one's own point of view, on the experience of each one and on the educational experience, which is particular (POMBO, 2004). No proposal for interdisciplinary praxis can be judged as adequate or inadequate, due to the problems and difficulties that will certainly arise in its development, but it should be judged as necessary and natural.

Interdisciplinarity presupposes an interaction and interpenetration between disciplines, from the simple communication of ideas to the mutual integration of knowledge (JAPIASSÚ, 1994). Teaching based on interdisciplinarity, whether with disciplines, assignments or research, has great structuring power. All concepts and procedures are organized around more global units, in which several disciplines are articulated, providing the student with a critical-reflective look at the proposed themes, as well as a view of the socio-professional knowledge experienced in theory or practice (FAZENDA, 2012). In this context, the application of interdisciplinary work in higher education institutions becomes essential for good professional training.

It is important that these works encompass a movement at three levels – curricular, didactic and pedagogical – within an educational institution, as proposed by Lenoir (1998). The curricular level

occurs when the disciplines are defined and consequently the interdependence and complementarity between them is determined, thus providing an interdisciplinary structure, prescribed in the curriculum. The second level, related to didactics, consists of articulating what the curriculum prescribes, inserting it into learning situations. Finally, the pedagogical level consists of the use of didactic interdisciplinarity in the classroom, taking advantage of all the possible implications of this space (LENOIR, 1998).

In this way, the interdisciplinary work applied in a higher education institution has the function of improving the reflection on knowledge; seek the totality of knowledge, respect the specificity of the disciplines; promote the integration of praxis with socio-professional needs, in addition to narrowing the distance that separates the university from society. Interdisciplinarity enables, therefore, the development of critical-reflective knowledge, in order to train citizens and professionals better prepared for the job market.

Higher education institutions that are open to the possibility of interdisciplinary work propose the overcoming "that is accomplished through dialogue between people who make the discipline a movement of constant reflection, creation-action. An action that depends, above all, on people's attitudes" (JOSÉ, 2008, p. 94).

It is important to emphasize that despite all the benefits of interdisciplinary work, it is a paradigm shift, and like any change, it provokes attitudes of fear and refusal. Every new one bothers you. Because it questions what has already been acquired, what has already been instituted, what has already been fixed and what has already been accepted (JAPIASSÚ, 1994). Pulling teachers and students out of their comfort zone can cause awkwardness and aversion. It is necessary, however, to insist, because society has changed and needs professionals established on an interdisciplinary basis, especially in the area of health, a fundamentally interdisciplinary sector.

2.3 INTERDISCIPLINARY WORK IN NURSING

According to the National Curriculum Guidelines (DCN) for undergraduate nursing courses, nurses should have generalist, humanistic, critical and reflective education, capable of promoting the integral health of human beings, within ethical principles (BRASIL, 2001). Nurses should be able to intervene in health-disease problems/situations, with a sense of social responsibility and commitment to citizenship, being able to promote the integral health of human beings, thus making up the principles of interdisciplinarity. In the area of nursing, the DCNs also emphasize that all theoretical and practical activities, carried out from the beginning of the course, must have an integrated and interdisciplinary character (GALINDOI; GOLDENBERG, 2008).

Such guidelines triggered a movement by higher education institutions to meet the new educational requirements. Undergraduate courses seek to reorganize the curriculum based on

interdisciplinarity, seeking to adapt to the new legal needs, a reflection of the new labor market. It is necessary to integrate disciplinary contents, innovate in pedagogical methodologies and adapt to the new profile demanded by society (ALMEIDA et al., 2012). In addition, it is important to remember that the area of health is essentially interdisciplinary, since it refers to the human being and its multifacets, which include social relationships, emotional and affective expressions, in addition to biology (GARCIA et al., 2007; OLIVEIRA et al., 2011).

Interdisciplinarity in the health area is often confused with teamwork, however, without knowledge construction, there is no interdisciplinarity, therefore, any step in the construction of knowledge is valid (OLIVEIRA et al., 2011). As Pombo (2004) describes, interdisciplinarity is any of the multiple possible variations between multidisciplinarity and transdisciplinarity. Therefore, it is not wrong that it starts with teamwork, but it is essential that it evolves into a transversal work that benefits everyone.

For success, the (re)construction of interdisciplinary work in a nursing school depends on the alliance between students, faculty, and management. Galindoi and Goldenberg (2008), however, point out that the resistance associated with the lack of knowledge of teachers and students can be a major obstacle. However, the change of paradigms is necessary to train nurses who are better prepared to work in this new health scenario, in line with the duties of citizens. Thus, the need to apply interdisciplinarity in the fields of nursing becomes evident, whether during academic training or during professional life.

3 METHODOLOGICAL APPROACH

This was a field research carried out with nurses who developed interdisciplinary work as nursing students at a college in the interior of Minas Gerais. The research had a descriptive character, when the researcher only records and describes the observed facts without interfering in them. The data collection procedure chosen was a survey, which involved the direct questioning of people, through the questionnaire technique, an instrument of rapid application to raise opinions (PRODANOV; FREITAS, 2013).

It is important to emphasize that the research also involved bibliographic study, when it was possible to evaluate concepts, results, discussions and conclusions produced in previous research (PRODANOV; FREITAS, 2013). For this part of the study, searches were conducted in scientific publications with free access on the internet, as well as academic books and government websites.

To answer the guiding question of this research, a structured questionnaire was applied to a group of 100 nurses who performed interdisciplinary work throughout their undergraduate studies at a college in the interior of Minas Gerais from 2006 to 2011.

The questionnaire was applied through the social network Facebook®, through the individual inbox of each nurse on the researcher's list of former students. Data collection was carried out from January to February 2014. Each questionnaire was preceded by a brief explanation about the research and followed by a thank you for participating.

The questionnaire consisted of five closed questions, with a 'yes' or 'no' answer, referring to the interdisciplinary work, as follows:

1 – At the beginning of the course, did you think interdisciplinary work was important?

2 - Was interdisciplinary work more difficult than other academic works?

3 - If it wasn't a curricular requirement, would you have done the interdisciplinary work?

4 - Today, after graduation, do you understand the importance of interdisciplinary work?

5 - Is interdisciplinary work important for your professional life?

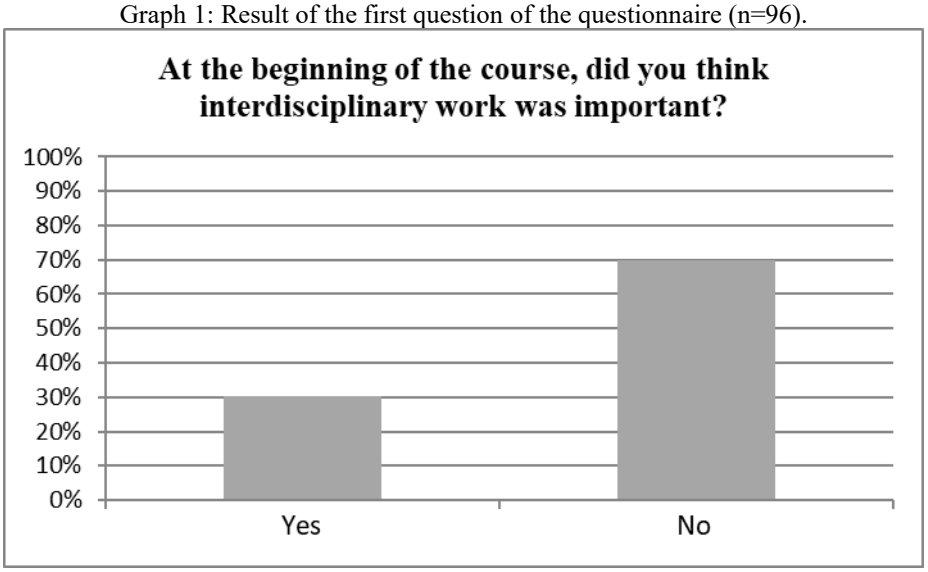
After the questionnaire was applied, the data were tabulated and analyzed to obtain the percentages for each question in the questionnaire. Tabulation made it possible to synthesize the research data in order to be able to represent them graphically, in search of better understanding and quick interpretation (MARCONI; LAKATOS, 2010). Subsequently, the data were interpreted by linking the results with existing knowledge.

4 RESULTS

Of the 100 questionnaires applied through the social network Facebook, 96 responses were obtained from the Meta® group, which became the sample number of the survey.

The initial question of the questionnaire refers to the first impression of interdisciplinary work at the beginning of the undergraduate nursing course. Of the 96 interviewees, 70% did not consider interdisciplinary work important at the beginning of the course (GRAPH 1).

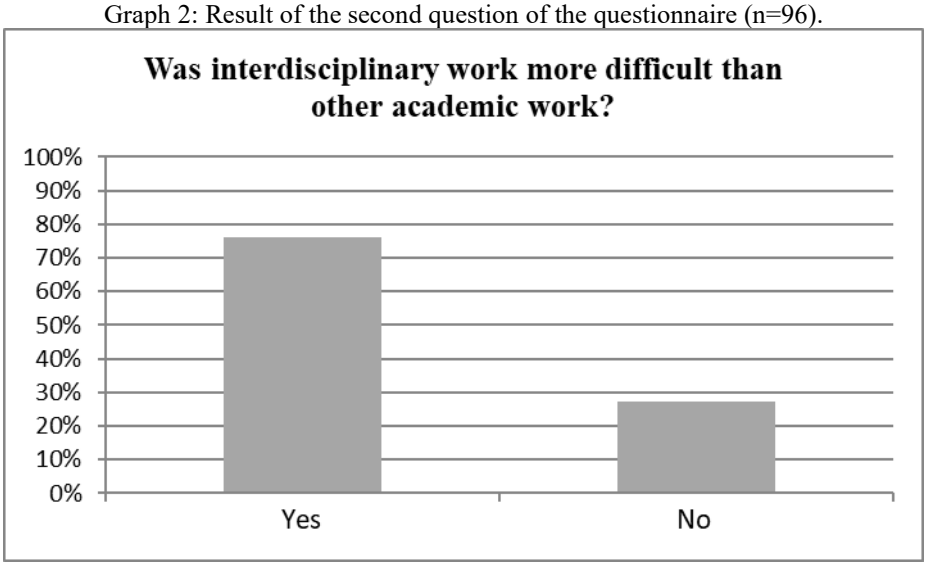
Graph 1: Result of the first question of the questionnaire (n=96).



Source: Survey data.

Regarding the second question, regarding the difficulty of interdisciplinary work, 76% of the interviewees claimed that such work was more difficult than other academic work (GRAPH 2).

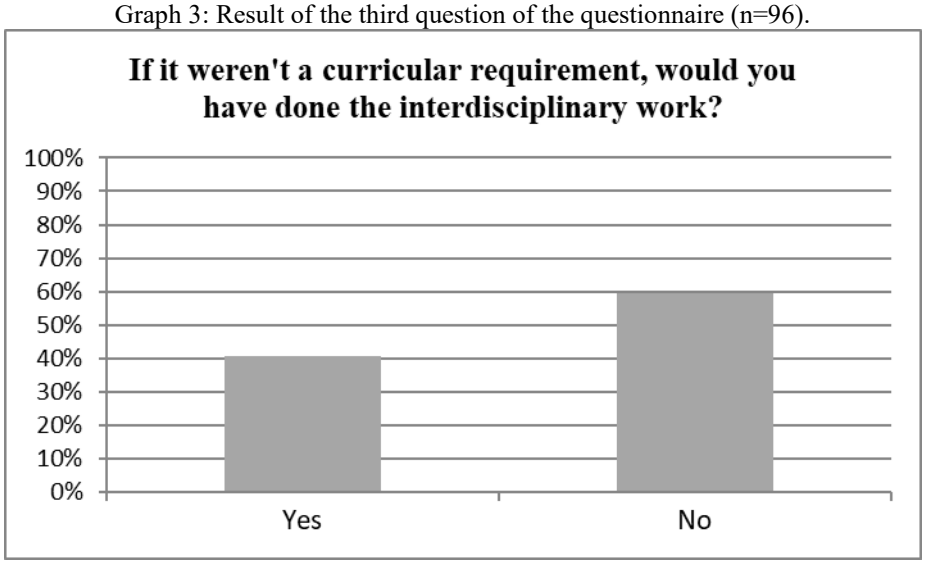
Graph 2: Result of the second question of the questionnaire (n=96).



Source: Survey data.

The third question encompassed the proactivity of the then academics in doing interdisciplinary work, if it were not a curricular requirement. In this question, 59% of the nurses interviewed said that they would not have done the work if they did not need the credits (GRAPH 3).

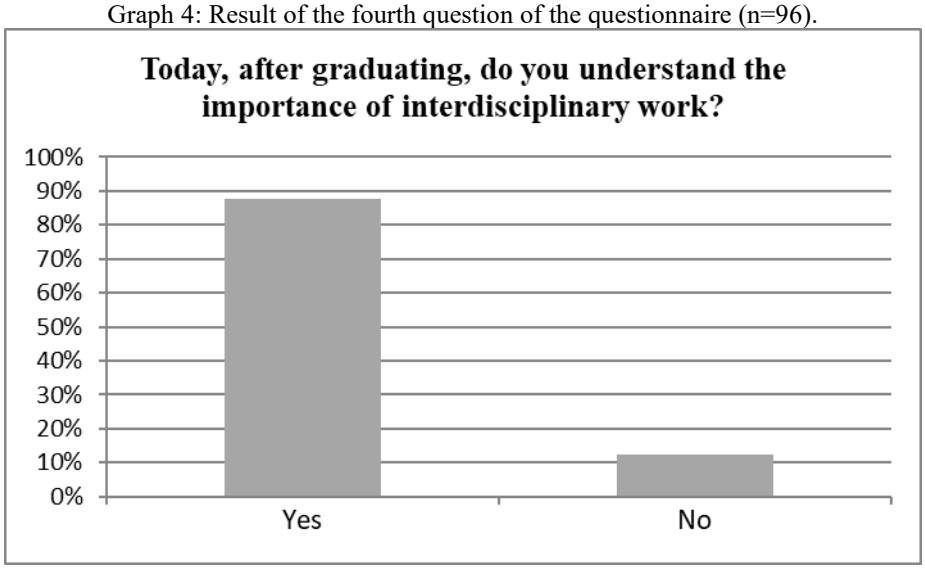
Graph 3: Result of the third question of the questionnaire (n=96).



Source: Survey data.

About question four, the nurses were asked if they began to understand the importance of interdisciplinary work after finishing their undergraduate studies. Of the 96 interviewees, 88% said they had come to understand the importance of this type of work (GRAPH 4).

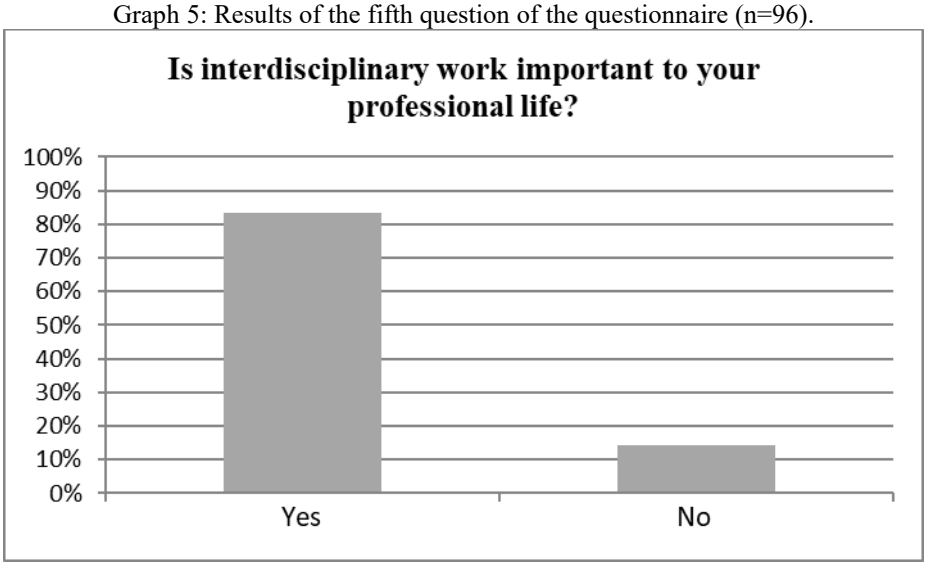
Graph 4: Result of the fourth question of the questionnaire (n=96).



Source: Survey data.

The last question of the questionnaire addressed the importance of interdisciplinary work for the professional life of nurses. In this question, 83% of the nurses interviewed claimed that this type of work is important for their daily work (GRAPH 5).

Graph 5: Results of the fifth question of the questionnaire (n=96).



Source: Survey data.

5 DISCUSSION

5.1 IMPORTANCE OF INTERDISCIPLINARY WORK IN UNDERGRADUATE STUDIES

Faced with this globalized world and new market perspectives, education has been breaking traditional teaching models in order to train professionals who are better prepared for the job market and to live in society. Supporting an undergraduate nursing course in accordance with the National Curriculum Guidelines enables nurses to promote the integral health of human beings in an interdisciplinary way (BRASIL, 2001). From this perspective, interdisciplinarity emerges as a way to

overcome the fragmentation between disciplines, providing a dialogue between them, relating them to each other and to the reality of society. The integration of knowledge ensures the construction of a critical-reflective knowledge, which should be increasingly valued in the teaching-learning process.

In the face of frequent changes in society and the demand for more qualified professionals for the labor market, interdisciplinarity is not just another law. Interdisciplinarity is a new attitude towards the question of knowledge (FAZENDA, 2001). It is something that is already being done in society, whether we like it or not (POMBO, 2004). To do so, it is necessary to think interdisciplinary, to do interdisciplinary and to be interdisciplinary. And for this to happen, it is necessary for nurses to practice interdicisplinarity from graduation, to develop the skills and competencies necessary for a good professional and citizenship education.

In higher education institutions, interdisciplinary work offers a stimulus for the discussion of reality, emphasizes the (re)construction of knowledge, and helps in the training of critical-reflective professionals (TELLES; GUEVARA, 2011). Galindoi and Goldenberg (2008) point out that, preferably, all theoretical and practical activities, present from the beginning of the course, should be permeated with interdisciplinarity. In this way, interdisciplinary work, when applied from the beginning of the course, can facilitate the perception of the student as a transforming, thinking, critical and reflective subject, no matter how difficult it may be to change the paradigms of education and convince academics of the importance of interdisciplinarity.

In the present survey, it was found that 70% of the interviewees said that at the beginning of the course they did not consider interdisciplinary work important. For students who had recently entered the academy, it was a novelty that countered the comfort of ready-made knowledge. If knowledge were absolute, education would be mere transmission and memorization of contents, however, it is dynamic, therefore, there is a need for criticism, dialogue, communication, and interdisciplinarity itself (FAZENDA, 2003). Unfortunately, many students have become accustomed to their role as receivers of information imposed by the old educational model, and have forgotten that they must be active subjects in the learning process.

Back to the questionnaire, why would 70% of academics consider something important that they didn't even know about? As Japiassú (1994) said, every change bothers and provokes attitudes of fear and refusal. Getting out of inertia is no easy task. Just like in physics, pulling a body out of the inertia of rest requires force to set it in motion. Therefore, insisting was necessary and not giving up was essential. Once the inertia of rest was broken, the minds of the students were opened and, today, after graduation, almost 90% of the interviewees said they understood the importance of interdisciplinary work developed during graduation. It is important to emphasize that all contact with the object to be known involves a re-admiration and a transformation of reality, therefore, it can take time (FAZENDA, 2003). But time was certainly permeated by the memory of the challenges overcome,

of the active participation in the teaching-learning process, of the possibility of constructing a critical-reflective subject and of the main teaching: learning to be.

Therefore, there is a change in the perception of academics in relation to interdisciplinary work, from the perspective of students and, today, as professionals. Interdisciplinary work has come to be better understood over time. After all, this type of work must be (re)built by the entire team along the way, since interdisciplinarity is a joint process. It is the attitude towards knowledge, which highlights the limits of the discipline while valuing the other disciplines and the agents that sustain them (FAZENDA, 2012).

Therefore, the present study demonstrated the maturation of interdisciplinary concepts throughout the undergraduate nursing course. In a study conducted by Oliveira et al. (2011), students in the 2nd period of nursing already express maturity in understanding the concept of interdisciplinarity, demonstrating that the understanding and application of the theme are independent of time. Fazenda (2012) reminds us that it is not enough to understand the meaning of interdisciplinarity in order to work in an interdisciplinary way, it is necessary, first of all, to perceive oneself as interdisciplinary. The attitude of professionals towards this approach is fundamental to favor "the learning process, respecting the students' knowledge and their integration" (FAZENDA, 2008, p.21), in order to develop a reflective critical being, builder of their knowledge and active agent in society.

Thus, adopting interdisciplinary work in an undergraduate nursing course is in line with the commitment to the pillars of education, the National Curriculum Guidelines, and the commitment to the training of citizen professionals. Demonstrating to academics the importance of these works should be a constant challenge towards the training of professionals who are better prepared to work in society.

5.2 DIFFICULTIES IN CARRYING OUT INTERDISCIPLINARY WORK

Interdisciplinary attitudes are necessary, but they are far from a simple process. Today's world demands increasingly versatile people to face society and its frequent changes (TRINDADE, 2008). Working on interdisciplinary issues in educational institutions has been the great challenge for educators.

In this survey, 76% of the nurses interviewed said that interdisciplinary work was more difficult than other academic work. This result was expected, since any interdisciplinary work will have a higher degree of difficulty than other disciplinary works. After all, interdisciplinarity is much more than the joining of disciplines, it is an act of exchange between areas of knowledge. Telles and Guevara (2011) add that interdisciplinary work offers a stimulus for the discussion of reality, emphasizes the (re)construction of knowledge, helping in the formation of critical-reflective professionals, and such activities are not easy for those who are used to traditional teaching. The interdisciplinary works consist

of a deconstruction, a rupture with the traditional and with the school routine (TRINDADE, 2008). These are therefore arduous tasks, but they are necessary and rewarding.

It is worth emphasizing that the complexity of interdisciplinary work is not only related to what is complicated, obscure or inexplicable, but mainly to what can be connected, can be woven, such as a weave, recognizing the order and disorder of knowledge (TRINDADE, 2008). In this aspect, interdisciplinary studies were and will continue to be more complex than other academic studies since they involve a series of variables. These are works that unite disciplines, stimulate discussions, reasoning, promote the (re)construction of knowledge, take the student out of the role of mere spectator and place him at the center of the teaching-learning process.

However, despite the benefits of interdisciplinary work, the initiative on the part of the students was low. This survey showed that 59% of the nurses interviewed said that they would not have done the interdisciplinary work if it had not been a curricular requirement. Therefore, it is still necessary to propose and assign credits to interdisciplinary works, in the expectation of completing the four pillars of education. This data reiterates the need to build the movement at three levels: curricular, didactic and pedagogical, in order to achieve interdisciplinarity (LENOIR, 1998).

The curricular level constitutes the first level, and consists of establishing the disciplines and their interdependencies, in order to set up an interdisciplinary structure to be followed. Galindoi and Goldenberg (2008) add that the search for integration in curricular reorganization is based on the effort to construct multidisciplinarity, as a starting point for interdisciplinarity. The didactic and pedagogical levels can only be achieved if there is a curricular foundation for interdisciplinarity, since the curriculum guides all the activities of an institution. Therefore, the curricular requirements, which "oblige" students to do the proposed interdisciplinary work, have great importance within the interdisciplinarity process.

It is worth remembering that it was thanks to this obligation that nursing students were able to experience interdisciplinary work and almost 90% of them said, at the end of the course, that they understood the importance of such work.

Another aspect that hinders the triggering of interdisciplinarity is concentrated in teachers. Many course coordinators highlight the resistance associated with the lack of knowledge and unpreparedness of teachers (GALINDOI; GOLDENBERG, 2008). Many teachers have limitations due to their disciplinary training (GARCIA et al., 2007). Therefore, it is necessary to train teachers to make their real engagement in interdisciplinary work effective (FAZENDA, 2012).

Despite the difficulties of students and some professors, interdisciplinarity is something that is already being done in society (POMBO, 2004). It is up to all those involved to build the work, with re-evaluations at each stage, respecting the consideration of interdisciplinarity as a process (FAZENDA, 2012).

5.3 IMPORTANCE OF INTERDISCIPLINARITY IN THE PROFESSIONAL LIFE OF NURSES

As previously demonstrated, the nurses interviewed realized, at the end of the course, the importance of the interdisciplinary work carried out during the undergraduate course. In addition, 83% of respondents recognized the importance of interdisciplinary work for professional life.

This result was expected, since health is an essentially interdisciplinary area, since it refers to the human being and its multifacets (GARCIA et al., 2007). Nursing requires professionals who are based on interdisciplinarity and complementarity between the various areas, in order to achieve excellence in the act of caring (OLIVEIRA et al., 2011). It is worth knowing that these professionals are guided by interdisciplinarity to intervene in health-disease problems/situations, with social responsibility and commitment to citizenship.

When the National Curriculum Guidelines law for nursing courses defined the necessary professional profile, it certainly took into account the current society, with new requirements and constant changes. The profile desired by the market, of a generalist, humanistic, critical and reflective nurse, capable of promoting the integral health of human beings and working as a team (BRASIL, 2001), can be shaped by interdisciplinarity. And working, perceiving oneself and being interdisciplinary can be learned from the beginning of graduation and unfolded into professional life.

The new health scenario defends the need to think about multidisciplinary teamwork with a view to interdisciplinarity, despite the fact that interdisciplinary experiences developed in health practice are still scarce (MATOS; PIRES, 2009). Everything is still new, and like all new things generate fear and need time for changes to take place. However, it is necessary to try, after all, any attempt that encompasses something between multidisciplinarity and transdisciplinarity because it is considered an interdisciplinary attitude (POMBO, 2004).

Therefore, it was expected that the majority of the interviewees would recognize the importance of interdisciplinary work in their professional lives, since this is what the new market yearns for, although it is still a great challenge for the health area.

6 FINAL THOUGHTS

Interdicisplinarity, which seeks the totality of knowledge, respecting the specificity of the disciplines, emerged as a way to enable the development of critical-reflective knowledge, in order to train professionals better prepared for the job market.

In this context, the application of interdisciplinary work during undergraduate nursing studies has become extremely important, since the health area is essentially interdisciplinary, as it takes care of the human being and its multiple facets. The application of such works ensured the breaking of the paradigms of disciplinarization, allowed the confrontation of the difficulties related to the work,

enabling the significant learning of the students, characteristics necessary for human and citizen development.

The present study demonstrated that, despite the difficulties, there has been a change in the perception of the importance of interdisciplinary work by nurses as academics and, today, as professionals. Several factors may have contributed to the recognition of the importance of interdisciplinary work at the end of the course, such as: maturity, greater understanding of the objectives and demands of the labor market, as well as greater applicability of knowledge in society. In addition, the emerging need for the use of interdisciplinarity in the health work environment allowed a new perception of the then students, now nurses, in relation to the work carried out during the undergraduate course.

Despite the greater complexity of the interdisciplinary work, the curricular requirement was decisive for the students to experience interdisciplinarity throughout the undergraduate course. This experience probably changed the perspective of nurses in relation to knowledge, making them critical and reflective nurses, capable of working as a team, promoting the integral health of human beings and exercising citizenship.

Thus, any work that manages to promote the student as an active subject of his/her learning should be prioritized. And it is in this context that interdisciplinarity emerges, to be (re)constructed with the aim of transforming society. Therefore, the challenges must continue to be overcome, so that an interdisciplinary culture can be established.

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Web Scraping: Data search and retrieval methodology in information science

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ABSTRACT
Web scraping is a process of automated data collection on websites through the action of bots or programs. It is important nowadays because databases are getting bigger and bigger and, in general, there is an urgent need for information. The technique presented makes it possible to extract texts, numerical data, images, files and tables, available both on the site's home page and in its various tabs. The aim of this chapter is to present the potential of using Web scraping through Python to collect data from websites and its importance for information retrieval in Information Science. We used command lines written by Lisa Tagliaferri to check whether these command lines work and whether we were able to obtain the desired information. The site used to retrieve the desired information about artists' names and the links to their names was Web archive, which lists all the artists whose works are in the National Gallery of Art in the USA. As a result, we realized that command lines are extremely useful for obtaining information, since they allow us to obtain a large amount of information in a short time. In conclusion, we saw that scraping data from websites is perfectly feasible using Python and its code and that the information retrieved was fully satisfactory.

Keywords: Information retrieval, Data scraping, Programming in Information Science, Python.

1 INTRODUCTION

Web Scraping is a process of automated data collection on internet sites (MITCHELL, 2018) through the action of "*bots*" or programs, for subsequent processing of this data and removal of the desired information.

Data scraping can be done manually, when it comes to a small amount of data, however, in times of "*Big Data*", it is practically impossible to carry out the activity in this way, which is why, in the *Web scraping* Programming is extremely important, mainly because it makes it possible to automate the consultation of the servers where the data are stored, and is well defined as an automatic method of data extraction (BARBOSA; CAVALCANTI, 2020).

The technique, presented here, not only allows the extraction of texts or numerical data from the analyzed sites, but also helps in the extraction of information presented in the form of images, files and tables, made available both on the home page of the site and in its various tabs, that is, in all areas of the site.

The entire *web* scraping process can be carried out through Python or R, especially the steps of programming, scraping and mining the data to extract elements and behaviors relevant to the interests of the research. In Python, the *Beautiful Soup* and *Requests modules are used*.

It should be noted that it is not the purpose of this chapter to teach how to use Python, R or even to teach a technique that allows you to scrape data on any and all web pages. The objective here is to discuss the importance of the *Web Scraping* technique or method, for the extraction of data in an automated way from the internet and the transformation of this data into relevant and useful information (MOOERS, 1951). Thus, the chapter aims to present the potential of the use of *Web scraping* through Python in the collection of data present *in* web *sites* and its importance for the retrieval of information in Information Science.

2 METHODOLOGY

As this is a theoretical-conceptual-practical debate, we used analysis and bibliographic research on the subject, seeking to elucidate the doubts related to all basic conceptual elements.

On the other hand, the practical part demanded the study of the language used in Python and the ways of writing the programming for Web *Scraping* through the modules *Beautiful Soup* and *Requests*.

The Python programming language is widely used in the data science community and therefore has an ecosystem of modules and tools that can be used in various projects. In this chapter we will focus on the *Beautiful Soup* and *Requests modules*.

Beautiful Soup is a library of Python tools that allows for a quick turnaround of results in *web scraping* projects. Currently available as *Beautiful Soup 4* (BS4) and compatible with Python 2.7 and Python 3. *Beautiful Soup* creates a parsing tree from HTML and XML documents. On the other hand, the Requests library is used to make requests and requests in a database.

The scraping of data on the internet is completely ethical and legal, in case of correct use of the information collected and in case of collection on websites that do not express in writing the prohibition of this practice. The legal challenge to the procedure may arise from the misuse of information, collection of private and private data and sale to third parties of the information obtained.

3 RESULTS AND DISCUSSION

3.1 PERFORMING WEB SCRAPING WITH PYTHON

As previously highlighted, the purpose of this chapter is not to teach Python, but it is worth remembering that it was used as a basis for the development of this research and that it greatly facilitates the work of those who want or need to scrape data from the web. Therefore, it should be noted that before any step to be carried *out in web scraping , it is necessary to install and configure*

this software, in addition to importing and installing the modules or libraries Requests *and* Beautifull Soup*, in case you decide to carry out the scraping process with the help of Python, of course.*

In addition to installing the software and importing the libraries, it is necessary to think about the command lines or the program to be used and, for this stage of the chapter, we use command lines written by Lisa Tagliaferri[1] (2023). The goal here is to check if these command lines work and if we can, in fact, get the desired information.

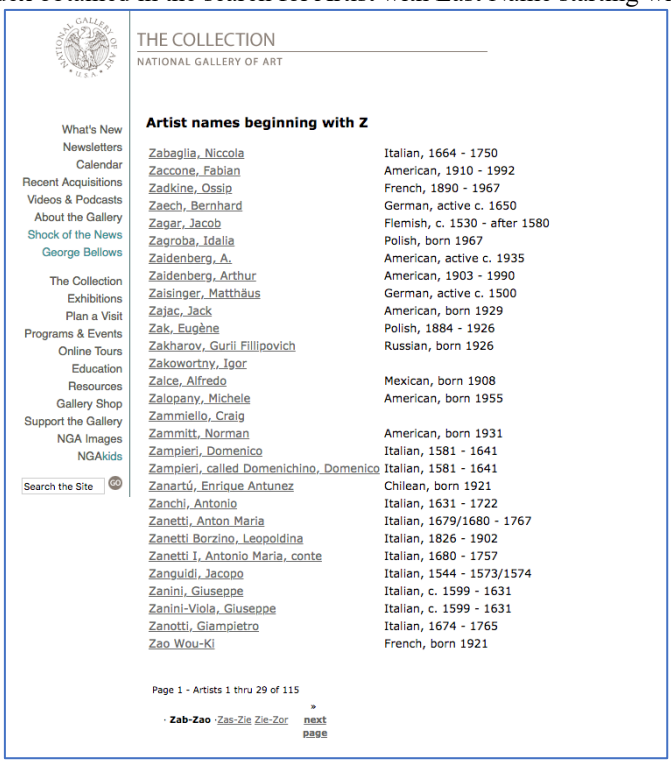
We will collect and analyze the data from a web page, in order to record the information in a text or CSV file. The page to be used is the official website of the *National Gallery of Art of*[2] the United States. The *National Gallery* is an art museum located in the city of Washington, D.C., where more than 120,000 pieces of art by more than 13,000 artists are stored, dating from the Renaissance to the present day.

Despite the large number of works and artists present in the museum, initially we will not need to extract much data from the site, as the objective here is to demonstrate the effectiveness of the tool in extracting this data and not in extracting all the data. With this, we will reduce the scope of research to just one artist and among all the letters of the alphabet, we decided to stick with the artists whose last name begins with the letter "Z".

Of the artists with a surname beginning with "Z", the one who appears in first place in the search carried out on the *Web Archive,* [3]where the works and artists of the museum are registered, is Niccola Zabaglia[4] (Figure 01), with the last artist mentioned being Václav Zykmund[5]. In all, 116 artists were found with surnames beginning with the letter "Z", distributed in four pages of results (e.g., Zab-Zao, Zas-Zie, Zie-Zor) (Figure 01).

[1] https://www.digitalocean.com/community/users/ltagliaferri, accessed November 20, 2023.
[2] https://www.nga.gov/
[3] Index available at: https://web.archive.org/ or https://archive.org/ or in https://web.archive.org/web/20170131230332/https://www.nga.gov/collection/an.shtm of the Internet Archive.
[4] https://web.archive.org/web/20121007172955/http://www.nga.gov/collection/anZ1.htm
[5] https://web.archive.org/web/20121010201041/http://www.nga.gov/collection/anZ4.htm

Figure 01: Index obtained in the search for Artist with Last Name starting with the letter Z



THE COLLECTION
NATIONAL GALLERY OF ART

What's New
Newsletters
Calendar
Recent Acquisitions
Videos & Podcasts
About the Gallery
Shock of the News
George Bellows

The Collection
Exhibitions
Plan a Visit
Programs & Events
Online Tours
Education
Resources
Gallery Shop
Support the Gallery
NGA Images
NGAkids

Search the Site GO

Artist names beginning with Z

Zabaglia, Niccola	Italian, 1664 - 1750
Zaccone, Fabian	American, 1910 - 1992
Zadkine, Ossip	French, 1890 - 1967
Zaech, Bernhard	German, active c. 1650
Zagar, Jacob	Flemish, c. 1530 - after 1580
Zagroba, Idalia	Polish, born 1967
Zaidenberg, A.	American, active c. 1935
Zaidenberg, Arthur	American, 1903 - 1990
Zaisinger, Matthäus	German, active c. 1500
Zajac, Jack	American, born 1929
Zak, Eugène	Polish, 1884 - 1926
Zakharov, Gurii Fillipovich	Russian, born 1926
Zakowortny, Igor	
Zalce, Alfredo	Mexican, born 1908
Zalopany, Michele	American, born 1955
Zammiello, Craig	
Zammitt, Norman	American, born 1931
Zampieri, Domenico	Italian, 1581 - 1641
Zampieri, called Domenichino, Domenico	Italian, 1581 - 1641
Zanartú, Enrique Antunez	Chilean, born 1921
Zanchi, Antonio	Italian, 1631 - 1722
Zanetti, Anton Maria	Italian, 1679/1680 - 1767
Zanetti Borzino, Leopoldina	Italian, 1826 - 1902
Zanetti I, Antonio Maria, conte	Italian, 1680 - 1757
Zanguidi, Jacopo	Italian, 1544 - 1573/1574
Zanini, Giuseppe	Italian, c. 1599 - 1631
Zanini-Viola, Giuseppe	Italian, c. 1599 - 1631
Zanotti, Giampietro	Italian, 1674 - 1765
Zao Wou-Ki	French, born 1921

Page 1 - Artists 1 thru 29 of 115

· **Zab-Zao** ·Zas-Zie Zie-Zor next page »

Source: Available at: https://web.archive.org/web/20121007172955/http://www.nga.gov/collection/anCOM1.htm, accessed November 20, 2023.

3.1.1 Step 1: Importing the libraries

Once we have decided on which site to scrape the data and most importantly, which data to scrape, it is time to proceed to what we call step 1, which involves the installation and configuration of Python and its libraries.

To install Python, just go to the https://www.python.org/downloads/ page and choose the version of interest (Windows, Linux, Mac), download it and proceed with the installation.

Python uses IDEs to insert command lines. Among the many IDEs that exist, we suggest installing Visual Studio, which is available at https://code.visualstudio.com/download.

Once Python and Visual Studio are installed, it's time to import the Python libraries, the first of which is the *Requests Library* and the second is *BeautifullSoup*. This step must be performed using command lines typed in Visual Studio (Figure 02).

A library is nothing more than a set of modules and commands in Python, organized and made available in advance so that you can import and save time when programming.

Once these two libraries are imported, we will need to identify or assign the URL of the homepage, creating a variable called *page,* using the *requests.get()* method as shown in Figure 02.

Figure 02: Importing Python Libraries.

```
import requests
from bs4 import BeautifulSoup


# Collecting the first page of artists
page = requests.get('https://web.archive.org/web/20121007172955/https://www.nga.gov/collection/anZ1.htm')
```

Source: The Author (2023).

After importing the *beautifullSoup* You must create an object or parse tree. This object must take as an argument the text of the page to be analyzed, i.e., *page.text* = *html.parser*. In other words, an html file is created, which is analyzed to remove the content of the response from the server (Figure 03).

Figure 03: Creating a BeautifulSoup Object

```
import requests
from bs4 import BeautifulSoup


page = requests.get('https://web.archive.org/web/20121007172955/https://www.nga.gov/collection/anZ1.htm')

# Creating a BeautifulSoup Object
soup = BeautifulSoup(page.text, 'html.parser')
```

Source: The Author (2023).

With the page of interest collected, it is possible to continue the process and proceed with the extraction of the texts of interest on the web page. It should be noted that this is only possible thanks to the fact that the page has been collected, analyzed, and configured as an object of *BeautifullSoup*.

3.1.2 Step 2: Extracting text from a web page

At this point we are interested in searching for the name of the artists and the most relevant links to the site, however, other data can also be collected, such as the nationality of the artists and the periods of history in which they lived.

The question at this point for those who are not familiar with the subject may be: How to do this? Where do we find such information? The answer to these questions is quite simple. The information can be found in the DOM of the website or web page.

3.1.2.1 And what is the DOM?

DOM is the acronym for "Document Object Model," which is a programming interface for HTML, XML, and SVG documents that provides a structured representation of the document. This model defines the methods that allow access to the structure, style and content of the site, being formed by nodes and objects with various properties and methods, which provide the connection between web pages to scripts or programming languages.

Access to the DOM of each site is done through the browser, just having the site open and right-clicking on any area of it and choosing the "Inspect" or "Inspect Document" option. In the list of artists' names, the object of analysis in this chapter, we could click on any name to obtain the desired information, as shown in Figure 04.

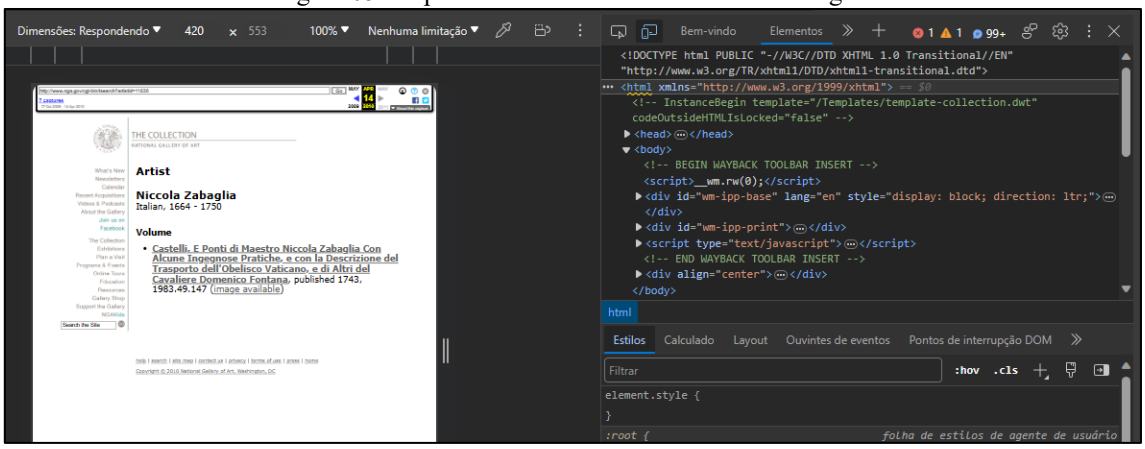
Figure 04: Representation of DOM access through the inspect item



Source: the author (2023).

After clicking on the Inspect item in the menu, the tools of interest to the developers will appear in the browser (Figure 05), which will allow access to the *Tags* linked to the names present in the list of artists and the html of the site.

Figure 05: Inspected item: artist name Niccola Zabaglia



Source: The Author (2023).

When we inspect from the name of Niccola Zabaglia it is possible to see that the table with the name of the artists present in the letter Z is inside the * * of the *tags* where we have a class called *"BodyText"*. Associated with this name is also a link *tag*, as it has a page that explains who the artist is (Figure 05).

In data scraping, it is important to extract the name of the artists present in the table, described in the *file "BodyText ",* for this you must go back to Python and *BeautifullSoup* with the command find() *and* find_all(). The program indicated for this is shown in Figure 06.

Figure 06: Extraction of text from the Site.

```
import requests
from bs4 import BeautifulSoup


# Collect and analyze the first page
page = requests.get('https://web.archive.org/web/20121007172955/https://www.nga.gov/collection/anZ1.htm')
soup = BeautifulSoup(page.text, 'html.parser')

# Extract all text from BodyText div
artist_name_list = soup.find(class_='BodyText')

# Extract text from all instances of <a> tag from within BodyText div
artist_name_list_items = artist_name_list.find_all('a')
```

Source: The Author (2023).

Right after finding the name of the artists present in the list, we will need to perform a *"forloop"*[6] (loop) over these names or variable (artist_name_list_items). Their presentation will be performed using *prettify() (*Figure 07), which is used to transform the *BeautifulSoup parse tree* into a *formatted unicode* string.

Figure 07: Creating a for loop.

```
...
artist_name_list = soup.find(class_='BodyText')
artist_name_list_items = artist_name_list.find_all('a')

# Create loop to print the names of all artists
for artist_name in artist_name_list_items:
    print(artist_name.prettify())
```

Source: The Author (2023).

From this moment on, we can run the program in order to obtain feedback from the pages where the information is stored. This data has already been recorded in the created document (Nome_do_arquivo).

Figure 08: Execution of the File with the information of the four pages

```
1. python nga_z_artists.py (that's the file name[7])
2.
```

Source: The Author (2023).

Once the procedure has been performed, we will receive the result shown in Figure 09.

What we see in the output at this point is the full text and *tags related*to all the artist names within the *<a>tags* found in the * tag* of the first page, as well as some

[6] A for loop is used to iterate over a sequence (which is a list, a tuple, a dictionary, a set, or a string). This looping will be performed as many times, until the programmer's need is satisfied.

[7] nga_z_artists.py = Python file with the list of artists with surnames beginning with "Z" from the *National Gallery of Art* (nga).

additional link text at the bottom. Since we don't want this extra information, we'll work to remove it in the next section.

So far, we've been able to collect all the link text data in a * * section of the web page. However, it doesn't matter at the moment that links don't reference artist names, so we're going to work to remove that part.

Figure 09: File Execution Result with Information

```
Output
<a href="/web/20121007172955/https://www.nga.gov/cgi-bin/tsearch?artistid=11630">
 Zabaglia, Niccola
</a>
...
<a href="/web/20121007172955/https://www.nga.gov/cgi-bin/tsearch?artistid=3427">
 Zao Wou-Ki
</a>
<a href="/web/20121007172955/https://www.nga.gov/collection/anZ2.htm">
 Zas-Zie
</a>

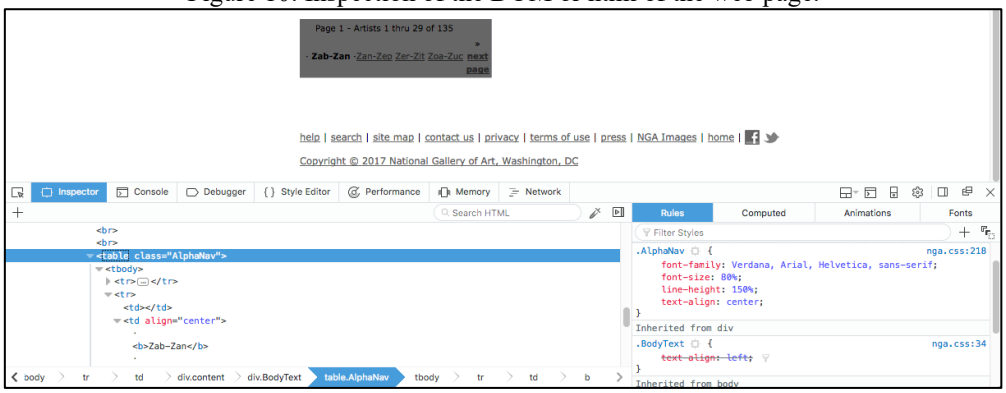
<a href="/web/20121007172955/https://www.nga.gov/collection/anZ3.htm">
 Zie-Zor
</a>

<a href="/web/20121007172955/https://www.nga.gov/collection/anZ4.htm">
 <strong>
  next
  <br/>
  page
 </strong>
</a>
```

Source: The Author (2023).

To remove the links from the page, let's right-click again and inspect the DOM. We'll see that the links at the bottom of the * * section are contained in an HTML table *<table class="AlphaNav">* (Figure 10).

Figure 10: Inspection of the DOM or html of the web page.



Source: The Author (2023).

We can therefore use Beautiful Soup to find the *AlphaNav class* and use the *decompose()* method to remove a *tag* from the parse tree and then delete it along with its contents. We'll use the *last_links* variable to reference these bottom links and add them to the program file (Figure 11):

Figure 11: Removing Link Buttons

```
import requests
from bs4 import BeautifulSoup


page = requests.get('https://web.archive.org/web/20121007172955/https://www.nga.gov/collection/anZ1.htm')

soup = BeautifulSoup(page.text, 'html.parser')

# Remove bottom links
last_links = soup.find(class_='AlphaNav')
last_links.decompose()

artist_name_list = soup.find(class_='BodyText')
artist_name_list_items = artist_name_list.find_all('a')

for artist_name in artist_name_list_items:
    print(artist_name.prettify())
```

Source: The Author (2023).

Now, when we run the program with Python, we will receive the output exposed in Figure 12.

At this point, we see that the output no longer includes the links at the bottom of the web page and now displays only the links associated with the artists' names. So far, we've directed the links specifically to the names of the artists, but we have extra *tag data* that isn't interesting for analysis and should be eliminated. This is what will be accomplished in the next section of commands.

Figure 12: Output File After Execution

```
Output
<a href="/web/20121007172955/https://www.nga.gov/cgi-bin/tsearch?artistid=11630">
 Zabaglia, Niccola
</a>
<a href="/web/20121007172955/https://www.nga.gov/cgi-bin/tsearch?artistid=34202">
 Zaccone, Fabian
</a>
...
<a href="/web/20121007172955/http://www.nga.gov/cgi-bin/tsearch?artistid=11631">
 Zanotti, Giampietro
</a>
<a href="/web/20121007172955/http://www.nga.gov/cgi-bin/tsearch?artistid=3427">
 Zao Wou-Ki
</a>
```

Source: The Author (2023).

3.1.3 Step 03: Extracting the Content of a Tag

To access only artist names, we'll want to target the content of the <to>tags instead of printing the entire link tag. We can do this with *Beautiful Soup's .contents*, which will allow us to revise forloop

so that instead of printing the entire link and its tag, we only print the list with the full names of the artists:

With the commands in Figure 13, we're *iterating* over the list of names by calling the index number of each item. We can run the program with Python to view the list of names and we will get back a list (Figure 14), with all the names of the artists available on the first page of the letter Z.

If we also want to capture the links associated with all these names, we can extract these URLs from <a>tags of a page using get('href'), which is a method of the *Beautiful Soup method* (Figure 15).

From the output of the links, we know that the entire URL is not being captured, so we will concatenate the link string with the front of the *URL* string (in this case https://web.archive.org/) (Figure 15).

Figure 13: Removal of Tag Children – artist names

```
import requests
from bs4 import BeautifulSoup


page = requests.get('https://web.archive.org/web/20121007172955/https://www.nga.gov/collection/anZ1.htm')

soup = BeautifulSoup(page.text, 'html.parser')

last_links = soup.find(class_='AlphaNav')
last_links.decompose()

artist_name_list = soup.find(class_='BodyText')
artist_name_list_items = artist_name_list.find_all('a')

# Using .contents to remove <a> the  children from the tag to artist_name in artist_name_list_items: </a>
    names = artist_name.contents[0]
    print(names)
```

Source: The Author (2023).

Figure 14: Output: List of artists' names with surname in "Z"

```
Output
Zabaglia, Niccola
Zaccone, Fabian
Zadkine, Ossip
...
Zanini-Viola, Giuseppe
Zanotti, Giampietro
Zao Wou-Ki
```

Source: The Author (2023).

Figure 15: Using href

```
...
for artist_name in artist_name_list_items:
    names = artist_name.contents[0]
    links = 'https://web.archive.org' + artist_name.get('href')
    print(names)
    print(links)
```

Source: The Author (2023).

When we run the program in Figure 15, we will receive the names of the artists and the URLs of the links that present more information about the artists (Figure 16).

Figure 16: Output after href run: names and links

```
Output
Zabaglia, Niccola
https://web.archive.org/web/20121007172955/https://www.nga.gov/cgi-bin/tsearch?artistid=11630
Zaccone, Fabian
https://web.archive.org/web/20121007172955/https://www.nga.gov/cgi-bin/tsearch?artistid=34202
...
Zanotti, Giampietro
https://web.archive.org/web/20121007172955/https://www.nga.gov/cgi-bin/tsearch?artistid=11631
Zao Wou-Ki
https://web.archive.org/web/20121007172955/https://www.nga.gov/cgi-bin/tsearch?artistid=3427
```

Source: The Author (2023).

Although we are extracting information from the website, at the moment it is only being presented in our terminal window, however this presentation format does not interest us much, although it is valuable. This chapter of this demonstration is interested in capturing and using this data elsewhere and this will only be possible by recording this information in a text file (CSV).

3.1.4 Step 04: Writing the Data to a CSV File

Collecting and visualizing data that is only presented in a Python IDE terminal window is neither very practical nor useful. On the other hand, comma-separated value (CSV) files allow you to store data in plain text tables, and are a common format for spreadsheets and databases. For this procedure, we first need to import the built-in Python *csv module* (Figure 17).

Figure 17: Importing a CSV file

```
import csv
```

Source: The Author (2023).

Right after importing the CSV, you can create and open a file called *z-artist-names.csv* (or whatever name you want to give it). In the creation of this file, the variable 'f' and the mode 'w' will be used. You should also write the titles of the top lines: *Name and Link*, which will be passed to the *writerow()* method as a list (Figure 18).

Figure 18: Creating a CSV file with Artist Name and Link.

```
f = csv.writer(open('z-artist-names.csv', 'w'))
f.writerow(['Name', 'Link'])
```

Source: The Author (2023).

Finally, inside forloop, we'll write each line with the names of the artists and the links associated with them (Figure 19).

Figure 19: Creating Lines with Artist Name and Link

```
f.writerow([names, links])
```

Source: The Author (2023).

You can see the rows for each of these tasks in Figure 20.

Figure 20: Adding each artist's name and associated link to a row

nga_z_artists.py

```
import requests
import csv
from bs4 import BeautifulSoup


page = requests.get('https://web.archive.org/web/20121007172955/http://www.nga.gov/collection/anZ1.htm')

soup = BeautifulSoup(page.text, 'html.parser')

last_links = soup.find(class_='AlphaNav')
last_links.decompose()

# Create a file to record and add header row
f = csv.writer(open('z-artist-names.csv', 'w'))
f.writerow(['Name', 'Link'])

artist_name_list = soup.find(class_='BodyText')
artist_name_list_items = artist_name_list.find_all('a')

for artist_name in artist_name_list_items:
    names = artist_name.contents[0]
    links = 'https://web.archive.org' + artist_name.get('href')


    # Add each artist's name and the link associated with a row
    f.writerow([names, links])
```

Source: The Author (2023).

If we run the program at this point, we won't get any output as a response, instead a file will be created in the directory you're working on, called z-artist-names.csv (or whatever name you want to give it).

In the test performed for this chapter, a readable CSV file in Excel was created. It is worth reminding readers that we are performing this scraping on a site where the information of the National Gallery of Arts is registered and that this may cause the presence of non-executable links in the output of the program, as is the case of the link in the output to the artist "Zadkine, Ossip" present in Figure 21.

Figure 21: Names and links of the artists present in the output of the terminal

```
z-artist-names.csv
Name, Link
"Zabaglia, Niccola",https://web.archive.org/web/20121007172955/http://www.nga.gov/cgi-bin/tsearch?artistid=11630
"Zaccone, Fabian",https://web.archive.org/web/20121007172955/http://www.nga.gov/cgi-bin/tsearch?artistid=34202
"Hitkine, Ossip",https://web.archive.org/web/20121007172955/http://www.nga.gov/cgi-bin/tsearch?artistid=3475w
...
```

Source: The Author (2023).

In the CSV file, this information may look like a spreadsheet (Figure 22).

With the creation of the CSV file, we will be able to use the data in a more meaningful way, since the information collected is now stored on our computer.

Figure 22: Spreadsheet created from CSV file.

Name	Link
Zabaglia, Niccola	https://web.archive.org/web/20121007172955/http://www.nga.gov/cgi-bin/tsearch?artistid=11630
Zaccone, Fabian	https://web.archive.org/web/20121007172955/http://www.nga.gov/cgi-bin/tsearch?artistid=34202
Zadkine, Ossip	https://web.archive.org/web/20121007172955/http://www.nga.gov/cgi-bin/tsearch?artistid=3475
Zaech, Bernhard	https://web.archive.org/web/20121007172955/http://www.nga.gov/cgi-bin/tsearch?artistid=25135
Zagar, Jacob	https://web.archive.org/web/20121007172955/http://www.nga.gov/cgi-bin/tsearch?artistid=2298
Zagroba, Idalia	https://web.archive.org/web/20121007172955/http://www.nga.gov/cgi-bin/tsearch?artistid=23988
Zaidenberg, A.	https://web.archive.org/web/20121007172955/http://www.nga.gov/cgi-bin/tsearch?artistid=8232
Zaidenberg, Arthur	https://web.archive.org/web/20121007172955/http://www.nga.gov/cgi-bin/tsearch?artistid=34154
Zaisinger, Matthäus	https://web.archive.org/web/20121007172955/http://www.nga.gov/cgi-bin/tsearch?artistid=4910
Zajac, Jack	https://web.archive.org/web/20121007172955/http://www.nga.gov/cgi-bin/tsearch?artistid=3450
Zak, Eugène	https://web.archive.org/web/20121007172955/http://www.nga.gov/cgi-bin/tsearch?artistid=1986
Zakharov, Gurii Fillipovich	https://web.archive.org/web/20121007172955/http://www.nga.gov/cgi-bin/tsearch?artistid=3451
Zakowortny, Igor	https://web.archive.org/web/20121007172955/http://www.nga.gov/cgi-bin/tsearch?artistid=20099
Zalce, Alfredo	https://web.archive.org/web/20121007172955/http://www.nga.gov/cgi-bin/tsearch?artistid=3452
Zalopany, Michele	https://web.archive.org/web/20121007172955/http://www.nga.gov/cgi-bin/tsearch?artistid=34309
Zammiello, Craig	https://web.archive.org/web/20121007172955/http://www.nga.gov/cgi-bin/tsearch?artistid=27191
Zammitt, Norman	https://web.archive.org/web/20121007172955/http://www.nga.gov/cgi-bin/tsearch?artistid=5846
Zampieri, Domenico	https://web.archive.org/web/20121007172955/http://www.nga.gov/cgi-bin/tsearch?artistid=3941
Zampieri, called Domenichino, Domenico	https://web.archive.org/web/20121007172955/http://www.nga.gov/cgi-bin/tsearch?artistid=3941
Zanartú, Enrique Antunez	https://web.archive.org/web/20121007172955/http://www.nga.gov/cgi-bin/tsearch?artistid=3453
Zanchi, Antonio	https://web.archive.org/web/20121007172955/http://www.nga.gov/cgi-bin/tsearch?artistid=35173
Zanetti, Anton Maria	https://web.archive.org/web/20121007172955/http://www.nga.gov/cgi-bin/tsearch?artistid=11133
Zanetti Borzino, Leopoldina	https://web.archive.org/web/20121007172955/http://www.nga.gov/cgi-bin/tsearch?artistid=3455
Zanetti I, Antonio Maria, conte	https://web.archive.org/web/20121007172955/http://www.nga.gov/cgi-bin/tsearch?artistid=3454
Zanguidi, Jacopo	https://web.archive.org/web/20121007172955/http://www.nga.gov/cgi-bin/tsearch?artistid=961
Zanini, Giuseppe	https://web.archive.org/web/20121007172955/http://www.nga.gov/cgi-bin/tsearch?artistid=11597
Zanini-Viola, Giuseppe	https://web.archive.org/web/20121007172955/http://www.nga.gov/cgi-bin/tsearch?artistid=11597
Zanotti, Giampietro	https://web.archive.org/web/20121007172955/http://www.nga.gov/cgi-bin/tsearch?artistid=11631
Zao Wou-Ki	https://web.archive.org/web/20121007172955/http://www.nga.gov/cgi-bin/tsearch?artistid=3427

Source: The Author (2023).

3.1.5 Step 05: Retrieving Information from Related Pages

We have created a program to extract information from the first page of the list of artists whose surnames begin with the letter **Z**, however, there are 4 pages in total of these artists available on the site. To collect all these pages, we can perform further iterations with *forloops*. This will review most of the code we've written so far, but it will employ similar concepts.

To begin, we must create a list that will contain the pages (Figure 23).

Figure 23: Creation of the list containing the web pages referring to the artists

```
pages = []
```

Source: The Author (2023).

We'll populate this initialized list with a *forloop* (Figure 24).

Figure 24: Scrolling through pages 1 to 5 to make the list of pages.

```
for i in range(1, 5):
    url = 'https://web.archive.org/web/20121007172955/https://www.nga.gov/collection/anZ' + str(i) + '.htm'
    pages.append(url)
```

Source: The Author (2023).

Since there are 4 pages for the letter Z, we constructed *the forloop* present in Figure 24 with a range of 1 to 5 so that it runs through each of the 4 pages. For this particular site, the URLs start with the string *https://web.archive.org/web/20121007172955/https://www.nga.gov/collection/anZ* and then are followed by a number for the page (which will be the integer i of the *forloop* that we converted to a *string*) and end with *.htm*.

We'll concatenate these *strings* and then append the result to the *pages* list. In addition to this *loop*, we must use another *loop* that will run through each of the pages. The code in this forloop *is going to look similar to the code that we've created so far in that it's performing the task that we completed for the first page of the letter Z artists, this will be accomplished for each of the four pages and since we put the original program on the second* forloop*, we now have the* original loop as a *nested for loop.* [8]

In the code (Figure 25), you should see that the first *forloop is iterating through* the pages and the second forloop *is collecting data from each of those pages and then adding the names of the artists and links line by line on each line of each page.*

These two *forloops* come below the *import* statements, the creation and writing of the CSV file (with the line to write the file headers), and the initialization of the *pages* variable (assigned to a list). The two *forloops* will look like this (Figure 25):

Figure 25: Execution of the two *forloops* traversing the 4 web pages

```
pages = []

for i in range(1, 5):
    url = 'https://web.archive.org/web/20121007172955/https://www.nga.gov/collection/anZ' + str(i) + '.htm'
    pages.append(url)

for item in pages:
    page = requests.get(item)
    soup = BeautifulSoup(page.text, 'html.parser')

    last_links = soup.find(class_='AlphaNav')
    last_links.decompose()

    artist_name_list = soup.find(class_='BodyText')
    artist_name_list_items = artist_name_list.find_all('a')

    for artist_name in artist_name_list_items:
        names = artist_name.contents[0]
        links = 'https://web.archive.org' + artist_name.get('href')
```

[8] It's the loop that occurs without interruptions. Example: the months of the year. They start in January and go until December, then it starts all over again.

```
        f.writerow([names, links])
```

Source: The Author (2023).

Within the larger context of the programming file, the complete code looks like this (Figure 26):

Figure 26: Full Code

nga_z_artists.py

```
import requests
import csv
from bs4 import BeautifulSoup


f = csv.writer(open('z-artist-names.csv', 'w'))
f.writerow(['Name', 'Link'])

pages = []

for i in range(1, 5):
    url = 'https://web.archive.org/web/20121007172955/https://www.nga.gov/collection/anZ' + str(i) + '.htm'
    pages.append(url)


for item in pages:
    page = requests.get(item)
    soup = BeautifulSoup(page.text, 'html.parser')

    last_links = soup.find(class_='AlphaNav')
    last_links.decompose()

    artist_name_list = soup.find(class_='BodyText')
    artist_name_list_items = artist_name_list.find_all('a')

    for artist_name in artist_name_list_items:
        names = artist_name.contents[0]
        links = 'https://web.archive.org' + artist_name.get('href')

        f.writerow([names, links])
```

Source: The Author (2023).

It may take a while to create the CSV file, since the program is long, but once created, the production will be complete, showing the names of the artists and their associated links from Zabaglia, Niccola to Zykmund, Václav.

4 FINAL THOUGHTS

The exercises carried out throughout this chapter, using the lines of code created by Lisa Tagliaferri (2023), allowed us to verify that data scraping on websites is perfectly achievable from Python and its codes.

The results obtained were fully satisfactory, since we were able to obtain, automatically, the information related to artists with surnames beginning with Z and who have works in the *National*

Gallery of Art. This procedure could be carried out for any list of artists, that is, for any letter between A and Z. It is not advisable to carry out the search for isolated artists, due to the work it takes and the ease that it would be to enter the site and type the name of this artist.

The retrieval of the names and links to these artist names allows access to other information about these artists, such as the time in which they lived, works created and place of birth.

Before thinking about carrying out the web scraping procedure, it becomes necessary to take into account the servers from which we will obtain the information. It is essential to check if the website has terms of service or terms of use related to web scraping, that is, if they allow or prohibit it in an explicit (written) way or if the website has an API that allows you to capture data, before extracting it.

It should be remembered that the constant and incessant search for data from a website will make it understand it as a robot or malware that must be blocked and certainly your IP will be blocked. That's why we shouldn't continuously access servers to collect data, we shouldn't overload someone else's servers.

A good practice for web scraping, and to avoid being blocked, is to include a header that contains your name and email so that a website can identify you and contact you if you have any questions. An example header you can use with the *Python Requests library* is shown in Figure 27:

Figure 27: Creating a Header for Personal Identification During Scraping

```
import requests

headers = {
    'User-Agent': 'Your Name, example.com',
    'From': 'email@example.com'
}

url = 'https://example.com'

page = requests.get(url, headers = headers)
```

Source: The Author (2023).

At this point, it's worth remembering that using the tools of *BeautifullSoup* and *Requests* is a good way to perform web scraping. And that saving the results in a CSV text file readable in Excel or another application allows for more in-depth analysis of the data and information collected.

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Profile of the teacher of Specialized Educational Service (SES): Professional analysis in a public university in Paraná

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ABSTRACT
Specialized educational service (SES) is a right of every person with disabilities, as an integral activity of the inclusive education policy, understood as the set of specific strategies and services that eliminate barriers and enable access to the curriculum, communication and physical spaces considering the specificities of each student, promoting integral education with a view to autonomy and favoring the completion of academic paths in the different levels of education for students with disabilities. Unioeste's Special Education Program (PEE) works to support the entry and permanence of people with disabilities. The objective of this study was to analyze the professional profile of SEA teachers considering the hiring notices. The methodology used is a descriptive research, developed from a case study, with the help of bibliographic and documentary research. The interpretative analysis of the data showed that Unioeste has formalized the attributions of the SEA teacher, that the hiring occurs through simplified selection processes and that the requirements include a bachelor's degree, with a postgraduate degree in Special Education. The results point to the institutionalization of the role of SEA teachers, with compliance with the laws and norms related to inclusive education, but which still lacks support from the State.

Keywords: Specialized educational care, Teacher of SEA, Special education, Inclusion, Higher education.

1 INTRODUCTION

Understanding education as a historical-social process is a fundamental condition when analyzing schooling and inclusion as a challenge of contemporary society that, in the face of diversity, is concerned with ensuring the right to education for all and in a qualitative way. It is also understood that there has been an evolution in this process and that discussions about education permeate human development itself, and therefore historical-social.

According to Libâneo (1996), education is a social phenomenon, an instrument of human mediation "that should aim at the construction of a society where everyone feels part of the process of social construction and reconstruction" (p. 18). This statement shows that it is necessary to recognize the complex social phenomenon that is education, and how important it is to relate society in this process.

As a social institution, the university is part of the full development of the subject, including the specialized educational service (SES) which, according to Decree 7.611, of November 17, 2011, can be understood "as the set of activities, accessibility and pedagogical resources organized institutionally and continuously [...]" (BRASIL, 2011, p. 5), is complementary and/or supplementary, and not a substitute for regular university education.

It is the role of SEA teachers, among others, to identify, develop and organize pedagogical and accessibility resources that eliminate barriers to the full participation of students, considering their specific needs. "The activities developed in the specialized educational service are different from those carried out in the regular classroom, and are not a substitute for schooling" (BRASIL, 2008, p. 15). This service supplements the training of students with a view to autonomy and independence in school and outside of it. Thus, it is important that the university has a way to ensure that the professional can meet all these specificities that the position requires.

Universities have specialized care centers or programs for students with special educational needs. UNIOESTE's Institutional Program of Actions Related to People with Special Needs (PEE), constituted by Resolution No. 323/97 and regulated by Resolution No. 209/2016, is part of a set of achievements obtained by the organized movement of people with disabilities. Its main objective is to contribute to the process of socialization of systematized knowledge, which is indispensable for the person to be able to see, understand and position themselves in the world as a subject.[1] (UNIOESTE, 1997; 2016)

To contribute to the fulfillment of special educational needs, the PEE is organized in a multi-campus way, articulating all sectors involved in the development of teaching, research and extension, since ensuring the inclusion of people with special educational needs in higher education is the responsibility of the institution as a whole. This service involves support in the completion of the entrance exams, as well as the specialized monitoring of undergraduate and graduate students. Therefore, it is worth asking: **What is the profile of the teacher of specialized educational services required by Unioeste in its hiring notices for the exercise of the function?**

In this way, the research is justified by the importance of studying the internal policies related to the care of people with special educational needs at Unioeste, such as Resolution No. 05/2021-CEPE, of March 23, 2021, which approves the Regulation of the role of teacher for Specialized Educational Service (AEE) to Unioeste students. This resolution is a milestone in the didactic-pedagogical organization of the PEE and in the standardization of the attributions of the SEA teacher in the most diverse *campuses* of Unioeste.

The general objective of this study is to know the professional profile of SEA professors at Unioeste. The specific objectives are: a) to describe the process of hiring SEA professors at Unioeste;

[1] Information from the Unioeste website: https://www.unioeste.br/portal/pee/sobre-o-pee

b) analyze the characteristics required for the fulfillment of the function and in accordance with the laws in force.

In order to analyze whether the professionals hired through simplified selection processes at Unioeste meet the requirements required by an SEA professor, descriptive research of a qualitative nature is used as a methodology, using bibliographic research and documentary research as a source of data for professional analysis. The interpretative analysis of the data intends to show how the relationship between the desired profile and the skills required in specialized educational service occurs.

Therefore, the internal organization of the article concerns this introduction, followed by the theoretical review, showing the laws and policies of inclusion in Brazil, the concept of special education and its performance in higher education and about the SEA professional, in section 2. Section 3 presents the research methodology, the data collection and analysis procedures, and the research subjects. Finally, section 4 discloses the analysis and discussion of the results, ending with considerations about the study and the references used.

2 THEORETICAL REVIEW

2.1 BRAZILIAN INCLUSION LAW

According to the Law of Guidelines and Bases of National Education (LDBEN n. 9.394/96), in Article 58, "For the purposes of this Law, Special Education is understood to be the modality of school education offered preferably in the regular school system" (BRASIL, 1996). However, historically and routinely, special education has been characterized as a parallel system of education, functioning in a specific way both in the subjects involved and in the policies and resources allocated.

The Brazilian Inclusion Law (LBI), No. 13,146, was created in 2015, with the aim of "ensuring and promoting, under equal conditions, the exercise of the fundamental rights and freedoms of people with disabilities, aiming at their social inclusion and citizenship" (BRASIL, 2015).

It is based on the UN Convention on the Rights of Persons with Disabilities and deals with accessibility and inclusion in different parameters of society, from health, education and technology, to the labor market, social assistance and transportation.

The main novelty that the LBI brought was the change in the legal concept of disability, ensuring that the rights of people with disabilities are respected, giving them the opportunity to carry out their tasks and activities without exclusion, discrimination or prejudice, and have the same conditions of equality, as provided for in article 2:

> Article 2 A person with a disability is one who has a long-term impairment of a physical, mental, intellectual or sensory nature, which, in interaction with one or more barriers, may obstruct his or her full and effective participation in society on an equal basis with other people. (BRAZIL, 2015)

However, more than the concept of disability, the LBI deals with several tools to ensure that all the rights of persons with disabilities are respected, and so that they can defend themselves from exclusion, discrimination, prejudice and the lack of real access to all sectors of society.

The law came to unveil a previous perspective, of the term disability, which was previously seen as a condition of people, and is currently understood as a situation of spaces, incapable of receiving them in an adequate way, being proportional to the amount of access and opportunities offered to people, in relation to the difficulties faced, therefore if the necessary conditions are offered, The person with a disability will be able to carry out all existing functions and tasks normally, whether in their personal or professional life. (MAZZOTA, 2011).

And in relation to the right to education, the law determines that persons with disabilities have access to an inclusive education system at all levels and modalities, according to their characteristics, interests and learning needs, as well as lifelong learning. In addition, it proposes individualized and collective measures in environments that maximize the academic and social development of students with disabilities, with the income of support professionals, without additional fees for this service.

In 2016, the State Council of Education - CEE/PR approved the Norms for the Special Education Modality in the State Education System of Paraná, by Resolution No. 02/2016. It explicitly states the inclusion in Higher Education and the necessary pedagogical and administrative procedures:

> Art. 5 Special Education, a teaching modality that crosses all levels, stages and modalities of Basic Education and Higher Education, has the function of identifying, elaborating and organizing pedagogical and accessibility resources that eliminate barriers to the full participation of students in the educational process, considering their specific needs.
> .....
> Art. 12. Specialized Educational Service is considered to be of a complementary or supplementary nature, offered to meet the educational needs of students with disabilities, pervasive developmental disorders, specific functional disorders, high abilities or giftedness. (PARANÁ, 2016).

Specifically in relation to Higher Education Institutions, Ordinance No. 3,284/2003 of the Ministry of Education contains accessibility requirements for people with disabilities to instruct the processes of authorization and recognition of courses, and accreditation of institutions (BRASIL, 2003).

More recently, with the enactment of State Law No. 20,443/2020, which provides for the reservation of a percentage of vacancies for people with disabilities in undergraduate and graduate courses in state institutions of higher education and in courses of state institutions of technical education, there has been an increase in the admission of people with disabilities in universities, which requires even more specific policies for this service (PARANÁ, 2020).

2.2 SPECIAL EDUCATIONAL NEEDS AND SPECIALIZED CARE

Special educational needs at university, as well as in society, can include various conditions that affect academic performance, such as physical, sensory, intellectual disabilities, learning disorders, autism spectrum disorders, mental health problems, among others. It is necessary for the university to have policies for the admission and permanence of these students, in order to develop their learning capacities. (PEACOCK; SILUK; FIORIN, 2015).

Some resources that the university can offer are: teaching materials in accessible formats (braille, audio, subtitles), sign language interpreters, assistive technologies, flexible and extended schedules of tests and assignments, academic monitoring, tutoring, boost in campus infrastructure (such as ramps, elevators, accessible bathrooms), among others. (POKER; VALENTINE; GARLA, 2018).

In addition, the university must have clear and effective policies for inclusion and diversity, awareness and training of professionals and teachers, and respect for the autonomy and choices of students with special educational needs. The goal is to ensure that all students, regardless of their conditions, can enjoy higher education with quality and equity.

The National Policy on Special Education from the Perspective of Inclusive Education (BRASIL, 2008) created guidelines regarding the training of professionals to work in the area, as well as the characterization of the students who make up this universe. Thus, with the advancement in the form of organization of special education, as a teaching modality for the school inclusion of students with disabilities, guiding the education systems, Mantoan (2006, p.10) highlights:

> From the perspective of Inclusive Education, the hegemony of the absolute segregation model in educational norms is verified. The legal documents and subsequent institutional actions reinforced the inclusive perspective and, increasingly, strengthened the new direction of the special education modality, which is now responsible for the organization and provision of specialized educational service (SES), thus supporting the inclusion of its target audience.

Within the new guidelines for the implementation of the inclusive education policy, specialized educational service (SES) is offered, as it works on the training of students, organizing didactic materials and pedagogical and accessibility resources that eliminate barriers to student participation, considering their specific needs (MANTOAN, 2006).

Although the legislation guarantees the right to education, the history of special education has gone through, and still goes through, moments of segregation of people with disabilities, both by society and by schools. And one of the main problems is the training of teachers who work with students with special educational needs. With regard to student care, with regard to the development of an essential human value, the need for otherness is understood, that is, consideration and respect for the other, distinct and different (FAGUNDES, 2001).

For the inclusion of students with special needs in regular education, it is necessary to train and qualify professionals, develop curricular schemes, intervene, in addition to psychopedagogical guidance, and the investigation of educational processes, as well as the adaptation of appropriate didactic resources. Ensuring equal opportunities does not mean guaranteeing an equal right to all, but offering individualized means for them to develop their skills (PESSOTI, 2001).

Article 3 of Decree 7.611/2011 presents four objectives of the SES, whose teachers need to know and foster the necessary connections so that Special Education students can be effectively included in the school environment, such as promoting access conditions, ensuring the transversality of special education actions, fostering the development of didactic and pedagogical resources that eliminate barriers in the teaching-learning process. (BRASIL, 2011, p. 5).

3 RESEARCH METHODOLOGY

It is a descriptive research, which aims to "describe the characteristics of a population, a phenomenon or an experience based on a detailed study, with data collection/generation, analysis and interpretation of the same" (COSTA-HÜBES, 2022, p. 24). It describes the reality of observing the study subjects, in order to collect, analyze and record their inferences about these collected data and, finally, interpret without inferring them.

The approach adopted will be that of a qualitative research, considering that it "promotes reflection on the theme/problem studied, using various instruments. It is concerned with the practices and interactions of subjects in everyday life. It focuses on answering social and subjective questions" (COSTA-HÜBES, 2022, p. 19). It is mainly justified by its relevance to the study of the social relations involved in the research problem.

For this study, bibliographic research, documentary research and case studies were used. In order to understand the concepts and how the theme has been treated in academia, it is necessary to carry out a bibliographic research, reviewing the main theories that guide the scientific work.

Documentary research, on the other hand, is necessary to analyze the institutional documents related to the subject studied, to provide complementary information about the laws and policies of specialized educational services. For Gil (2007, apud COSTA-HÜBES, 2022, p. 28) "research based on documents is important not because it definitively answers a problem, but because it provides a better view of that problem or, alternatively, hypotheses that lead to its verification by other means".

And the case study will offer subsidies to learn about the work of SEA teachers and the requirements at the time of hiring. It is a type of research, according to Costa-Hübes (2022, p. 30) "that focuses on the detailed analysis of an individual case, with the purpose of acquiring greater knowledge about the phenomenon studied" and in this study, focuses efforts on the case of continuing education policies for teachers with a focus on specialized educational service.

The instruments used in this research will be: bibliographic research and documentary research in the public notices for hiring PSS for the position of SEA professor. The selection notices analyzed will be from the year 2021, when Resolution No. 05/2021-CEPE was approved and regulated the role of the SEA teacher at Unioeste. In this case, three selection processes were analyzed.

The data analysis aimed to know the procedures and requirements for hiring SEA teachers, based on Resolution 05/2021-CEPE. Thus, after data collection, a theoretical and analytical deepening was carried out, for which it was necessary to resort to the methodology of interpretative data analysis, because "[...] [the issues] can be approached in different ways and from a number of angles" (LÜDKE; ANDRÉ, 2018, p. 48).

Document analysis makes us reflect that it is not possible to fully understand the past, so it is always good to remember that it is the research (CASTANHA, 2011), or the researchers who select their sources for thematic reasons or methods, as Evangelista (2009) teaches that law is very formal and when producing documents, knowledge is produced, which is to produce consciousnesses.

4 ANALYSIS AND DISCUSSION OF RESULTS

UNIOESTE is a multi-campus university, with campuses in the cities of: Foz do Iguaçu, Marechal Cândido Rondon, Francisco Beltrão and Cascavel, and has its Rectory and University Hospital in the city of Cascavel. It has 61 face-to-face undergraduate courses, totaling 7824 students and 3 distance learning courses with 1933 students enrolled, according to data from the Dean of Planning (PROPLAN, 2022).

The PEE, created in 1997 through Resolution 323/97-CEPE, is registered as a university extension program. The General Coordination of the PEE is installed on the Cascavel campus and the Sub-Coordinators are located on each campus and are responsible for putting into practice the demands of specialized educational services.

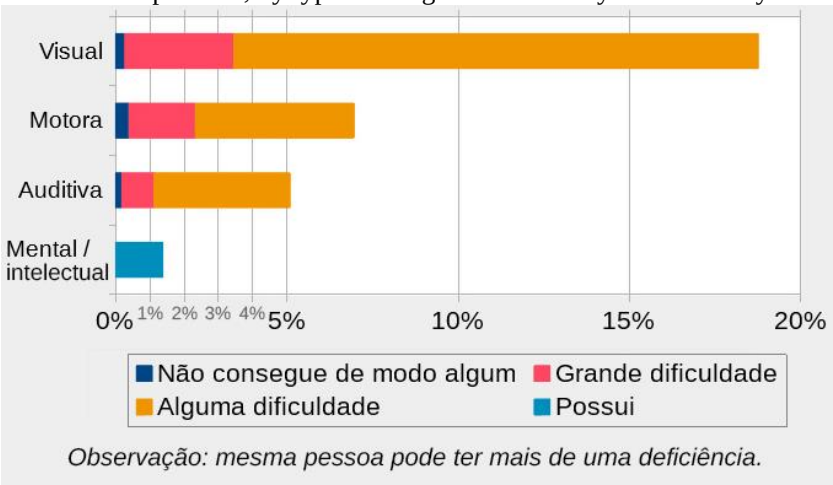
In 2002, Resolution No. 127/2002 – CEPE, approved the Regulation of Procedures for the Admission and Permanence of People with Special Needs at Unioeste, in order to ensure the attendance of people with disabilities/special needs who intend to enter the State University of Western Paraná to take undergraduate and/or graduate courses, describing the admission criteria (SILVA et al., 2022).

At the beginning of the PEE, the difficulties encountered were related to the care of students with visual impairment, which according to Silva et al. (2022) demonstrate that:

> The journey that began with the care of people with visual impairment (blindness and low vision) and which consisted of the production of adapted materials such as, for example, the texts and books defined by the teachers, which are digitized in txt extension to enable reading by the Dosvox system, by these users. (SILVA et al., 2022, p. 15).

This movement to assist people with visual impairment is in line with a national movement. According to data from IBGE (2010), about 18.8% of the population had some difficulty in seeing and almost 46 million Brazilians, about 24% of the population, reported having some degree of difficulty in at least one of the skills investigated (seeing, hearing, walking or climbing stairs), or having mental/intellectual disabilities (IBGE, 2010), as shown in Figure 01 below:

FIGURE 01 – Population, by type and degree of difficulty and disability in Brazil



Source: Demographic Census, IBGE (2010)

These data demonstrate, today, how the reference framework has evolved, as well as the diagnoses, especially related to ASD. And the main challenge of universities is to promote not only the admission of students with special educational needs, but also to provide mechanisms for permanence, attention and reception, and training of this individual.

And to meet this breadth of special educational needs, Unioeste has sought to strengthen its internal policies for the entry and permanence of people with disabilities in the university environment. The PEE provides, together with the other bodies of the university, technical, scientific and academic support, necessary for the activities of Teaching, Research and Extension, developed in the areas of education and administration of the university (UNIOESTE, 2016).

The process of hiring the SEA Teacher takes place through a simplified selection process (PSS). The State does not have the position of SEA Professor, which is why the university, after a broad debate, decided to regulate the function within the scope of Unioeste. Thus, in 2021, Resolution No. 05/2021-CEPE, of March 23, 2021, was approved, with the aim of formalizing the teaching work of the professional who attends the PEE.

In Article 5, it shows that the SEA teacher is responsible for, among others: extra-classroom pedagogical support; adaptation of bibliographic references, slides and other materials made available by the professors of the disciplines; perform alternative communication according to the resources used by the student; promote the constitution of autonomy and independence of

the student, considering ethical conduct and respect in interpersonal relationships; collaborative work between the professionals of the specialized educational service, such as the professors of the disciplines, university agents, considering the ethical conduct and respect in the interpersonal relationship and establishing articulation with the classroom teachers and other academics in order to adapt the dynamics of the groups for practical class and Mandatory Supervised Internship. (UNIOESTE, 2021).

The University, when hiring is necessary, publishes the PSS notice, with information about the vacancy, requirements, points, remuneration and information about the didactic-pedagogical evaluation and evaluation of titles. Candidates undergo a didactic test in a panel formed by three professors, indicated by the respective Centers and/or sub-coordinators of the PEE.

4.1 THE PROFILE OF THE SES FACULTY AT UNIOESTE

Resolution No. 05/2021-CEPE brings as a requirement for the selection and hiring of the SEA Teacher: Undergraduate and Bachelor's Degree with Specialization in the area of Special Education and/or Master's and/or Doctorate in the area of Special Education and/or in another area in the line of research in Special Education. It also presents the duties of the SEA Teacher, the workload and other information relevant to this function.

Since the implementation of Resolution No. 05/2021, Unioeste has had three PSS Notices, one in 2021 and two in 2022. Analyzing the hiring notices via PSS for the vacancy of SEA Professor, we have what is shown in Table 01:

TABLE 01 – Analysis of PSS Notices with Resolution No. 05/2021-CEPE

What Resolution No. 05/2021-CEPE says	**Public Notice No. 181/2021-GRE**	**Public Notice No. 096/2022-GRE**	**Public Notice No. 179/2022-GRE**
Job Requirements	Bachelor's degree and/or special education with specialization, master's degree in special education.	Bachelor's degree and/or special education with specialization, master's degree in special education.	Bachelor's degree and/or special education with specialization, master's degree in special education CECA, from Cascavel, also required a certificate of languages such as TOEFL, IELTS, TOEIC.
Test Points	The points presented are the same for some campuses, with the exception of Cascavel, which for CCET focused on assistive technologies for some disabilities and CECA focused on the Foreign Languages Program at Unioeste.	The points presented are the same for some campuses, with the exception of Cascavel, which focused on assistive technologies for CCET, and CECA focused on the Foreign Languages Program at Unioeste.	Case study, related to a disability. Generally, the points are the same, but the CECA of Cascavel presented different points, related to the English language.

Duties of the SEA Teacher	It doesn't.	It doesn't.	It doesn't.

Source: from the survey (2023).

Despite the attributions contained in Resolution No. 05/2021-CEPE, no information was found in the PSS notices analyzed, which focus on the requirements for the vacancy. However, considering the interactive and interdisciplinary nature of their work in relation to the classroom in which each of the students is enrolled, it is essential that the SEA teacher has the facility to work cooperatively and that he has some experience in the area. After all, the points of the didactic test refer to a case study that must be developed by the candidate.

In addition, one of the main objectives of the service is to create or find alternative pedagogical strategies that enable participation and learning in the classroom, so the role of the SEA Teacher is closely linked to the elaboration of strategies and the availability of accessibility resources.

Thus, in order to attract professionals who, in addition to being prepared to work from the perspective of inclusive education, know what attributions and professional profile Unioeste wants and seeks in its selection processes, it is essential that this information is included in the PSS notices for SEA Teachers.

5 FINAL THOUGHTS

Inclusive education is a guiding principle of the institutional policy of each and every university and is part of Unioeste's educational policy, through the actions of the PEE. The objective of this research to analyze the profile of SEA professors in the university environment was met by describing the process of hiring SEA professors at Unioeste, which takes place through a simplified selection process.

The characteristics required for the fulfillment of the function and in accordance with the laws in force bring to light the importance of Unioeste's role in promoting inclusion, considering that there is an effort on the part of those interested in constituting a Resolution to regulate the function of the teacher of specialized educational service.

In response to the research problem, it is evident that the function of SEA Teacher is institutionalized at Unioeste, since it does not exist in the career plan of the teaching profession of the State of Paraná. The profile covers the requirements of graduation in a bachelor's degree with a postgraduate degree in the area of Special Education, however the attributions of the position are not clear in the notices.

The hiring takes place only through a PSS notice, since Unioeste does not have the autonomy to create a position. This does not detract from the teaching work, nor is it unimportant within the

inclusive education policy, however it is precarious because it does not have the support of the State and because there is a constant turnover in hiring.

In addition, as of 2020, with State Law No. 20,443/2020, the flow of new academics at the university tends to grow, being an important and necessary initiative, but that universities are not yet prepared for because they do not have an effective position to meet the demands of these students (PARANÁ, 2020). Pessoti (2011) points out that ensuring equal opportunities, in which it does not mean guaranteeing an equal right to all, but rather offering each individual the means to develop their skills. Thus, for the principle of equal opportunities to be possible, it is necessary to offer diversified and continuous educational opportunities.

This study, an initial report of the work of the SEA Faculty at Unioeste, indicates the need for future research on teacher training, as well as how the work has been carried out and what are the results evidenced in this trajectory of constitution of the SEP at Unioeste in its various *campuses*.

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Contributions of toys and games in early childhood education

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ABSTRACT
Games and games have a creative, imaginary, innovative and socializing character and therefore gain more and more space in the school routine, especially in Early Childhood Education. Playfulness is, therefore, a means of promoting the integral development of the child, as he seeks to understand the world that surrounds him and builds his relationship with knowledge in a unique and participatory way. The present research, essentially bibliographic, aims to investigate the contributions of play in the stage of Early Childhood Education, without losing sight of Piaget's ideas. To this end, we consulted books and scientific articles by authors who discuss the subject, such as: KIshimoto (2001), Sneyders (1996), Santos (2006), Brougère (2010), among others. The results point to the importance of pedagogical practices involving play, from the perspective of a coherent action on the part of teachers, to fulfill their function in favor of the integral formation of the student, in view of the rights of learning.

Keywords: Playfulness, Pedagogical practices, Jokes, Early Childhood Education.

1 INTRODUCTION

Quality education must be established with practices that can enable a new way of managing educational institutions. From this perspective, establishing a study addressing the theme of Early Childhood Education and playful activities, games and games as teaching tools represents an action of extreme relevance for professional training, as well as for the development of a practice that seeks theoretical and methodological support for Early Childhood Education teachers with suggestions for actions agreed on ethical values. moral and affective through children's games and games.

Intentionally reflecting on how the effects are solidified from the construction of a holistic suggestion of play, grounding this moment as an element of procedure and aggregation with the world in which we are inserted is more than thinking, that is, it is contributing to the training of a professional whose practices are increasingly important in the learning process in Early Childhood Education.

This research addresses contexts related to playfulness in the scope of Early Childhood Education, with emphasis on play and aims to investigate the contributions of playfulness in the Early Childhood Education stage, without losing sight of Jean Piaget's ideas. Educational practice only

makes sense if it enables the understanding of the differential that in teaching there is no transfer of knowledge, but the creation of possibilities for its production or construction. It is worth understanding, then, that the school has become a place in which there is an urgent need for work focused on social practice and, in addition, an environment that must first of all be attractive and stimulating for students, in order to promote meaningful learning.

In this way, games and games in the school routine, especially in Early Childhood Education, have been gaining more space, since they have a creative, imaginary, innovative and socializing character. Playfulness is, therefore, a means of promoting the integral development of the child, as he seeks to understand the world that surrounds him and builds his relationship with knowledge in a unique and participatory way.

2 METHODOLOGY

This article is an excerpt from a master's research in which a study was carried out on the ludic in Early Childhood Education, between reality and what is recommended by the National Common Curricular Base – BNCC. This qualitative study had the data collected through a structured interview, after approval by the Ethics Committee of the Federal University of Mato Grosso, Araguaia Campus - UFMT, located at Avenida Senador Valdon Varjão, N° 6390 - Araguaia University Campus - Unit II, ICBS, Block 25 - Block 48 - Room n° 06, with the Certificate of Presentation of Ethical Appreciation - CAEE No. 69784323.5.0000.5587.

3 PLAYFULNESS IN THE CONTEXT OF EARLY CHILDHOOD EDUCATION

When thinking about education, it is known that its main objective is to form critical and creative people who are able to interact satisfactorily in society and who can also build knowledge, acting actively in their environment. For this reason, it is essential that children learn from a very early age to discover and overcome challenges (SANTOS, 2016).

From this perspective, it is valid to consider that play is a fundamental resource for the development of preschool children, since through it it is possible to improve affection, motor skills, language, perception, memory and other important functions. Play favors the child's affective balance and contributes to the process of appropriation of social signs. It creates conditions for a significant transformation of children's consciousness, by demanding from children more complex forms of relationship with the world.

Moraes and Araújo (2019) contribute to this discussion, showing that the school, by valuing playfulness, allows a good formation of concepts of the world and society, being able to work with affectivity, socialization, creativity. Through play and games, the child learns to deal with the world around him, forms his personality, deals with various feelings and achieves a healthy and harmonious

development. This increases their independence and visual and auditory sensitivity, getting in touch with the culture and developing motor skills. There are several benefits of using playfulness at school, so it is necessary to pay attention to these aspects so that the student can exercise their imagination, improve their emotional intelligence and favor their integration.

Santos (2016) makes it clear that playfulness consists of satisfying the child through the real and the concrete, leading him to construct and reconstruct contexts and situations, interact, think, reflect, make decisions and, consequently, develop integrally.

The Law of Guidelines and Bases of National Education No. 9,394/96 explains that Early Childhood Education will be offered in daycare centers or equivalent entities for children up to three years of age; preschools, for children aged four to five. In the same direction, the National Curriculum Reference for Early Childhood Education points out the guidelines that should guide this stage of teaching. .

According to these documents, the indication of play as one of the priorities for the development of children in this age group is visible. Article 4 of the National Curriculum Guidelines for Early Childhood Education states that:

> The pedagogical proposals of Early Childhood Education should consider that the child, the center of curriculum planning, is a historical subject with rights who, in the interactions, relationships and daily practices he experiences, constructs his personal and collective identity, plays, imagines, fantasizes, desires, learns, observes, experiments, narrates, questions and constructs meanings about nature and society, producing culture (BRASIL, 2009, p. 10).

Some items of the new LDB text were already described in the Curricular Guidelines for Early Childhood Education, including the discussion on ways to evaluate the stage. One of them is the one that determines the issuance of documentation that allows attesting to the child's development and learning processes.

Currently, with the change of several paradigms in education, especially in the scope of Early Childhood Education, the practice of playful activities is strengthened every day and provokes stimuli in the child so that teaching and playing are inserted in educational projects, having the intention and awareness that the result of this action is a more significant child learning.

According to Kishimoto (2010), the word playfulness has its origin in the Latin word "ludus", which means "game". If its origin were to be confined, the term ludic would be referring only to play, to play, to spontaneous movement, but it came to be recognized as an essentially psycho-physiological trait, that is, a basic need of the personality of the body and mind in human behavior.

Sneyders (1996, p.36) states that [...] "To educate is to go towards joy." Playful techniques make the child learn with pleasure, joy and playful education is not a pastime or a diversion. In early childhood education, playful activities contribute to children's learning, as they enable interaction, enable the development of imagination, creativity, as well as motor and reasoning skills.

In this way, it is possible to understand that play as a child's language is capable of keeping the child in contact with the imaginary world, that is, the little ones are able to imitate reality in a pleasurable way. In this scenario, it is observed that each game plays an important role in the acquisition of new learning and discoveries, in addition to constituting a unique and privileged moment for new interactions.

The RCNEI - National Curriculum References for Early Childhood Education (1998), point out the importance of keeping the child in contact with the games of other times, especially with regard to the rules and types of toys used. Such an adult procedure enables the recovery of children's culture, in addition to contributing to the integral development of children.

> Moments of play should be permanent activities in which children can also be in contact with themes related to the social and natural world. The teacher will be able to teach the children games and games from other times, proposing research with family members and other people in the community and/or in books and magazines. For the child, it is interesting to know the rules of the games of other times, to observe what has changed in relation to the current rules, to know what the toys were made of, etc. (BRASIL, 1998, p. 45).

For Kishimoto (2010, p. 83), there is a difference between the toy and the pedagogical material based on the nature of the objectives of the educational action, presenting his interest in the pedagogical game, when he states that by allowing the manifestation of the child's imagination, through intentionally arranged symbolic objects, the pedagogical function subsidizes the integral development of the child. In this sense, any game used at school, as long as it respects the nature of the playful act, has an educational character and can also be given the general name of educational game.

It is for all these reasons that playfulness is a human need, especially for children and their development, and cannot be seen only as fun, but as learning. The personal development that playfulness provides associated with social and cultural factors contributes to good physical, cognitive, affective, emotional and mental health, facilitating the process of socialization, communication, construction of knowledge, as well as a full and integral development of children, individuals involved in the teaching-learning process.

For the child, games help develop language, thinking, socialization, initiative, and self-esteem. It prepares them to be citizens capable of facing challenges and participating in the construction of a better world. Therefore, it is suitable to be used as a tool for school learning in all areas of knowledge.

Also according to Kishimoto (2010), it was in the mid-1930s that educational games began to be inserted in children's institutions, the meaning of play was considered as a manifestation of children's interests and needs and not just as a distraction. The child's education was made possible through the toys and games he played.

On the other hand, it is necessary to consider what Negrini proposes (apud Costa, 2006 p.104): [...] "The conception that play is reserved for children is nothing more than the loss of human

naturalness, imposed by man on man himself, since history tells us - the adult used to devote many hours to leisure."

If we consider that the preschool child learns intuitively, acquires spontaneous notions, in interactive processes, involving the whole human being with their cognitions, affectivity, body and social interactions, the toy plays a relevant role in developing it. (Kishimoto, 2010, p. 36).

With regard to professional training, in order for the pedagogue to be able to act as an educator, it is necessary, according to Dewey (1961 apud Kishimoto, 2010, p. 94-95), that he knows how to conduct the teaching-learning process in a democratic way, organizing the participation of individuals in social awareness, since all education comes from the participation of the individual in the social consciousness of the race. This process begins almost unconsciously at birth and continually forms the powers of the individual, developing their consciousness, forming their habits, training their ideas, and awakening their feelings and emotions.

In Early Childhood Education, the process of playful activities takes place with more emphasis on children aged 0 to 5 years. Where they interact with each other, playing a social role in which they can develop imagination, creativity and also motor and reasoning skills.

Thus, playfulness has been a current theme that demands a theoretical discussion in order to enable the understanding of its functionality. The ludic is a pedagogical and social resource, a tool that the educator can use in his pedagogical practice. Playfulness will provide the student with a great discovery of stimulating inner aspects for the development of their learning.

Early Childhood Education represents the beginning of the child's formal contact with the world of letters. Although at this stage literacy is not the focus, the child knows, through play, the first letters, learns to spell his own name. There are countless pedagogical proposals that have been raised over the years, seeking to find privileged resources that can help the child in the teaching-learning process and, especially, in literacy.

It is important to highlight that in 2006, with the enactment of Law No. 11,274, the age of entry of children in Elementary School was reduced to six years. According to the proposals of PNAIC (2017), "The Literacy Cycle should be marked by an intentional and progressive pedagogical action that prepares a solid structure for new lifelong learning." In this sense, playful play has been pointed out as a privileged and fundamental resource for the child's development.

Froebel, one of the first educators to take into account the importance of early childhood as a decisive phase in adult education, defended the idea that play would be the first resource on the path to learning. For him, games would be much more than fun, it would also be an alternative for the child to represent the concrete world around him in the expectation of understanding it. According to Oliveira,

> Play is the privileged resource for the development of young children because it triggers and

> develops psychological processes – particularly memory and the ability to express elements with different languages, to represent the world through images, to take the point of view of an interlocutor and adjust their own arguments through the confrontation of roles that are established in it. to have pleasure and to share situations full of emotions and affectivity" (OLIVEIRA, 2019, p.235).

The cognitive development of a child, according to Piaget, is not only due to the accumulation of information received, but results from a process that is elaborated from the child's interactive activities. In this way, "Educational games, in their essence, lead to learning based on leisure and fun, and the size of the child's motivation is interconnected with the form and approach given by the educational focus presented" (SOUZA, 2012, p. 27).

In the process of child development, playfulness with educational purposes can transform content that does not bring meaning or interest to the student into an important teaching tool. Therefore, using this resource, the teacher can stimulate the child to interact with the written language and from it promote in their knowledge construction process a significant learning that provides the development of their motor, mental and social skills.

From this perspective, the literacy process is an important stage in children's lives, and should contain subsidies that enable the student to permeate conditions to obtain elements that support a solid structure that serves as a basis for the improvement and development of new learning throughout the trajectory of their existence.

Based specifically on consideration of school learning and teaching, the theory of meaningful learning proposed by David Ausubel [1]is based on the valorization of students' prior knowledge. When this specific knowledge existing in the individual's cognitive structure interacts in a substantive way with the new information, attesting to its relevance, it contributes in this sense to the reinforcement or construction of new meanings.

Moreira (2011) describes this prior knowledge:

> In simple terms, subsumer is the name given to a specific knowledge existing in the individual's knowledge structure, which gives meaning to a new knowledge that is presented to him or discovered by him. Both by reception and by discovery, the attribution of meanings to new knowledge depends on the existence of specifically relevant prior knowledge and interaction with it (MOREIRA, 2011, p. 14).

In the event that there is no interaction between the new information and existing knowledge, or that this information produces less incorporation and assigns little meaning, the result will be purely rote or repetitive learning. In this sense, "In colloquial language, rote learning is known as 'memorize', so used by students and encouraged at school." (MOREIRA, 2011, p.32)

[1] David Paul Ausubel (1918-2008) American researcher, with training in Psychiatrist Medicine and Psychology, author of the Theory of Meaningful Learning. Taking into account the school context, David Ausubel developed his theory taking into account the subject's history as well as his or her predisposition to learn and relate to potentially significant material. <Https://novaescola.org.br/conteudo/262/david-ausubel-e-a-aprendizagem-significativa> accessed in Aug. 2023.

In this way, Moreira, based on Ausubel, presents two essential conditions for meaningful learning to actually occur: the student's predisposition to learn and potentially significant school material or content. As far as predisposition is concerned,

> It's not exactly about motivation, or liking the material. For some reason, the learner must be predisposed to interactively relate (differentiating and integrating) the new knowledge to his previous cognitive structure, modifying, enriching, elaborating and giving meanings to this knowledge. (MOREIRA, 2011, p. 34)

As for the potentially significant material, it is important to emphasize that there is no significant material (class, books, playful games...) because the student will be the one who will attribute meaning to the material and this will depend on the logical meaning of the material and the learner's predisposition. Therefore, the logical meaning will result from the non-arbitrary relation of the contents presented with the anchor ideas existing in the learner's cognitive structure, that is, from the relation of the learner's anchor ideas to the new information.

4 JOKES WITH EMPHASIS ON JEAN PIAGET'S IDEAS

Games and interactions should permeate all pedagogical actions aimed at children. For Piaget (1971), "when the child plays, he assimilates the world in his own way, without commitment to reality". Piaget defines this type of play as symbolic play, which is the representation of one object by another with different meanings. This game is composed of an expression of gestures accompanied by speech. It is possible to highlight "make-believe" as one of the examples of symbolic play.

According to Kishimoto (2010):

> In role-playing or make-believe games, the child is free to choose roles to play and set their rules. Its functioning is the process that has an end in itself. The child plays and enjoys playing. In these games, the child takes initiatives, organizes actions, in short, plans and replaces the meaning of the objects in order to reproduce the relationships and phenomena observed by him (KISHIMOTO, 2010, p.111).

Therefore, before the power of symbolizing, it is difficult for a child to act with roles, with make-believe, because it is in play that the child will make use of objects in a subjective way, regardless of their objective social functions. Brougère (2010) adds that:

> Play is a means of minimizing the consequences of one's own actions and, therefore, learning in a situation that carries fewer risks. However, it is an open, uncertain world. You don't know, in advance, what you're going to find: the game has a random dimension. In it we find chance or indeterminacy, resulting from the complexity of the causes that are at work. It's a space that can't be totally dominated from the outside. Every internal coercion resurfaces the game... all external coercion risks destroying it (BROUGÈRE, 2010, p. 43).

Therefore, it can be said that, through the child's games and voluntary expressions, it is possible to observe their inclinations, their anxieties, their desires and their conceptions about the culture in

which they live, including about its social actors. This is the moment when values are learned, the child internalizes and socializes meaningful concepts. Therefore, playfulness is configured as an activity with its own purposes, to the extent that it arises voluntarily and is conducted unexpectedly, happening for the simple pleasure of playing.

It is important to distinguish make-believe play from pedagogical games, which, in turn, must have determined the objectives to be obtained. In this case, the game can have two functions: playful, because it provides fun, pleasure and/or displeasure and consists of voluntary attitudes; and the educational function, because it adds knowledge. Considering, therefore, Piaget's cognitivist approach, which analyzes the game in relation to the child's mental life, as something that is influenced by the process of assimilation, he states that, in other words, the game:

> (...) it is a particularly powerful form of activity to stimulate the social life and constructive activity of the child (...) it is true that in most of my publications I have dealt with various aspects of cognitive development, particularly with cognitive development, particularly with the development of operativity, but I believe that in my early works I have already emphasized the importance of interindividual exchanges (PIAGET apud KAMII, 1991, p.10).

In this sense, the function of the game would be to create situations or activities for the child to fantasize, because fantasy is the element for the assimilation of events and objects to the child's "I" and "mental structures". In child development, Piaget (1971) distinguishes that children's games are assigned according to three major structures: exercise, symbol and rule.

Thus, several studies carried out in the 1980s already showed that the first five years of life are essential for human development and the formation of intelligence and human personality. However, until 1988, in Brazil, children under 7 years of age did not have the right to education. The current constitution, for the first time, recognized Early Childhood Education as a right of the child, an option of the family and a duty of the State. Since then, Early Childhood Education in Brazil has ceased to be linked only to the social assistance policy, but has become part of the national education policy.

On December 26, 1996, Law No. 9,394/96, the Law of Guidelines and Bases for Education (LDB), was enacted. The Law of Guidelines and Bases of National Education LDBEN No. 9,394, makes evident the importance of Early Childhood Education, a period in which this modality began to be considered as the first stage of Basic Education with the aim of the integral development of the child from zero to five years of age, in its psychological and physical aspects.

Through playful activities, games and games, the teacher can work on the social side, with established rules and limits and thus helping in the formation of personality, making the student respect each one's space, allowing interaction and socialization.

According to Rego (1997):

> Play represents the possibility of solving the impasse caused, on the one hand, by the child's need for action and, on the other hand, by his impossibility of performing the operations

> required by these actions. "The child wants to drive the car himself, he wants to row the boat by himself, but he cannot do so, and he cannot do so mainly because he has not yet mastered and cannot master the operations required by the real objective conditions of the given action." Thus, through toys, the child projects himself in the activities of adults, seeking to be coherent with the roles assumed (REGO, 1997, p. 82).

Both games and games are important for the child and for the adult, the problem is that the adult often does not want to enter this child universe, leaving aside and even forgetting how the games and games were experienced in childhood. It is necessary to lose the fear of being judged, of making mistakes, understanding that if we enter the world of games, children will thank us for our attitude, therefore, letting games be part of our lives, will bring us satisfaction.

The sense of playing and playing is lost because they understand that it is a child's thing and often this reflects on the child's learning. The simple fact that the child wants to play and somehow handle the objects escapes the eyes of the adult who think that children's behavior through games and games are mischief, scolding them.

Contemporary education seeks to introduce games as a pedagogical resource, as they provide the child's interaction with the proposed content. Often the look at the methodologies developed in Early Childhood Education characterizes traditional teaching and, therefore, the education that makes a difference for children is far from existing.

According to Almeida (2003, p. 30): "It is very common to hear that games are useless and have no meaning within schools, except in physical education. Such an opinion is closely linked to the assumptions of traditional pedagogy, which excluded playfulness from any serious or formal educational activity." Games and games in Early Childhood Education enable children to express themselves through the daily exercise of directed activities that promote the development of their motor, cognitive and social skills.

> Playing is one of the fundamental activities for the development of identity and autonomy. The fact that the child, from a very early age, can communicate through gestures, sounds and later play a certain role in the game makes him develop his imagination. In play, children can develop some important skills, such as attention, imitation, memory, imagination. Some socialization capacities also mature, through interaction and the use and experimentation of rules and social roles (BRASIL, 1998, p.22).

It can be seen that encouraging the use of toys and games that favor greater interaction between children allows them to communicate with other people and express their anxieties and joys. The family and the school are institutions that must develop knowledge that helps in the future of children, enabling the construction of meaningful learning. In order for these activities to be expressive, they must be present in the school curriculum, games, games and playful activities that children enjoy and participate in an interactive way. According to the Federal Constitution of 1988, it is the duty of the family, society and the State to ensure to the child and adolescent, with absolute priority, the right to

life, health, food, education, leisure, professionalization, culture, dignity, respect, freedom and community family life.

Toys and games in recent times have aroused the interest of psychologists and educators, due to their importance for the development of the child, and the construction of knowledge. The active participation of the child and the games have served as an argument to strengthen the conception according to which one learns through play.

In the set of human activities, some games mentioned as "playing" from a complex process of designation and interpretation are not the purpose of this paper to show that this process of designation changes in time according to different cultures. When dealing with playful activities and with the objects present in play and games, the child can deal with the definition of words through the concrete object itself, and the child, through this action of playing, although he does not have grammatical language, is able to internalize the functional definition of objects, and then begins to relate the words to something concrete.

When using the game for educational purposes, the educator should promote activities that are interesting and that motivate the child to participate in the activities developed. In this way, he should value creativity, show interest in the proposed activities and encourage children to practice the game or play, intervening, if necessary, in the child's actions so that he can relate, acquire concepts, learn the different languages, in which he communicates and expresses himself through feelings and ideas. Therefore, it is the teacher's role to consider, as a starting point for their educational action, the knowledge that children have, acquired in family and social life.

> The role of the teacher is of paramount importance, as he is the one who will work on these moments, transforming them into learning situations, that is: The school needs to perceive the child as a being in development and in constant movement, endowed with a body. The educational act is not only mental, on the contrary, it is directly linked to the body, in its totality. (CORDIOLLI, 2011.p.182).

Dealing directly with the object of study, including thoughts and feelings in physical activities, enables significant learning, developing attitudes and values, transforming them into people capable of transforming, preserving the environment in which they live and interacting with others.

Thus, it is possible to consider that playfulness, games, toys and games are resources used by children to relate to the physical and social environment in which they are inserted, arousing their curiosity and expanding their knowledge and skills, in the physical, social, cultural, affective, emotional and cognitive aspects, and thus, we have the theoretical foundations to deduce the importance that the educator should give to the experience of teaching in Early Childhood Education, since the construction of knowledge happens through interpersonal relationships and reciprocal exchanges of experiences that are established throughout the student's integral education and consequently the teacher learns while teaching.

5 FINAL CONSIDERATIONS

Within the scope of the final considerations of this research, it must be stated that the living space in Early Childhood Education is rich in diversity of experiences and enriching situations with regard to study and research to understand the teaching and learning process. In this sense, it is important to understand that it is increasingly necessary to investigate the teaching-learning process from different perspectives, especially when it involves playfulness. Early Childhood Education has gained space in the field of research, considering that it has become a target of concern for many when it comes to learning.

In view of this, it became evident that in addition to learning, it is necessary to observe the methodologies and the relationship between teacher and student, as these factors are preponderant to develop learning. It is known that there are several theories and contextualizations about how to work with playfulness, and it is then up to the teacher to carry out studies to improve their pedagogical practice.

It is not a matter of choosing a right or wrong methodology, but of understanding that learning takes place through a process that must be experienced in a satisfactory way by the student so that it can become meaningful. With the study of playfulness, it was notorious that when thinking about playfulness there is a range of strategies to be explored by educators, such as singing, playing, playing, dancing, moving, among other activities that stimulate students' interest and develop multiple skills.

In addition, games as a teaching tool can effectively contribute to child development, considering that through these tools it is possible to stimulate learning, as play and play are part of the experiences of children's culture. By playing, the child learns to respect rules, to pay attention during the game, to socialize and interact with peers.

Finally, one cannot neglect the importance of play in education, as children learn through play. In this context, the importance of play in Early Childhood Education is indisputable, considering that the child interacts and is actively involved in the learning process, being able to explore and develop multiple skills and knowledge.

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The symbology of the body and the resignification of power relations in the media with typologies *Plus Size*

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ABSTRACT
The representation of the body has always been associated with ethical and moral values determined by social groups, such as society, religion, among others. The ephemeral social relations of contemporaneity have transformed the female body into an instrument of personal assertion. In this sense, the present research seeks to reflect on how the media have explored the female physical and bodily pattern, relating them to self-acceptance and social status, through the acceptance of the other. The objective of this research is to analyze the discourses of social media with Plus Size typologies, in order to evaluate how social media conveys information about the body, associating it with the identity of individuals. The methodology used includes a literature review and uses content analysis (BARDIN, 2010), aiming to understand the resignification of the power relations of the body in social media. Goffman (1988), Bourdieu (2000), Vargas (2014), Brunelli, Amaral and Silva (2019), among others, were used as theoretical frameworks. That said, issues related to beauty standards and some forms of media influences capable of creating, maintaining, or intensifying the resignification of the body are highlighted, as well as evidencing the difficulties of self-acceptance, considering the liquid modernity that transforms values into something transitory with the creation of active concepts in people's perception of themselves and of what is expected of society.

Keywords: Symbology, Body, Media, *Plus Size*.

1 INTRODUCTION

Currently, the body is understood as an object of power and its subjectivity is sustained by the identities that individuals assume and go through possible judgments, especially aesthetic. *Plus-Size* fashion is allied to discourses that spread self-acceptance and the inclusion of fat people in various gears of society. In addition, the symbolism of the body seems to question a certain ideal of beauty, even relativizing its direct relationship with thinness.

It is notorious that contemporary society creates body standards according to its culture, values, customs, and specificities, thus giving rise to standards of beauty, sensuality, health, and even posture,

according to what they assume to be the ideal.

The objective of this research is to analyze the discourses of social media with *Plus Size* typologies, in order to understand how social networks work with the identity of individuals, and also with their self-esteem in breaking paradigms.

The methodology used in this work includes a literature review and uses content analysis (BARDIN, 2010), aiming to understand the resignification of the power relations of the body in social media.

Thus, this scenario related to *Plus Size* fashion and its approaches to acceptance are analyzed in order to minimize prejudices and stigmas about the fat body in society, especially from the perspective of Goffman (1988), who points out that stigma affects a negative mark, which is capable of causing prejudice and other forms of social exclusion. designating that individuals are considered sub-human, not belonging to the position of subjects of rights.

The first part offers reflections, in the light of the theoretical foundation, divided into three subtopics, with emphasis on the issue of the symbology of the body and the aesthetic standards required by society, in order to reflect on individual and social representations; followed by the stigma and the feeling of belonging of the person outside the standards established by society, *the Plus* Size models and, finally, the influence of the media and *the Pluz Size typology* in the current context.

The second part contemplates the results achieved from the testimonies of non-standard people, posted on social media for content analysis. And finally, there are the final considerations and references.

Therefore, this research evidences the accentuation of the debates in relation to women's body idealization, warns about the influence of the media on the lives of individuals and society, which imposes an "ideal" body standard.

2 THEORETICAL BACKGROUND

2.1 THE SYMBOLOGY OF THE BODY AND AESTHETIC STANDARDS

Beauty has become something to be conquered by individuals, especially by postmodern women[1], those who accumulate victories with their insertion in the labor market, expansion of their sexual and reproductive freedom, achievement of financial independence and political rights, women who relate beauty with personal success and success in various aspects of life. This may be due to the fact that people submit to social standards that judge appearance to the detriment of essence, ignoring other competencies (BRUNELLI, AMARAL and SILVA, 2019).

According to Goffman (1988), as the rigidity of aesthetic standards intensifies, individuals are

[1] The postmodern woman in this study is understood in the logic of what Zygmunt Bauman (2008) sees as characteristic of our current society, which had a greater emancipation in relation to previous generations, affecting people's sense of individual freedom.

increasingly pushed into the condition of being stigmatized. Thus, there is a considerable increase in the number of individuals who become part of two groups: the discredited and/or the socially discredited.

It is necessary to consider that appearance is one of the forms of presentation or revelation of how each individual wishes to be represented in the world, because the way the world is represented probably impregnates patterns built from cultural values, established in society or in the social group.

It is possible that this representation is not limited to aesthetic appearance, but that, among other elements, it is influenced by the way one is apprehended by others, based on the impact that the visual impression causes in the first contact in everyday life, after all, it is common to hear from common sense that "the first impression is the one that lasts".

In this sense, there are the individual and social representations that others construct about the other, since they are not exclusively subordinated to the aesthetic aspect per se, but which, in the first contact, may be relevant.

The relationships that are made from the "body" tend to relate what is "beautiful" and "healthy" – often denounced as a common sense that is very present in the discourses of ordinary people, of various professionals who work with the "body", of health and beauty professionals, journalists and digital "influencers". This common sense is created, in large part, due to symbolic power (BOURDIEU, 2000) and the means of communication used in modernity to disseminate mass culture and establish social standards that permeate reality, influencing the formation of subjectivities.

For Tavares (2003 *apud* RUSSO, 2005), body image is the way the individual perceives and feels about his body, and is directly linked to the beauty standards imposed by the media, since women seek this social framework, often utopian for the majority of the population, but still Thus, they struggle to get close to them. The point is that every epoch, a new discourse is produced about the dichotomy of the beautiful and the ugly.

Throughout its trajectory, the body carries historical and cultural changes of a certain group or society, constructing certain specificities that lead to patterns. However, it should be noted that people, therefore, are literally influenced by what they see on the networks, by what is posted by celebrities or *influencers*, seeking to imitate what is presented as beautiful and ideal (SHOHAT; STAM, 1996).

In this way, studying the impacts of aesthetics on the perception of the female body can provide an understanding of the relationship that people have with their own bodies under the influence of thought and behavior models, since socially established beauty standards lead individuals to doubts, as well as can generate dissatisfaction in people with their own image and shake their self-esteem. encouraging a senseless pursuit of the bodily ideal.

2.2 THE STIGMAS AND THE FEELING OF BELONGING OF THE PERSON OUTSIDE THE STANDARDS ESTABLISHED BY THE SOCIETY OF USERS OF PLUS SIZE MODELS

Stigma focuses on a negative mark, which is capable of provoking prejudice and other forms of social exclusion, designating that individuals are considered sub-human, unnatural, pathological, among other negative characters. However, it is not up to them to be subjects of rights, on the contrary, various forms of violence are directed to this population as a form of punishment and/or punishment for their deviations and dissimilarity (GOFFMAN, 1988).

Goffman (1988) in his studies uses the word "stigma" to characterize the process that takes place between individuals or groups that differentiate themselves from the majority, creating "labels" exacerbating the difference.

The term stigma is an ancient concept, the Greeks created the word to refer to people who had bodily signs, with which they sought to highlight something different, extraordinary or bad about the moral *status of* the one who suffered the evaluation of being different (MATTOS, 2012).

Stigma induces a series of discriminations, prejudices, and feelings of not belonging due to the beliefs of people with certain characteristics Inhumane. These discriminations reduce individuals' relationship with society and hinder their life prospects. Goffman (1988, p. 13) states that this term,

> (...) It will be used in reference to a deeply derogatory attribute, but what is really needed is a language of relations and not of attributes. An attribute that stigmatizes one may confirm the normality of another, so it is in itself neither horrible nor dishonorable. a stigma, then, is a special kind of relation between attribute and stereotype, although I propose to modify this concept, in part because there are important attributes in which almost all of our society is discredited.

Stigma, therefore, is a form of social control, in which there is a selection according to moral, religious, institutional, political, cultural and commercial principles, standardizing what is appropriate or not in our society. Those subjects who do not fit into the pre-established end up being stigmatized and then socially excluded, and can be literally eliminated from the society where they live. In this amplitude, Goffman (1988, p. 28) elucidates that:

> (...) There could be a discrepancy between an individual's virtual identity and real identity. When known or manifested, this discrepancy spoils your social identity; It has the effect of alienating the individual from society and from himself in such a way that he ends up being a discredited person in the face of an unreceptive world.

Studies add that it is common for individuals to differentiate the process of group stigmatization from individual prejudice. This perspective is seen in such a way that a selective group can only effectively stigmatize the other when the latter feels in the superior position of power from which the other group is excluded. Elijah; Scotson (2000, p. 27) states that: "stigma is a paralyzing effect on groups with less power".

From Goffman's (1988) perspective, the idea of a group of discredited and/or discredited people seems conceptual in function of the problem of the emancipation of individuals in the face of the problem that involves the dictatorship of beauty. In the meantime, the stigmatized social identity destroys attributes and qualities of the individual, leading him to exercise the power of control of his actions in order to reinforce the deterioration of his social identity, emphasizing a series of thoughts and attitudes giving rise to stigmas.

It should be noted that another aspect highlighted by Elias and Scotson (2000) is the social stigma imposed by the dominant group that usually invades the self-image of the stigmatized group. In this way, Elijah; Scotson (2000, p. 24) takes the view that:

> Affixing the label of "inferior human value" to another group is one of the weapons used by superior groups in power struggles, as a means of maintaining their social superiority. In this situation, the social stigma imposed by the more powerful group on the less powerful group tends to penetrate the self-image of the latter and, with that, weaken and disarm it.

Taken together, the evidence announces that society imposes rejection, leads individuals to lose self-confidence and reinforces the symbolic character of social representation. Finally, it is observed that these subjects, who are the minority, are often considered incapable, a situation that strengthens the social stigma, being internalized by the person, who often serves as a shield to overcome their difficulties.

2.3 THE INFLUENCE OF MEDIA AND THE *PLUZ SIZE TYPOLOGY* IN THE CURRENT CONTEXT

Historically, it is possible to observe that the media exerts influences in relation to bodily changes, offering individuals aesthetic modeling tools at any cost. However, the use of aesthetic procedures without adequate guidance can lead to pedagogical, physical, psychic and social maladjustments.

Vargas (2014, p. 30) elucidates that:

> The human body has, through its materialization, an image and content that communicates, conscious and unconscious, as a symbol. And it is through symbols that the different archetypes structure our consciousness, our ego, throughout our existence.

A few decades ago, the aesthetic standards imposed by the media dictated a thinness that was not in accordance with the reality of the vast majority of people. As everything has pros and cons, the media contributes to the exposure of individuals, causing a democratization of beauty standards in the media, influencing people's attitudes with prejudiced thoughts and attitudes.

However, as Ribeiro *et al.* (2012), the body has representations established by each one, in order to seek changes to obtain the ideal body, valuing their self-esteem in favor of self-acceptance.

Vargas (2014, p. 13) points out that:

> (...) In his studies on corporeality, he taught that the human body has been considered a crucial factor for society since antiquity, whether in its use as an instrument of work and communication or aesthetic care in the tireless search for ideal beauty. The importance of the body has never been a matter of doubt, but over time, the search for beauty has led people to care more and more about it.

From the beginning to the present time, the body has been the target of several questions in order to have an ideal body. Often, the intentions to define the concept of corporeality dissociated its existence in a cultural and social sense.

Nowadays, the exposure of Plus Size models in the media is more frequent. The *Plus Size* movement began in the United States (USA), where the obesity rate is one of the highest in the world. Over the years, Brazil has been adhering to this body typology, with *Plus Size* models in its advertising campaigns, making the public trust themselves more and not looking for an "ideal" thin body.

According to the website Plus Size with Style (2013), "Plus Size is the name that was given by North Americans to the models of clothes above the conventional standard sold in stores. In other words, "Plus Size in English means bigger size".

This exacerbated concern with the body is influenced by the media that disseminate views on obesity, with this the so-called "Plus Size market" gains strength, which has been a reality for some time and has been breaking taboos, having an increasing prominence and with the significant changes in the modern world.

A survey conducted by the World Health Organization (WHO) reveals that a person is considered obese when they have a body mass index equal to or greater than 30 kg/m². This calculation is used to classify the subject according to his or her body mass, and to reach this result, the following is done: weight in kg is divided by height in meters squared (weight ÷ height² = BMI[2]).

Betti (2014) in her dissertation, *"Beauty without measures? Body, gender and consumption in the Plus-Size fashion market"*, exemplifies the value of the theme and the diffusion of health and well-being issues, with regard to physical and mental health, reflecting on the current appreciation of the body permeating aesthetics and its judgments.

Santos & Nicolau (2012, p. 03) state that:

> (...) the emergence of the *Plus Size* trend, which comes to meet a supposed demand from a group that does not fit into the current fashion standards, is nothing more than an efficient strategy of the cultural industry to incorporate a new group of consumers, after all, what matters is that everyone is inserted in the consumer society, since prejudices must be overcome in favor of the objective gains that the capitalist system has.

It should be noted that despite the great achievements of plus-size people , many still have great

[2] Body Mass Index (BMI) is an international measure used to calculate whether a person is at their ideal weight.

difficulty finding pieces of clothing in popular stores where the size grid does not meet their needs. In this way, these people end up being forced to look for specialized stores, where often the pieces have a much higher value, and end up not being able to purchase the product.

Therefore, it should be noted that people are influenced by what they see on the networks, by what is posted by celebrities or *influencers*, seeking to imitate what is presented as beautiful and ideal, without taking into account the different types of stereotypes of those who are outside the standard imposed by the media.

3 RESULTS ACHIEVED

It is observed that the habitual thought that prevails in society in relation to fat people seems to be more linked to the issue of beauty than to the health of the body.

It is interesting to think about how the issue of aesthetics relates to the facts of everyday life, as for example, in the current cases of *bullying* in schools, in which the conflicting situation is usually related to the "body", which is the code for being prejudiced in the face of patterns present in subtle ways of one individual discriminating against another by physical characteristics considered as "different", "weird" and/or "non-standard". And, according to Goffman (1988), as the rigidity of aesthetic standards intensifies, individuals are increasingly pushed into the condition of being stigmatized.

The media reflect the non-acceptance of the real body, leading people to see imperfections and marks of time, thus giving rise to hate speeches with Those who expose their own bodies on social networks, these are called *hatters*, who mobilize on social networks to depreciate people's self-esteem, often leading them to depression and despair of doing aesthetic procedures abruptly to meet this demand of the "fashionable" society, even passing through already established principles.

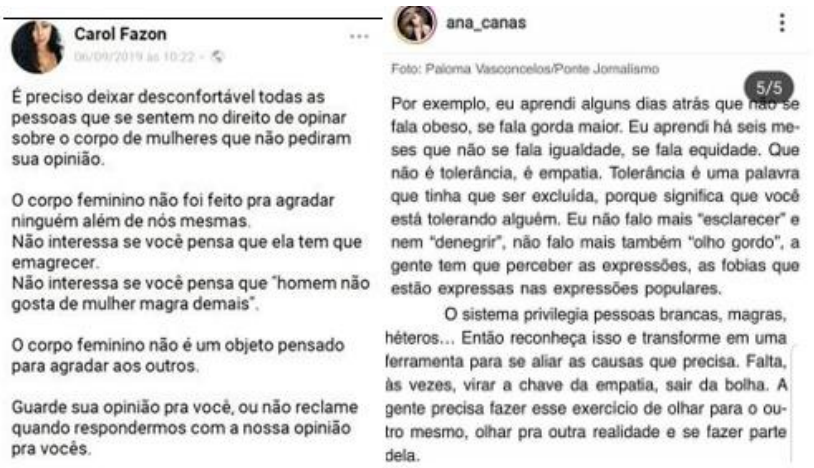
The thin body was seen by the media as an interesting identifier for displaying the conceptual work of fashion designers, but industries, stores and designers are already looking at the "chubby" ones, as there are already *Plus Size* models in the fashion market, who stand out for a different aesthetic from what was seen on the traditional catwalks as shown in Figure 1:

Figure 1: Fashion Week Plus Size (Fonte: http://www.alllingerie.com.br/)



It is observed that even the proportions of the mannequins in the store windows already contemplate the *Plus Size size.* This is a reality, the Brazilian body is already above the average of the ideal Body Mass Index (BMI).

Some testimonies were highlighted for analysis of content posted on social media:



In the testimonies analyzed from social networks, it is possible to observe the expression of a vision of valuing and devaluing the fat body in society. It can be inferred that the acceptance of *the Plus Size* body is changing due to the need to dress and please people who have the real body and not the ideal body desired by the media. Thus, it can be seen that society is reflecting on the symbology of the body and the resignification of power relations.

4 FINAL THOUGHTS

In view of the above, the research sought to highlight the challenges encountered by the *Pluz Size typology*, focusing on several factors. Thus, in this relationship between health, aesthetics and the media, there are important elements to be punctuated, tensioned, reflected and criticized when thinking about issues related to the "body", especially when this search for beauty can reinforce identities and deepen stereotypes in relation to themes about health and aesthetics, because they are also products of

a time and a culture that reinforces such discourses and practices.

The present research achieved the objective of giving voice to a group of people who feel on the margins of society, who, based on the reports, exacerbated their feelings. The debate on this theme was broadened, bringing together theories and studies in order to reflect on prejudices and stigmas.

The results highlight relevant issues that deserve to be highlighted, such as the body being conceived as a symbolic way subject to conceptual changes. It is notorious that the media exert influence on the ideal body, and that its various forms have gained great prominence with *Plus Size models*, in search of demystifying the symbology of the body, which until then were considered ideal.

That said, it is considered that this research can serve as a theoretical basis for future studies and debates within this theme, which is little explored and known. The proposal of the study includes contributions that aim to demystify reflections that there is no ideal body, but a real body that should be accepted and respected as such in the media and outside of it.

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Experiences of families in public schools, a territorial analysis in the municipalities of Guarulhos and São Paulo

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ABSTRACT
This study was developed in the Master's Degree in Education of the Graduate Program in Education of the Federal University of São Paulo. The objective of this study was to identify and problematize some of the relations between Family and School, seeking to understand manifestations through the territorial dimension of their configurations. To this end , we interviewed teachers and family members of elementary school students from a municipal school in Guarulhos-SP and another in São Paulo-SP. The families, as well as the teachers interviewed, experience the place from different points of view, but the vision of both appears permeated by the social relations established with the place. In this work, we will discuss the conceptions of the researched families about the school and the place.

Keywords: Families, Schools, Municipalities.

1 INTRODUCTION

This article is the result of an investigation carried out in the field of education in the area of teacher training[1], in which we seek to identify relations between family and school from a territorial perspective in the municipalities of Guarulhos and São Paulo, through a comparative case study. In this work we will deal with the conceptions of families about the school and the place in which they are located.

In this sense, we seek to understand how people relate to the place and in which social spheres such relationships are established. The evidence indicates that these relationships appear in an accentuated way in school practices, as well as the fact that families and the school develop a relationship in which two modes of socialization undertaken in different spaces and times are evidenced, but which converge in the school space, impacting on the teaching and learning processes.

In this context of an intricate network of correlations, with regard to teacher training, we realize that our view of the school has been changing to the point of thinking of it as a phenomenon that can

[1] Master's dissertation entitled Relations between Family and School from a territorial perspective in the municipalities of Guarulhos and São Paulo, developed in the Graduate Program in Education of the Federal University of São Paulo. Carried out between 2014 and 2017.

also be understood if we take into account its location and its impacts on the relationships that unfold between the subjects that constitute it.

Mediated by these contexts, this work exposes ideas of Bourdieu (1996), (1998), (2007) about the processes of schooling, which focuses on how individuals develop different trajectories from the place in which they are located. To these considerations, we add other readings and reflections focused on the understanding of the school institution (bearer of a web of relationships between different subjects) and the aspects related to its locations.

These considerations, in turn, provided questions and reflections about how the school institution is disposed in relation to families and the place they occupy in society, instigating us to questions and reflections in two orders, which are articulated. The first concerns how the school institution is disposed of in terms of its relations with families. Does the school know its students and their families? Is this relationship relevant for the school to organize its formative actions with the students? How does this happen? Is this relationship an agenda point in the continuing education of teachers in their working hours? The second is about the location of the school, that is, does the place in which it is located impact the trajectories of families, teachers and students? Does the school consider its insertion in the neighborhood, in the countryside and in the areas of occupation, that is, in the context in which it is inserted, in order to think about the educational processes?

Still analyzing this path, in relation to the educational experiences that caught our attention, we had the opportunity to teach in the municipal school systems, in the cities of São Paulo and Guarulhos, in the initial and final years of elementary school, in addition to an experience in Guarulhos with early childhood education and with the education of young people and adults. In these experiences, among our observations, we were struck by the ways in which the school is seen by families and appropriated by students in different ways at each educational stage and that the same content taught in different schools, located in different locations, represented us to be developed with numerous differences, among them, the understanding of locational characteristics and their impacts on students' learning processes. It is worth noting that in these experiences we were also able to observe relationships developed in different ways by the students' families with the school institution.

In these experiences, we observed that in each educational modality there is a public that differs in its relations with the school and with knowledge. Some of our observations allow us to infer that in all modalities, with greater or lesser intensity, there is an expansion of the sphere of the public school, going beyond teaching, being used as a space for the implementation of social policies, converging this observation with the arguments of Nóvoa (2011), when analyzing the situation of the school:

> [...] it refers to an overflowing school, a utopian school that seeks to compensate for *the deficiencies of society*, calling upon itself all possible and imaginable missions (NÓVOA, 2011, p. 537).

We noticed that there is a distancing of the school in relation to the reality of the students, with a difficulty in adapting the teaching practices to the public served. We also noticed that there is a conflict between the school reality and the students' reality, evidencing what was pointed out by Nóvoa (2011), when analyzing the school's relations with knowledge and students.

> Today, all students are in school, but not everyone has access to knowledge. There are many students who do not want to learn, who do not have any school project, and the school is totally lost in the face of this reality. We don't know what to do with this *mass* of students who don't respect us, for whom school has no meaning (NÓVOA, 2011, p. 538).

When we relate our observations to each specific educational modality, we notice that, in early childhood education, there is an expansion of the sphere of the public school, going beyond teaching, being used as a space for the implementation of social policies. In youth and adult education, we noticed that there is a distancing of the school from the reality of the students, with a difficulty in adapting teaching practices to the public served.

In elementary school, where most of our experiences were developed, we noticed that there is a conflict between the school reality and the students' reality, and in relation to the construction of knowledge, we observed that students often do not understand what the school designates as knowledge, as well as other social practices related to human formation.

Still in this movement of rescuing our observations about the school routine, we were able to observe, in the meetings of parents and teachers and in the entrances and exits of students, some characteristics related to the relations between families and schools, calling our attention to how these relationships become increasingly tenuous with the advancement of the educational stages. We also noticed that in each location where we worked, the school was arranged in a different way, and in some places it appeared as an island, in others it was integrated into the landscape and in others it was shown as a fortress far from the local reality.

In order to elucidate our inquiries pointed out so far, we searched the academic literature for analyses and approximations about these points observed and verified that such questions occupy a place in the reflection of important thinkers in the area of education studies. Many researchers, including Vigotsky (1991), Bourdieu (1998), Thin (2006) and Luria (2010), have drawn attention to the role that the bonds between family and school play in pedagogical practices, in learning processes and in how relationships are established between families and schools, which are also determining factors in children's school life.

By looking at the school through the arguments of researchers in the field of education, who seek to trace a bias between the territory and the school, such as Kaztman (2000), Cavalcanti (2005) and López (2008), we address the question of how the territory is inserted in the social relations between the institutions of family and school.

In a reflection on these relationships based on the realities experienced by the families, we ask ourselves: Do the families know the places in the neighborhood where they live? Do you know the places in the school where your children study? How do they think about their places of residence? How do they get around, work, and play where they live? How do they conceive of their relationship with the school? Do they feel like they belong in the school territory? These questions allow us to point out that identifying where these families live and what meaning they attribute to each place in which they establish relationships helps us to think about their territorialities, that is, their sense of belonging to the place.

We understand that the location and distribution of teachers, students, families and others in the school environment, as well as the neighborhood, contribute to determine the various processes that delineate the school in its daily life, especially with regard to the teaching and learning processes. In this sense, it is worth noting that the term "territorial" in the present work does not refer to an object, but rather to "a way in which the subject identifies the ordering of the things that make up the place" (Santos, 2016, p. 32).

Thus, from a territorial perspective, we seek to consider that the locations of schools and families are central to our work, developing teaching and learning processes in these institutions, thus constituting factors to be considered with regard to the bonds of belonging of the individuals involved.

Instigated by such experiments and studies, we developed a research in which the act of getting to know the families constitutes an important foundation to reflect on the teaching and learning processes, as shown by Thin (2006) when he relates school learning to that carried out in the context of primary socialization2. Still in this line of thought, we are guided by the ideas of Szymanski (2009) when analyzing how this relationship occurs in the family and school spheres, making the family and the school socializing institutions, therefore, partly responsible for a portion of the construction of this identification with the place, taking into account the experiences of families and the professional practices of teachers. From this perspective, the presence of families is fundamental in the learning processes of children, as well as teachers through their teaching practices, so that recognizing who teachers are and what they think enables us to have a greater understanding of how the bonds of families with the school and the place develop.

In this sense, we researched families and teachers with the objective of identifying relationships between family and school, seeking to understand how families attribute meanings to the places where they live and to the school where their children study, as well as to recognize the meanings that teachers attribute to the place where the school institution is located and whether this recognition is included in their teaching practices. To this end, we focus on the early years of elementary school, which will be discussed later.

To this end, we considered two public elementary schools of municipal education networks, one in the Parque Alvorada neighborhood, located in the district of Pimentas, in Guarulhos, and the other in the neighborhood of Penha, in São Paulo.

2 THE SEARCHED FIELD

The municipalities selected as the field of research are both located in the state of São Paulo in Brazil, a country with a territorial extension of 8,514,876 square kilometers, which corresponds to 48% of the total area of South America, currently with more than two hundred and fourteen million inhabitants (Instituto Brasileiro de Geografia e Estatística Projection of the population of Brazil − IBGE, 2022).

tag. The city of Guarulhos is the second largest municipality in the state of São Paulo considering its population and economy. It is located in the northeastern portion of the metropolitan region. It has an estimated population, according to preliminary data from the 2010 Census (Brazilian Institute of Geography and Statistics − IBGE, 2010), a total of 1,221,979 inhabitants, of which 626,936 are women and 595,043 men. On the economic level, according to IBGE data, it is in 9th place in the country, considering the Gross Domestic Product – GDP (Prefeitura Municipal de Guarulhos – PMG, 2006).

The city of São Paulo, capital of the state of São Paulo, has an estimated population, according to preliminary data from the 2010 Census (IBGE, 2010), of 11,253,503 inhabitants, of which 5,924,871 are women and 5,328,632 are men. In the economic plan, according to IBGE data, it is in 1st place in the country, considering the Gross Domestic Product – GDP.

Analyzing data from the IBGE and the State Data Analysis System Foundation (SEADE), which provides the São Paulo Social Vulnerability Index (IPVS), both municipalities have a high economic development, despite having areas in a situation of vulnerability; they are bordering, densely inhabited, have large municipal elementary school networks and constitute two of the largest economies in the country.

The location of elementary schools, located in municipalities with high economic development, but in neighborhoods with characteristics of great social vulnerability, instigates us to think about the different ways in which people build their feelings of belonging to places and thus, inserting themselves or not within processes that demarcate their territorialities.

In this sense, it is worth noting: when dealing with vulnerability, we refer to Kaztman's positions, which understands the concept of social vulnerability as follows:

> By social vulnerability, we mean the ability of a person or a family to take advantage of the opportunities available in different socioeconomic spheres, in order to improve their well-being and prevent its deterioration. As the waste of opportunities implies a weakening of the

> process of capital accumulation, situations of vulnerability usually trigger social degenerative processes that tend to progressively worsen (KAZTMAN, 2000, pg.281).

Therefore, when we refer to situations of vulnerability, we are directly referring to the relationship that families establish with the opportunities that the place provides them, thus creating conditions for analytical densification of the meanings of being where they are.

Thus, the concept of vulnerability is linked to the segregation of families in such a condition, which directly impacts their expectations regarding what is expected of the school, as corroborated by the position of Silva, Batista and Alves when dealing with the issue.

> A complex phenomenon par excellence, its explanations emphasize both characteristics of the supply of services and of demand. Among the investigations that focus on the characteristics of demand in the construction of the effect of socio-spatial segregation on school inequalities are those that focus on the characteristics of families, especially on their ethical and cultural dispositions and on their school expectations (SILVA, BATISTA & ALVES, 2014, p. 124).

We propose this approach in a comparative way because this method allows us to understand social events breaking with their singularity, as Schneider argues:

> Comparison, as a moment of cognitive activity, can be considered inherent to the process of knowledge construction in the social sciences. It is by using a type of comparative reasoning that we can discover regularities, perceive displacements and transformations, build models and typologies, identifying continuities and discontinuities, similarities and differences, and making explicit the more general determinations that govern social phenomena (SCHNEIDER, 1998, p.1).

In this way, it seeks to consider the locations of families, schools and their respective teaching and learning processes in order to understand the meaning of the reasons why they are there and how this determines their forms of existence.

3 A LOOK AT SCHOOL AND FAMILIES.

By looking at the school using different scales of observation and through fieldwork that implemented data collection and analysis, in which we sought to dialogue with the arguments of researchers in the field of education, who seek to trace a bias between the territory and the school, such as Kaztman (2000), Cavalcanti (2005) and López (2008), We address the issue of how the territory is inserted in the social relations between the institutions, family and school.

In a reflection on these relationships based on the realities experienced by the families, we ask ourselves: Do the families know the places in the neighborhood where they live? Do you know the places in the school where your children study? How do they think about their places of residence? How do they get around, work, and play where they live? How do they conceive of their relationship with the school? Do they feel like they belong in the school territory? These questions allow us to point out that identifying where these families live and what meaning they attribute to each place in

which they establish relationships helps us to think about their territorialities, that is, their sense of belonging to the place.

We understand that the location and distribution of teachers, students, families and others in the school environment, as well as the neighborhood, contribute to determine the various processes that delineate the school in its daily life, especially with regard to the teaching and learning processes. In this sense, it is worth noting that the term "territorial" in the present work does not refer to an object, but rather to "a way in which the subject identifies the ordering of the things that make up the place" (Santos, 2016, p. 32).

Thus, from a territorial perspective, we seek to consider that the locations of schools and families are central to our work, developing teaching and learning processes in these institutions, thus constituting factors to be considered with regard to the bonds of belonging of the individuals involved.

Faced with the complexity of the factors involved in learning processes, Vygotsky (1991, p. 93) proposes "that the development of one capacity promotes the development of others". We can understand that from this dynamic, individuals create specific neural structures to deal with the different issues that the environment presents to them.

> Just as the instruments of work change historically, the instruments of thought are also transformed historically. And just as new instruments of work give rise to new social structures, new instruments of thought give rise to new mental structures (BERG apud VIGOTSKY, 1991, p. 149).

Thus, the learning process results from a dialectical interaction between the individual and the social environment, that is, from the transformation of everyday concepts into scientific concepts, building reasoning from previous knowledge. Cavalcanti (2005), when analyzing the contributions of Vygotsky's ideas to the teaching of Geography, which seems to us can be extended to other curricular components of the early years of elementary school, the author argues that:

> The idea to be emphasized here is that man's higher mental functions (perception, memory, thought) develop in his relationship with the sociocultural environment [...] (CAVALCANTI, 2005, p.187).

Still thinking about the issue of the development of these mental functions in the socioeconomic and cultural environment, in which the individual is inserted, Luria, in his work also based on the ideas of Vygotsky, proposes that:

> The modes of generalization, typical of the thinking of people living in a society in which their activities are dominated by rudimentary practical functions, differ from the modes of generalization of formally educated individuals. The processes of abstraction and generalization are not invariable at all stages of socio-economic and cultural development. On the contrary, such processes are a product of the cultural environment (LURIA, 2010, p. 46).

When analyzing how the relationship between individuals and the sociocultural environment takes place, taking into account the school learning processes developed during these interactions, Bourdieu tells us that:

> [...] the interest that a listener may have in a message, whatever it may be, and, even more, the understanding that he or she may have of it, are, directly and strictly, a function of his "culture", that is, of his education and his cultural environment [...] (BOURDIEU, 1998, p. 62).

Thus, part of the learning processes is a result of the evaluations about a given subject, which are products of the relationships that the individual establishes with the sociocultural environment in which he is inserted, constituting the school a social environment in which different evaluations about the most diverse subjects are related.

We developed a research in which the act of getting to know the families constitutes an important foundation to reflect on the teaching and learning processes, as shown by Thin (2006) when he relates school learning to those carried out in the context of primary socialization[2]. Still in this line of thought, we are guided by the ideas of Szymanski (2009) when analyzing how this relationship occurs in the family and school spheres, making the family and the school socializing institutions, therefore, partly responsible for a portion of the construction of this identification with the place, taking into account the experiences of families and the professional practices of teachers. From this perspective, the presence of families is fundamental in the learning processes of children, as well as teachers through their teaching practices, so that recognizing who teachers are and what they think enables us to have a greater understanding of how the bonds of families with the school and the place develop.

In this sense, in line with the study of this relationship, Bourdieu (1998) argues that knowing the family demographic characteristics, that is, knowing how families are distributed over the territory and in what context this distribution occurs, helps us to understand how the hopes of families regarding their children's school life are projected.

Resuming the discussion about the axes around which this research was developed, the family constituted a relevant axis, since, according to Martins (2006, p. 148), "The family is one of the richest sources to know the influence of the connection of two, three or more people on human development." When dealing with the concept of family, Sarti (2004) points out that:

> The family is not defined, therefore, by the individuals united by biological ties, but by the signifiers that create the links of meaning in relationships, without which these relationships fall apart, precisely because of the loss, or non-existence, of meaning. (SARTI, 2004, p.18)

[2] Primary socialization is the first socialization that the individual experiences in childhood, and by virtue of which he becomes a member of society. Secondary socialization is any subsequent process that introduces an already socialized individual into new sectors of society's objective world (Berger and Luckmann, 1978, p. 175 apud Barbosa, 2007, p. 1064).

Thus, we consider that the idea of family goes beyond biological relations, inserting itself in the field of social relations from a symbolic order, as the author points out.

Thinking about the place where families and schools are located allows us to formulate questions that can reveal the nature, that is, the essence of the relationships established between the institution and the people involved with it, but we need to pay attention to how different visions about the place of residence and the school institution are developed, since families in their most varied configurations constitute an entity (philosophical concept of everything that exists) up to then distant from the school reality.

Sarti (2004) helps us to think about this question when he considers that the family as a social sphere has suffered external interference over time, by showing that the events linked to it are more than merely biological responses, configuring social and cultural responses available to men and women in specific historical contexts.

These ideas of the author in focus are important, since, when we reflect on this argumentation, confronting the data collected in the field, we can infer that the families are linked to the place, here understood as territory (sense of belonging) for the most diverse reasons and that this exerts influence on how they organize themselves.

When analyzing the relationships that families establish with the school, it is necessary to understand how they conceive such an institution and how they incorporate the values transmitted by it, converting them to their realities and desires, understanding the role that the school occupies in the social logic of such families. Thin considers that in the relationship between families and the school:

> [...] the effective relations of parents with the school institution occur according to the way they appropriate their children's schooling and the meaning they attribute to it, taking into account family socializing practices, since the correlations that we can establish between practices and school capital constitute the manifestation of the lasting effects of socialization exercised by the school (THIN, 2006, p. 212).

Based on this definition, what can be expected from families in relation to the school is a position formed by the set of what is left of these family members from the school processes of which they were part, as well as the role that society currently attributes to the school. Also in this definition, the concept of school capital refers us to the school knowledge itself, transmitted during the processes of school socialization, sometimes distant from the socialization that occurs in the family environment, as Bourdieu points out, bringing the following question:

> It is no coincidence that the opposition between "scholarly" (au "pedantic") and "worldly" is at the centre of debates on taste and culture at all times: in fact, through two ways of producing or appreciating cultural works, it designates quite clearly these opposing modes of acquisition, and at least the same way of acquiring them. for the present time, two different relationships with the school institution (BOURDIEU, 2007, p. 67).

Still analyzing the role of families in the face of such socializing practices, Martins points out the following:

> Another important action that is part of the role of the family is to insert its children into the social world. From an early age, children are sent to daycare centers and schools so that their mothers can go to work, and this ends up contributing to the family in its socializing role. There is, in fact, a support network for families in the task of educating and socializing their children, such as the church of which they belong, the formal educational system and the neighborhood (MARTINS, 2006, p. 152).

Therefore, in these relationships, what we analyze according to Thin's words is that:

> It is not, therefore, only cultural capital or school capital that are at stake; it is the set of socializing practices of families that are implicated in the relationships between parents and teachers, and these practices must be understood by their distance from the school mode of socialization, rather than by the school capital of the parents (THIN, 2006, p. 212).

Also when analyzing the relations between the family and the school and how they reflect on the construction of knowledge, Bourdieu (1996, p. 35) argues that "The reproduction of the structure of distribution of cultural capital occurs in the relationship between the strategies of the families and the specific logic of the school institution."

When we define the family as one institution and the school as another, when we try to identify which relationships the two institutions maintain with each other. Szymanski (2009), when dealing with the relations between family and school, argues that both are institutions aimed at preparing the individual to enter society, providing them with an adequate education to become a citizen.

We note that the socializing logics implicit in such relationships go beyond the school environment, residing in the families' expectations about what the school represents and what it should provide, influencing the school practices and the social practices of these families.

Based on the considerations presented in the previous lines, we can understand that this strong link between school practices and family social practices demarcates different territorialities, as well as the various ways in which families establish relationships with the school institution through inquiries, understandings and silences about the reasons for pedagogical referrals constitute factors of greater or lesser establishment of links with the place where their children study and where they study Live.

4 METHODOLOGICAL PROCEDURES

The approach to the rural schools took place primarily through contact with the directors and coordinators of the institutions, to whom the research intention had been presented. Next, we present our research to teachers. Based on the teachers' adherence to this work, we scheduled interviews with a teacher from the second and one from the third year of each institution, and 4 teachers were

interviewed. In the next stage of the research, we interviewed two family members of students from each of the classes related to these teachers, and 8 family members were interviewed, totaling 12 interviews conducted in the research.

Data collection was carried out in the field schools, inside the classrooms, before the start of classes. The teachers were interviewed one week before their families, and each teacher was interviewed individually. To carry out the interview with the family members, a date was scheduled through the teachers, and the family members were interviewed individually, inside the classrooms, at the time before the beginning of classes.

In the case of a qualitative research, in which we tried to identify, recognize and listen to families and teachers, verifying what they think about the school, using semi-structured interviews as an instrument for data collection, André (2003) points out that from the instruments of this nature it is possible to perceive the ways in which the subjects interpret their reality and the meanings they attribute to the given situation. thus being able to express themselves through different languages.

The realization of semi-structured interviews allowed us to obtain data through an interaction between interviewer and interviewee, with the presence of conditioning factors that directly influence the result of the research, such as questions, answers and interpretations that vary according to the participants and their experiences and conceptions. Manzini (2004) proposes that semi-structured research consists of a larger conceptual spectrum, which is the interaction itself that occurs at the time of collection. In this sense, for us, the interview can be conceived as a process of social, verbal and non-verbal interaction, which occurs face-to-face between a researcher, who has a previously defined objective, and an interviewee, who, supposedly, has the information that makes it possible to study the phenomenon in question and whose mediation occurs, mainly, through language. Therefore, if the research is a process of social interaction and the interpretation of data, the social nature of such information must be taken into account.

First, we listened to the research participants, in order to understand how families and teachers relate to each other and understand the place where they live, taking into account how they represent their belongings[3].

In this same movement of listening, which is based on a narrative developed during the interview, constitutes, as Thompson argues when analyzing the importance of this rescue of the[4] interviewee's oral history, that:

> We have as much to learn from memory reformulation as we do from facts—and in this case, both come from oral recollections. The theme of memory will always be a fundamental issue

[3] This sense of belonging refers to how the individual understands himself as an integral part of something, a group, a place, as Santos (2016) points out.

[4] Thompson defines oral history as "[...] the interpretation of history and of changing societies and cultures by listening to people and recording their memories and experiences" (THOMPSON, 2002, p. 9).

> for oral historians, but I think we should approach it positively, with confidence in the *dual* force of oral history, both objective and subjective (THOMPSON, 2002, p. 23).

This rescue is one of the points to be considered about the conception of family members and teachers about the school and the place where they are located. Based on this premise, Thompson proposes that:

> There is no doubt that much can be learned from reading interviews with this kind of sensitivity. It is very surprising, for example, the differences in language and style of a life story [...] (THOMPSON, 2002, p. 24).

Continuing this process of listening to the research participants, we sought to identify how the families also represent the relationship they establish with the school and the teachers with their educational practices, thus seeking to assess how the relationship between school development and the family's proximity to the school occurs. In this sense, in line with the study of this relationship, Bourdieu (1998) argues that knowing the family demographic characteristics, that is, knowing how families are distributed over the territory and in what context this distribution occurs, helps us to understand how the hopes of families regarding their children's school life are projected.

When we refer to school development, we are putting the discussion in a perspective of the human formation of individuals, that is, thinking about this relationship beyond the simple improvement of performance in school assessments, but in how the construction of knowledge enables them to understand and act effectively in society, referring us to Young's (2007) ideas about the construction of powerful knowledge.

In the interview conducted with the students' relatives, the questions aimed to obtain information about the interviewee regarding the age and family relationship with the children. Next, the questions sought to establish the proximity of the families to the school institution and their view of the school, because according to Thin (2006) part of the socializing logics are established from the relationships between the families and the school.

As the author points out, the family and school socializing logics sometimes come into conflict, constituting socializing practices organized and experienced in different ways, with a clash of greater or lesser intensity between the socializing logics of the family and the school, according to the school experiences of the family in relation to the school. Still in relation to the proximity of families to the school, Bourdieu (1998, p. 50) argues that "Cultural capital and *ethos*[5], when combined, contribute to define school behaviors and attitudes towards school", bringing us the question of how the cultural capital of families influences this proximity according to its adequacy to what the school defines as legitimate knowledge.

[5] The definition of *ethos* according to Bourdieu (1998, p.42) it refers to a "[...] an implicit and deeply internalized value system, which helps to define, among other things, attitudes towards cultural capital and the school institution."

Still regarding the interviewees, we understand that each one constitutes an individual on whom a reflection is developed, and that when we look at the family, as Sarti (2004) points out, it is possible to visualize this:

> [...] As a reality that is constituted by language, socially elaborated and internalized by individuals, the family becomes a privileged field to think about the relationship between the individual and the collective, therefore, between me and the other. (SARTI, 2004, p. 13)

The family and school environments constitute a promising field of observation of social interactions.

As for the number of interviewees based on Ludke & Andre's arguments about the universe studied, they point out that:

> [...] it is preferable to reduce the universe itself (and therefore the scope of the analysis) in order to ensure greater relevance and greater consistency of what is really important to highlight and deepen in the study in question (LUDKE & ANDRE, 1986, p. 54).

We understand that because this is a qualitative research, in which we seek to broadly understand the positions of the participants, we opted for a concise approach of a group that was not very extensive, but that had representatives of the different social spheres analyzed within the scope of the selected educational stage, since the reflection on each individual is aligned with our research questions. seeking in the group of interviewed participants to delineate social relations through their discourses.

With regard to the interview, according to the guidelines of the Research Ethics Committee, we guarantee the anonymity of the participants, since this procedure allows the interview process to have a greater breadth of information collection from the interviewee, as pointed out by Ludke & Andre, when they point out that:

> In the interview situation, this issue becomes particularly relevant, because the guarantee of anonymity can favor a more relaxed, more spontaneous relationship, and consequently the disclosure of data that may compromise the interviewee if his or her identity is not protected (LUDKE & ANDRE, 1998, p. 50).

To ensure the anonymity of the individuals surveyed to the family members, fictitious names were assigned, in Guarulhos Nair and Julia, refer to the families of the second-year students and Iara and Leda refer to the relatives of the third-year students. In São Paulo, we will treat the families of the second-year students as Tais and Bia; and Luis and Geni, the families of the third-year students.

5 WHAT FAMILIES TELL US

When we analyzed the answers of the interviewed family members, we found that the average age of the family members is 34 years, ranging from 23 to 44 years. In Guarulhos, half of the

interviewees live in rented residences, while in São Paulo only one of the residences is rented, and there is an indication of a different relationship with the place in the respective municipalities, as will be seen later. The length of time living in the area is also a factor to be analyzed: while in São Paulo most families do not spend more than five years in the neighborhood, in Guarulhos the minimum time of residence in the region is five years.

It is also possible to detect in the discourse of the family members interviewed in the city of São Paulo that, due to the installation of the school studied, the families that lived in the region where the school was installed, were relocated close to it, and such action was unconditional to the will of the people, but being related to political issues, since where the school was previously installed there was a land occupied by several families and with the arrival of the school this community was moved to the vicinity of this place, as we can see in the statement of the family member Tais, when asked about the changes in the neighborhood:

> [...] when I arrived, there was no CEU, Taquara and Etec[6]; And it's changed quite a bit.

Analyzing the relationship that family members establish with the place, families in the city of São Paulo demonstrate that they establish a more assistentialist bond with it, in a chronic way related to the situation of vulnerability in which they find themselves. This fact is notorious in the discourse of these family members when asked about the reason for living in the neighborhood and whether they would like to live elsewhere. As we can see in the statements of the Tais relatives, when referring to the reason for living in the place:

> [...] It's a neighborhood that's close to everything, close to the market, the hospital, it gives you access to everything.

And from the familiar Geni:

> [...] It's good here, there's everything we need, school, hospital, bus.

We note that these are linked to the advantages that the place provides them, and there is no feeling of belonging to it, but rather a bond of dependence.

In Guarulhos, the families say they chose the place to settle because it presented possibilities for development. This placement allows us to approach Cavalcanti's (2013) considerations that when individuals settle in a place, they seek possibilities of social interactions that, in addition to enabling

[6] The CEU Taquara to which the interviewee refers is the Unified Educational Center in which the field school in São Paulo is located and received this name because it is on the banks of the Taquara River, which flows into the Tietê River. The referenced Etec is located next to the field school.

the formation of an individual space, provide the realization of a public space, which has multiple meanings for society by virtue of habits and customs, as well as a more stable housing condition.

As evidenced, in part, in the response of the family member Iara:

> My house is financed by Caixa, we have lived here for more than five years, we chose here because of the financing.

Demonstrating a deeper bond between the families of Guarulhos and the region, as we can see in the response of the family member Julia:

> I have been renting for five years and I chose this neighborhood because other family members are nearby and the rent is cheaper than where I lived before in downtown Guarulhos.

Still in the speech of this relative, when asked if she was thinking of moving, she pointed out that:

> [...] Yes, because the house is not mine, I intend to buy my house, but I really like this neighborhood, I want to move house, but continue here.

Since, these families understand this territory as being their conquered and established place, as we can see in the speech of the familiar Nair:

> [...] I have lived here for 15 years and despite the difficulties, I consider it a good neighborhood to live in.

Belonging to a place shows the level of social relations that an individual projects onto space, the deeper these relations take place, the more evident this belonging becomes. Valdés (2009), when dealing with this belonging, states that this feeling is a relevant factor to understand how social groups deal with the space they occupy.

When we asked the family members about the origins of their families, we found that the sample was predominantly descended from the northeastern region of Brazil. Among the families in the city of São Paulo, all said they came from the northeast region of the country. In the municipality of Guarulhos, in addition to an ancestry from the northeastern region of Brazil, the presence of immigrants from other countries appeared in the sample.

Analyzing how this movement is related to the schooling process, Algebaile, in rescuing a little of the history of how the expansion of basic education in Brazil took place, argues that:

> Throughout the history of the expansion of the basic educational offer in Brazil, one of its most important aspects concerns the fact that the expansion of access has brought to school segments of the population whose integration into the most modern nuclei of the country's social and economic life had not only taken place, but, to some extent, it was not effectively "foreseen" (ALGEBAILE, 2009, p. 146).

Taking due care with regard to generalizations, it is not that such a position reflects the reality of all the family members interviewed, but in a certain way, it is related to the brief life history described by them. Pointing out how the school comes to integrate the various population profiles under the same socializing logic.

Still analyzing how this process of schooling impacted the formation of Brazilian society, Algebaile analyzes that:

> The expansion of supply did not become, after a certain point, the accompaniment of population growth. It has persisted and updated itself as a saga of slow and precarious social insertion of "poorly integrated" segments of the population, whose profile has been partially redefined with each new economic and political conjuncture, but whose presence in the Brazilian societal formation is structural and far from having only residual weight (ALGEBAILE, 2009, p. 146).

Thus, based on the author's arguments, the questions about the role of the school as a socializing institution and how the school has dealt with the distances between the family and school socializing logics, in the face of the new social realities that are presented, are resumed.

In relation to the choice of school, the family members, in the midst of their arguments, present the issues of the proximity of the school to their homes and the quality of the school, which is clear in the discourses of the family members interviewed in both municipalities, as we can identify, for example, in Leda's statements:

> Because they tell me it's a good school and because it's close to my house.

And Geni:

> In the eyes of the family it is the best school in the neighborhood and it is close.

In Guarulhos, the quality of the school appears in the sampling as the main reason for choosing the institution, however, the issue of proximity predominates in the sampling of the city of São Paulo, which leads us to infer that the choice of the school institution is due to the ease of access, with a regionalization of the public served. Algebaile, when analyzing the expansion of access to schools, argues that:

> [...] the expansion of access to school is not limited to the increase in the supply of vacancies, but involves changes in the organization of this offer, which included, among other aspects, the forms of territorial distribution of vacancies (ALGEBAILE, 2009, p. 123).

This means that we are talking about a public policy referenced in the ordering of the territory, according to the grouping desired by the public power, that is, the sectorization of certain areas, aiming

at the supply of public services proportional to the demand of the place. When it comes to a policy of expanding the school offer, Algebaile brings us the following idea:

> The arrival of the school in the places "maintained a correlation with the demographic density and age of the geographical regions it reached" (Lima, 1983, p. 80). But this did not mean that the same type of school reached everywhere (ALGEBAILE, 2009, p. 126).

Thus, the school is constituted in this perspective, an extension of the State over a portion of the territory, ordered through a public policy of expansion and school access. Leading us to the question of which type of school is being accessible to which population.

Regarding the children's participation in school life, we sought to recognize what the families think of the pedagogical referrals offered by the school.

The family members indicate that the two main bonds established between the family and the school are the parent-teacher conferences and homework, as shown in the statement of the family member Nair, when asked if she attended the parents' meetings:

> I go whenever I can, I think it's very important to be present at the meetings, because I show interest in the study and monitoring of the child.

This argument is repeated in the discourses of the other interviewees, in which in their arguments they seem to use part of the time they spend with the children developing the activities that they bring to be performed at home, as we can see in the statement of the family member Bia, when we asked if she helped the child with any school task:

> In all of them, I try to help with some homework that my son has difficulty with.

Still in relation to the proximity of family members to the school, the parent-teacher meetings appear as the main bond, where the teacher establishes direct contact with the family members, who in turn see in such meetings the possibility of receiving an opinion regarding the children's performance in classroom learning. as well as knowing more details about the children's school behavior and social life, as we can detect in the argumentation of the family Tais:

> [...] What they address is very important both inside the school and outside the school, namely, the behavior in the classroom and if there are any doubts, we ask them at the time of the meeting.

The family members do not show that they know the pedagogical proposal of the school, as summarized in the statement of the family member Bia:

> No, I haven't actually participated in this school's teaching proposals yet.

As pointed out by several authors, among which we highlight the positions of Veiga (1995) and Paro (2012), the pedagogical proposal constitutes an important foundation of school democratic management, since such proposal constitutes a document elaborated in the school environment, provided for in the L.D.B. − Article 12, item I, of the Law of Guidelines and Bases of National Education (Law 9394/96), provides that:

> [...] educational establishments, respecting the common norms and those of their education system, have the task of elaborating and implementing their pedagogical proposal (L.D.B. 1996).

In the pedagogical proposal, the educational objectives and action strategies are foreseen, in addition to guiding the functioning of the school, taking into account the diversity of its structures and functions, and this proposal is expressed through a pedagogical political project, which is configured in a guiding document regarding the functioning of the school.

Regarding the construction and importance of the pedagogical political project, Veiga argues that:

> [...] It must be built in the school and for the school, with the participation of all those involved in the educational process, management team, teachers, staff, parents and students. Therefore, the same is part of school planning and management. The main point of planning is to express the ability to transfer the planned to the action. Therefore, it is the responsibility of the Political Pedagogical Project to operationalize school planning in a constant movement of reflection, action and reflection (Veiga, 1995, p.13).

Still in relation to the construction of the pedagogical political project, taking into account approximations with school administration issues, Paro brings us the idea that:

> The proposition of objectives identified with social transformation and their effective achievement are two inseparable aspects of School Administration as a transformative practice, since it is the very organic link that must exist between theory and practice and the necessary mutual determination between idea and action (PARO, 2012, p. 209).

Rescuing what was pointed out by Veiga (1995) in relation to the construction of a project with the participation of all those involved in the educational process, Paro, when dealing with how such action is established in the face of a democratic management of the school, points out that:

> The "coordination" of the efforts of employees, teachers, technical-pedagogical staff, students and parents, based on collective participation, is extremely important in the installation of a democratic administration within the school (PARO, 2012, p. 212).

In view of these arguments, we can infer that the participation of family members in the elaboration of the pedagogical proposal is fundamental and that their knowledge is necessary for an effective participation in its elaboration and application, because, as Veiga (1995) points out, the main issue when we talk about planning is to put what was planned into practice. In the statements of the

family members, it is evident that they are unaware of the Pedagogical Political Project of the schools, pointing to a direction that goes in the opposite direction to what was idealized about it, thus hindering the effective transposition of planning into action.

Regarding the importance that family members attribute to school, what we noticed is a vision of preparation for the job market and a generation of greater possibilities of professional success, a discourse observed in both schools, as we can observe in the statements of the family members Leda:

> It is very important for her future, so that in the future she will become a quality professional.

Luis:

> [...] It is the path for your development, of your life as well as in study and work.

Geni:

> [...] It's important because it's a place to learn all things, for work and the future.

As well as the familiar Tais, saying that:

> [...] The education of the school, which is the basis of the child, his character and development, is the formation and learning of him, to be a successful person in the future at work.

However, the statements of two family members, one from Guarulhos and the other from São Paulo, present a variation, the family members Julia and Bia presented arguments in which there is a concern with the individual's education, without referring to a market-oriented education, as we see in their statements, Julia says that:

> The school is of great importance due to the construction of an individual full of knowledge, learning and interaction with the collective life and society. It is a foundation for the development of wanting to be what you want to be when you grow up, stimulating choices and improvements in your daily life.

The family member Bia argues that the school is:

> [...] Very important in everything, in teaching, in education, in knowing how to socialize with other schoolmates. School is essential in the social development of my son and all the other students as well.

A relevant point to be observed in the analysis of the statements of the interviewed family members is that all of them consider the school important, but a predominant concern with preparation for the job market predominates in the sample, when it does not appear as a space for social coexistence, as it appears in the statements of the interviewees Nair, attributing importance to the school:

> [...], because he learns social and moral life.

And Iara, saying that:

> School is important for a child's learning and social development.

It is also noteworthy that in the Guarulhos sample, social interaction appears in three of the four interviews, while in São Paulo only one family member touched on the issue of social interaction. This leads us to reflect on how the vision and expectations about the school process change according to the observer's point of view.

Still in the discourse of some family members of the children in the city of São Paulo, what appears with some frequency in their discourse is that when they are at school, the children stay away from the streets, as appears latently in the discourse of the family member Geni, when asked about the importance of school, she says:

> [...] It is important because it is a place of learning all things, for work and the future, it leaves the child off the street.

Attributing to the school a function of physical and mental protection of the children in the face of the harsh social reality of the place they inhabit.

We can notice in the discourse of the interviewed family members that the school constitutes the most diverse functions, occupying in the above excerpt a place in the vision of this family member of a safe space, free from the harmful potentialities to which these families are exposed in their daily lives.

Equating the social function of the school, we note that it goes beyond the transmission of knowledge properly scholarly, it helps us to think about this expansion of the school spectrum, Algebaile when analyzing this expansion of the functions of the public school, proposes that:

> The school in Brazil took place in an unforeseen way, "it flew off the wing". And even though this "flight" does not have the poetic dimension of the canoeist's flight, even if it refers to a melancholic panorama, it is still the creator of an original reality, defining the "unboundedness" of expansion as an axis of production of this school (ALGEBAILE, 2009, p. 148).

In an analysis based on this perspective of expanding the supply of public schools in Brazil and how this process took place, Libâneo (2012, p. 23) points to public schools as being "[...] characterized by its assistance and welcoming missions (included in the expression inclusive education) becomes a caricature of social inclusion."

Based on these positions, when we analyzed the statements of the interviewed family members, considering the ideas discussed by the authors about what constitutes the public school. We observe a

school that goes beyond teaching, which is inserted in the social life of families in different ways, constituting a space for the implementation of public policies, as Silva (2014, p. 4) adds, "The social function of the school institution, to mediate the processes related to human development, has been delineated to a large extent by public policies of various natures." Impacting such policies on the construction of knowledge and on the place socially constructed by the school in the face of the reality of these families.

6 INTERIM CONCLUSIONS

The families interviewed demonstrate a clear sense of belonging to the place, however, this feeling occurs in a very different way in the schools of the municipalities surveyed.

While in São Paulo the bond with the place seems to be more linked to the product of an absence of options and opportunities, in Guarulhos this bond seems deeper, since the families who settled there did so in search of a definitive place to consider as their own, regardless of welfare ties arising from a situation of vulnerability. as we can see when comparing the discourses of family members from São Paulo and Guarulhos, since, while those from the capital of São Paulo point to palliative assistance works and aid scholarships as the main reason for living there, in Guarulhos the main argument is that they were born there and intend to remain there, being close to their families, and it is evident in their speeches that they have established roots in the place, understanding this not only in the condition of providing them with something, but where families can build their place, just as it builds them, in a mutual relationship integrating individuals and the place in which they live.

In both cities, families see in the school the possibility of both social and economic change, with the majority of the interviewees seeing the school institution as a preparation for the job market. We noticed that in the discourses the school was pointed out as a place of physical and mental protection of the children, constituting a safe space for coexistence.

Still in relation to the school, the family members describe in their speeches a participation in the accomplishment of homework and an attendance at parent-teacher meetings, referring us to school learning processes that develop in the family environment, which leads us to how families enter school and providing an indication of one of the ways in which the family is inserted in the learning processes.

This research allowed us to understand one side of the spectrum of how the territory is inserted in the teaching and learning processes, enabling us to understand some of the relationships that individuals establish with the place, considering the interaction between families and the school.

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The importance of teaching stoicism in basic education

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ABSTRACT

This paper addresses the importance of teaching Stoicism in basic education. In view of this, it will be showing the need for the teaching of philosophy in basic education, in a deeper way, such as, for example, the Stoic themes of Seneca, Epictetus and Marcus Aurelius and their relevance to the present day. The main objective of this work is to investigate whether, in fact, Stoicism is so important, why it is not deepened and often even ignored in schools and how to make schools and teachers give due attention to the Stoic school. The Stoics seek to keep away from a life guided by carnal pleasures and feelings, focusing only on moral good and reason. The Stoics have a very unified view of the world, a formal logic, non-dualistic physics, their ethics are naturalistic, and they advocate a virtuous life. Stoic philosophy considers that individuals possess an inner divinity capable of guiding them, since reason originates in the divine reason ordering nature. Nowadays, Stoicism is in evidence and has become a desired lifestyle.

Keywords: Stoicism, Basic education, Seneca, Epictetus, Marcus Aurelius.

1 INTRODUCTION

This research begins with the Rise of Stoicism. This is due to the need to present from the beginning to the present day a school that has remained immutable, but with current thoughts at the same time. Although it was initially represented by the philosophers Zeno of Cition, Chrysippus of Soli, Cleantes of Assos, it took roots that permeate the present day with Seneca, Epictetus and Marcus Aurelius, who are the Stoics highlighted in this work. The choice of these three authors, and not others, is justified by the objective of bringing to the reader the advantages of delving into a stoicism that remains alive and effective (Menezes, 2019).

With Epictetus, in addition to the contrast between freedom and slavery, between poverty and wealth, it is possible to learn great and eternal Stoic lessons (Ramos, 2020). In the course of the work, Seneca, a great and rich politician, who defended equality and had his values according to Stoicism (Oliveira, 2021) will also be addressed. Already with Marcus Aurelius, the philosopher emperor, it is possible to learn that it does not matter how great it is, because Stoicism still makes it greater. After talking about these three philosophers and defending the importance of Stoic philosophy, this work will follow a different direction: Stoicism (Bittar, 2018).

In the second chapter, the work is purely theoretical and referential, presenting with the greatest possible rigor about the teaching of philosophy in schools in contemporary times, since the main contribution of philosophy in classes is to be able to stimulate students to think for themselves, since this skill is essential for them to develop autonomy and protagonism in their own lives. Philosophy is always transformative, because it is part of the learning process that, in the future, will help in the transformation of the world and society. The chapter will focus on what is currently taught in classrooms about philosophy, what is the relevance of everything that is taught, and how the whole subject is approached for students.

In the third and last chapter of the dissertation it is pointed out the reason that should teach Stoicism in a deeper way. The chapter is undoubtedly the most difficult of the dissertation, since it tests the feasibility of deepening the knowledge of Stoicism in basic education. One can mention, for example, the importance of deepening Stoicism, how Stoicism can give relevance and applicability to philosophy. These are items that will prove the need for Stoic teaching in basic education.

Stoicism teaches to maintain a rational and calm mind, regardless of what may happen, being a philosophy of peace and inner strength. It teaches that this helps the human being to recognize and focus on what he can control and not to worry and accept what cannot be controlled. In view of this, this research has as its main objective the reflection of the way that Stoicism is taught in the school environment, especially in basic education, because the theme still has real meaning with the present day, especially when it comes to schools that have their practices in the daily life with unique teachings.

Therefore, in concluding with the resolution of the questions raised, it is intended with all theoretical framework to answer the questions: If Stoicism is in fact so important, why is it not deepened and often even ignored in schools? How can schools and teachers give due attention to the Stoic school?

2 THE STOICISM

Stoicism, based on strict ethics according to the laws of nature, held that the universe was governed by a divine universal reason. Thus, for the Stoics, happiness was found in man's domination over his passions to the detriment of reason (Pereira and Feitosa, 2018). The Stoics, in their origins,

spoke of the usefulness of temperance in being able to cope with the misfortunes and pains of life. They were convinced that the world was made up of a naturalistic ethic, a formal perspective, and a non-dualistic physics. The Stoics considered ethics to be the primary focus of knowledge (Berraondo, 1992).

The meaning of stoicism has to do with firmness and self-control to be able to deal with thoughts that are self-destructive. In other words, it has to do with ethics and the moral well-being of human beings. In addition, the Stoics believe that reason is the right way to achieve maximum knowledge (Novak, 1999). Another teaching is that human beings must always live in unity with nature. In view of this, man enters into communion with himself and with the universe, in addition to being able to feel a greater peace within himself (Russell, 2014).

The main representatives of Stoicism were: Cleantes of Assos (330 B.C.-230 B.C.); Chrysippus of Solis (280 BC-208 BC); Panaetius of Rhodes (185 BC-109 BC); Posidonius of Apama (135 BC-51 BC); Epictetus (55-135); Seneca (4 B.C.-65) and Marcus Aurelius (121-180), as shown in the table below, which shows the representatives of each phase of Stoicism.

Ancient Stoah	***Stoa Medium***	***Stoá Nova***
It focused on ethical issues:	It was of more eclectic themes:	More Religious Themes:
Cítion Zen	Panécio de Rodes	**Seneca**
Chrysippus of Solis	Posidonius of Apamea	**Epicteto**
Cleantes of Assos	Cicero	**Marco Aurélio**

2.1 RISE OF STOICISM

Stoicism was founded in the third century B.C. by Zeno of Citium or Zeno, who was a wealthy Phoenician merchant from the city of Citium, located in Cyprus, who worked transporting goods by sea. After surviving a shipwreck in which he lost everything he had, Zeno went to Athens, in Ancient Greece, where he began to frequent bookstores and learned about the philosophies of Plato, Socrates, Aristotle and all their followers (Ramos, 2020).

In one of the bookstores he frequented, Zeno became acquainted with the writings of "Diogenes of Sinope". He immersed himself in philosophy, becoming a philosopher as well. In Athens, Zeno managed to found his school, which unlike all the others of the time, could be attended by any type of person, regardless of their social class. Meetings were always held in open spaces, called *Stoa Poikile* or painted balconies. Because of this, the philosophy became quite popular throughout history and its doctrines were possible to be practiced by nobles, poor, rich and slaves (BBC News Brasil, 2018).

Zeno realized that there was a non-material world that was far more controllable and predictable than the world he had as a merchant. As a result, he agreed with the ideas of those philosophers and began to lead a simpler life, founding his own philosophical school (Menezes, 2019).

The early Stoics were able to create a philosophy that offered a single view of the place and world that man occupied. This thought was composed of three parts: physics, logic, and ethics (Oliveira 2021). Stoicism had the purpose of making men live in harmony with nature - which, for them, meant living in harmony with themselves, with the universe, and with humanity (Menezes, 2019).

For the Stoics, the universe was governed by reason, which was a divine principle that could permeate everything. Therefore, being in harmony with the universe meant living in harmony with God (Bittar, 2018). In addition, according to Robertson (2020), Stoic philosophy also aimed to make men live with virtue, a concept that, for them, was closely associated with reason.

In addition to Zeno, Chrysippus was also a great diffuser of Stoicism in Ancient Greece. The philosopher went on to write about 700 books on the doctrine. But unfortunately, none of the works of Greek authors have been found, due to the Roman Empire adhering to some elements of Greek culture, Stoicism ended up surviving in this way. Some very important authors have managed to develop and it is the works written by them that are mainly responsible for continuing the work started in Ancient Greece.

Therefore, Stoicism is divided into three moments: ancient Stoicism (*ancient stoah*) – represented by the philosophers Zeno of Cition, Chrysippus of Soli, Cleantes of Assos, who focused the doctrine on ethical issues; Roman Hellenistic Stoicism, represented by the philosophers Panaetius of Rhodes, Posidonius of Apemea, and Cicero. The *Middle Stoah, as* it is also called, was already more eclectic; Roman imperial Stoicism, which was developed by philosophers such as Seneca, Epictetus, and Marcus Aurelius. The *New Stoah* had a character based on religion (Ramos, 2020).

2.2 EPICTETO

Epictetus was born in the year 55 in the Hellenistic city of Hierapolis, in what is now Turkey, and died at the age of 80, in the Greek city of Nicopolis. Epictetus was an ancient Greek philosopher, who belonged to the Stoic philosophical school. He has been regarded as one of the main representatives of Stoicism (Menezes, 2019). The philosopher lived part of his life as a slave in Rome. His works did not spread, however, his teachings, thoughts and ideas are very present in two works that were edited by his disciple Flavio Arriano, the well-known Manual and Discourses of Epictetus (Ramos, 2020).

Every element of the cosmos, including the human being, has its own function. Human beings can be happy when they perform their function in harmony with the functioning of the universe. For the philosopher, desire is one of the main causes of human unhappiness (Ramos, 2020). The main

works written by this philosopher were: Epictetus' manual and Epictetus' speeches (Ramos, 2020). His main thoughts, ideas, and teachings are: the pursuit of happiness; To be realized man must try to change only that which can be changed, that which cannot be changed must be accepted as it really is. In the face of this, reality must be accepted; It is important to differentiate between what is useful to always be followed, and what is useless, to be always discarded; valuing knowledge and reason; Man needs to know social representations, which is one of the main purposes of philosophy, in order to be able to make good choices in life; vision of the organized, harmonious, and rational universe (Oliveira, 2021).

2.3 SENECA

Lucius Anaeus Seneca, better known as Seneca, was an orator, philosopher, politician and poet, born in the city of Córdoba, currently called Spain, was and continues to be considered one of the most important intellectuals of the Roman Empire (Russell, 2014). The philosopher was an important representative of the Stoic third phase (*stoah nova*), focusing on the concepts of physics, logic, and ethics for the development of Stoicism. In addition, he had the Roman emperor, Nero, as his pupil and became the main advisor to the Roman Empire (BBC News Brasil, 2018). Of his works, the Dialogues, the Tragedies and the Letters (Berraondo, 1999) stand out.

In his writings he emphasizes the falsity of the emotional response to everyday facts. Understanding the mind as a rational unit, the philosopher proposed that these answers would be failures of reasoning. Many of his writings have been preserved, among the most relevant are: on anger; about the brevity of life; about the tranquility of the soul, and about providence (Berraondo, 1999).

2.4 MARCO AURÉLIO

Marcus Aurelius was born in Rome in the year 121 A.D. to a noble family. He had many difficulties because of the position he held and because he always wanted to live a more moral life. His main field of activity was the city of Rome, where it was necessary to learn how to deal with the diversity of religions, languages, pestilences, invasions and betrayals. He was able to exercise his morals according to these difficulties that presented themselves (Oliveira, 2021). He gained recognition as a ruler and philosopher during his lifetime. His contact with Stoic philosophy originated through his tutor, Junius Rusticus.

His Meditations, a text whose compilation and title are posthumous, can be understood as a personal record that was intended for his moral development and not only as a work aimed at publication, explaining the asymmetric character of these reflections (Bittar, 2018). From an early age, Marcus Aurelius was dedicated to the search for wisdom through philosophy. He was integrated into the current of Stoicism, having as his main objective the development of a human morality, helping to

differentiate what is fleeting from what is eternal; the unrighteous, of what is just; that which departs from the good, from what is good. And it was from these distinctions that he was able to make better choices and have a safer and more serene life (Oliveira, 2021).

2.5 STOICISM IN THE PRESENT DAY

Stoicism is founded on the desire to progress towards the good and morals, regardless of the difficulties to be crossed. Even if man had in himself an inclination towards the good, since he came into the world to be virtuous and happy, he needed his will for the realization of such a decision (Vito, 2011). Through Stoicism, a Stoic manifestation that adapted to the Roman reality, man, suffering, frightened, submitted, enslaved by passions and vices, would be led to regeneration. Philosophical reflection and the Stoic principles of duty, self-discipline and subjection to the natural order of things are the basis for the formation of the Roman man, that is, endowed with ethical and moral qualities, this man could regenerate and achieve happiness (Alves and Nardi, 2017).

In their origins, the Stoics talked about using temperance to deal with life's pain and misfortunes. They believed that the world was composed of a formal perspective, a naturalistic ethic, and a non-dualistic physics (Ramos, 2020). Ethics was the main focus of knowledge. The meaning of stoicism is related to self-control and firmness in dealing with self-destructive thoughts. In other words, it involves a person's ethics and moral well-being (Menezes, 2019). Furthermore, the Stoics believe that reason is the way to attain maximum knowledge. Another teaching is that man must live in unity with nature. From this, man enters into communion with the universe and with himself. Thus, he feels a greater peace within himself (Bittar, 2018).

The Greeks saw the world in a very particular way. They were truly aficionados of nature and its exuberances: the waves and the seas, the setting of the stars, the development and growth of plants, planting, the birth of life and death, and so on (Pereira and Feitosa, 2018). It was from this admiration for nature that the Stoics began to identify a certain inherent harmony, believing that there is a force, called the Cosmos, that is responsible for bringing order and harmony to the world. It is a little complicated to be able to imagine this thought nowadays, due to the fact that human beings are living in large metropolises, far from nature, since the Greeks were always in direct contact with it (Menezes, 2019).

In this day and age, Stoicism can help in controlling feelings. Thus, in the same way that psychoanalysis can help to better understand who each human being really is, the Stoic teachings help to improve the quality of life, such as, for example, controlling anxiety, knowing oneself, staying calm in certain situations, dealing with insecurity, processing negative thoughts and feelings, and reducing stress (Bittar, 2018). The proposal of the Stoic teachings is quite appropriate nowadays as a way to

help keep calm. Therefore, it is important to learn to deal with uncertainties within limits, better managing what seems to be out of control (Bbc News Brasil, 2018).

Since the Stoic school deals with reason to achieve knowledge, its main characteristics are: virtue is the only good and the way to happiness; people should deny external feelings; pleasure makes no difference to the wise; The universe is governed by a natural reason; value to indifference; cosmopolitanism: the end of geographical boundaries; put into practice what has been learned; focus on what can really be controlled and accept what cannot; take responsibility for what can be controlled and turn obstacles into opportunities. After all, there are always possibilities to extract something positive from bad situations (Pereira and Feitosa, 2018).

A person who is considered a stoic is one who acts indifferent to pain, sadness, pleasure, or joy. That is, it is a person who represses his feelings. But this doesn't have to be bad: it means that you are an individual who can stay calm in a situation of chaos (Oliveira, 2021). That said, the Stoic is the one who doesn't get carried away by their emotions or their beliefs. That is, he is more rational with how he deals with life. He is a person open to acquiring new knowledge (Bbc News Brasil, 2018). A stoic person is mistaken for a cold person because of the way they handle situations. But that doesn't mean she doesn't have feelings or doesn't know how to deal with people. After all, she just knows how to control her emotions better (Russell, 2014).

Through reflective exercises it can be noted that, in the same way that the Stoic philosophers found ways to excel in the midst of their difficulties faced in the period of their existence, nowadays it is also possible to strengthen and recognize that what depends on the will of each one cannot be taken away or forced by anyone. For it is remarkable that what causes most concern and fear in people is not the facts that are affected, but the misinterpretations that people make. In addition, it is noticeable that many of the efforts that people make are misused in relation to what everyone tries to find throughout life, which is the search for things that can make them happy, and many are carried away by external factors, such as addictions, and ephemeral things that do not complete man's search for him to feel happy (Alves and Nardi, 2017).

It is worth mentioning that the demands of today's society, such as competitiveness, aptitude, consumption and the pursuit of happiness desired by most men since ancient times, are a challenge. For this reason, Seneca's thoughts have permeated his time, and can become references for contemporary education, whose purpose is to form a man capable of facing the challenges imposed by social demands (Vito, 2011). The Stoic school has a profound influence on civilization and, consequently, on thought as a whole. It is present in Christianity, Buddhism and in the thought of several modern philosophers, in addition to influencing the contemporary technique of psychotherapy known as Cognitive-Behavioral Therapy (BBC News Brasil, 2018).

In the year 2022, a literary phenomenon has been seen in Brazilian bookstores: many of the best-selling books deal with Stoicism. "The Life of the Stoics", "Little Stoic Manual", "Diary of the Stoic" and "Being Stoic" are some of the works that make up the list of the most prolonged. According to scholars, this movement has resurfaced in the country because it brings several lessons to individuals today, even though it was created so many centuries ago. What defines the phenomenon of Stoicism today is the interest in this ethic acting as a therapy for contemporary problems. Philosophy has been seen as a "way of life" in recent decades and, during the twentieth century, therapies began to focus on self-criticism, as is the case with psychoanalysis. With the COVID-19 pandemic, new questions and pains have arisen among humans in various parts of the planet, making books become important tools for relief and the search for answers (Sponchiato, 2022). Stoicism is a therapy of the mind and spirit, or the soul if you prefer. This school is seen as a hospital, where anxieties and suffering can receive treatment and care, which resonates a lot these days (Robertson, 2020).

Through all this, resilience has become one of the most used words in the contemporary vocabulary, as if it were one of the main qualities of human beings in the midst of a period of turmoil. This indicates the reinterpretation of Stoic philosophy. Usually, when someone is called a stoic, they are characterized as someone who is able to endure suffering without showing what they are feeling. However, Stoic philosophy today is interpreted as a practical operating system for everyday life, which seeks to put an end to the bad judgments that each one makes and that lead to negative emotions, such as envy and anger, generating suffering. However, nowadays, resilience has come to mean the ability to adapt to change, regardless of how the person experiences this suffering (Sponchiato, 2022).

Stoicism begins by focusing on those things that are truly within our control: thoughts, emotions, choices, refusals, and decisions that are up to us. This helps to focus on what can be improved and to understand how we ourselves contribute to our suffering (Alves and Nardi, 2017). Nowadays, Stoicism provides a number of tools to improve mental health: keeping a journal to deposit responsibilities; premeditate evils so that you can temper expectations and dispel toxic emotions such as anger, fury, envy and everything that gives rise to suffering and anxiety (Menezes, 2019).

3 TEACHING PHILOSOPHY IN CONTEMPORARY SCHOOLS

What is the main purpose of philosophy? The important role of philosophy in schools, in the first place, is the development, and at the same time, the impulse of the students towards knowledge. The philosophical meaning concerns wisdom, that is, the pursuit of knowledge. It is necessary for the educational environment to have a very active philosophy within the teaching-learning process of students, and this has been observed during educational processes, especially in high school, where the teaching of the subject is mandatory (Cotrim and Ferndes, 2016). Philosophical teaching is

transformative, because it is part of the learning process that will later help in the transformation of a better world (Bittencourt, 2015).

Educational philosophy is a branch of knowledge that, for many, is considered difficult and abstract, but the truth is that it is not a seven-headed beast. The basic objects of the study of this discipline are very fundamental and common themes in the existence of the history of humanity, such as, for example, good and evil, life and death, happiness and pain, truth and falsehood, power, love and many others that elucidate the coexistence and mutual learning among all people in a society (Silva, 2011).

Philosophical teaching in the educational environment is a liberating instrument that has several effects that are transformative, belonging to a society that comes in search of ways to solidify itself in full ascensions, in order to be subjects who have a voice and a turn (Davidov, 1988). In this context, the teaching of this discipline in the school environment is a great opportunity to place as provocative students all those people who have received instruction to have a critical, transformative and liberating identity in general (Cotrim and Ferndes, 2016). The insertion of the philosophical discipline in educational teaching has demonstrated the gap that exists in the construction of a critical being who is categorically prepared for complex interaction with society. In view of this, the transformative power it has in the process of learning development is remarkable.

Thus, it is a total challenge in learning, but a valuable priesthood (Silva, 2011). It is important to report that the coexistence with Philosophy in the classrooms contributes to the students being able to acquire their own security and begin to enjoy learning, due to the fact that, when it is practiced in an integrated and dialogical way, it manages to develop in the students a very balanced self-esteem and, with this, they begin to recognize the value and importance of their own ideas for the enrichment of the groups in which they belong. in addition to the enrichment of society as a whole (Cotrim and Ferndes, 2016).

3.1 WHAT IS TAUGHT ABOUT PHILOSOPHY

In classrooms, philosophy goes far beyond teaching students the thoughts of philosophers by showing ready-made ideas, but rather teaching them how to think. Philosophical thoughts are based on doubt and invite students to reflect on everything around them, in addition to thinking, rethinking, seeking new ideas, questioning, understanding, understanding and interpreting. Based on language and reason, the practice of philosophizing is a reflexive activity always in search of the meanings of all things and, based on the formation of ideas, manages to establish a philosophical discourse. The philosophical proposal is to make the student capable of reading and understanding this discourse, analyzing the ideas, discovering the logic of thought, arguing and interpreting the entire line of reasoning (Silva, 2011).

The learning of this area of study aims at the development of skills of analysis, identification, interpretation and comparison of ideas, phenomena, thoughts and geographical, historical, economic, social, cultural and political processes. For both High School and Funtamental, these competencies allow students to develop the skills for the elaboration of hypotheses, construction of arguments and action in society, always based on the fundamentals and concepts of the components of the area. Thus, the philosophical discipline within the classrooms has been proposing the systematization of reasoning and the construction of argumentation, broadening and deepening its conceptual basis based on interpretation and analysis. In High School, Philosophy has allowed the stimulation of a more critical and contextualized view with reality, in the application and elaboration of interpretations about relationships and in the conceptual domain, the multiple dimensions and processes of humanity's existence (Pereira, 2019).

Philosophical thinking is essential in the experience of all human beings, because it provides the practices of analysis, reflection and criticism, benefiting the encounter of knowledge of man and the world. In the teaching of this discipline, it is recommended to prioritize practices that can favor the formation of students who are able to develop their own criticism and their own thinking, forming citizens who have the ability to face the various situations that may arise in the course of their lives (Silva *et al.*, 2020).

What can be expected from this teaching? In view of all that is taught in the discipline, it is expected that students may be able to: know the stories of the various philosophers and all the contents of their time; understand the main ideas of philosophers throughout history; be able to relate all the philosophical ideas that have been studied with their own daily lives; carry out the elaboration of reflections, arguments and questions about attitudes, values or situations that have been lived based on Philosophy; recognize the right to freedom of thought of all people, in an attitude of tolerance and respect for all of them, and be able to develop philosophical reflections that can lead to the construction of critical thinking that generates ethical and conscious attitudes (Pereira, 2019).

How is the teaching of the discipline seen in Brazil? In the country, Philosophy as a subject in schools has always been a target of several controversies, either in its absence or presence in the curriculum or in relation to the pedagogy of Philosophy and the didactic-methodological issues of how philosophical education should happen in High School and Elementary School. The issue of the presence of the discipline in school curricula was marked in the Brazilian country by comings and goings that have always hindered the creation of an identity about its objectives at these levels of education, which are still not properly clarified (Alves, 2002).

Philosophy as a teaching subject at the basic levels of school education is characterized, in terms of didactic-methodological issues, by the lack of a specific model that is unique. It is more accurate to say that philosophical teaching is defined by a plurality of models, which can be close to

the French model, the Italian model, or a mixture of the two, among other influences. This fact can be verified with relative clarity in books or philosophical textbooks for teaching in high school, such as the textual elements that approach history and philosophical thought through the study of the themes, authors and classic problems of philosophy, this being a proposal that is closer to the Italian model than to the French one in general (Alves, 2009).

Currently, the perspectives for the study of the discipline in Brazil are progressively expanding, although there is still a professional devaluation of professors and researchers in this area by obscurantist nuclei of our own society that, limited to their common sense, tends to consider philosophical thought as difficult, obscure, vague and of little practical use in an immediatist and technocratic sociopolitical order in its relations of production (Bittencourt, 2015).

The situation of philosophical teaching in Brazil, in certain circumstances, can suffer from the same problem when it is based on the transmission of closed contents, leading the student to the impossibility of questioning and to the act of "dialoguing" with the author's thought, but simply making him a repeater of ready-made knowledge, which does not establish the process of formation of new concepts. In several institutions, the non-problematized reading of the approached author is adopted, a method of study that is characterized by not stimulating the creation of new interpretations, a tendency that can harm consistent teaching, since quality philosophical didactics should propose questioning, the intellectual autonomy of the student and the organized debate of ideas between teachers and students.

Philosophy teachers, due to the short time allotted to them in the course plan at their educational institution, are hardly able to develop a satisfactory work with their students, motivating frustration due to the feeling of being coerced to adopt a teaching methodology that demeans their abilities as educators (Alves e Silva, 2021).

3.2 WHAT IS THE RELEVANCE OF WHAT IS TAUGHT?

What is the main contribution of Philosophy in the classroom? It is the stimulation for students to be able to think for themselves, since this is an essential skill for them to develop protagonism and autonomy in their own lives. The discipline is able to put systematic doubts into practice, through questioning and self-questioning, enabling the construction of dialogues and scientific investigation, due to stimulating the discovery of new ideas and curiosity, in addition to stimulating future skills, such as critical thinking (which through doubts allows arguing and questioning based on logic and reason). originality and creativity, because thinking for oneself already allows the conception of new ideas, the solution of problems through the elaboration of hypotheses and among other positive points (Dantas *et al.*, 2014).

Philosophy presents situations and concepts that make students feel motivated to develop critical thinking, reasoning and a taste for the pursuit of knowledge and knowledge that are elaborated by various philosophers in different places and periods. In this way, students are invited to reflect on everything they learn, developing critical thinking and interest in scientific research (Cotrim and Ferndes, 2016). It is important to address that the experience with the discipline in the classrooms contributes a lot for students to acquire more self-confidence and a taste for learning. In addition, it also encourages students to freely express their opinions without being afraid of making mistakes and being ridiculed by others or being misunderstood by their own teachers, making classes much more dynamic and teaching much more creative for both parties who are involved in the construction of knowledge (Cristine, 2018).

Philosophy is not limited only to the scientific field, although it can be a great reflection on everything about science. The philosophical discipline is a set of understandings that always understand and give meaning to the world and to all existence. Thus, it is important to know how philosophy is constituted and how this whole set of understandings is constructed (Borges and Souza, 2016).

Philosophy has been questioned a lot as a discipline, because of this, it is essential that teachers are able to become aware that teaching should not always be considered as just another discipline to be taught. What is certain is that teachers who have the responsibility of applying this discipline keep in mind how important it is to ensure that students do not become totally dependent on textbooks, not in an undeserving way, but in the sense of not dedicating themselves to the famous "memorizations" of authors and ideas (Dantas *et al.*, 2014).

The teacher's conscience dictates to him that his task is always to teach philosophy, and that is his main goal. However, in a didactic way, the discipline should be used as a means in the act of philosophizing, so that, in an indirect and oblique way, the teacher can accomplish the ends of his role: teaching philosophy. The phrase written by Kant "Philosophy is not taught, but philosophizing" is always introduced in the teaching and learning processes, in addition to revealing a truth of philosophy as a body of understandings, however, it has become distant from an absolute truth in the limits of generic terminalities, which require apprehensions of contents that are expressed in the main currents of thought and philosophical ideas. allowing students to say that they have learned philosophy (Borges and Souza, 2016).

In a society with a technocratic and morally conservative ideological orientation such as the Brazilian one, the presence of philosophical activity, when exercised with professional dignity and intellectual commitment, always causes discomfort in the reactionary layers of the social organization. This is the caustic philosophical role, to dissolve the unthinking foundations of our way of life and its social, cultural and political manifestations. However, philosophizing is often swimming against the

tide, because where philosophical activity exercises its radical reflection, the degrading massification of human obtuseness, present in various social segments, spares no effort in demeaning against the dignity of Philosophy (Alves and Silva, 2021).

The philistines embedded in journalism make philosophy a package of aphorisms that are easy to assimilate, and when they summon philosophers for media interventions, they usually simplify their discourses to the delight of consumers of information. In many educational institutions, the discipline is only present because of the pedagogical demands of the curriculum, and many of their bureaucrats and intellectually dull students do not recognize in the philosophical discourse a possibility of opening consciousness to critical reflections on human life in its interaction with the concrete world. However, despite the adversities, philosophical activity in Brazil finds reasonable editorial support, so that the reading public of philosophical texts is gradually expanding, regardless of whether or not there is a study orientation, because autonomy is one of the philosophical sieves, and it is up to the subject himself to develop this capacity in his intellectual reflections. Another circumstance worthy of note lies in the virtualization of communication: despite the large number of imbecilities disseminated every minute on the Internet, there is also a significant presence of intellectuals expressing their ideas on the networks, thus making public use of reason in a new management of the human agora. Philosophizing is a constant agonizing experience, and those who have entered this field cannot expect it to be easy. There is an even greater stimulus for philosophy to always manifest itself as the bad conscience of the prevailing time (Morin, 2011).

Philosophical activity, therefore, is a means that can provide a life experience that will help the human being in the process of developing self-knowledge, of his existential limits, of his perception of the political dynamics of the social order, of his creative potentials, thus helping in the process of self-discovery, that is, so that a set of forces that come together in the core of the individual is transformed into creation and that They manifest externally when man discovers and conquers himself through autonomous interaction with the concrete world. It is possible to glimpse the possibility of changes in the present situation. It is possible to verify the increase in interest shown by the students in entering the undergraduate courses of Philosophy, proof of the desire of an increasing number of young people to take a critical stance on the issues concerning the existence and the situation of the human being in the face of the contradictions of the contemporary world. The teaching of Philosophy to young people is of paramount importance and pertinence for the progress of Brazilian Education, and the law that determines the teaching of Philosophy must be applied effectively, in the name of improving the quality of teaching in Brazil, with a view to creating new values and the spirit of transformation that our culture needs to live (Bittencourt, 2015).

It is possible to note that in the current conditions in which school educational processes are carried out in Brazil, it is totally necessary to introduce the discipline in the curriculum of High School

and Elementary School in the form of a subject, as a way to ensure its specificity and the fulfillment of all the objectives that are proposed, so that they can really contribute throughout this process and be able to assist students in the development of basic skills and abilities that are required for the area. The explicit need for Philosophy to be included in the curriculum in the form of a discipline is based, among other reasons, on the history of its presence at the levels of education, due to the fact that all the times it had its space reduced in the curriculum, it was precisely at the moments when the federal legislation made the discipline optional for students or when it pronounced itself in a contradictory and ambiguous way about this issue (Alves, 2009).

3.3 HOW IS IT TAUGHT?

For teachers who are concerned about knowing the best way to apply Philosophy in the classroom, there is still no ready-made recipe. As already mentioned, it is recommended to prioritize practices that favor the formation of people who are capable of developing their criticism and thinking, creating human beings who have the ability to face all the varied situations that may appear in the future (Cristine, 2018). Philosophy professors who do not care about the good education of their students will certainly be doing more harm than good for all of them. An excellent education is one that is based on true knowledge, that leads students to seek wisdom and that contributes to the good of students and society as a whole, leading students to reflect on everything that surrounds them and not only on the things that will be useful to do and know. In view of all this, it can be said that only true Philosophy contains all these qualities (Silva, 2011).

In order to contribute to the education of high school and elementary school students in Brazil, the teaching of the discipline must be taught by teachers who are really trained and licensed in it, due to the fact that it is believed that these educators are better prepared to know how to work with the variety of questions and philosophical issues that need to be presented to students (Cristine, 2018). Only the teacher truly trained in the Philosophy course has the preparation to be able to develop critical thinking in students, providing them with the opportunity to debate ideas, elaborate reasoning and develop a more autonomous thinking about the problems and theories that are proposed to them, and in addition, also build their own textual elements (Dantas *et al.*, 2014).

Teachers should be concerned with transmitting totally true knowledge during philosophical teaching, and as already said, not only what can be useful to students, but only enlightened by the truth, they will be equipped with the faculty of evaluating, discerning, deciding, choosing and pondering, which will help them to acquire intellectual autonomy (Pereira, 2019).

In the act of educating, Philosophy teachers may even use some resources and methods to improve teaching-learning, but these uses should only serve as a way to achieve the main objective, which is to be able to help students to have knowledge that will serve them to improve as human beings

(Silva, 2011). Dialogues can open paths to friendships and these are also what ensure an opening for teaching. Educational dialogue should not be used as a tool for the transmission of ideologies. Teachers who use classes to propagate social, religious, and political ideas, in addition to their particular conceptions of life, should be considered unethical, manipulative, and disloyal (Silva *et al.*, 2020).

Philosophy can never be comfortable, even when its basic purpose is to make palatable or justifiable the way of being of a given epoch, presenting it as the most rational or inevitable. It's a double nuisance. First, for the philosopher himself, who, both in criticism and in apology, has to carry out a movement in which the concrete is taken conceptually and is posited as a set of theoretical determinations, which must, of course, express what is philosophically exposed. Secondly, it is for sociability as a whole (Pereira, 2019).

Society must either face the theoretical and critical presentation of its most deleterious aspects, or it must at least tolerate the expression of its so-called essential harmony in a register that is beyond that of common sense. The transformation of what is actually given into a concept is an operation that, whether in the case of conservative conceptions or in those that advocate a critical movement, moves human understanding away from its immediate comfort zone, despite the fact that the former end up proposing a return to it. The categorical examination of the existent – entities, processes and relations – entails exactly this movement that aims at the explicitness of the determinations under which a particular and concrete mode of social life – and of the relationship with the world formatted by it – is what it is and presents the forms of appearance that correspond to it (Alves and Silva, 2021).

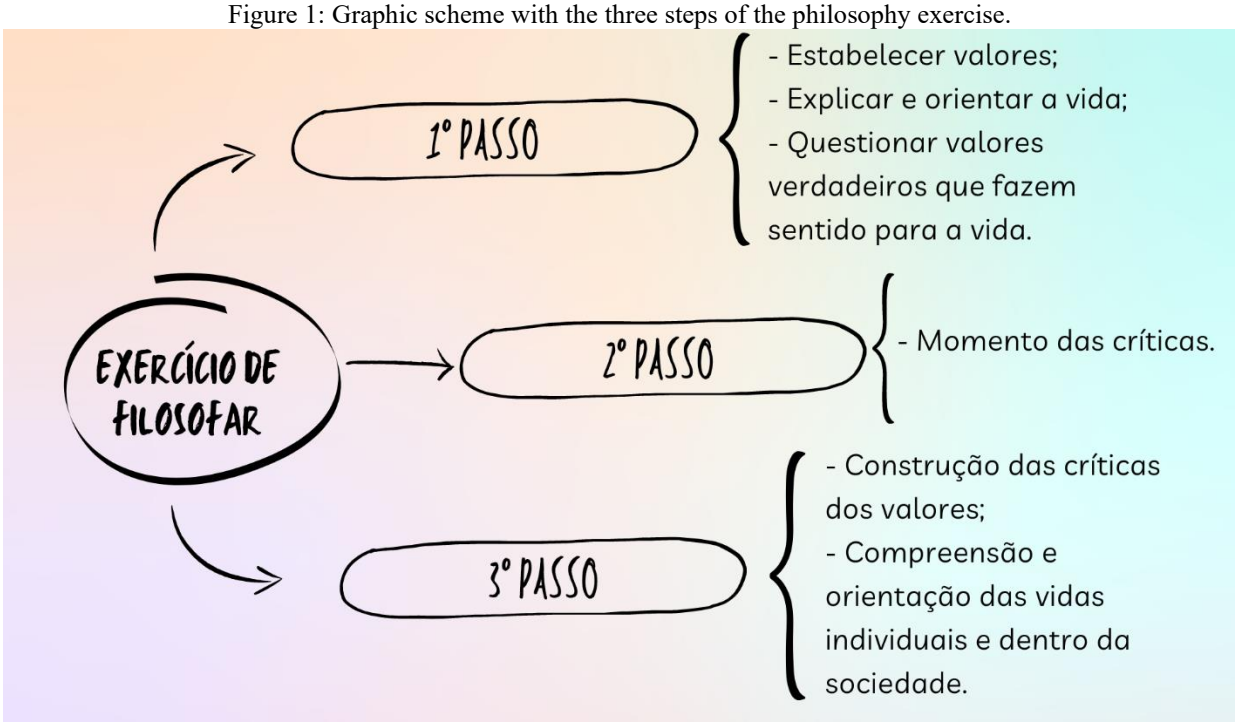
Kant's statement "One does not teach philosophy, but how to philosophize" addresses a series of questions related to the teaching of philosophy. The phrase rallies an important question where the following question is generated: since philosophy is not taught, but how to philosophize, how do one teach to philosophize? In this context, there is an important starting point that, by analogy, manages to guide reasoning through the idea that in the educational environment one only learns by practicing. The act of learning is linked to the act of doing and practicing, that is, the act of inserting the theoretical contents together with the practical ones, addressing what is desired to know. In an analogical way, reasoning can be transferred to the teaching of philosophy, at least provisionally, to the conclusion that philosophy is taught by "philosophizing". With this, it can be inferred, by extension of the reasoning, that, in fact, "philosophy is not taught, but philosophizing" (Borges and Souza, 2016).

The act of philosophizing has the action of pointing out the requirements of a method in the form of exercises, as well as an attitude that must be philosophical. Philosophical attitudes require the removal of various prejudices, especially the one that induces people to think that the art of philosophizing is difficult, useless, and complicated, as if it were only for ultra-specialized people. However, philosophical attitudes require a very different stance, even in the face of the findings of the high level of knowledge of several philosophers, and it must be understood that the act of

philosophizing is not limited only to philosophers who are consecrated or who have a relevant academic background (Alves and Silva, 2021).

The philosophical exercise that was proposed by Luckesi (1992), in the chapter called "the exercise of philosophizing", requires the execution of three steps that are didactically sequential, during a very dialectical process, schematized in the image below (figure 1).

Figure 1: Graphic scheme with the three steps of the philosophy exercise.



Source: Personal archive.

The purpose of questions of this nature is to make people aware of their own actions, of the place where they are and of the directions they take in life, which are the directions that are born both from popular consciences and from the sedimentation of philosophical and political thoughts that are formulated and disseminated in society over the years (Alves e Silva, 2021).

The exercises of the act of philosophizing require the inventory of values and concepts; the study of values and criticisms; and the study and reconstruction of values and concepts, and for all this to happen, it is necessary to look not only at the day-to-day, but to study and read what all other philosophers and all other thinkers have already said (Dantas *et al.*, 2014). They can help everyone reach higher levels of understanding and other categories of understanding as well. The exercises of the act of philosophizing can be a guiding thread for learning philosophy, without philosophy being taught itself (Bittencourt, 2015). Its comprehension should result from more than one relationship that has in the student the starting point of the infinite questions that philosophy can provide, mediated by the teacher, aided by philosophers, thinkers and their ideas, by the main currents of thought from a very distant past in time, but very close in history. They have a great contribution to offer. It is the aid

for all the work of building philosophical understanding, of the world, and of actions (Alves and Silva, 2021).

4 WHY SHOULD STOICISM BE TAUGHT?

Stoicism is a practical philosophy that has its teachings based on ways to live a good life, focusing only on what can be controlled. Stoic ideals can help reduce stress and anxiety and help you cope with insecurities and other negative feelings (Câmara, 2014). Practitioners of Stoicism seek to keep their minds rational and calm, regardless of what may happen. Stoicism is quite influential because it is one of the most popular schools of philosophy in Rome and Athens, which are important foundations from which Western civilization began to be built (Dinucci, 2018).

One of the main reasons why Stoicism is studied today is that it is not just an armchair philosophy. From the times of Zeno of Citium to the times of Ryan Holiday, all those involved in this philosophical current are individuals who know how to value actions over words (Fontoura, 2021). Stoicism never makes a distinction about who each individual is or where they came from. Another important reason is that the Stoics deal with timeless issues, such as ways to deal with adversity, know oneself, invest energy only in what matters, and abstract negative emotions (Costa *et al.*, 2019).

For practitioners of Stoicism, acting in a virtuous manner is the only way to achieve a good and light life. For this reason, they guide their actions always based on the four Greek cardinal virtues defined by Plato, which managed to influence not only the Stoics, but also other Hellenistic philosophers and even Christian thinkers. These four virtues are character traits that must always act in accordance with and be able to value in others: wisdom, courage, temperance, and justice (Dinucci and Julien, 2017).

A person who practices Stoicism is one who does not let himself be carried away by passions, beliefs or any feeling that is capable of taking away his rationality when acting, such as, for example, pain, desires, pleasure and fear. Stoicism looks for ways to act rationally, even with the presence of any of these feelings. The Stoic is not an individual without feelings, but he does not make himself a prisoner of them. To become a Stoic person, it is important to study, exercise, and strengthen rationality (Grimal, 2018).

Stoic philosophy focuses on practical life, on everyday events and actions, and on how the individual can deal with these events in a rational way. For the Stoics there are things that are possible to be controlled, but there are also things that are not under people's control. In the face of what cannot be controlled, such as the climate, there is nothing that can be done to change its state (Lima, 2021). In addition, for the Stoics, things that are out of control cannot bring any happiness, as this feeling depends only on events that can be controlled (Luz, 2018).

The simplicity of Stoicism's concepts is purposeful, for when a philosophy is too complex, human beings spend more time trying to understand it than practicing it. Due to the fact that the Stoics value actions always above words, this philosophy is not about abstract and complex concepts (Grimal, 2018).

Stoicism is a simple answer to the problems of modern life. And its philosophers already knew it. For modern life, like life in antiquity, is made up of people with the same fears and anxieties. And with the same desires and dreams. However, what is learned from Stoicism is that perceiving and feeling situations as they are, without judgment, and in order to fully live in the present is a skill (Fontoura, 2021).

4.1 IMPORTANCE OF DEEPENING STOICISM

The first Stoic school was invented by Zeno of Citium around 300 B.C. in Athens. However, this doctrine only became effectively known when he arrived in Rome. His main theme was the defense that the whole world would be governed by a rational and divine natural law. Therefore, in order for individuals to achieve true happiness, they should depend only on their "virtues", that is, their values and knowledge, giving up "vices", considered by Stoicism as an absolute evil (Gazolla, 1999).

Stoicism is one of the most essential classical philosophical schools of all time, always conceiving of nature as a balanced and harmonious cosmos. The Stoics always rely on rationality as a way to adapt their behaviors to the natural and divine laws that are common to all individuals. This philosophy teaches that reasons should always prevail over passions in the pursuit of happiness (Husserl, 2014). Therefore, in order to be happy, it is necessary to act with resilience in the face of everyday events, since everything is part of the total harmony of the cosmos and it is up to individuals to adapt to the right measure (Fontoura, 2021).

The name "Stoicism" originates from the Greek term "stoa *poikilé*", which designated the meeting place where Zeno's disciples met, which was a portico of the public space for political meetings in the city of Athens (Marcondes, 2007). Their doctrine is often represented by the image of a tree, where the stem symbolizes the physical part, the branches represent logic and the leaves indicate morality or ethics (Moura, 2012). Stoicism is highlighted by the emotional balances of those who practice it. Happiness is not attained through external aspects, nor through reacting or repressing events. In fact, it is about resilience and self-control in the face of the events of the cosmos, even if everything is part of a perfect and natural order (Marcondes, 2007).

Stoicism, by teaching the individual to maintain a calm and rational mind, regardless of what may happen, shows that this helps him to recognize and also to focus only on what can be controlled and not to worry and always accept what he has no control over (Lima, 2021).

The principles of Stoicism that guide individuals who follow this doctrine are: people should always give priority to knowledge and always act according to reason; Virtue is the only good and way to find happiness; pleasures are the enemies of the wise; Attitudes have more value when compared to words, that is, the things that are done have more importance than those that are said; A universal, natural, and divine reason governs the universe; One should not question the reason that led something to happen, but accept it without complaints, focusing only on what can be changed and/or controlled in the face of the situations; external feelings make human beings unbiased and irrational; act prudently and take responsibility for one's actions; Life and circumstances are not idealized; Things happen according to a law of cause and effect. Individuals need to accept and live with their lives the way they are (Santos, 2021).

Stoicism is divided into three main periods: ancient (ethical), middle (eclectic), and early (religious). The first phase was lived by the founder of this doctrine, Zeno of Cicium (333 to 262 B.C.), and was completed by Chrysippus of Solent (280 to 206 B.C.), who developed the Stoic doctrine and managed to transform it into the model that is known today. In the second phase of Stoicism, the movement began to spread among the Romans, with Panaetius of Rhodes (185 to 110 BC) as the main motivator for the introduction of this doctrine into Roman society. The characteristic that most marked this period was the eclecticism that this doctrine suffered in the face of the absorption of the thoughts of Aristotle and Plato. Posidonius of Apamea (135 B.C. to 50 A.D.) was largely responsible for this fact. In the third phase of Stoicism, members saw this philosophical doctrine not as part of a science, but as a priestly and religious practice (Santos, 2018). The Roman Emperor Marcus Aurelius was one of the great representatives of this phase and was one of the few known philosopher-kings in all of history. He wrote diaries of personal improvement that today, compiled under the title of Meditations, are one of the most widely read and well-known texts in the philosophical tradition (Marcus Aurelius, 1977).

Notwithstanding the differences in the characteristics that marked the three phases of Stoic development, it is possible to note the effort of this doctrine to thematize happiness as a philosophical problem. In view of this, it can be emphasized that what all practitioners of Stoicism have in common is the perception that happiness is not achieved through adaptations to external events. The search for happiness, in fact, refers to accepting the determinations of nature in the face of the cosmos, which is always balanced and harmonious. To be happy, it is necessary to welcome everything that is good unconditionally (Stock, 2020).

Stoic philosophy is linked to the relationship between laws and nature. Practitioners of Stoicism believe that nature is responsible for determining how people act and how they are. Therefore, deepening and studying this philosophy involves the need to associate it with reflections on the law, the cosmos, forms and all their relations. The foundations of Stoicism are related to the idealizations

that the constitutive principles and conduct of human beings are based on a natural, divine and common law for all of them (Câmara, 2014). The relevance of the theme "nature" to Stoicism is quite highlighted. The natural elements are balanced and perfect, besides being endowed with divine elements in their constitution and ordering. As such, individuals insert themselves within this cosmos – the balanced Stoic nature. Thus, it is necessary to seek natural balance, both in personal and political life (Gazolla, 1999).

For practitioners of Stoicism, happiness is always an act of will. Individuals achieve happiness when they are able to live according to nature, in a rational way, accepting things as they really are – since the cosmos is considered perfect. All those who control their passions are able to harmonize with the cosmos, since the importance that is given to things is nothing more than judgments and conceptions that come not from reason, but from passion (Verges, 1982).

One of the most important characteristics of Stoicism, as it is an ethical vision linked to indifference, is ataraxia, which must be understood in a practical way, going beyond mere intellectual reflections. If the cosmos is balanced and harmonious, virtue lies in the way of living according to its design. In ataraxia, human elements such as friendships, health, illness or enmity cannot be rejected or desired because they go against the natural unfolding of the cosmos (Stockdale, 2017).

What is bad or good, in turn, if it comes from unconditional elements, such as, for example, an enmity is dependent on the actions of individuals. Thus, the existence or non- existence of an enemy does not cause happiness or sadness. Virtuous attitudes consist in the way of accepting external causes, which are not dependent on willing. The founder of Stoicism, Zeno, pointed out that in order to achieve happiness, it is necessary to have such acceptance, which agrees with the will to do good, moving away from directing actions to an external end. The models of philosophy proposed by Zeno do not contain the completeness of Stoic thoughts (Luz, 2018).

For the Stoics, only vice is part of evil and only virtue is part of good. Among them, there are an extensive amount of things, such as fame, diseases, wealth, and health, which are named indifferently and, therefore, do not deserve to be valued so as not to be able to influence the sadness or happiness of the human being. People who tend to appreciate things indifferently have a deficient understanding of the natural order and cannot understand that things that are used for both evil and good can be considered neither bad nor good (Moura, 2012). In this reasoning, Costa *et al.* (2019) reported that health and wealth cannot be considered more beneficial than harmful, and are not considered as goods. Moreover, anything that can be used for good or evil is not considered a good thing.

According to what was taught by Stockdale (2017), Stoicism considers physical pain less important compared to the agony that good men experience when they are failed while performing some task before God or their companions. The fact that the Stoics went in search of the formation of

men with courage, good will and sanity, made many families send their young children to learn from these thinkers about everything that a good life is and how they should act. Epictetus made it clear that his thoughts are about unhappiness and happiness, failure and success, freedom and slavery, and not about income and earnings or war and peace. For him, each person is responsible for all his or her own judgments and the error of one individual cannot cause suffering to another.

Happiness has been a recurring theme in the history of mankind. The search for a happy life" is a fact that has always been sought by women and men of all places and times, from classical philosophers such as Epictetus to the employees of any large company. It is clear that this idea of responsibility present in Epictetus manages to bring power to people in anguish. Practicing virtue is quite common for all people. This practice, when based on reason, plays a very important role in achieving happiness (Lima, 2021). The way to live well and achieve happiness are considered practical exercises. Thus, the practices that lead to the materialization of virtue need to be understood as habits that need to be consolidated. In Stoicism, according to Epicitetus (2006), Epictetus' thought stands out in relation to the habit of doing good practices:

> Every habit or ability is maintained and developed by its corresponding activities: the habit of walking makes us walk better, regular running makes us better runners. The same is true of our soul. Whenever you get angry or angry, the more your anger and rage increases. You intensify a habit and add fuel to the fire [...]. If you don't want to have a bad temper, don't feed the habit [...] (EPICTETO, 2006, p. 86-87).

In the course of her study, Luz (2018) spoke well about habits as philosophical exercises. In this sense, he pointed out that, for Epictetus, habitual dispositions are the result of the repetition of certain actions, which can generate more direct responses to future situations. The activities of habituating to good practices strengthen those who follow the philosophical paths advocated by Epictetus. For this philosopher, it is necessary to put into practice what is learned in philosophy and to have the habit of acting like a philosopher and not just talking like one. The habits and actions of habituation are related to the mental aspects of each individual.

Faced with the self-understanding of each individual's place in nature, the use of reason and philosophical exercises as a habit, possibly the individual will be able to achieve a resilience that will allow him to deal with everyday problems, whether existential or not, with a greater lightness, being able to understand that there are several situations that can get out of control, since they are situations of manifestations of a nature that is considered perfect and balanced. It is up to individuals, then, through reason, to adapt to this natural justice and, consequently, live a better life (Grimal, 2018).

4.2 HOW STOICISM CAN GIVE RELEVANCE TO THE APPLICABILITY OF PHILOSOPHY

Stoicism is a philosophical tradition that seeks to preach an ethic in the pursuit of happiness and a good life. In this way, its practitioners are able to define what this life means. The Stoics

encompass the entire philosophical current that corresponds to the context of lived history (Dinucci, 2018).

Stoicism seeks happiness through ways of mastering one's passions, as well as aligning oneself with nature's desires. In the face of what Stoicism believes, happy and wise is the individual who has the gift of being in tune with the flows of events without being discouraged by any adversity that may arise (Costa *et al.* 2019). Therefore, he should not need anything more – that way, nothing will bring him any dissatisfaction. Because of this fact, this philosophy manages to value the practical connections of ideas, without focusing on issues that are strictly intellectual. Nowadays, stoicism is related to attitudes that emphasize discipline, which persists above difficulties and controls passions (Câmara, 2014).

In the pursuit of a happy and peaceful life, the Stoics advocate the fact that the external factors that compromise intellectual and moral perfections should always be ignored. Even in the face of adversity, in difficult or problematic situations, individuals must always react with rationality, calmness and tranquility, without letting the external compromise the capacity for action and judgment (Costa *et al.* 2019).

The Stoics consider that all external feelings, such as lust, passion and so many others, are harmful to the human being, as they cause the individual to become irrational and stop being impartial. These feelings are considered as vices and cause absolute evils that can compromise the organization of thoughts, decision-making in an intelligent and logical way (Dinucci and Julien, 2017).

People seek to follow the teachings of Stoicism to find inner peace, tranquility, and better cope with all the chaos around them. In short, we can say that Stoicism teaches you to maintain a calm and rational mind, regardless of what happens, and this helps you to understand and focus on what you can control and not worry and accept what you cannot control (Husserl, 2014).

Stoicism can be followed by any individual. This philosophy of life teaches that what is truly worthwhile is the integrity of actions and the strength of character. Practitioners of Stoicism make no distinction about who the individual is and where he or she came from. The important thing for them is how much control they are of themselves; how they deal with situations that are not favorable; how they manage their own emotions; how they make decisions; how much they know about themselves; and what they do when they have time (Costa *et al.*, 2019).

Quintessentially, Stoicism is a practical philosophy. For the Stoics, just thinking and studying was not enough to learn how to live life and, therefore, it was necessary to put these teachings into practice (Grimal, 2018). Adopting Stoicism as a philosophy of life causes its practitioners to become less emotionally reactive, more resilient, and more aware of the present. Stoicism can be understood as a system to help individuals thrive in places of stress (Marcondes, 2007).

The Stoic philosopher teaches people to look at life from a new perspective. The strong point of Stoicism is precisely the fact that it is a set of universal and timeless lessons, which can be very useful and used in a practical way by any practicing person, regardless of whether or not they consider themselves a philosopher (Moura, 2012).

Unlike other existing philosophies, Stoicism seeks practicality and direction for actions. The simplicity of the principles of this philosophy is deliberate, since the more complex the subject, the more time people waste trying to understand it – meaning less time to practice it (Santos, 2021). The Stoics do not dwell on abstract and complex concepts. After all, most of the Stoic teachings were passed down "by word of mouth" from generation to generation. The small records they have today were taken from diaries and excerpts of philosophers and also from the notes of their pupils and students (Luz, 2018).

In view of the basic precepts of Stoicism, the four cardinal virtues stand out: courage, wisdom, justice and temperance, which preach acting wisely and making decisions based on reasons (Câmara, 2014). For this philosophy of life, men need to avoid excesses and seek self-control in the face of all their desires. Those who follow this model of discipline are always on the move, in addition to having an appetite for more movements, always prepared to be able to face uncertainties in a calm way (Dinucci, 2018). For practitioners of Stoicism, men's freedom lies in the way of relinquishing control in the face of situations and things that are beyond their reach (Fontoura, 2021).

This maxim of Stoicism, about not trying to control the uncontrollable, has been translated and incorporated by several doctrines, including Christianity and Buddhism, and has even influenced some behavioral therapy techniques (Santos, 2021). The principles of Stoicism are marked by practical and relevant ideas and have everything to do with our time, after all, who doesn't want this self-improvement and lead a lighter life? (Stock, 2020).

Acting in the same way that a Stoic acts is very simple, however, it is not easy or intuitive. The simple way the concepts involved with Stoicism are purposeful. When a philosophy is very complex, people spend more time trying to understand it than practicing it, but when the Stoics come to value actions over words, philosophy is no longer about complex concepts (Dinucci, 2018). Practitioners of Stoicism always rise above their emotional reactions and choose to apply reason to be able to observe everyday situations. If some emotion, such as fear, fails to improve a situation, it is probably considered a useless emotion by the Stoics. Feeling fear is inevitable, but engaging with fear can be a good option to become better (Câmara, 2014).

Stoicism, by itself, is not concerned with complicated theories about the workings of society and/or human behavior, but rather with exercises and teachings that can help overcome destructive emotions and focus on what really matters, valuing action, not the endless debate about aspects that are out of control. It differs from other schools of philosophy for a very simple reason: its application

is extremely practical, and does not leave many "gaps" for intellectual debates (Moura, 2012). In it, philosophy is understood not simply as an intellectual activity, but as an exercise. Thinkers believed that everything that existed was before the determination of a harmonic cosmic force and that virtue would be before living according to the designs of this force (Dinucci and Julien, 2017).

The goods to which human beings may aspire, such as friendship, health, and contentment, are considered secondary, not essential and good. Similarly, notions that are typically rejected such as enmity and illness should always be avoided (Moura, 2012). The refusal to let oneself be carried away by desires and feelings is intended to prevent superfluous ends from being valued and excesses from being committed. Only that which is unconditional should be considered essentially evil or good (Dinucci and Julien, 2017). The preservation of a good reputation is beneficial, but its loss should not be bitterly regretted, just as enmities should be avoided, even if its presence cannot diminish happiness (Grimal, 2018).

The partisans of Stoicism were involved in several clashes with different philosophies experienced in the same period, such as, for example, the Epicureans, the remnants and the skeptics of Plato's academy (Santos, 2021). In direct opposition to Epicureanism, the Stoics rejected pleasures and passions as forms of happiness and considered these feelings to be forms of agitation that could disturb the soul. Attempts to conform to external events to try to satisfy a desire would not be a correct way to go in pursuit of happiness. As a result, happiness came to be related to the acceptance of the designs of the harmonious determinations of events and decisions for the choices of what they are good unconditionally (Stock, 2020).

The results of these decisions would not need to be reflected in external achievements. In light of this, many thinkers were regarded as steadfast-minded and serene people. It is not only a matter of repressing or inhibiting reactions to events, but of having self-control and always knowing how to choose what is morally good, regardless of the proper circumstances – peace in the midst of misfortunes. Today, there are still philosophers who follow the principles of Stoicism, such as Lawrence Becker, John Sellars, and William Irnive, who continue to develop the thoughts of ancient philosophers (Santos, 2021).

5 FINAL THOUGHTS

The Stoics seek to keep away from a life guided by carnal pleasures and feelings, focusing only on moral good and reason. Stoicism is considered a philosophical current linked to Hellenism, and is among the most influential philosophies of antiquity. It's a practice-oriented philosophy. In this sense, philosophy is also a meditation on death, because it meditates on the finitude of existence. On the face of it, the Stoics don't represent the figures of depressed people, they just don't want to be fooled by the promises.

The Stoics have a very unified view of the world, a formal logic, non-dualistic physics, their ethics are naturalistic, and they advocate a virtuous life. For them, philosophies should be able to guide the way of living and not just be theoretical knowledge. Ways of living must conform to destinies, that is, to nature, as the Stoics believe. Most Stoic content is timeless because it teaches people how to deal with adversity and negative feelings. On top of all that, this philosophy can lead individuals to a better knowledge of themselves. Because of its timelessness and because it manages to address themes that are present in the lives of all human beings, Stoicism continues to be widely explored and studied.

Although it is difficult to attain tranquility in the face of life's journey, the Stoics insist that much of the suffering is caused by the individuals themselves, as they occupy themselves with matters that do not concern them and try to control things that cannot be controlled. Stoic philosophy considers that individuals possess an inner divinity capable of guiding them, since reason originates in the divine reason ordering nature. However, because they do not cultivate this inner relationship, they become constant victims of mistaken judgments.

Nowadays, Stoicism is in evidence and has become a desired lifestyle. There are still thinkers who seek to keep this tradition alive, such as William Irvine, Ryan Holiday, Lawrence Becker, and John Sellars. Stoicism has been used to reduce and control stress, anxiety, insecurity, and negative thoughts. Stoics are usually able to keep their minds rational and calm no matter what is going on. People who have never heard anything about Stoicism probably already have some contact with this philosophy of life.

Stoicism is a philosophy that remains known even after more than 2300 years. Several philosophical schools after Stoicism failed to survive and did not become as well-known when compared to Stoic philosophy. Much of the reason for this is related to practical direction, which is always focused on actions and not only on conceptual learning that does not translate into the life of each individual. Another major feature of Stoicism that contributed to its popularity was the simple manner of things being taught. The principles of this philosophy of life are intuitive, they can be easily assimilated from everyday life. It is not without reason that Stoicism is known as the philosophy of good living.

Stoicism—and philosophy—are not the domain of idle professors. They are the rescuer of the successful and the men and women of action. To be a philosopher is not only to be able to have subtle thoughts, or even to found a school, it goes far beyond that. To be a philosopher is to know how to solve some of life's problems not only theoretically, but also practically.

In the face of all this, today's schools and teachers need to teach more about Stoicism in classrooms, showing students the importance of this philosophy and how it can improve the day-to-day lives of people who can practice it.

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Artificial intelligence in education

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ABSTRACT
With the great advancement of technologies in recent years, Artificial Intelligence has been assuming a relevant role in several areas of knowledge. The use of this technology has been developing for more than two thousand years with the aim of providing the computer with the ability to think and act like a human being. In this context, this work aims to deepen the studies of Artificial Intelligence, with a focus on education, showing ways of how it is possible to introduce this technology in the classroom, providing student interest and better teaching and learning. The main aspect that will be presented in this theme is the use of educational robotics as a learning tool, helping to improve logical reasoning and the student's cognitive capacity. The methodology addressed in this paper was the exploratory research and the bibliographic review carried out from the theoretical framework found in articles, books and scientific journals. In conclusion, this work intends to present concepts and applications in the use of Artificial Intelligence (AI) in education, presenting some lines of research and promoting new trends in studies.

Keywords: Artificial Intelligence, Education, Robotics, Educational Robotics.

1 INTRODUCTION

Artificial intelligence, or AI, began after World War II and currently covers several areas of activity, from general use, such as learning and perception, to specific tasks such as proving mathematical theorems, chess games, and diagnosing diseases. Artificial intelligence systematizes and

automates intellectual tasks and is therefore potentially relevant to any sphere of human intellectual activity. In this sense, it is a universal field (Russell; Norvig, 2004).

Artificial intelligence is an area of computer science research that involves technology and is constantly evolving, and that has been transforming today's society through the way people perform their daily tasks, such as banking transactions, automation of services, smartphones, use of social networks and location systems. Briefly, the meaning of AI relates to the ability of machines to learn to think and act like humans.

According to Pereira (2018), some of the areas of application of Artificial Intelligence are, for example:

– electronic games and toys;
– robotics and industrial automation;
– automatic software verification;
– process optimization and control;
– natural language processing;
– deductive databases and data mining;
– learning, planning and scheduling tasks;
– recognition of faces, voices, smells and tastes.

Despite this great technological advance in society, in the field of education, in the use of new technologies, especially artificial intelligence, has been growing slowly, but its use as an ally in the process of interaction and mediator of learning is already perceived, and robotics has been implemented in schools as an interdisciplinary and transdisciplinary learning tool. where it uses the teaching of programming to develop solutions to real-world problems and assist in the improvement of students' cognitive and logical ability (Polini *et al.*, 2018).

In view of this information, this work aims to carry out an exploratory and bibliographic review on the theme Artificial Intelligence in Education and the use of educational robotics in schools, as one of the aspects of AI, seeking to gather studies on the subject and awaken to the need to use new technologies in the education of young learners. to meet the challenges posed by today's information society.

2 ARTIFICIAL INTELLIGENCE IN EDUCATION

Research on artificial intelligence (AI) is expanding and being applied in several areas every day and claims to be the great technological advance of humanity, such as autonomous control, smart cities, medical diagnostic *software*, games, robotics, etc.

The first systems in the field of education, where the computer was used as a teaching tool, were computer-based training (*CBT) and computer-based instruction* (Computer Assisted Instructional - *CAI) (McArthur* et al., 1993) and were used in the teaching of arithmetic, for example.

The purpose of these systems was to present a problem to the student, record their answer, and evaluate their performance. It did not provide the individualized attention of a human tutor, since according to Beck *et al.* (1998), the systems did not consider the individual abilities of the students, because the sequence of questions and answers was directed by the students' successes and mistakes.

According to McArthur *et al.* (1993), this evolution of systems, in the search for personalized teaching, could only be achieved through a system that could reason about the domain and about the student. And from there, the Intelligent *Tutoring Systems (ITS) emerged*.

> An STI is a computer system that provides personalized instruction or feedback to students without much intervention from human teachers" (Cooper *et al*. 2012, p. 138).

According to Vaz and Raposo (2002), Intelligent Tutoring Systems offer flexibility in the presentation of the material and have greater ability to respond to the user's needs. They provide individualized learning to the student, learning relevant information about them. He also says that these systems are considered "intelligent" because they present pedagogical decisions on how to teach the material, allowing greater interactivity of the student with the system. These systems have proven to be efficient in improving student learning and motivation.

In modern times, there have been more and more actions involving the use of ITS systems to modify and improve the teaching model considered traditional, always based on the use of new technologies, such as intelligent teaching/learning systems.

> An ITS can have several benefits with the goal of enabling effective instruction: (1) presenting individualized instruction that allows all students to access the same curriculum with different entry points and learning tasks that are tailored to the needs of the students; (2) enable students to achieve similar proficiency levels more efficiently; and (3) From an appropriate design, ITS can empower teachers to focus on a small subset of students who need extra help and thus provide more effective instruction (COOPER, NAM, and SI, 2012).

In addition to STIs, there are other educational systems that make use of artificial intelligence, such as learning management systems (*Learning Management Systems* - LMSs), analysis learning (*Learning Analytics* - LA) and intelligent educational robotics. All of these only become possible to be used in the school environment with the use of technologies underlying the WOULD, such as the Internet, via wireless or wired networks, computers and/or mobile technologies, such as *Tablet* and *Smartphone*, and cloud storage. It is these technologies that are most commonly found in schools today and that directly influence AI, in addition to being responsible for the emergence of new technologies, such as *Big Data*, *Machine Learning*, Virtual Reality, etc.

2.1 ROBOTICS AS AN APPLICATION OF AI IN EDUCATION

Robotics can be defined as "the science of systems that interact with the real world with little or no human intervention" (Ars Consult, 1995, p.21). It is a multidisciplinary area, which involves themes in the areas of Mechanical and Electrical Engineering, Computing, Artificial Intelligence, among others. All with the goal of developing robots.

Among the various definitions of the robot, there are:

a) A robot is any machine, or mechanical equipment, that works automatically, simulating human abilities (Random House Dictionary *apud* Zilli, 2002, p. 4).

b) A machine that in appearance or behavior imitates a person or a specific action of that person, such as a movement of his body (Marsh *apud* Zilli, 2002, p. 4).

Ullrich (1987, p. 5) presents another definition for the term robot:

> (...) a multifunctional and reprogrammable piece of equipment, designed to move materials, parts, tools or specialized devices through variable and programmed movements, for the execution of a multitude of tasks (Ullrich, 1987, p. 5)

From these concepts, it can be seen that robotics is a technology that can act and solve problems in the most diverse areas that involve human activity, as they can perform various tasks as long as they are designed to do so. This growth in the various sectors, especially in industry and in the medical area, has enabled the insertion of this technology in the school environment, as a way to enable students to learn new ways through experimentation and collaboration, explaining technical issues in a more fun and attractive way, where the student can intervene in the social environment in which he lives creating solutions based on science and technology.

In this way, the term educational robotics emerges, which According to the Interactive Dictionary of Brazilian Education (2004):

> (...) It is a term used to characterize learning environments that bring together scrap materials or assembly kits composed of various parts, motors and sensors controllable by computer and software, allowing to program, in some way, the operation of models.

Maisonnette (2002) defines educational robotics as being

> (...) the control of electro-electronic mechanisms through a computer, transforming it into a machine capable of interacting with the environment and performing actions defined by a program created by the programmer from these interactions.

It is a new educational proposal, which enables the teacher to apply in a practical way, the theoretical concepts worked on in the disciplines, which were often not understood by the students, and which can be stimulated and motivated to learn through observation, abstraction and invention

from the use of this technology. Multidisciplinarity is used to build models, allowing the student to have different learning experiences (Besafe, 2003).

Among the various types of application of robotics with the use of artificial intelligence, the *chatterbot stands out,* which according to Wikipedia (2012), derives from the junction of the word chatter (the person who talks) and the word bot (abbreviation of robot), that is, a robot, in the form of a program, that interacts and simulates the conversation with other people. Its purpose is to make the person who asks a question to the system not be able to realize that the answer comes from a computer program.

Chatterbots, intelligent conversational robots, are commonly used in computing as a form of introduction to the teaching of programming, and it is a good option to use as a robotics teacher, as they are already used by young people in online games, supporting the player or simulating a virtual partner, which characterizes the presence of an artificial intelligence.

Zilli (2002) presents some skills that the use of educational robotics can develop, such as: logical reasoning; interpersonal and intrapersonal relationships; research and understanding; research work; problem solving through mistakes and successes; use of creativity in different situations; critical capacity.

3 FINAL THOUGHTS

This exploratory and bibliographic research on the integration of Artificial Intelligence (AI) and robotics in education reveals the significant influence of these technologies on the teaching/learning process. AI, since its post-World War II origin, has evolved in a comprehensive manner, playing crucial roles in diverse spheres of contemporary society. However, the insertion of these technologies in education, although growing, still lacks a more effective and broad implementation.

In the educational landscape, AI especially stands out through Intelligent Tutoring Systems (STIs), which offer personalized instruction and adaptive feedback to students. The ability of these systems to consider students' individual abilities represents a significant step towards more personalized teaching. As an example, Chatterbot was presented as an educational robotics application, standing out as a motivating agent in the introduction to programming teaching.

Educational robotics, in turn, is conceptualized as the science of systems that interact with the real world, providing students with practical and multidisciplinary experiences. The use of computer-controllable assembly kits, motors and sensors contributes to the development of skills such as logical reasoning, interpersonal relationships, research, creativity and critical skills. This innovative approach allows for model building and problem-solving in a more attractive way, promoting a more dynamic learning environment.

However, the effective implementation of these technologies in education requires a well-planned pedagogical proposal, with an emphasis on teaching support. There are still challenges to be overcome, such as the slow assimilation of these innovations in the educational context. It is imperative that educational institutions and educators are prepared to incorporate new technologies in an integrated way, providing students not only with access to the tools, but also with an understanding of their transformative potential.

In this context, it is evident that AI and robotics have the potential to revolutionize education, making it more dynamic, personalized, and aligned with the demands of the information society. The search for innovative paths, exploring the various possibilities of these technologies, promises to positively impact the way knowledge is acquired and assimilated. It is believed that, in the near future, the presence of these technologies will be even more common in classrooms, providing significant benefits to learners and preparing them more effectively for the challenges of the 21st century. Therefore, it is essential to continue investing in research and development in this area, aiming to constantly improve educational practices and maximize the benefits offered by AI and robotics in education.

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Rural and Professional Education in Paraíba in the 1930s and 1940s

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ABSTRACT
This chapter seeks to understand rural and professional education in Paraíba in line with the political and social discussions of the Vargas period. It is the result of the research project Social Representations on Professional Education in the newspaper A União (Paraíba, 1930s) funded by the IFPB's INTERCONECTA public notice. At first, the text presents a small contextualization of Professional Education in Brazil and Paraíba up to our time frame, 1930. Soon after, he discusses, based on some bibliographic references, how, throughout the Vargas period, a rural education focused on work and nationalism became increasingly evident. Next, it presents some examples of rural education in Paraíba, discussing how it was organized and what would be the social and political representations that shaped the practices of this education. As a conclusion, we present a little of the trajectory of Sizenando Costa, a teacher and intellectual who fought for rural education in the period in question. Also, the proposal of the Model Rural Schools that he defended. The chapter dialogues both with studies on the history of rural and professional education in Paraíba and Brazil, as well as with analyses that deal with politics in the 1930s and 1940s.

Keywords: Rural Education, Vargas Period, Social Representations, A União newspaper.

1 INTRODUCTION

Our text is an excerpt from the project *Social Representations about Professional Education in the newspaper A União (Paraíba, 1930s)* that seeks to understand rural education in Paraíba in the Vargas context. This project is funded by the INTERCONECTA-IFPB 07-2023 notice. Partial results and excerpts have already been presented at the following scientific congresses**: IX National Congress of Education** in October 2023 we presented the poster abstract: *Reflections on Professional Education*

in the Paraíba newspaper A União (1930s) later transformed into an expanded abstract and published in the annals of the event. At **the 5th IFPB Research, Innovation and Graduate Symposium (SIMPIF)** in November 2023, we presented the banner entitled *Social Representations about Professional Education in the newspaper A União (Paraíba, (1930s).* And, finally, we presented at **the I Science and Technology Week** of the IFPB-Picuí campus in December 2023 the poster *Social Representations on Professional Education in the newspaper A União (Paraíba, (1930s)* awarded first place in the Human Sciences category. Before entering into the excerpt proposed here, we would like to develop some general considerations about the history of professional education in Paraíba. Our project, as mentioned above, focuses on professional education and seeks to understand what kind of changes there were in the conceptions about it with the arrival of the labor discourse in the 1930s. The proposals for rural education are part of a larger project of Vocational Education, therefore, we consider that this historical contextualization that follows is necessary.

In 1809, for example, the "Colégio das Fábricas" (Colégio das Fábricas) emerged in Rio de Janeiro, the first established school created by the government with the objective of training "artists and apprentices" to work in artisanal and manufacturing trades (CANDEIA, 2013, p. 45). It should be noted that the creation of the College of Factories dialogues with the charter of April 1, 1808, which authorized the establishment of factories and manufactures in Brazil, repealing the legislation of 1785 that prohibited the carrying out of such activities in the colony (CABRAL, 2016). In the aforementioned charter, the then Prince Regent, D. João, determines that

> [...] desiring to promote and advance the national wealth, and one of the sources of it being manufactures and industry, which multiply and improve, and give more value to the goods and products of agriculture and the arts, and increase the population, giving to many hands to do, and furnishing means of subsistence to many of my vassals, who for want of them would indulge in the vices of idleness; and it is expedient to remove all obstacles that may render useless and frustrate such advantageous benefits: I am pleased to abolish and revoke any and all prohibitions that exist in this regard in the State of Brazil and in my Overseas Dominions (BRASIL, 01 abri. 1808)

Such practices and discourses – raised in the context of Brazil's transformation into the seat of the Portuguese Empire – already revealed the link between education for work and economic development.

In Paraíba, Candeia (2013, p. 45-56) identified some milestones in the history of professional education. In 1854, a *School of Theoretical and Practical Agriculture was created*. In 1859, the Legislative Assembly authorized the creation of a School for apprentice craftsmen in the capital. However, it was only in October 1866 that the government of the then province was able to implement such a project, thus emerging the *Colégio de Educandos Artifices da Paraíba*, which would operate until 1874. In 1871, another institution with a professional profile was created in the capital of Paraíba: the *School of Apprentice Sailors.* At the time , the rulers on duty understood professional education as

an "antidote" capable of solving two problems at the same time – the social control of poor children and the formation of the free labor market:

> The creation of these schools signified the willingness of the Brazilian State to face the problem of underprivileged children who are not accustomed to work. It had to be solved, even more so when, in addition to the social problem (children in the streets and squares), the State's concern with the training of labor to meet a labor market that would indicate its demands, pointing to the need for minimally qualified workers, began to be announced, timidly at first, but increasingly with the passage of time. Thus, taking children off the streets was the objective pursued by the State, which, in addition to pure and simple repression, gradually sought to improve actions and assimilate other ideas, including the pedagogical resource of qualification for work (CANDEIA, 2013, p. 47).

The abolition of slavery in 1888 accentuated the debates and government actions in shaping the labor market. As Chalhoub (2012, p. 47-50) has shown, the end of the slave regime placed work as a problem to be solved by the dominant classes. In this context, it has become urgent for the owners of capital to create new mechanisms of domination of the labor market. It was necessary to "compel the "free man" to sell his labor power under conditions that were interesting to capital. Moreover, it would not be enough to expropriate labor power. It was also necessary to "redeem" work, socially devalued by centuries of slavery, building a new ideology capable of representing work as a factor of civilization. Moreover, the new policy of domination practiced by the republican state was also based on the constant surveillance of the various spheres of life of the working classes, and [1]was also aided by the police and judicial repression of habits considered "unwanted", with "vagrancy" being one of the main concerns of the owners of capital. Now, when analyzing the governmental actions in the field of professional education, it can be seen that it was also practiced with the objective of (con)forming the subalternized classes, from childhood, to the demands of the capitalist market. Historically constituted in Brazil in the midst of these injunctions, professional education was initially conceived and implemented based on a dichotomy of projects and ideas:

> These initiatives, by the State and private individuals, were legitimized by discourses that, at the same time that they justified such actions, constructed the idea of a type of education for certain workers, thus affirming the duality of Brazilian education, in the sense of the existence of a school for workers and another for the elite, supposedly with different and predetermined missions. Therefore, it was necessary to stimulate the less favored classes to work and, thus, hinder the development of ideas that challenged the political order (CANDEIA; CURY, 2022, p. 69)

Later on, we will see how this dichotomy crossed the projects and representations of rural education.

[1] Singer (2012, p. 191) characterizes this segment of capitalist societies by its dependence on wage labor as a form of subsistence. Thus, it is the need to work in order to survive, and not the type of occupation, that confers some degree of integration between the characters we consider as "working classes" in the research as a whole, whether they were inserted in the labor market or not.

In the historical context of the "new" republican order, public education would occupy more and more space in the debate and in government actions. Together with the urban reforms and sanitation policies of the period, it would be one of the pillars of a technical-scientific administration[2] of society that intended to produce the "orderly progress" (PATTO, 1999, p. 170) desired by the leaders of the Republic. But when we analyze the sources that deal with professional and rural education, we can see that alongside the concern with the economic development of the Nation there were concerns of a welfare order in relation to impoverished children, or, to use a term of the time, to the "unfortunate ones". Thus, professional education was initially constituted in Brazil as a response of the dominant groups to demands such as the training of workers, assistance to the poorest and the social control of the subalternized classes. Now, when we analyze the case of Paraíba, the welfare and repressive elements seem to have played an even more decisive role in the conformation of professional education, since

> [...] in states where the industry was incipient and the need for qualified personnel to work in the factories was very small (as in the case of Paraíba), social control seemed to guide such actions, thus signifying the presence of the State and its effort at affirmation, unification and civilization. Thus, vocational education in republican Paraíba seems to be born with this accentuated bias, with this "historical mission" of serving the unfortunate, the poor in general. Even in 1909 (with the EAAPB) [School of Apprentice Craftsmen of Paraíba], this trend was accentuated (CANDEIA, 2013, p. 56)

It was in the midst of these practices and representations that 19 Apprentice Craftsman Schools were created in 1909 in the different Brazilian states. These institutions began to function between January and October 1910 (CANDEIA, 2013, p. 58). In *the Recitals* of the Decree of Creation, signed by the then President Nilo Peçanha (1909-1910), it is possible to find a synthesis of the thinking that founded the project:

> The President of the Republic of the United States of Brazil, [...] Recital:
> That the constant increase in the population of the cities requires that the proletarian classes be provided with the means of overcoming the ever-increasing difficulties of the struggle for existence;
> That for this it is necessary, not only to equip the children of the disadvantaged of fortune with the indispensable technical and intellectual training, but also to make them acquire habits of fruitful work, which will keep them away from ignorant idleness, the school of vice and crime;
> That it is one of the first duties of the Government of the Republic to form citizens useful to the Nation:
> Decrees:
> Article 1 – In each of the capitals of the States of the Republic, the Federal Government shall maintain, through the Ministry of Agriculture, Industry and Commerce, a School of Apprentice Craftsmen, intended for free primary professional education (BRASIL, September 23, 1909, emphasis added).

[2] According to Chalhoub (2017, p. 23), between the end of the nineteenth century and the beginning of the twentieth century, the idea of a public administration based solely on technical or scientific criteria was constituted in Brazil: "it is the belief that there would be an extrinsic rationality to urban social inequalities, and that it should then guide non-political, 'competent' conduct, 'efficient', of public policies". However, as the same author argues, "The most tragic thing about this whole story is that the claim of 'scientificity', of neutrality in administrative decisions, always has violence against citizenship at its core" (CHALHOUB, 2017, p. 67).

Assistance, control and "rehabilitation[3]" of the "dangerous classes": this was the logic that underpinned the constitution and functioning of Brazilian professional education in the first decades of the twentieth century. Thus, in the midst of the political, social and economic changes accentuated from the 1930s onwards – notably the rise of Getúlio Vargas to power and the urban-industrial growth – the demand for technical staff for the industrializing project led by the state initiative grew. In this new historical context, professional education has undergone changes in its semantics and pedagogical function, since

> With the industrializing project, the vision of a professional education aimed at the underprivileged was abandoned. Between 1930 and 1945, the demand for skilled workers and technical staff grew, given the implantation of national industrial capitalism. The Constitution of 1937 established the obligation of the organization of vocational schools by companies and unions. In 1942, the National Learning Service (Senai) was created and the Organic Law of Industrial Education was enacted, which organizes this type of education, no longer exclusive to companies and unions, in addition to equating it to propaedeutic high school (WINCKLE; SANTAGADA, 2012, p. 98).

As nothing in history is so simple, we will see how at the same time that the government and part of society are organizing this professional education for the industry, the debates about the improvement and expansion of agriculture were also taking over the country. And within these debates, the organization of a rural professional education will be of fundamental importance.

Converging with this new guideline, which we can call labor, in 1942, in the context of the education reform implemented during the administration of Gustavo Capanema, then Minister of Education and Public Health in the Vargas government, professional education began to be designed and practiced on other bases, structured around the notion of "industrial education" (CANDEIA, 2013, p. 19). That same year, *the School of Apprentice Craftsmen of Paraíba* was transformed into an Industrial School, explaining the new perspective that the Brazilian State sought to give to professional education.

It is on this "time of changes", between ruptures and continuities, that our project and this text turn its attention. To do this, we will turn to the official journal *The Union*[4]. The main media outlet in Paraíba at the time, its pages allow access to the worldviews and social projects of the then dominant

[3] Chalhoub (2017, p. 26-34) has shown that since the end of the nineteenth century, the discourse of national political elites has helped to build an association between "poor classes, dangerous classes", as defined by their supposed "potential threat" to the organization of work, the maintenance of public order, and collective health.

[4] Created in 1893 by the then president of Paraíba, Álvaro Machado, and maintained since then by the state government, A União was published in the capital and had a government editorial line (MARTINS, 1977, p. 16). In this sense, it defended and propagated the projects of society, the actions and the worldview of hegemonic groups. The editions of A União published in the 1930s have been digitized and released to the public on the newspaper's own website, which facilitated research. This collection is available in https://auniao.pb.gov.br/servicos/copy_of_jornal-a-uniao#gsc.tab=0 Accessed on 13-10-2023.

classes, since it was a government body, maintained and produced by the local elites[5]. Now, we know that the press is not only a vehicle of information, much less an impartial propagator of events; in modern societies, it functions as a "social practice that constitutes social reality, which shapes ways of thinking and acting, defines social roles, generalizes positions and interpretations that are intended to be shared and universal" (MACIEL, 2004, p. 15). To reinforce the importance of choosing our source, we bring below a quote from another work that shows how the press in general helps to understand education, especially rural education, but not only:

> "We gave significant importance to the sources found in the periodicals, especially the *newspaper A União*, because they share the ideas developed by Campos (2012, p. 49), when he states that the "non-pedagogical newspapers" play a crucial role in the daily education of people, or, at least, of a certain social segment, that is, the readers. Thus, considering that the issue of rural education was debated, primarily, by the literate public, namely, intellectuals, teachers, public administrators, we think that the publication of news related to rural education had the role of mobilizing the opinions of these social subjects, and could even interfere in the actions of the federal, state and municipal governments" (PINHEIRO: 2020, p. 97).

In search of what some social segments think about professional and rural education in the period, the newspaper *A União* and other periodicals are powerful windows for discordant or agreeing voices on this issue. Concluding this brief contextualization of professional education, we present our questions: that is, what interests us in rural education.

We want to develop two basic points: how what was called Agricultural Education at the time is structured, what are its objectives, what are its difficulties and what are the political-institutional disputes that cross it. After understanding this issue, dive into some examples of rural school practices in Paraíba and describe the performance of one of its strongest advocates: Sizenando Costa. It must be said that this text is a *work in progress,* we have not finished the research. So, at times there will be hypotheses launched, at times we will have to grudgingly end the argument. In the narrative of the text, we wanted to make these incompleteness clear.

One more small but important comment before we get into our two questions stated above. We know that since the end of the 1990s there has been a process of semantic resignification of the notion of rural education for education of and in the countryside. Such a change is very significant in the struggle of rural peoples in favor of an education that is methodologically thought of from the countryside and not about the countryside. All this discussion is very interesting and touches directly on our themes, but we will not elaborate on it here, as it is a time frame far from ours[6]. But it is necessary

[5] Due to the limits of the project and this text, it will not be our intention, at least not for the time being, to investigate the social representations elaborated by the working classes about professional education. Even though we have a clear notion of the relevance of this goal, our intention is to develop it in future projects.

[6] For a brief introduction on this issue of education of and in the countryside see: (HENRIQUES et alli, 2007), (RANGEL; CARMO: 2011), (MUNARIM: 2008), (SANTOS: 2010), (CALDART et alli: 2012).

to keep in mind that rural education, both today and in our period, is part of a larger history, the history of rural peoples (MORAES, SOUZA-CHALOBA: 2022).

Another initial comment is necessary: is it about the nomenclature: Rural Education and/or Agricultural Education? In the sources and bibliography of the period, both before and after 1930, both appear. Sizenando Costa, for example, published the book in 1941 *Rural Education,* The federal government creates the *Organic Law on Agricultural Education* in 1946, the first schools in Paraíba in the late 1930s are called *Model Rural School,* technical agreements between the U.S. and Brazil in the context of World War II reshape what they call the *Agricultural Education*. So, we still don't have a way to define which is the best or how to deepen a theoretical-conceptual discussion that would be fruitful. On account of the call *Movement for the Ruralization of Education* which encompasses many individual and institutional initiatives between the 1930s and 1950s, we prefer the term Rural Education (MORAES, 2021). But there remains the question to be thought about in other projects.

In order not to dwell any longer on these initial notes, let's enter into our discussion. First, we agree with some recent studies that have pointed out the error of considering the period of Getúlio Vargas, notably the Estado Novo, as ground zero in educational policies for the rural world.

> "Another frequent mistake is to attribute the origin of primary and secondary rural education to the initiatives perpetrated during the Estado Novo when the new bloc in power outlined after the coup of 1930 was consolidated under the aegis of the dictatorship. According to some, it was only there that "schooling programs considered relevant to rural populations were initiated (...), which emerged under the patronage of the Ministry of Agriculture of the Vargas government" (Id., ibid.: 16-17, emphasis SRM). There is nothing more misleading than to take 1930 as the inaugural milestone of agricultural educational policies and, even more, to attribute them to the Vargas "Ministry of Agriculture", since the Ministry had already contemplated initiatives aimed at rural elementary education since the 1910s, through institutions such as the Apprenticeships and Patronages and Agricultural (MENDONÇA, 1997: 69), the latter corresponding to the social prophylaxis proposed by urban-industrial groups" (MENDONÇA: 2016, p. 3).

The experiences of Apprenticeships and Agricultural Patronages since the 1910s are important elements in the history of rural education in Brazil as a whole, but they are outside our time frame. We would just like to bring the first example of Rural Education in Paraíba to be developed here: the Presidente João Pessoa Professional School, better known as Pindobal. We bring this example here for a few reasons: first, it looks a lot like the Patronage model. Second, it is a clear example in Paraíba of rural education being thought of as social control, a characteristic that will mark this type of education and also professional education as a whole from the First Republic to the 1930s, as already shown in the initial contextualization. In these years, following the national ideological trends, rural education has appeared with another objective: training and settling rural workers in the countryside. But these two goals are intertwined. The second we know from the history of Brazil that it has not been affected: from the 1930s until today the tendency is for the countryside to expel its inhabitants to the cities.

In the speech of the intervenor Argemiro de Figueiredo – he was at the head of the government from the mid-1930s until its end – this association of education as a way to contain the increase of the population in conditions of poverty is clear. This situation is directly linked to the urban and social transformations associated with the end of slavery and Brazil's entry into mercantile capitalism. The black population – the majority of those who were in a situation of poverty – began to flock en masse to the cities and this became a social problem of great proportions in the first decades of the twentieth century. But let's pay attention to Argemiro de Figueiredo's speech:

> "It is painful to see how the wave of the unemployed is increasing every day. Having studied the reasons for the phenomenon, we will conclude that they lie largely in the failures of our teaching processes. There are countless young people, magnificent energies thrown into the dispersion that could produce the best fruits, if the school would root them in the countryside from where they came out, ignorant that the daily work of the peasant contains the unparalleled nobility of an edifying patriotism" (Message of 1935, p.13)" (PINHEIRO, p. 3-4).

Pindobal has had several names: Agricultural Center, Agricultural School and had rural education as a model for the resocialization of juvenile offenders. Its first director was Sizenando Costa, who we will talk about again in this text. It was founded in 1930 and quickly acquired the reputation of a prison because of its austere regime and disciplinary character. Some issues we would like to reinforce with the example of Pindobal: in accordance with the ideological discourse born in the 1930s, which would later be called Laborism (GOMES: 1994), rural education was used as a tool for social training, as a nationalist tool for the use of those considered marginal in the midst of rural work.

> "Agricultural Education has the intention of training the underprivileged male childhood and adolescence of Paraíba for redemptive agricultural professional work, capable of transforming their lives, making them productive citizens and, consequently, resocialized. Brazil's concern in the first decades of the twentieth century was with the reduction of crimes committed by these subjects, and, mainly, with the fight against idleness and vagrancy, seen as the main evils of the lack of progress in a Brazil that needed to modernize and moralize itself. In the last years of the nineteenth century and in the first decades of the twentieth century, the pedagogical action of the dominant sectors, along with other more directly repressive practices, will be focused on "national reconstruction", the conformation of citizenship, and the question of the organization of work. Numerous strategies and devices are developed aimed at moralizing and adjusting workers to the new social order. (Moraes, 2000, p.70)" (NASCIMENTO, MACHADO: 2021, p. 4).

Pindobal reinforces an educational dualism that came from the First Republic and was already mentioned in the initial contextualization: the so-called School Groups in the big cities to train the children of the elite and sponsored by the federal government and the rural and/or isolated schools to form the children of the working classes and financed in a very precarious way by the municipal and state governments. This is a characteristic that the reforms of the Vargas period perpetuated and will mark the entire trajectory of education in the twentieth century.

> "Agricultural technical education is gradually implemented in Brazil, through policies developed by the Ministry of Agriculture and the Ministry of Education and Health, in the mid-

> 1930s, If it is a fact that, throughout the twentieth century, Brazilian education underwent major reformulations, becoming more complex in proportion to the changes in the pattern of capitalist accumulation, On the other hand, its dual character remained as a basic characteristic. In the midst of this scenario, the reflection on Agricultural Education acquires relevance, one of the most complete expressions of this dualism, especially because it has been, at least until 1961, crossed [...] not only by the duality that antagonizes manual work versus "intellectual" work, but also by the one that polarized two agencies of the Political Society in charge of it: the Ministry of Agriculture and the Ministry of Education and Health, particularly in the 1930s to 1950s. (Mendonça, 2007, p.244). The sinuous conflicts of the twentieth century, especially in the 1930s, are present in education based on this duality, between education for the children of the working poor and education for the children of the ruling elite. Agricultural Education becomes the mantra of Paraíba capitalist society, as one of the main instruments of resocialization of internal subjects in Pindobal, this tactic of the State takes shape with the policies implemented by the education ministry here in Paraíba and the debate held by the press is an important field of observation of what was being implemented by the state government" (NASCIMENTO, MACHADO: 2021, p. 7).

Other examples of rural education in Paraíba will be*: The School of Agronomy of the Northeast,* founded in Areia in 1936, focused both on agricultural education and on the dynamization of techniques and rural producers in the state, and with a focus on the training of agrarian elites. The *Rural School on the Simões Lopes Farm*, the Model Rural Schools*, a* project defended by Sizenando Costa that became law in 1938, but only implemented in the 1940s. The rural school at *Fazenda São Rafael*. The *Rural Normal Schools* from the 1940s onwards, which had the intention of settling teachers in the hinterlands of Paraíba and will be important in the *Movement for the Ruralization of Education*.

About the São Rafael Farm, we present an excerpt from the newspaper A União that demonstrates a little of the dynamics of this education. Primary school students are taken to these farms to take hands-on farming lessons. From what we can see from the source and the bibliography, this is a persistent method that comes from the First Republic.

> "... In obedience to the agricultural education program outlined by the Argemiro de Figueirêdo government, a program that includes rudimentary practical teaching of rational agriculture, gardening, horticulture, pomiculture, poultry farming, beekeeping, sericulture and dairy products, given by the technicians of the Secretariat of Agriculture in the demonstration fields, the students and teachers of the Isabel Maria das Neves School Group were at the S. Rafael farm. From this capital [...] Starting from the park where the brooders and brooders are placed and passing through the housing of chicks of different ages to the houses of breeders of various breeds, the agronomists João Henriques da Silva, Director of Production Promotion, and Gabriel Barbosa de Farias, Inspector in Charge of the Service, went, in simple and practical lectures, teaching the rational processes of breeding, in its various phases [...] Thus, he found the best will on the part of all and Decree No. 1339 of March 6 of this year, in which the Argemiro de Figueirêdo government established measures aimed at bringing the precious fruits of rural education to primary schools" (A UNIÃO: 1939, p. 9)

We'll come back to discuss some of these examples. Now let's talk about the ruralization of education.

It is possible to encompass all the initiatives presented here and the problematic of this text within what the historiography of Education has called *Movement for the Ruralization of Education*. First, this movement is quite complex, has many actors and even a long duration: it goes from the

discussions of the early 1930s for the professionalization of Education to the approval of the Basic Guidelines Law (LDB) of 1961, going through several inflections and changes. We do not want to go into more detail here, but we refer to the important work of Moraes *Ruralization of education: ideas in motion and the movement of ideas (1930-1950)* of 2021. Let's raise the working hypothesis that needs to be deepened: are our examples, and particularly Sizenando Costa, part of this movement? We believe so, but only more research into the sources will confirm it.

The movement is part of the so-called Brazilian Ruralism that emerged in the 1930s in the face of what was called the *Agriculture Crisis*. Faced with an increasingly industrial and urban project, agrarian groups pressured governments, especially the federal government of Getúlio Vargas, to guarantee fiscal protection and incentives for the agrarian economy. The government itself was divided between agrarians and industrialists. (MENDONÇA, 1997). It is also not the objective here to deepen the connection of the Campaign for Ruralization with Ruralism as a whole, but I could not fail to mention it. What I would like to mention are some general aspects of the Movement and its implications in Paraíba

> "The need to put ruralist ideas into practice was recurrent in the discourse of the Movement for the Ruralization of Education; In this sense, several actions were implemented, such as the organization of events, publication of printed materials, creation or performance in school educational institutions, as well as in societies and institutes, with emphasis on lectures, conferences, speeches, congresses and ruralist weeks. In fact, Sud Mennucci's speeches, given on some of these occasions, were published as books and/or articles in periodicals, such as, for example, in the Revista do Professor, published by the Centro do Professorado Paulista. The ruralization of education influenced educational institutions, such as the Rural Normal Schools — a topic dear to the ruralists — and the Typical Rural Schools (SOUZA; MORAES, 2015). Other expressions of this movement were the agricultural clubs adopted in several primary schools in different states of the country, with the purpose of forging a ruralist mentality in children. It is also worth mentioning the relevance of some associations, such as the Society of Friends of Alberto Torres, the Luiz Pereira Barreto Society, and the National Institute of Studies and Research (Inep)" (MORAES, SOUZA-CHALOBA: 2022, p. 69).

An important achievement of *the Movement* were the sections of the 1934 Constitution that guaranteed for the first time rural education as a right, as well as a specific budget. It also guaranteed, in line with the government's discourse at the time, manual rural work as an element of eugenics, control, and social prophylaxis, as it was said at the time. The 1937 Constitution perpetuated this notion (MORAES, SOUZA-CHALOBA: 2022, p. 71). In the case of Paraíba, we would like to further develop the work of Sizenando Costa and the example of the *Model Rural Schools*.

Continuing the hypothesis raised above, we want to understand the performance of Sizenando Costa. We are still beginning to explore the paths of rural education in Paraíba in these years and his name appears a few times in the little bibliography that exists on the subject. What do we know about him? First director of Pindobal, we have already mentioned. Author of the book *Rural Education,* which seems to be part of his campaign for the professionalization of rural education that he had been advocating since the 1930s. Unfortunately, at this stage we have not been able to deepen the reading

and analysis of this work. It will be part of the unfolding of this work. Proponent and defender of the Model Rural Schools that would be transformed into law in 1938, but which only a few years later began to get off the ground. During this period, we know that Sizenando, in some lectures, charged the governments of the intervenors Argemiro de Figueiredo and Ruy Carneiro with the implementation of the Law. He was Director of Primary Education in the State. When we talk about rural education, we are always talking about what was understood at the time as primary education. For his defense of an education that is closer to the reality of the students, we can include him as a defender of the New School movement. This needs to be further researched. The following is a quote that contains Sizenando's speech in which he makes clear the school he intends to attend and how it would be an instrument of regenerating nationalism through the valorization of work, very close to what was defended by the federal government at the time:

> "The State and society are in need of the school directing its action more relatively, more coherent with the needs of life, processing everything in accordance with the moral interests of the environment in which it operates. The school of letters only, hieratic, dogmatic; school, something of a cloister, something of a barracks, must give way to another that is perhaps less wordy, less bookish and more dynamic, more appropriate to the environment and to the supreme collective needs (...) It is urgent and absolutely necessary to ensure that the school becomes, as a whole, a laboratory where regional activities that ensure the maintenance of the people and institutions are developed, accentuated and perfected. Guided in this way, the school is better accommodated to the collective interests and will prepare a nationality in correspondence with the interests of the people and the State, creating a new mentality with a very noble concept of work and capable of immediately influencing all the manifestations of life, from the humble home of our rural worker" (Id. Ibid: p.15). (PINHEIRO, p. 7).

In another part of his speech, more related to the rural issue, one can perceive several recurrent images of Brazilian ruralism at the time. That is why we advocate for its inclusion as part of this national and international movement called *Ruralization of Education*:

> "rural activities should be developed largely in the school, and that the land of Brazil should undergo a reforming influence in order to make our housewife more apt, more efficient, less dispersive, less disinterested in economic questions, and parallel to this work, we should also value man, offering him the means to produce abundantly, to settle on the soil, stimulating a deep love for its generous glebeba, an udder source of wealth and happiness" (PINHEIRO, p. 4-5).

Now let's talk about the Model Rural Schools, a project defended by Sizenando. One of the biggest problems faced by Education in Paraíba since the Empire was the difficulty of teachers in the countryside. This problem is shared by practically all states. As soon as a teacher could, he tried to move to the larger cities of Brejo – Campina Grade, Areia – or to the capital, João Pessoa. The conditions of life not only expel the worker from the field, but expel everyone. The idea of the Model School aimed to solve this issue by defending, in its model, the existence of a teacher's house attached to the school and to guarantee some career advantages for those who remained in the countryside. When these schools really started to get off the ground in the late 1940s, we know that this problem

persisted. Another issue that these schools aimed to improve was the teaching methods that included content more related to agricultural techniques. This, in fact, already came from other older experiences, from the Farms and Farms Schools that functioned as places of practical classes for the students of regular primary education, already mentioned above when we talk about the experience of São Rafael.

This issue is also part of a ruralist campaign to expand and improve agrarian technology in Brazil as an alternative to the so-called *Agriculture Crisis.* From the end of World War II, with the rapprochement between Brazil and the USA, several agreements and institutions were created for the implementation of these rural education policies. It is an important moment in this history, as it established once and for all rural education focused on rural work, agrarian development and no longer as a control of rural populations in larger cities (MENDONÇA: 2010) (MORAES, SOUZA-CHALOBA: 2022) (PINHEIRO). We are not going to delve into this period – the 1950s – because it escapes our time frame, but it is the culminating and defining moment of the Ruralization of Education. I bring some quotes from the text *The Era of Rural Primary Schools in Paraíba* to delve deeper into these issues. First, what the author sees as contradictions and problems since the 1938 Law:

> "The aforementioned decree, however, presents contradictions in relation to the public to which the school in question was intended and the reasons presented therein for its implementation. While the justification contained in the decree considered that rural education would improve the living conditions of the inhabitants of the countryside, settling them in their land and thus avoiding the exodus to the large urban centers, the second article established that the school was responsible for training an emergency teacher and "providing special rural education to students in the poor neighborhoods of the city" (emphasis added), who had passed the subjects included in the 3rd year of primary education (Id., Ibid., p. 24). It is clear, therefore, that the model rural school, in fact, did not have the purpose of "settling" men/women in the countryside, although it was up to them to train teachers, who would probably be sent to work in the countryside or in cities in the interior. In fact, one of the greatest difficulties faced by public education managers in Paraíba was to settle teachers in the interior of the state – mainly in the sertaneja region – in the interior of the state. Many of them, upon reaching a better level of qualification, often requested transfer to larger cities in the Agreste or Brejo region (Campina Grande, Areia, etc.) and, mainly, to the capital, João Pessoa" (PINHEIRO, p. 5-6).

The schools, as I said above, would function as training camps where teachers from neighboring localities could train more quickly. The decree-law also obliged the municipalities where the schools would be installed to open farm-schools, "that is: all those that, "in addition to the teaching of letters in the official program, [ministered] practically, on land donated by the City Hall or by a private individual, the teaching of horticulture, gardening, forestry, pomiculture, pig farming, rabbit farming, beekeeping, sericulture and cooking" (PINHEIRO, P. 7).

Throughout the 1940s, the number of schools in this model grew, reaching 28 in 1948, according to this study. Both this model and any other example from the Estado Novo faced a serious institutional problem that would shape its destinies: the intra-state dispute between the Ministries of Health and Education and the Ministry of Agriculture. Since the First Republic, the initiatives of rural

education were the responsibility of the Ministry of Agriculture, which followed both a bias of training the worker and of direct encouragement of agriculture through the dissemination of agrarian knowledge. Throughout the 1930s, with the growth of the New School movement and its coming to power in the Vargas Ministry of Education, a new bias began to be thought of for all primary education in the country, which included rural education, which is the issue of ending illiteracy. Divergent interests, different objectives converged in the experiences of Rural Schools from the 1930s onwards. Often the same school was run by the two ministries, often one ministry disputing with the other over questions of methods. (MENDONÇA: 2010) (MENDONÇA: 2000). Our research needed to go deeper to understand this national conflict and its particularities in Paraíba. How has it really affected schools in Paraíba? We don't know yet.

Having mentioned the issue of illiteracy above, we would now like to dwell on it. Perhaps the biggest problem in our education throughout the twentieth century directly affects rural education models, as campaigns in favor of literacy focus on primary school. In the excerpt below we bring an excerpt from an article from our source addressing an aspect that will always appear: the "scourge" of illiteracy, something that shames the country by appealing to the nationalist discourse so much to the taste of the time:

> "A Berlin magazine has just published a sensational statistic. Sensational and, above all, depressing for Brazil. By the data exposed to the curiosity of its thousands of readers, we occupy the second place among the countries that vote horror to education. Out of 100 men, we have 70 who can't read. [...] In order to force at least a reduction in the frightening percentage of illiterate people that we have, it is, first of all, indispensable that we facilitate the study of poverty, that the government turns to the whole of it, to concentrate on the solution of the problem that all educated men consider the greatest in Brazil. [...]" (A Strategy That Inferiorizes Us, April 7, 1933, Report from the U.B.I. to The Union). (The Union: 1933, p. 8).

In our source there are mentions of social organizations formed to combat this issue. In addition, the involvement of existing associations on the same topic.

> "We are asked to publish the following: "In view of the urgent need to combat illiteracy, which is one of the greatest moral scourges in Brazil, some spirits dedicated to the most noble cause of education wish to gather elements that are in solidarity in this patriotic attempt and develop a completely practical action, together with the popular masses, in order to encourage the learning of the first letters, Starting with this capital. [...] If the seed succeeds in germinating, as everything predicts, the first meetings and démarches necessary for the organization of a sodalitium of love and sacrifice for the literacy of a large number of children and adults living in the metropolis of a state such as ours, where the apostolate of popular instruction should already be more intense and more intelligent. [...]" (Popular Instruction League, Feb. 10, 1933) (The Union: 1933, p. 5)

It can be seen that it was not only organizations and clubs that were afflicted with the "scourge" of illiteracy, but also that in the general population there was a growing awareness that education was the key to the progress and development of the country, as reported by the writer Narciso Berlese, in

which he published an article portraying the urgency of governmental and collective actions to reverse this situation.

> "The national issue that deserves the greatest affection and our greatest attention is literacy in Brazil. Currently, there is no cultured and common-sense Brazilian who does not understand it and knows that illiteracy is the maximum problem of our nationality. [...] All the governments of our country, therefore, like every Brazilian citizen, should commit themselves to the immediate, non-transferable solution of this great problem [...] Let us save Brazil from the enormous moral damage that is the thirty million illiterate people in a country of forty million inhabitants. 75% illiterate is a shame that belittles and slaughters us. Only 25% of our population can read. [...] To eliminate collective ignorance is to fortify the power of nationality. Brazil's prosperity depends fundamentally on the extinction of illiteracy, on national education, on the awakening of the conscious energies of our people." (Fight against Illiteracy, 25 Oct. 1933) (The Union: 1933, p. 8).

Vocational and rural education are thus presented as a way to eradicate illiteracy. However, many people had a vision that such education could not only be a simple solution to the scourge of illiteracy, but also a powerful and effective tool for the transformation of society, mainly directed to the less favored classes, as stated by M. Florentino da Silva in his message to Monsignor Pedro Anísio, talking about a normal education project.

> "[...] When I refer to professional education, I do not have my eyes turned to the sea, to France or to North America, points of maximum attraction for our pedagogues, but rather to our poor neighborhoods, to the hinterland, and I do not want to make Paraíba an industrial land, in the sense of a land of large industries, but a homeland of industrious people. capable of mitigating and compensating with his work the evils caused by the uncertainty of time, the evil effects of a hostile nature. [...]" (Normal Schools, March 3, 1934) (The Union: 1934, p. 3)

The interesting thing about this excerpt is that in the same block in which professional education is gradually turning to the issue of industry, there are projects and representations in which it is thought of in other ways. And this is where the issue of rural education comes in. In states where the economy is predominantly rural – such as Paraíba – we are still far from industrialization. Education is more important to think about the rural world and everything that surrounds it.

In the political sphere, the deputies made incisive speeches about professional education, emphasizing how crucial this education was to solve social problems. Thus, the educational challenge needed to be overcome for the country's ascension, as elucidated by state deputy Heretiano Zenaide in his speech at the March 31, 1934 session.

> "[...] Illiteracy is a scourge that shames us in the South American scenario, where we are, in this regard, behind the other contemporary nations in political majority. If we want to get out of this situation which is so humiliating to us, we must now face the problem with the necessary energy, fixing in a positive way the powers of the Union, the States and the municipalities, making them capable of dealing with the great problem of literacy and further education in a profitable and efficient way. [...]" (The Problem of Education in the Constituent Assembly - The Speech of Deputy Heretiano Zenaide, in the March 31 session, studying the important subject, April 14, 1934) (The Union: 1934, p. 1)

Zenaide proposes a structured approach, calling for a clear definition of responsibilities for the Union, States and municipalities. His proposal suggests responsible decentralization, in which each level of government plays a specific role in building a comprehensive education system. This whole discussion about illiteracy became important here in this text, because the sources show a concern of various social groups with this issue. We know that it was not resolved on that court or afterwards. It remains a social and educational problem. This is a problem that particularly afflicts rural peoples.

Synthesizing our work. It is part of a project that began this year, but needs developments to advance its problem. We hope to be able to do so. We first show a short history of vocational education up to the end of the 1930s. Soon after, developing examples of rural education in Paraíba, we draw attention to a dialectic between two models: one aimed at controlling populations with unfavorable social conditions and the other, also at control, but focused on work. The first, the oldest, dates to the nineteenth century, with the idea of isolated schools. The second is more linked to the nationalist context of the Vargas period and associated with Labour. One does not replace the other completely, they coexist, converge, and diverge. Then we go a little into the trajectory of Sizenando Costa, an important defender in rural education in our time frame. It is necessary to delve deeper into this trajectory, to place it in relation to others. Finally, we draw attention in our source to the issue of illiteracy because we consider it a burning issue at the time and today.

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Oratory as a didactic resource for high school philosophy teachers

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ABSTRACT
This study addresses the relevance of public speaking as a crucial tool for high school philosophy teachers, aiming to arouse students' interest in philosophical thinking and encourage them to a reflective and critical approach. The research investigates the ability of public speaking to convey philosophical ideas effectively, promoting more engaging and accessible teaching. Based on a literature review and analysis of the research objectives, this study aims to highlight the importance of public speaking in philosophical education, concluding that its incorporation can contribute significantly to the development of philosophical skills and student engagement.

Keywords: Public Speaking, Teaching of Philosophy, Middle school, Skills development, Effective communication.

1 INTRODUCTION

The teaching of philosophy in high school is widely discussed in various academic contexts. In order to comply with the National Curriculum Guidelines (DCNs) of the Philosophy Course, which establish the development of reflective, argumentative and critical competence in students, several methodologies were proposed. This research, linked to the research line "Teaching Philosophy: teaching methodologies, curriculum and didactic issues," aims to explore the feasibility of oratory as a methodological and didactic resource in philosophy classes.

The teaching of philosophy, as highlighted by Tretin and Goto (2009), involves the "exercise of subjectivity" and is shaped by history, as knowledge emerges as a strategy of existence. The ability to communicate effectively is essential for the preservation of human existence, as life is full of discontinuities and therefore the transmission of knowledge between generations is critical.

In this context, it is imperative to improve our communication skills, especially public speaking, to express ideas clearly and understandably to the target audience. Professors, especially of philosophy, often deal with complex theories, requiring a superior skill of verbal expression to engage students, since they may have difficulty accepting the discipline of philosophy.

The focus of the research is to address the importance of oratory as a means of bringing students closer to philosophy, encouraging the development of critical reflections and promoting personal and

social change. This urgency was evidenced through public speaking courses and classroom interactions, as observed by Oliveira and Oliveira (2018), who highlight the potential of public speaking to contribute to lifelong happiness.

Based on Anderson's (2016) hypothesis that oratory is reemerging as a fundamental element in the dissemination of ideas, this study seeks to understand how teachers and students, through oratory, can find in Philosophy a source of personal satisfaction and intellectual growth.

The central research problem that guides this study is: Can oratory be considered a fundamental instrument for the Philosophy teacher to be able to arouse the interest of high school students in philosophical thought, encouraging them to engage in a "radical, rigorous and comprehensive" approach to Philosophy and, consequently, encouraging them to critically explore the world around them?

The general objective is to reflect on the importance of oratory as a technique for the dissemination of ideas by the Philosophy teacher, enabling students to explore philosophical issues in their personal and social lives.

The specific objectives include the presentation of the relationship between philosophy and oratory, the investigation of the relationship between oratory, teaching and student in the documents that govern High School and the emphasis on the importance of oratory in the training of the Philosophy teacher. The study seeks to integrate oratory into the teaching of philosophy, making philosophical knowledge more accessible to students, thus promoting a deeper and more reflective understanding of the discipline.

This research is essentially theoretical-exploratory in nature, supported by a literature review. We adopt philosophical methodological approaches to the analysis of concepts and theories, drawing on the expertise of experts in oratory and philosophy teaching. In the light of the exploratory perspective, our intention was to familiarize ourselves with the phenomenon in question, acquire new perceptions and conceive innovative ideas, following the precept of Cervo and Bervian (2002, p. 69) that this stage represents the starting point in any research endeavor. We conducted a brief but substantial review of the relevant topics – philosophy, public speaking, and philosophy teaching – drawing on pertinent scholarly sources, including literary works and scientific articles, as well as exploring current educational legislation.

1.1 PHILOSOPHY AND THE AWAKENING OF 'THAUMA': THE IMPORTANCE OF ORATORY IN THE TEACHING OF PHILOSOPHY

The term "philosophy" originated in ancient Greece, deriving from two other words: "philos," which denotes friendship or affection, and "sophia," which refers to wisdom or knowledge (Chauí,

2012). Etymologically, "philosophy" implies a love of knowledge or a friendship of knowledge. In short, it is a passion for the mysteries of existence, encompassing its principles and causes.

In a broader interpretation, philosophy can be defined as "an unlimited and unregulated speculation on any theme or issue, at the mercy of the inclination of each author, his preferences and even his states of mind" (PRADO JUNIOR, 2003, p. 6), which expands the love for knowledge exponentially.

According to Aristotle cited by Rezende (1998), philosophical thought has its roots in "thauma", a term that denotes astonishment, admiration and perplexity, all of which instigate a reaction to life. The "thauma" is something that captures our attention to the point of causing us to question and interrogate ourselves incessantly. This awakening demands of us an explanation in the face of a world that presents itself to us as a cosmos in the midst of chaos. Philosophy emerges from the human condition itself, which is faced with a strange, complex, and disordered universe. However, human beings tend to get used to or be conditioned to a stable and unchanging reality, which pushes them to detach themselves from torpor or to leave the "cave", as Plato suggests.

Kohan (2013, p. 56) states that "philosophy, first and foremost, is a practice, an occupation, an experience, and a human activity." Therefore, it is crucial to emphasize once again that the "thauma" is present from childhood, and it is enough to observe the development of a child to confirm this assertion. The child is naturally curious and tirelessly inquisitive, as he experiences life as something always new and unexpected.

However, as the years go by, we tend to stifle and bury this astonishment, wonder, and bewilderment in the face of the world. It is challenging to rescue this enchantment in a multiple and wonderful world in a society where answers are readily offered, that is, they are considered immutable and unquestionable, and norms are accepted without challenge. The tendency is for us to settle down, becoming dogmatic, arduous and repressive adults of the "thauma" of children and youth.

To revive the curiosity and amazement at the world inherent in children, a possible solution would be to cultivate friendship and a love of wisdom. However, in order to love something, it is necessary for that something to attract us to the point that we establish a relationship that gradually leads us to love the object of desire. In this context, it can be considered that oratory is a means of facilitating this encounter, transforming it into a passion and, consequently, making the student come to love philosophy. Oratory is a powerful tool to awaken the student to philosophical principles and to the "thauma".

According to Mendes (2017), it is imperative that the Philosophy teacher is a thinker, a philosopher, so that he has the ability to transform the classroom into a space for reflection, minimizing the technical approach as the teaching standard. However, in addition to being a qualified thinker, in order to legitimize this title before the students, the teacher needs, in addition to the theoretical

foundation, to have a solid training in oratory to transmit the ideas he wants to promote and, in this way, stimulate debates. Theoretical exposition alone would not be enough to instigate the student to enter the universe of reflection.

It would be crucial, therefore, for the teacher, through the art of public speaking, to make the philosophical content accessible, since, on many occasions, it becomes unintelligible even to colleagues and, for the most part, obscure to students. In other words, the teacher should express himself in a clear and persuasive way, even using immanent languages to captivate the audience. By doing it more appropriately, it would tend to obtain remarkable results (ANDERSON, 2016).

1.2 PERSUASION THROUGH PUBLIC SPEAKING: THE POWER OF IDEA, IDENTIFICATION, AND TECHNIQUE

According to Chauí (2012, p. 189), language is defined as "a system of signs or signals used to indicate things, for communication between people and for the expression of ideas, values and feelings". This broad definition views language as an interactive system that identifies objects with the purpose of facilitating communication between individuals and disseminating ideas, values, and emotions.

According to Polito (2008, p. 8), the history of humanity is, to a large extent, the history of the evolution of the word, a complex and symbolic language that differentiates human beings from other animals and that is fundamental for the construction of culture. It is through language and word that we develop an awareness of ourselves and others, as well as being the foundation of human communication, a vital element that is often challenging to express effectively, to both small and large audiences. To overcome this difficulty, public speaking and its resources are exploited to make communication efficient.

Oratory is a linguistic resource used to present arguments in a clear and persuasive way, with the aim of "provoking or increasing the adherence of minds to the theses presented" (J. DUBOIS et al, 1974, p. 21). In other words, the art of oratory seeks to be a tool that disseminates ideas and effectively influences interlocutors. To understand it in depth, it is essential to explore this language tool.

First, it is important to clarify that our focus is on deep oratory, which is part of the human essence and uses encapsulations to convey ideas, as suggested by Anderson (2016), as a powerful means of changing people's perspective of the world.

In deep oratory, three key elements stand out: the idea, the identification with the idea and the technique (PERELMAN AND TYTECA, 2005; ANDERSON, 2016).

The idea is the essence of what is intended to be communicated and must be capable of changing a person's or group's conception of reality. For this, it must be something significant and relevant, because "all argumentation seeks the adhesion of minds and, therefore, presumes the

existence of an intellectual contact" (PERELMAN AND TYTECA, 2005, p. 16).

A propagated idea needs to be motivating, because only then will it remain in time. Exemplifying with notable historical figures and their ideas that endure: in philosophy, Plato and the idea of the supreme good; in religion, Christ and faith in salvation; in the black movement, Martin Luther King and his dream of freedom (I have a dream). These people spread powerful ideas that contained a truth and a purpose, contributing to transform people and, consequently, reality.

Identification with the idea is another fundamental element for those who want their ideas to transcend the barriers of an auditorium and endure over time. An idea devoid of passion tends to be ephemeral in history, while a passionate and symbiotic idea, on the contrary, tends to endure, as people are naturally attracted to individuals who have passion and conviction in their ideas (GALLO, 2014). Passion infects, engages, excites and establishes connections with the audience.

An idea devoid of an emotional component leaves the speaker vulnerable in front of the audience, as listeners tend to close themselves off to what is being conveyed. As stated by Perelman and Tyteca (2005), it is essential that the speaker, when speaking, has listeners willing to listen and, for this, must create a psychological state that is only possible when there is identification and connection with the theme. The speaker must be morally qualified to address the subject.

According to Anderson (2016, p. 55), "it is not possible to push knowledge into the brain. It needs to be pulled." In order for someone to grant permission, they must first feel that the idea is part of the speaker's life and that it will be part of their own life, establishing a triad: idea, speaker, and listener. "The great orator, the one who has ascendancy over others, seems animated by the very spirit of his audience" (PERELMAN and TYTECA, 2005, p. 27). History is full of examples, since the ideas that have stood the test of time have not come alone; Those who propagated them came along and conquered the rest. Once again, Jesus is cited as an example, because the idea and the audience are inseparable. Where he is, there is his idea and the people who have been captivated.

Technique is also essential for the speaker to be able to convey their ideas effectively, revealing the truth contained in them and impacting the audience in a way that persuades them. As Anderson (2005) observes, if the speaker conducts his lecture in an appropriate way, he can imprint the idea in the minds of the listeners and, based on this, make them consider that their worldview may not be completely correct, thus encouraging a possible transformation.

For this to occur, technique plays a crucial role. Perelman and Tyteca (2005, p. 9) state that it is "incontestable to prepare the public, making them more receptive to the arguments that will be presented". Gallo (2014, p. 9), considering "ideas as the currency of the 21st century", brings a practical and economic perspective to oratory and highlights that "ideas, when packaged and transmitted effectively, have the power to change the world". Therefore, it is essential to know and study the techniques that can amplify the propagation of an idea.

Polito (2018) points out that the one who manages to combine technique and communication style is the real winner, someone who has an idea to share, identifies with it and uses the entire technical repertoire to give the listener a gift. It is only possible to "present someone with an idea when minds are prepared to receive it" (ANDERSON, 2005, p. 43). Therefore, it is essential that there is a symbiosis between the idea, the speaker and the audience for the communication to be truly effective.

1.3 THE SYMBIOSIS BETWEEN PHILOSOPHY AND ORATORY: EXPANDING THE COMMUNICATION OF PHILOSOPHICAL THOUGHT

Philosophy is the love and friendship for knowledge, thus becoming an intrinsic practice of our daily lives, something that permeates and is part of our lives. To communicate his questions, studies and theses, the philosopher uses both writing and speaking.

Writing has been a fundamental means for the preservation of thoughts over time, ensuring a high level of reliability in relation to the ideas transmitted. However, the use of speech is and always will be necessary to disseminate these ideas, since few people have access to books and, even for those who do, a "translation" is often necessary. In this context, speech alone is not enough; Good oratory is necessary so that both laymen and experts can understand philosophical ideas.

When it comes to the teaching of Philosophy, especially for high school students, Favaretto (1993) questions what is necessary to make philosophical content more intelligible. One clue to an effective response would be for the teacher to incorporate public speaking into his or her efforts to disseminate philosophical ideas and stimulate philosophical thinking among students.

Ideally, the teacher should use the entire arsenal of oratory in their classes, considering the essence of the ideas, the identification with the ideas and the best techniques to allow students to understand and fall in love with the knowledge presented.

Philosophy and oratory should go hand in hand, since philosophy brings thoughts and oratory manifests them to the world, especially to those who are not experts in the field. We argue that without oratory, philosophy would be confined to books and brilliant minds, accessible and appreciated only by a few, and inaccessible and disregarded by the majority, a scenario that seems to be playing out today.

We believe that it is essential to awaken passion to promote the encounter and, consequently, the love for the object of study, in our case, to allow high school students to find, fall in love and come to love Philosophy.

1.4 THE CRUCIAL ROLE OF PUBLIC SPEAKING IN THE DEVELOPMENT OF STUDENTS' SKILLS IN TEACHING PHILOSOPHY

In this topic, it is discussed, in the light of oratory, what the official documents signal on the subject, since there is no clear and specific manifestation in this regard. In fact, we have already left our criticism, because we speak of several competencies, however, they seem to exclude the communicative competence for the teacher and the student.

As already pointed out by Anderson (2016), this competence is no longer a differential to be conquered, but an imperative to achieve success in all areas, especially in the one that is intended to present and foster thoughts. In other words, oratory should be part of the teacher's life, so that he can clearly communicate the ideas of the past and those in force, so that the student can better understand them and also improve his ability to communicate with the world.

According to LDB (9394 – 12/20/1996) – Law of Guidelines and Basis of Brazilian Education, the student must have his "improvement [...] as a human person, including ethical formation and the development of intellectual autonomy and critical thinking (SECTION IV, ITEM III). On the other hand, the PCN's – National Curriculum Parameters (p. 61), point out that the student has to be able to "debate, taking a position, defending it argumentatively and changing position in the face of more consistent arguments" and that "Philosophy, therefore, was born in the social space that constituted Greek democracy, a space-square (agora) created as a function of the Public debate about common life".

We understand that the human improvement that the LDB deals with, also gives rise to the communicative capacity through speech, an element that seems to be clearer in the PCN's, when it addresses the debate, a preponderant element in oratory.

The BNCC – National Common Curricular Base (2018, p. 548), regarding the teaching of Applied Human and Social Sciences in High School, where Philosophy is inserted, highlights that the area of Applied Human and Social Sciences still has the great challenge of developing students' ability to establish dialogues between individuals, social groups and citizens of different nationalities, different types of knowledge and cultures.

The ability to establish dialogues, in our understanding, is strictly linked to communicative competence, the ability to express oneself well in public. In this way, mastering the techniques and instruments of communication,

> [...] Young people build hypotheses and elaborate arguments based on the selection and systematization of data, obtained from reliable and solid sources. The elaboration of a hypothesis is the first step towards dialogue, which always presupposes the right to be heard. It is through dialogue that students broaden their critical perception of both scientific production and information circulating in the media, putting into practice systematic doubt, an essential element for the improvement of human conduct (BNCC, 2018, p. 548).

As the BNCC points out, it is through dialogue and debate that we improve our reasoning capacity and, thus, we can tend to improve our human coexistence.

As for the specific competencies of human and social sciences applied to High School, for our object, we highlight the 6th, where the student must "participate, personally and collectively, in the public debate in a conscious and qualified way, respecting different positions, with a view to enabling choices aligned with the exercise of citizenship and their life project, with freedom, autonomy, critical awareness and responsibility (BNCC, 2018, p. 558)".

Thus, it is noteworthy that, even in a veiled way, in our understanding, the LDB, the PCN's and the BNCC, perhaps a little more explicit, as well as the other documents, point to the need to master oral communicative competence to meet the legal requirements and, in particular, those of humanization. That is, the student must develop and improve his oratory ability

1.5 THE IMPORTANCE OF PUBLIC SPEAKING IN THE TEACHING OF PHILOSOPHY: THE VITAL ROLE OF THE TEACHER

With regard to the activity of the teacher, especially the Philosophy teacher, the documents, in our understanding, follow the same line pointed out to the students, but with the difference that it is the teacher who is responsible for ensuring that the understanding of the philosophical contents reaches the student in a clear way. This allows the student, by understanding well, to assimilate these contents, develop the skills required by the documents and, at the same time, improve their communicative skills, since they will have an example and inspiration.

According to the LDB, Art. 36, item II, the teacher must adopt "teaching and evaluation methodologies that stimulate the students' initiative". The National Education Plan (PNE), when dealing with the guidelines for the continuing education of teachers, states that "training should aim at reflection on educational practice and the search for its technical, ethical and political improvement". In addition, the National Curriculum Guidelines for Basic Education (DCNs), when dealing with Secondary Education (p. 171), state that it is necessary to "review the training of teachers so that they can face the new and diversified tasks entrusted to them in the classroom and beyond".

An analysis of the three documents presented indicates that teachers need to rethink their teaching practice in order for students to grow in proactivity. In this sense, technical improvement, among other important elements, is fundamental. In our view, public speaking techniques are essential to improve the quality of teaching. As previously pointed out, oratory techniques have the potential to influence behaviors and prepare the ground for people to be receptive to the arguments being communicated (PERELMAN and OLBRECHTS-TYTECA, 2005).

Reflecting on teaching practice, Neto (2021, p. 126) points out that:

> "The philosophy teacher must use all the tools available to initiate and conduct philosophical reflection. The world materialized in human manifestations and achievements constitutes the necessary instrument for philosophical practice, which involves reflection on the world based on the experiences lived by the human species throughout its history. Art, philosophical traditions, science and religion, all human manifestations are resources for philosophical thought."

This means that the teacher must explore all the teaching resources available to present the philosophical knowledge to the students. The ancient art of persuasion, as a technique and tool to captivate and keep students' attention, is particularly relevant in Philosophy classes in High School, where students often have difficulty concentrating on theoretical content. Here, persuasion refers to the ability to attract the audience's attention to disseminate an idea.

As is well known, Philosophy had its origin in a social context where Greek democracy was practiced, in the agora, where public debates took place on issues of the common life of the citizens of Athens. Therefore, given that the school environment aims at the construction of knowledge and community life, the student is immediately invited to participate in debates, starting with the school environment. The ability to take a thoughtful position can only be developed during the teacher's presentation, in his or her own oral presentation, in small group discussions, or in general debates in the class. It is essential that the teacher offers students the opportunity to ask questions, answer, ask for clarification, oppose, criticize, confront different positions and possibilities, refuse interpretations and make interpretations. In addition, students should be encouraged to change positions when they are convinced that their position is not necessarily the best (DCNs, p. 61).

We found a clearer recommendation in the National Common Curricular Base (BNCC) in the part that addresses the areas of Human Sciences and Applied Social Sciences. The BNCC highlights the importance of mobilizing didactic resources in different languages (textual, imagery, artistic, gestural, digital, technological, graphic, cartographic, etc.). This suggests that the Philosophy teacher should develop oratory as a fundamental didactic resource to promote teaching-learning and student engagement, as well as to promote the construction of an ethical and moral attitude.

In his article, Tomazetti (2010) discusses the practices of future Philosophy teachers to effectively attract students. They observed that new teachers tended to reproduce the practices they criticized. One possible solution is for the new teacher to take the time to think about how the classroom dynamics work, in order to create opportunities for "gaps" and "cracks" in the sedimented model, making the class a new event.

In this line of thought, Kohan (2013) suggests that pedagogical action, mediated by dramatic art, can be a promising path. Theatre is, par excellence, the field of oratory. Therefore, in addition to many other elements, we believe that the didactics of oratory is fundamental for the teaching of Philosophy, in order to fulfill what the documents propose.

To realize this proposal, we believe that the teacher, whether beginner or veteran, must understand and practice public speaking effectively to persuade students to participate and internalize the elements of the lesson. For example, Oliveira and Oliveira (2018), in their article on rhetoric and argumentation in school education, highlight the importance of considering the audience as a fundamental element for listeners to engage with the discourse. This indication is crucial because, in order for an argument to develop, it is necessary that those to whom it is addressed actually pay attention (PERELMAN and OLBRECHTS-TYTECA, 2005, p. 20).

Mentioning a subject repeatedly without effectively engaging listeners is not enough. Effective communication involves more than just talking; It requires being heard and understood, promoting active participation. For this to occur, Perelman and Olbrechts-Tyteca (2005, p. 17) state that "the minimum indispensable to argumentation seems to be the existence of a common language, of a technique that enables communication". Therefore, the teacher needs to value the students' adherence, their consent, and their mental engagement with the content of the lesson. Once again, we emphasize that public speaking is an essential way to achieve this goal.

What is expected of the teacher is that he unites his philosophical knowledge with oratory, creating a skill that allows the knowledge he intends to share to reach the students in an intelligible way. This implies that the learner must be willing to take in what is being said, be interested in the content, and develop a critical understanding of that knowledge.

1.6 THE POWER OF PUBLIC SPEAKING: CULTIVATING A LOVE OF PHILOSOPHY IN HIGH SCHOOL

Through public speaking, we can disseminate ideas efficiently and effectively. Therefore, we believe that this skill is a fundamental ally for teachers to awaken the interest of high school students in philosophy and cultivate a love for knowledge.

Oliveira and Oliveira (2018) point out that rhetoric and oratory date back to Sicilian Greece around 465 BC. Initially, they arose to meet legal demands, but over time, they also proved crucial for teaching and philosophy. However, it is noticeable that this connection between oratory, teaching, and philosophy is underutilized in schools.

In this context, many philosophy professors may be experts on the subject, possessing a vast amount of knowledge, but may not know how to transmit it effectively to the public. Therefore, we propose that they transform the classroom into a practical laboratory (FERREIRA, BRISKIEVICZ AND FERREIRA, 2018). To achieve this, we suggest that they use the entire repertoire of the art of public speaking to bring together the teacher, the student and philosophy in a chain of friendship through knowledge.

According to Tomazzetti (2010), many teachers face structural challenges in the school and deal with a great diversity of students. In addition, they face a certain apathy from students and a supposed lack of "philosophical culture". The author lists several difficulties pointed out by teachers as justifications for the difficulties in teaching.

Carvalho, in an article on oratory and rhetoric as complementary tools in teacher training, already highlights the importance of oratory/rhetoric as a differential for future teachers. This is because many, as well as students, may feel a certain inhibition and difficulty in public expression. In addition, it is essential that the teacher knows how to make a good oral presentation of the content he wants to transmit.

Language and, consequently, the ability to speak in public are skills that are developed from childhood and must be improved throughout life. Otherwise, we run the risk, as Kohan (2013) points out, of dehumanizing ourselves, returning to a more primitive state. We must continue to develop our communicative capacity, as we are beings in constant evolution.

How can we pave the way for students to genuinely fall in love with philosophy? Araújo (2021), in an article that addresses the Assessment of Learning in Philosophy, highlights the importance of theater as an aesthetic didactic tool. Theater provides a context for students' protagonism, allowing them to act as actors in a plot that they can construct themselves. This aesthetic experience dialogues with philosophy and can enchant students with its philosophical knowledge.

From this perspective, we suggest that teachers use oratory and its entire repertoire to attract students' attention. With this, one can create a pleasurable and long-lasting philosophy learning environment. In addition, it seeks to awaken critical citizens who value knowledge, because, as it says in 1 Corinthians 13:8: "Love will never pass away".

Just like love,

> The use of argumentation implies renouncing the exclusive use of force, valuing the interlocutor's adhesion through rational persuasion, and not treating the interlocutor as a mere object. Argumentation requires the establishment of a community of thought that excludes violence (PERELMAN and OLBRECHTS-TYTECA, 2005, p. 61).

Love and argumentation go hand in hand, since loving means putting oneself in the other's shoes, while in argumentation, it is crucial to interact from the perspective of the interlocutor. In both cases, our beliefs and prejudices should be minimized as much as possible to establish a greater affinity between lovers and debaters.

Through this harmony promoted by oratory, we believe that the teaching of philosophy can be grounded in a solid foundation to awaken the love of knowledge.

2 FINAL THOUGHTS

Philosophy, understood as the love and friendship of knowledge, is like a sharp blade that cuts through the curtains of ignorance. However, it seems that it has been largely confined to the confines of academic institutions and the minds of scholars. Therefore, it is the role of the orator, the one who masters the art of oratory, to seek to translate in a simple way the thought of the great philosophers and, thus, to win adherents to philosophical ideas.

The philosophy teacher, whether he is a philosopher by training or not, as evidenced in the official documents and in the analysis of oratory, must employ all available didactic resources to arouse the interest of high school students in the study of philosophy.

In conclusion, the use of oratory, in its conceptual depth, is a valuable methodological and didactic tool that the philosophy teacher should use in order to make the teaching of philosophy relevant and enjoyable for high school students. In this sense, we advocate the inclusion of oratory studies and practices in the general training of teachers, especially in the training of future philosophy teachers. This will allow these teachers not only to master thinking and writing, but also, and above all, to know how to convey the content effectively to students. Therefore, we suggest that the study of oratory be incorporated not only into the general training of teachers, but also into the specific training of future philosophy teachers.

This research, in no way, intends to exhaust the theme, since its breadth is related to love, an eternal element. It has limitations and merits, like any study, and therefore we recommend that further research be carried out, exploring the richness of this field, in order to shed more light on the topic.

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SEVEN
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Violent acts in physical education classes from the school's sports field to the hall of justice

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ABSTRACT
The objective of this study is to characterize the violent events that occurred in Physical Education classes in schools in Belo Horizonte between 2014 and 2015. The documentary data of the research are constituted by lawsuits originated by violent actions practiced by adolescents in the time and space of Physical Education classes that suffered intervention by military police and legal operators. Through the analysis of these documents, it was possible to identify not only a change in the nomenclature of violent actions through the Brazilian Penal Code, but also to contact the judicial procedures in the treatment of such occurrences in the school. The contact with such information tensions the idea that the school is a place of safety and capable of contributing to the development of children and adolescents.

Keywords: School violence, Physical education, Judicialization.

1 INTRODUCTION

Studies that investigate the phenomenon of judicialization in education have been increasingly dedicated to understanding the challenges faced by schools in relation to the context of violence in which many of them find themselves and from which many of their students come. The lack of knowledge or fear of having to face situations of school violence can generate attitudes and behaviors that result in lawsuits, in which the judicial system is forced to intervene when it finds the absence of public management in the solution of most of these problems.

In this sense, the objective of this work is to characterize the violent events that occurred in Physical Education classes in schools in Belo Horizonte in the period between 2014 and 2015 that were mediated by the Military Police and, then, by operators of the judiciary. To this end, we analyzed 21 lawsuits originating from aggressions practiced by adolescents in Physical Education classes.

Thus, we carried out a documental analysis of these lawsuits[1] following the recommendations of Cellard (2008), who points out the techniques used to handle documents, namely: describe how the document is organized; classify the documents; and create categories.

[1] The most important document found within the processes was the Police Report (BO). The inquisitorial procedures used by the Military Police throughout the judicial process through which the adolescent goes revolve around the need to reach the verification of the evidence, since it is the "soul of the process" (SENASP, 2019).

2 FROM THE SCHOOL COURT TO THE JUDGE'S ROOM

In the last 30 years, researchers have sought to understand the presence of violent acts practiced by adolescents in the school context. These investigations indicate that the phenomenon of violence and its mediation, previously carried out by the school, is now also conducted by other subjects: police officers and magistrates.

Since the 2000s, some studies have observed, at least in Minas Gerais territories, a visceral approximation between the police and schools. This entry is justified by the fact that it, the school, has been part of the route of drug trafficking and consumption since the late 1980s. According to Oliveira (2008), the school was and still is a space to be observed, monitored to ensure the safety of society, needing, for this purpose, a closer police action. "Basically, it is in this context of combating organized crime that the school appears first on the list of spaces to be observed" (2008, p.132).

The connection between the Military Police (PM) and the school influenced the way the school deals with the violent acts that take place inside it. If previously indiscipline, fights were treated pedagogically by the school, for some years now, the PM has been activated by the schools themselves to deal with these issues when they happen within their space. In other words, when the school calls the Military Police to intervene in situations of aggression committed by adolescents within its space, including in Physical Education classes, the treatment becomes the one guided by the principles and procedures of this institution.

For example, when situations involving aggression between students occurred, this case was recorded in the school's occurrence book in the presence of the parents and, for that, terms such as kicks and punches made up this record. Currently, with police intervention, there is a linguistic adjustment of these aggressions to the police-legal vocabulary. The kicks and punches between the students are framed in Article 129 of the CPB of the crime of *Bodily Injury* and are now recorded by the military police officer who answered the call of the school in an Occurrence Report (BO) at a specialized police station (CIAMG).[2]

In the reading of the 21 judicial processes, we identified the categories of the Penal Code used by the military police to classify the violent acts that occurred in Physical Education classes:

(a) *Bodily Injury* – Art. 129 CPB (Bodily fight between students and/or teachers during Physical Education classes): 9 times.

(b) *Threat* – Art. 147 CPB. (Threat of death or assault outside of school): 6 times.

[2] In the case of Belo Horizonte, when an adolescent commits a violent act and the Military Police is called, the offender is taken by the military police to the *Integrated Support Center for Adolescent Offenders – CIAMG*. In addition to the Military Police, the Civil Police, the Public Defender's Office, the Public Prosecutor's Office, as well as the Guardianship Council and other bodies responsible for the protection of children and adolescents are located in this space. We will bring you more information about this place and its operation later in the text.

(c) *Desacato* – Art. 331 CPB. (Verbal abuse of teachers. Disrespect): 3 times.

(d) *Crime of Damage* – Art. 163 CPB (depredation of public property. Sports court): 2 times.

(e) *Drug consumption* – Art. 28 Law 11.343/2006. (drug use inside the locker room): 1 time.

In the case of Bodily Injury, the largest number of violent events that occur in Physical Education classes, we have its legal framework described in Article 129 of the Brazilian Penal Code and refers to the act of "offending someone's bodily integrity or health" (BRASIL, 2016). The episodes of physical aggression practiced by student(s) against another student(s) in Physical Education classes, caused bodily injuries such as abrasions, nose bleeding, abdomen injury, bruises on the arms, face, eyes, cuts on the lips, forehead, face, requiring the victim to be sent to the hospital. Teachers were also victims of aggression, which caused them physical harm when they intervened in situations of indiscipline and confrontations involving adolescent students, whose reactions generated a physically negative impact on the teacher.

> "We attended the Municipal School [...] who informed us that during the physical education class the student [...] was participating in a dodgeball game and was the only one who did not adapt to the rules of the game, that he was asked to withdraw with great resistance on the part of the student. Going so far as to assault the teacher to continue in the game, he was given several kicks and threatened to throw objects such as a trash can that was nearby. The teacher did not need medical attention." (BO-24).

In addition to the linguistic adequacy to the police-legal vocabulary recorded in the BO, there are inquisitorial procedures[3] involving the process.

And, how does this process unfold? After the aggression event, the direction or the pedagogical coordination activates the Military Police who listen to those involved while still inside the school. Then, the offending student(s) is taken to the police station in a police car. At the same time, the school tried to locate the person responsible for the adolescent(s) and informed them of what had happened, asking them to go to the CIAMG. When the parent(s) could not be located, a representative of the school should follow up on the procedures.

At CIAMG, the adolescents were sent to the Military Police station to produce the police report with the police officer who responded to the school's call. Then, those involved were sent with the BO to the Civil Police station, which became aware of what had happened, initially, by reading the BO and, later, by listening to those involved in the aggression, a record of the interview (hearing) was produced, which was also attached to the judicial process.

Then, this documentation was sent to the administrative secretariat of the CIAMG, which consulted the system to verify the presence or not of a past record of a crime of an infraction(s) committed by the adolescent considered to be an offender of the aggression in question. The registry then issued a certificate containing the result of the search, which was also added to the file.

[3] It should be noted that these procedures are defined by the Statute of the Child and Adolescent. (BRAZIL, 2014).

In possession of all the files – the police report, the hearings and the certificate – a *preliminary hearing* was held in the presence of the Child and Adolescent Law Judge and the representative of the Public Prosecutor's Office and the defense lawyer (public defender's office). At this hearing, the magistrate decided whether to close the case and/or to apply (or not) a socio-educational measure and/or[4] protective order[5] to the adolescent who committed the infraction. The two measures could also be used together.

Of the 21 cases analyzed, we counted the following court decisions:

(a) Dismissal of the case: 7 decisions.

(b) dismissal of the case with the application of a protective measure: 7 decisions.

(c) application of a socio-educational measure only: 5 decisions.

(d) Application of a socio-educational measure with a protective measure: 2 decisions.

Silva (2007) shows that, before the existence of the ECA, the school board acted and warned students in cases of aggression. It is clear that the ECA has modified this procedure. Today, as we have explained, it is the judge who warns, but never with suspension, or expulsion, of the student from school.

The problem that has come to be considered by school agents is the return of adolescent offenders, who, although they have been warned by an agent of the judiciary, are in no way prevented from being in school. This situation is what leads school agents to declare that their "hands are tied", as Silva and Salles (2019) pointed out, or that they can do nothing else. The warning once given by the school board could result in the expulsion of the students, but now the warning given by the judiciary, in the interpretation of the school agents, sounds unimportant. This becomes more conflicting, especially when the egress himself/herself, upon returning to school, uses this situation to say that nothing happened to him/her. And, at times, he even boasts that it happened. Due to this dissatisfaction arising from the teachers, it is difficult to control the school climate. The question that has been asked is what would be missing to transform this feeling that nothing has been done into another perspective that values the work of the school as a space not only for the transmission of knowledge, but also for protection, or, more precisely, for learning coexistence?

3 FINAL THOUGHTS

Whenever the Military Police is called by the school, the police officer assigned to the case is required to record the infraction for which he was called. And that's when the differences begin.

[4] The Socio-Educational Measures are those designated in Article 112 of the ECA: Warning, Reparation of Damages, Provision of Service to the Community, Assisted Freedom, Insertion in a semi-freedom regime and Internment in an educational establishment. (BRAZIL, 2014)

[5] Protective Measures are those designated in Article 101 of the ECA. For this work, the magistrates pointed out those contained in items III (which requires the enrollment and attendance of the adolescent in elementary schools), V (which requires medical and psychological care, or psychiatric care for the adolescent). (BRAZIL, 2014)

Previously, the school's registration followed the standards of ethics and customs that were adopted even by the students' families. The student who broke any norm was sent to the principal's office and there they were isolated for as long as necessary, or they were exposed in a place that was seen as shameful. However, today, through police intervention and the production of the police report, these behaviors are reclassified in order to fit the logic and vocabulary provided for in the Statute of the Child and Adolescent and in the Brazilian Penal Code.

With this process, we observed that the school has had difficulty intervening in violent situations. By abdicating this mediation, we question ourselves about the place of the school as a support point in the protection and safety network for children and adolescents. Thus, we ask ourselves if, by not intervening in such situations, the school ends up weakening its function of helping students to develop essential skills for the formation of citizens and a society based on a good coexistence.

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The art of captivating by teaching the spanish language

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ABSTRACT
The purpose of this text is to publicize a project whose objective is to captivate students in the process of teaching and learning the Spanish language. As a theoretical framework, the studies of (WOOLFOLK, 2010), (KAWASAKL, 2011), (FREIRE, 1971, 2007) and (WALLON, 1995, 2008) are presented. Methodologically, the project was carried out in 3rd year classes of High School, to seek a teaching based on affectivity and the art of captivating the student. Based on our analysis, the study revealed that when the teacher can create a closer interaction with the class, through affection and respect, students allow themselves more easily to the learning process; The realization of the project was also able to send that more creative and dynamic classes are configured as pedagogical strategies to work on the discipline (of Spanish).

Keywords: Teaching and Learning, Affection, Spanish Language.

1 INTRODUCTION

Captivating is one of the necessary tools in the profession of educating, according to Kawasaki, G. (2011). Captivating causes a voluntary change in hearts, minds, and therefore deeds. On the other hand, for Paulo Freire (2009), education is praxis, reflection and action on the world in order to transform it. According to Freire, education is an act of love, of courage, of practicing freedom, focused on reality.

Agreeing with these two great pillars of education, we consider that the act of captivating should be linked to education and the educator. There is an intrinsic connection between educator and student that reflects on learning and, above all, on the emotional part of the student.

Considering this, this experience report aims to show the importance of captivating students to learn the subject: Foreign Language/Spanish in the classroom, reinforcing the relevance of the study of the Spanish language in High School for external evaluations (ENEM, SPAECE and VESTIBULARES). In addition, it covers the study of Spanish as an opportunity for the student in a comprehensive formation, capable of developing skills of social interaction with different cultures.

Taking into account the geographical location, we have 7 countries that officially speak the Spanish language and border Brazil: Peru, Bolivia, Venezuela, Colombia, Uruguay, Argentina and Paraguay. So, it can be said that the Spanish language stands out in the vicinity of Brazil.

As a teacher of the subject, I plan and execute activities that can somehow motivate students to study and learn the Spanish language.

I present this story of mine, first talking about my beginnings in education; how I was captivated by the art of educating, my training along the way, the arrival in Brazil, how I became a Spanish teacher, one of the many experiences that I consider to have a positive impact both on the students of EEEP José Maria Falcão and on my profession[1].

The experience to which I refer is an artistic project in which the classes of the 3rd grade of High School (Commerce, Nursing, Informatics and School Sec.) were involved and interacted.[2]

- To provide an artistic experience of the aspects of the Spanish language, highlighting authors, musicians, and dances, through the development of research, composition and study of works.

The project was carried out in the 4th bimester of 2019. Based on the specific objectives, methodology, impact and results, the project served to help not only in the learning of Hispanic artistic works, but also as a motivation for students to learn the Spanish language.

2 THE STORY

Before delving into the activities carried out in the report, it is appropriate to present, even if briefly, the relationship between the teacher of the discipline and the students; The analysis of this relationship could show that captivating students is a strategy to facilitate the process of teaching and learning the Spanish language.

"Teacher, what's that name? Where are you from?" It was one of the many questions students asked me when I arrived in class and wrote my name on the board. It was and still is very funny my day to day life in the classroom, considering the fact that I constantly learn and become better personally and professionally. This exchange of conversation and interaction favored a lighter and more captivating atmosphere in the classroom. Thus, classes could flow better and with student involvement.

In the path of education, the path is never completed, there will always be new learning, because, simply, the students never repeat themselves, they may even look alike, but we do not learn, nor do we teach in the same way, because there is diversity of learning.

[1] This report was supervised by Prof. Dr. Walisson Dodó, who co-authored this text.
[2] As it is a vocational school, the formation of the classes is based on a technical course.

According to Woolfolk (2010), learning diversity is an inherent condition of any teaching and learning situation in which students include a personal history, considering their previous experiences; This allows knowledge to be built in a dynamic of interaction that makes it unique and particular.

In this way, I relive my experiences in the magical world of education and remember my beginnings. I started as a pedagogical assistant in a daycare center (*UEPJLFA Unidad Educativa Padre Joaquín López Fé y Alegría*) more than 20 years ago. I still remember the full teacher that I had the privilege of accompanying, she showed me the love that can be had in the profession of educating, I remember the way she taught, her dedication and affection for all boys (without any distinction), the way she made an effort to make each class an educational moment and above all, making every lesson joyful, joyful, and meaningful for the children. That made a big impression on me. Shortly thereafter, I was enrolling in university to pursue a degree in Pedagogy. In the Spanish language it is called (*Educación Inicial*).

At the university, I met and studied many illustrious people in education along with their theories: Maria Montessori, Jean Piaget, Lev Vygotsky, Paulo Freire, Celestin Freinet, Antonio Gramsci, Henri Wallon, John Dewey, among others. Together with them and the many teachers I met and were part of my training, I fell even more in love with the art of educating.

So, like most people, I was able to graduate and work on the side. In the mornings, I was in daycare; In the afternoons, he studied. My personal and family life continued to advance, I got married, had children, but I always focused on education. After my training, I started a master's degree in Research Methodology.

This training allowed me to work at the *USR Universidad Simón Rodríguez* exercising, at first, the position of professor of the discipline Research Methodology. Later, I became a coordinator in the area of research and review of pedagogical works. I thought that everything was already completed and I would dedicate my life between children in daycare and adults in university. But, as I mentioned at the beginning of these lines, in the world of education nothing is completed, there will always be something to know, teach, learn, unlearn, experience and relearn. That's what happened to me.

I arrived in the Federative Republic of Brazil in 2018. My first contact with high school and with the discipline of Spanish Foreign Language allowed me to rethink my conception of an educator. Being a foreigner (Venezuelan), I understood that, in order to teach my native language (Spanish), I had to captivate Brazilian students, first showing the value that my language has for me and then showing the impact, importance and development that learning this new language can bring to their lives, in different areas: personal, professional and social.

In the experience of the different classrooms, I learned that by relating the Spanish language to the context, needs and realities of each of my students, I can get their interest and attention in a simpler way. Clear! With challenges.

One of the biggest challenges in teaching Spanish that I found was to be able to link the curricular contents with the context of the students and make them interesting for them.

Planning and reflecting on how I could do it, to motivate the students to be interested in Hispanic art, including literary works, dances, sculptures and artistic works, (art being the curricular content that I had to address throughout the 4th bimester at EEEP José Maria Falcão), I wanted first of all to captivate them so that they would be interested in learning and getting to know Hispanic art in a pleasant and attractive way.

With this in mind, I proposed an artistic project addressing different aspects of Hispanic culture. The project covers the development of students' artistic conceptions, as well as the practical understanding of classroom content and the composition of the partial grade of the period.

The approach, development, execution and presentation of this project was one of the most significant experiences as a Spanish language teacher, which generated, in addition to learning, a desire to continue learning and teaching within the classroom.

Below, we present the structure of the project that was developed:

Project: GETTING TO KNOW ART THROUGH HISPANIC CULTURE

OBJECTIVES:

- ✓ Understand characteristics of Hispanic culture, through the selection of information, in addition to the development of a presentation;
- ✓ Compile the research project, expanding the understanding of the chosen works;
- ✓ Conceive an adapted artistic production, in such a way that the cultural and artistic experience shines through;
- ✓ To expose to the school community the work developed, aiming at the realization of learning and the culmination of the project.

ACTIVITY

Project design:

Description: A summary of how the class conceived the project was made, highlighting the chosen works. In this part, the central idea of the entire project was also placed, that is, how the adaptation was seen by the public.

*(*Note: it was written in Spanish).

Research notebook: Fully typed, obeying the standard norm of the Spanish language for text formatting. The notebook contains the following structure: personalized cover associated with the proposed themes, presentation of the class and description of the project, biography and works of the author, musician and painter intended for the class, details of the activities developed (calendar or routine record), conclusion of the project and the observations learned in the development.

Thematic room: reproductions were made in the classrooms by means of decoration of the artistic works and excerpts written by the authors, containing a brief presentation, in addition to exposing the work of the class.

(Note: 15 minutes each room).

Artistic presentation: a brief presentation was made with the choice of a specific theme (dance, staging, recitation of a poem) according to the themes passed on.

(Note: Up to 25 minutes).

Final report of activities: a report was delivered by the project teams, considering all the activities developed by the members of the class, between positive and negative aspects.

Proposed themes: each class received a triad, consisting of an author, typical dance and a visual artist. Therefore, the mixture between the conceptions of each one and the themes addressed in their productions is the best direction that should be given within the activities of the project. Below is the division by classes:

YEAR 3 TRADE	Author: Ernesto Sabato
	Dance: Paso Doble
	Plastic Artist: Pablo Ruiz Picasso
YEAR 3 NURSING	Author: Gabriel Garcia Marques
	Dance: Bolero
	Artist: Frida Kahlo
YEAR 3 COMPUTER SCIENCE	Author: Isabel Allende
	Dance: Salsa
	Artist: Salvador Dalí
YEAR 3 SCHOOL OFFICE	Author: Mario Vargas Llosa
	Dance: Flamenco
	Artist: Diego da Silva Velàzquez

Within the aspects worked, it is important to highlight the creativity, learning and effort of the students in linking the literary and artistic works of the Spanish language, making an impact first on them, managing to get to know literary and artistic works, dances, customs and traditions of the culture of Hispanic countries, through didactic activities, expanding their interest and cultural collection with the objective of recognizing the Spanish language as an opportunity for personal overcoming, professional and social.

Subsequently, in the school context and in the community, the presentations and exhibitions of the thematic rooms were attended by parents and guardians of the students, teachers from the school and also teachers from other educational institutions who attended the event and formed part of the evaluation process of the works presented.

3 CONCLUSION

We saw that the objective of this report was to present a project that aimed to provide an artistic experience of the aspects of the Spanish language, highlighting authors, musicians and dances, through the development of research activities, composition and study of works in 3rd year classes of High School.

From the realization of this artistic project, we were able to come to the conclusion that, in the teaching and learning process, it is necessary to adopt strategies capable of sensitizing students so that they allow themselves to immerse themselves in classes. Such strategies, in this case, were represented by dynamic and creative practices, combined with captivation and affectivity, factors that proved to be decisive to involve students in classes, in addition to facilitating the apprehension of the contents.

We hope that the presentation of this story, although summarized, can raise reflections so that we can (re)think language teaching, in order to make it increasingly productive, meaningful, creative and CAPTIVATING.

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SEVEN
publicações acadêmicas

Elaboration of a problem-situation applied to the decontamination of mercury waters present in the lands of the Yanomami indigenous peoples

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ABSTRACT
For a long time, several methodologies have been studied in order to facilitate the process of teaching and learning chemistry, which is a discipline considered complex, because the forms of teaching do not always lead the student to clearly understand this science. Considering problem solving as a proposal that contributes to the student having autonomy in classes, actively participating in the teaching process and being challenged to build new knowledge, this research addressed the use of investigative questions in experimental activities based on problem-situations. In this qualitative research, students of the discipline of physical chemistry, of the chemistry degree course, were asked to elaborate and evaluate experimental investigative activities by means of problem-situations (PS), in which the resolution of the problem was obtained experimentally, with the objective of PS replacing the traditional script of experimental class. In this work, students were asked to develop a PS with the objective of electrochemical decontamination of mercury-contaminated water on the lands of the Yanomami indigenous peoples. Since the problem-situations elaborated by the students did not meet all the proposed characteristics, the undergraduate students of this research proposed a problem-situation in which the students would have to perform an electrochemical experiment to decontaminate the water, and then some chemical analyses to confirm that the water does not contain mercury. It was found that chemistry undergraduates had difficulties in the elaboration of these problems, despite having already studied this theme in another discipline. This shows the need to intensify the study of this theme in the training of chemistry teachers.

Keywords: Electrochemistry, Problem situation, Mercury.

1 INTRODUCTION

For a long time, several methodologies have been studied to facilitate the teaching and learning process. Although the evolution of studies is evident, we can still perceive several challenges to be overcome in the field of education. One of the ways to cooperate for development in the teaching and

learning process is to use contributions from important philosophers who have made it possible, through their studies, to develop innovative teaching methodologies and a greater understanding of the learning process.

In traditional teaching, the methods correspond to a transfer of knowledge from the educator to the student, in this way, the individual learns through the exposure of information, where the teacher holds all the knowledge. Freire (1988) addresses the importance of educators creating ways to contribute to the construction of the student's knowledge, without this process being limited to just a transfer of knowledge. In view of this scenario, we have Chemistry as a discipline sometimes considered complex, because the forms of teaching do not always lead the student to clearly understand the study of the subject and its transformations.

Ferreira and Justi (2008) comment on learning chemistry, relating some difficulties encountered by students in understanding this subject to non-concrete aspects found during their approach. Despite these conflicts, chemistry as a discipline makes teaching by experimentation possible. This type of method, because it is illustrative and practical, attracts the attention of students, bringing the opportunity to build a class in which the approaches are carried out, not only in an expository way, or with the following of pre-established scripts, but also bring a practical notion of this subject. These characteristics can be used in order to establish proposals that stimulate students' reasoning, such as the elaboration and resolution of problem-situations. The articulation of ideas in the solution of problems can be carried out within the laboratory, through experimentation, allowing for a diversification in teaching methodologies.

The use of experimental activities in Chemistry classes aims to facilitate the teaching and learning process, in which students can actively participate because this science is experimental. However, it is not possible to innovate teaching if its evaluation is linked to the traditional, quantitative and classificatory molds (ANDRADE; VIANA, 2017). In addition, the new perspectives for High School say that Chemistry should be valued, as a cultural and essential instrument in human education, as a co-participant in the interpretation of the world and responsible action in reality (BRASIL, 2006). And for this to happen, according to Freire (1996), the teaching practice must reinforce the critical capacity of the student, his curiosity and his insubordination.

One of the philosophers who contributed to the development of innovative teaching methodologies was Piaget, his research carried out through interviews brings a constructivist perspective of knowledge. Carvalho (2013) comments on the importance of proposing a problem according to Piagetian research, and evaluating the interviews conducted by him in these researches, he understands that the proposal of a problem that students can solve in the classroom is an important factor, being a watershed between expository teaching and teaching in which it stimulates the student's autonomy for the construction of knowledge. Therefore, it is possible to affirm that the elaboration and

resolution of problem-situations requires the participation of the student, giving him a position of autonomy in the classes and, consequently, the opportunity to stimulate critical thinking.

According to Meirieu (1998), the problem-situation is something in which its resolution cannot be possible if the subject does not first have a precise knowledge about the subject and this knowledge constitutes the objective of the situation, which is realized when the subject overcomes the obstacle to fulfill the task. In this way, the student builds his learning by overcoming the obstacle. Stuart (2014) makes a relationship stating that the investigative experimental activities have their origin in a problem-situation, and it is important that this situation is of interest to the student and that, in its description, the obstacle of the problem, is not difficult to the point of discouraging the student to complete the task. Maldaner (2020) states that experimental activities facilitate the process of acquiring knowledge that aims to bring concrete objects closer to their theories, and in this process, the origin of more knowledge about these objects occurs.

Considering problem solving as a proposal that contributes to the student having autonomy in classes, actively participating in the teaching process and being challenged to build new knowledge, this research addresses the use of investigative questions in experimental activities. The participating students had a conceptual theoretical approach related to the elaboration of problem-situations and also on methods of experimentation, worked in the physical chemistry classes. The theoretical classes aimed to prepare the student in the construction of a critical consciousness, which is a fundamental condition for the elaboration of a problem-situation.

According to the above, we propose the following research question: Can experiments by investigation contribute to the undergraduate student in chemistry, in the development of critical thinking and creativity to solve critical problems?

To answer this question, we consider the following assumption: The investigative approach implies, among other aspects, planning investigations, using experimental setups to collect data followed by the respective interpretation and analysis, in addition to communicating the results. Such an approach allows students to free themselves from the passivity of being mere executors of instructions, as it seeks to relate, decide, plan, propose, discuss, report and other implications contrary to what occurs in the traditional approach (HOFSTEIN; LUNETA, 2004).

In this research, the physical chemistry students of the chemistry degree course were asked to elaborate and evaluate the experimental investigative activities through problem-situations (PS), where the problem resolution must be obtained experimentally, with the objective of PS replacing the traditional experimental class script. The requested problem situation had the theme of electrochemical decontamination of mercury-contaminated waters on the lands of the Yanomami indigenous peoples.

To solve the problem, the students received only explanations related to the conceptual and procedural content corresponding to the experiment. For the analysis of the results, criteria were elaborated based on Carvalho (2013) and Meirieu (1998).

2 RESULTS AND DISCUSSION

After the analysis of the problem-situations elaborated by the students, it was found that none of them met all the characteristics proposed, therefore, the scientific initiation students of this research proposed the problem-situation shown in chart 1.

Table 1. problem-situation.

Mercury is a metal widely used by illegal miners in order to promote the obtaining of gold in a "pure" form and after its use, this mercury is thrown into the rivers causing water pollution with health impacts. The constancy of this practice has brought several harms to the Yanomami indigenous peoples, in this region several rivers have a high rate of contamination, bringing a situation of great risk to this population. Faced with all the calamity suffered by the Yanomami peoples, a group of students from the chemistry degree course were sensitized and decided to study a way to decontaminate these waters, thus opting for the electrochemical route. Considering this, how can you help students in this process of conducting an electrochemical experiment that decontaminates this water, to ensure that it is completely free of mercury? And knowing that to carry out this study they have an analytical center and a physical chemistry laboratory with a voltage source, metal sheets of various metals and various salts.

Source: Prepared by the author, 2023.

We consider that the proposed SP meets the objective of solving the problem in an experimental way and the criteria of SP of Carvalho (2013) and Meirieu (1998). To solve it, the students would have to perform an electrochemical experiment to decontaminate the water, and then some chemical analysis at the analytical center to confirm that the water does not contain mercury.

3 FINAL THOUGHTS

It was found that chemistry undergraduates had difficulties in the elaboration of these problems, despite having already studied this theme in another discipline. This shows the need to intensify the study of this theme in the training of chemistry teachers.

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Systematic mapping of the discussion about the multifacets of language in the deconstruction of binarism in the Amazon

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ABSTRACT
Given the need to understand the phenomenon of binarism in the Amazon and how current research is inserted into the discourses created in this context, there was interest in this investigation. Thus, the PICOC methodology and the use of the Parsifal online tool were used, which guided the research paths. The aim was then to find out whether research connects binarism in the Amazon with the use of discourses via language in the educational context. Thus, the main references used were the articles selected in the databases, namely RIUFPA and Scielo, which allowed us to predict that, despite the discussions raised in the last five years, the relationship is not made directly and there is a need to delve deeper into gender themes and the construction of binarism related to decolonial epistemologies when using discourses.

Keywords: Amazon, Decoloniality, Binarism, Systematic mapping.

1 INTRODUCTION

The construction of gender [3] in the Amazon was consolidated and is still in force today through the colonizer's discourse from a binary perspective of separation of man and woman with assumptions of power and subordination of the body that does not concern Amerindian thought, but the Western vision. According to Gontijo (2021), the impacts of colonization fall on the gender binary that generates a kind of coloniality of affections and desires imposed on native peoples.

This dichotomy has occurred through discourses over time and has its records in several areas, which are of interest here in the educational field with emphasis on language, as it is one of the crucial factors even for the domination of a people. This occurred in Brazil and in the Amazonian context, making invisible not only the use of indigenous languages, but also their organization as a social, economic and cultural class, where it caused identity damage to the ethnic diversity that permeates gender issues, an important agenda to be discussed in the identity construction of native peoples.

The assumptions of colonization were based on the Christian logic, with colonization mainly through the missions of the Jesuits, a vision that remains in society spreading the sexist and lgbtphobic trail whose prejudice still dominates and extends under other religious manifestations and the gender

identities of individuals, despite the consideration that Brazil is a secular country.

Thus, the interest of this research was to understand where the use of language as a contributing factor to the dismantling of the idea of binarism in the Amazon, especially in an educational context. And it aimed to identify in the discussions on the theme: a) to identify the means for resistance through education that emancipates via language/discourse; b) Analyze the discussion of the theme and whether it occurs by researchers today in the Amazonian context; c) Understand the bias of decolonial discourse as a tool that acts on binarism.

In order to consider what is being discussed about the theme, it was of interest to build a state of the art, where the tool for the quantification and qualification of the works used was the Parsifal website, which allows filtering articles of specific form using inclusion and exclusion criteria that guided the research and will be described. The methodology used was the PICOC, which allows the analysis of the following factors: population, intervention, comparison, results and context.

Thus, the selection of relevant works for the research questions and their objectives was followed, which aimed to answer: 1. What is the role of education and language in the conception of discourses? 2. Is there a discussion about binarism in the Amazon today? and 3. What is the role of education discourses in the conception of binarism in the Amazon?

2 THEORETICAL FRAMEWORK

We started this research from the assumption that indigenous peoples were framed in a pattern imposed by European dominators, denying their freedoms and identities, producing a widespread image as submissive and subjugated. This integration almost caused the disappearance of the native peoples and the annulment of their cultural diversity. The written knowledge they have about their realities was not constructed by them, as well as their gender identity, but was made by other subjects unrelated to their context.

Regarding the tools of domination, it is known that discourse and language are linked to colonial rule in Brazil. In this way, Portugal's discursive dominance took place through the junction of different ethnic peoples, who had their own linguistic trunks, hindering communication and organization.

According to Assis *et al.* (2012, p. 66) The Portuguese "tried to mix different dialectal groups so as not to understand each other, in order to, through ethnic and linguistic diversity, prevent them from uniting. Gontijo (2021), on the other hand, argues that despite the cultural diversity of indigenous peoples, there do not seem to be many studies discussing the theme of gender in studies on indigenous peoples.

In this way, the problem then passes through other paths, where language resides as a discourse and political tool, the same one that was used to colonize, now via transgression inaugurating new meanings, strategies and faces to continue the struggle for rights.

With regard to educational documents, which lead to language and discourse, therefore ideological constructs, those that govern teaching and learning, such as the National Common Curriculum Base (BNCC), the term genre in this text is mentioned 320 times, but only to refer to textual genre of discourse, digital, oral, multisemiotic and others.

With regard to sexuality, it is confirmed that the term is only mentioned in the eighth-grade curriculum, and only once involves non-biological issues in competence (EF08CI11), "Selecting arguments that highlight the multiple dimensions of human sexuality (biological, sociocultural, affective and ethical)", shows that the curricular basis does not cover the discussion. (BRASIL, Ministry of Education, 2018, p. 349).

Thus, this search for alterity in the relationships between subjects goes through the pedagogy of resistance and education that understands free individuals and recognizes the other, where, Ramos (2022) points out, there is a need to recognize the other as a free subject for ethical relations and when this understanding does not occur, the other is as a victim trapped in the system that suffocates him in the totality of his existence.

Therefore, it is understood the importance of this theme as a lever for other research and to identify the discourses that are being used and if there is work in this direction, because the need to reinforce even due to the lack of information in the documents that govern education, which form individuals, is already identified. Thus, we propose to make a systematic mapping about the multifacets of language and thus denote how the deconstruction of binarism in the Amazon has been discussed in academic productions today.

3 METHODOLOGY

This academic production followed the work methodology known as Systematic Mapping, which is based on the production of data through evidence, and after having it in contact the researcher can compare the data, observe what has been raised on a given subject and from that generate new hypotheses from the map of results found.

For Eco and Sebeok (2008) the initial step for systematic mapping is abduction, for them "[...] the procedure of adopting a hypothesis or a proposition which would lead to a prediction of what would appear to be surprising facts [...]". Thus, the methodology used in this work approached systematic mapping, since we aim to map, quantify and qualify the works on the theme of Binarism in the Amazon. To this end, we used Parsifal, an online tool designed to assist researchers in conducting systematic literature reviews, RSL, also known as State of the Art.

As a strategy to refine the data found, we used the problem in question, which is: to understand at what stage is scientific research in relation to the theme of binarism in the Amazon? Or even if there is recent research on the subject.

In this sense, in order to select the studies to be mapped, we used the following platforms as a database*: Scientific Electronic Library Online (Scielo)* and the Institutional Repository of the Federal University of Pará - RIUFPA.

Also as a selection method, focusing on the refinement of the works already published, we will use keywords based on the theme of this work, which is structured from axes that distinctly reflect scientific productions. From these paths, a search string was established, which serves as a categorizer of the keywords, listed here as in the example: "traditional communities" OR "traditional communities" AND "binarism in the amazon" OR "binarism in the amazon". It should be noted that at this stage we made use of PICOC, a strategy through which it is possible to construct questions of different natures, in order to assist us in the research question that we actually want to specify as a focus.

In this way, we arrive at the keywords and synonyms used for the search, as evidenced in the following table:

Table 1- Search words and corresponding terms (synonyms)

Keywords	Synonyms
Amazon	Amazonia
Cultural Binarism	-
Traditional communities	Traditional Community
Mapping	Cartography
Binarism in the Amazon	Binarism, Amazonia

Source: The Authors (2023)

In addition, in order to act as a resource for selecting the searches for the works, as it facilitates understanding, and so that there is not a very extensive production, this refinement of the productions is subdivided by means of the following criteria:

Table 2 – Criteria

Inclusion Criteria (IC)	Exclusion Criteria (EC)
CI 1- Research on discourse and binarism	EC 1 - Duplicate works
CI 2- Papers that discuss binarism in Amazon	EC 2-Works before 2018
CI 3- Current studies that discuss the Thematic	CE 3- Research that does not discuss the thematic
CI 4- Papers in Portuguese or Spanish	

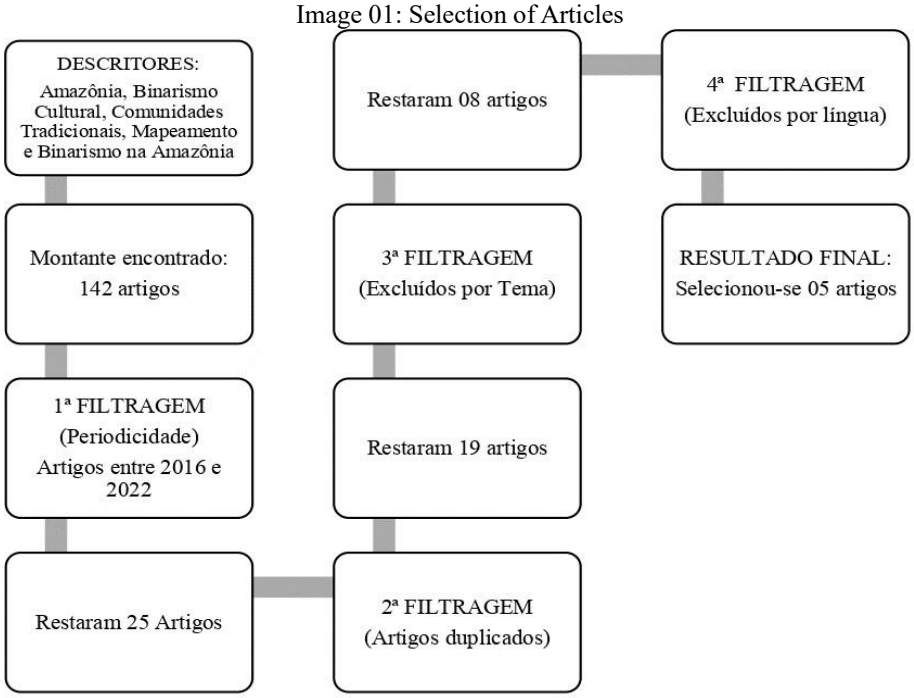
Source: The Authors (2023)

It is worth noting that the works observed on the platforms were analyzed through the relevance of the theme exposed and in relation to the studies of this research, so those that did not add up and

were discrepant were eliminated, not accepted by the researchers.

In summary, first the literature was searched through the search strings through *Scielo* and RIUFPA, totaling a total of 142 articles, this number dropped to 25 articles after using the date filter (works between 2016 and 2022) within the sites. The date was set this way because some websites only allow you to search between specific time periods and intervals. After this moment, the IC and CE were applied, where 06 studies were excluded because they were duplicates, 11 works because they did not address the binary in the Amazon, and 3 because they were not in the target languages. Thus, subtracting an amount of 25 articles and resulting in 05 articles with relevant themes of interest to researchers, as we can see in the following figure:

Image 01: Selection of Articles



Source: The Authors (2023)

We observed that one of the works was not written material despite being in the RIUFPA article repository, but the importance of the video for the work was noted and it was decided to keep it as one of the sources.

4 DISCUSSION AND RESULTS

From the refinement made by the search whose method used was the PICOC within the Parsifal platform, and after the filter within the defined inclusion and exclusion criteria, we arrived at the five articles presented in the following table.

Table 3 - Selected articles

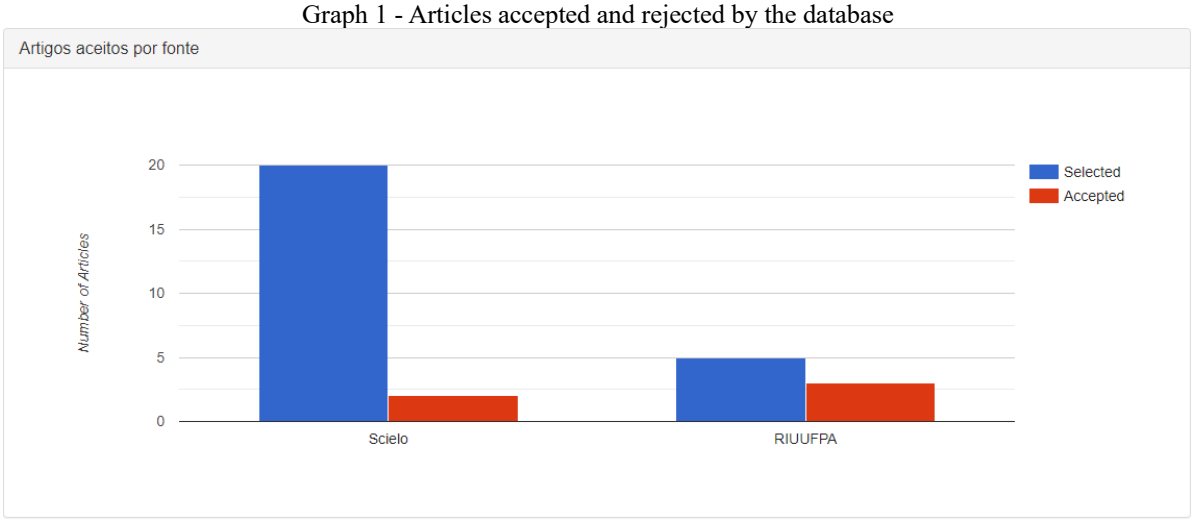
Title	Authorship	Local	Year
Mary's Oral Powers on the Thresholds of Taperaçu - Campo.	Fernando Alves da Silva Júnior and Aline Costa da Silva.	Nova Amazon Magazine	2017
Odivelities: cultural binarism in construction Identity in city Amazon site.	Joseph Guilherme Fernandes dos Santos and Rodinell Aquino Palha.	New NAEA Notebooks	2021
Breaking gender and sexuality binaries: rehearsing a non-binary education.	Roney Polato of Castro and Neilton of the Goularth Kings.	Interdisciplinary journal Margins	2017
From Southern Epistemologies to a New Southern Ethos: Traditional Communities and responsibility environmental.	Jelson R. de Oliveira.	Transformation Journal	2022
The Web of Peoples and the University: Agroecology, Insurgent Traditional Knowledge, and Epistemic Decolonization	Spensy Kmitta Pimentel and Paulo Dimas Rocha de Menezes.	ANPPAS-Environment and Society Magazine	2022

Source: The Authors (2023)

Thus, of the selected articles, two were published in 2017; one in 2021; and three are works from 2022. And, as for the theme, four works talk about binarism in the context of the Amazon, while the other two talk about discourse and epistemic decolonization. On the other hand, the media (video on youtube), The oral poetics of Maria in the thresholds of Taperaçu-Campo, talks about a shaman whose identity is Maria do Bairro, fleeing from heteronormativity. Therefore, we will incite discussion based on what has been found about the topic and necessary correlations.

As for the selection of these remaining articles for the research, 3 are from the RIUFPA website and 2 are from *Scielo*. The five are represented in the following graph, showing the percentage of accepted and rejected according to the two search sites used in the systematic mapping.

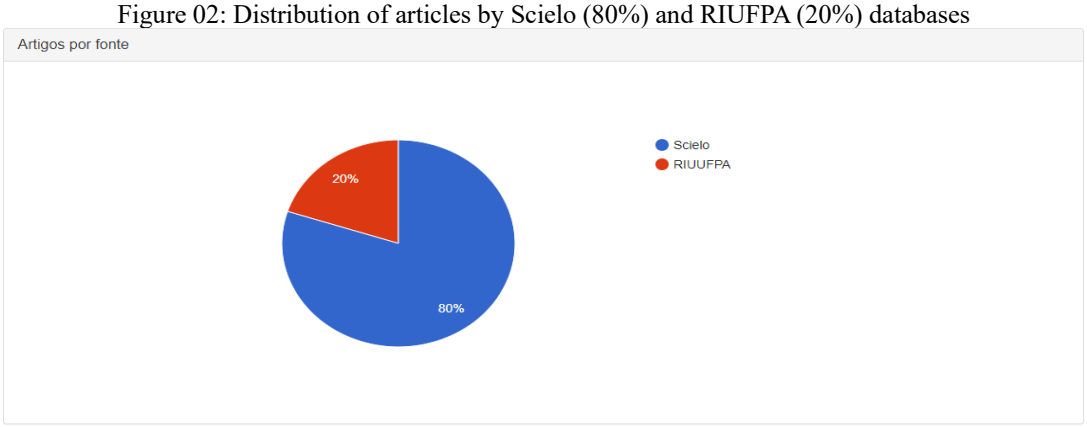
Graph 1 - Articles accepted and rejected by the database



Source: The Authors (2023)

Regarding the distribution of the databases, we noticed that *Scielo* had a higher percentage of accepted articles, since this search platform excels in the variety of publications aiming at a multiplicity of academic works, so there are more articles collected on the research theme. This does not happen in the RIUFPA, since these are institutional repositories restricted to the productions of the entities of the Federal University of Pará. As seen in the image below:

Figure 02: Distribution of articles by Scielo (80%) and RIUFPA (20%) databases



Source: The Authors (2023)

Throughout the selection and reading of the articles, it was possible to notice where each one had a direct or partial impact on the topic discussed. Regarding, for example, the issue of binarism, three papers go directly into the subject, and only two focus on the issue of binarism and gender within the Amazonian context. More precisely, one article deals with the issue, the other being the video.

Thus, the other texts discuss decolonial epistemologies and one of them discusses binarism in education in a broad context. From this, we can already notice the lack of research that involves the issue of binarism specifically in the Amazonian context, but that these, not being research that inaugurate the discussion, continue and begin to emerge in the years studied.

The text by Castro and Reis (2017) problematizes the binary included in the educational context and cites binarism as a matter of power over the other in a kind of dichotomy of exclusion and exclusivity of knowledge in the classroom that correlate to other contexts. By inserting the binary relation, then, one works with a duality in any context that dictates where power and submission are situated; the accepted and the unaccepted.

According to the authors, the question remains as to why dualisms should be used in the grammatical analysis of the world? Therefore, the proposed question that passes through the experiences of education in and around the classroom is based on the issue of dualities, interpretations and exclusions of other ways of thinking that escape duality, but do not take the problematic of discourse to the extreme. We might think that this is still an open question in this debate.

It is necessary to analyze the discourse constructed about binarism within the historical contexts of individuals, and within the locus of research, which is the Amazon. In this sense, Oliveira (2022) discusses an ethos of the South and the importance of confronting knowledge, taking into account the knowledge denied throughout Western history. The decolonization and decentralization of this knowledge is the starting point for understanding the dual divisions that include binarism, including as a tool of control.

Still on Western epistemologies, Oliveira (2022 apud, Jonas 2013), believes that the epistemological problem expresses a misunderstanding of nature and life, which resulted in a consequence of environmental destruction. Thus, the colonizing ethos was oriented towards the destruction of natures, lives and the subjectivities of individuals.

Regarding the issues of binarism in the Amazon raised by Fernandes and Palha (2021), the clear objectification of the authors in systematizing this plot in identity relations through access to the cultural ancestors of a certain city in the interior of the Amazon is observed, for this the authors make use of oral history reports as a source of data collection in order to materialize cultural nostalgia and thus configure binarism through composition in São Caetano de Odivelas-PA.

Thus, the discussion raised by the aforementioned authors results in apparent dichotomies, in the frequency and constancy of the intergenerational and intergroup binarism since it listened to culture makers, personalities of the city and made a context before and after that involved local politics as a marker of these anthropic processes. In addition, we perceive the characterization of binarism only in relation to artistic and cultural events as constituents of local cultural hegemony.

Contrary to the works usually addressed in an RSL, we have the figuration of an academic production in audiovisual format selected here, *The Oral Poetics of Mary in the Thresholds of Taperaçu-campo, in which* we have a mythical dive into the threshold experiences with the Amazonian mythopoetic, which guide from the real narratives to the use of metaphysical and wonderful elements in the exemplification of their contexts. In this particular case, the Amazonian cultural binary is drawn

through the oral narratives of the character Maria do Bairro, a shaman, healer and transmitter of ancestral knowledge. Thus, it is worth emphasizing the importance of deconstructing the cultural binarism, and properly of the discourse through the linguistic field, a human-environment comparison, since in the case of a relational issue, the Amazonian binary is intertwined inside or outside the great civilizational centers and also enters the vast Amerindian universe of the Amazonian peoples in the (de)construction of their own identities.

5 CONCLUSION

After the systematic mapping, it was possible to notice that the PICOC methodology used was very useful for the study of the results and the online tool Parsifal can be useful regarding the defined inclusion and exclusion criteria that helped to delimit the specific moment of the studies, the theme and the interest of the articles to be included in the research.

Regarding what was found on the subject, it was noted that studies on binarism in the Amazon and decolonial epistemologies have been discussed in recent years in a still in-depth way when it comes to discourses on binarism in the Amazonian context. Despite being a topic of interest, there are more separate relationships and, in this sense, it is urgent to deepen this theme when it also involves the field of education.

In this way, through this systematic mapping, we have the possibility of deepening the studies about the multifacets of language in the deconstruction of binarism in the Amazon, in order to make this theme increasingly viable, which needs greater academic studies and attention to researchers in education, given the degree of social relevance that it imposes.

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The evolution of education and emerging educational technologies: A comparative analysis between education 4.0 and education 5.0

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ABSTRACT

This chapter explores the evolution of education, focusing on the influence and integration of emerging educational technologies, especially in Education 4.0 and Education 5.0 approaches. Initially, the fundamental distinctions and convergences between these concepts are analyzed, highlighting the main technologies associated with each approach. This analysis aims to provide an in-depth conceptual understanding and explore its significant impacts on the contemporary educational landscape. The study, in turn, highlights the challenges, opportunities and results experienced by educators and students in the face of this new educational paradigm. Teaching practice is thoroughly examined, considering the transformations resulting from the implementation of emerging technologies in classrooms. Practical examples of educational institutions that incorporate the pedagogical practices of Education 4.0 and 5.0 illustrate their application in the educational reality. In this sense, it seeks to contextualize and justify the relevance of research on the evolution of education with the advent of emerging educational technologies. Despite the remarkable advances in learning and collaboration provided by these approaches, significant challenges are faced, such as the need for continuous training, ethical issues, and the urgency of investments, partnerships, and the active involvement of students. In summary, Education 4.0 and 5.0 require innovation, commitment and an ethical approach to transform the educational landscape in a dynamic, equitable and responsible way.

Keywords: Education 4.0, Education 5.0, Educational technologies, Teaching practice.

1 INTRODUCTION

Contemporaneity is marked by significant transformations in the educational sphere, driven by the incessant advancement of technology. This phenomenon has ushered in a new educational era, full of possibilities and challenges for pedagogical practice and shaped by the introduction and growing adoption of innovative educational technologies, such as artificial intelligence, virtual reality, gamification, among others. In this context, UNESCO (2015, p. 9) highlights that technology has become intrinsic to modern society, suggesting that its integration into education is not only inevitable, but also essential for effective education, thus making it increasingly complex to argue that education can be effectively conducted on the margins of this phenomenon.

This study is justified by the need to understand the implications of these technological changes in education. It seeks to understand the concepts and technologies associated with the approaches of Education 4.0 and Education 5.0, which represent the latest trends in the integration of technology in education.

The need to understand the implications of these transformations is evident. The introduction of these technologies in the educational environment not only reconfigures pedagogical practice, but also challenges preconceptions about the teaching and learning process itself. The reflection proposed by Moravec *et al.* (2010) is fundamental to understanding the role of technologies in education. They argue that technologies are not just passive tools, but active agents that shape the way we teach and learn. This perspective underscores the inevitability of integrating technology into education, as it recognizes that technology is not just a means to an end, but a formative influence that can transform education in meaningful ways.

This reflection is particularly relevant to Education 4.0 and Education 5.0 approaches, which see technology as a central element in promoting more effective and engaging learning. These approaches recognize technology as a catalyst for a substantial change in educational dynamics, moving beyond a mere support tool and becoming an integral element of the educational process. Therefore, it is essential that we continue to explore and understand how these technologies can be used more effectively to improve the quality and effectiveness of education, aligning with the vision proposed by Moravec *et al.* (2010) on the active and formative role of technology in education.

Thus, the main objective of this chapter is to analyze and compare the concepts and approaches related to Education 4.0 and Education 5.0, in order to identify their differences and similarities. In addition, it is proposed to understand the impacts of these approaches on the teaching and learning process, considering the perspectives of both educators and students. The importance of such an undertaking is reinforced by authors such as Johnson *et al.* (2015), which emphasize the need for in-depth investigations to effectively assess the impact of emerging educational technologies.

The methodological strategy employed in this study comprises a systematic review of the literature. This process involved the consultation of several academic databases and digital libraries, aiming to comprehensively identify scientific articles, books and reports that address the evolution of education in the context of emerging educational technologies, with special attention to the perspectives outlined by the Education 4.0 and Education 5.0 approaches. The choice of this methodological approach is supported by the recommendation of Tranfield *et al.* (2003), which emphasize the relevance of the systematic review for the careful synthesis of the available literature on a specific topic. The systematic search and careful analysis of the selected documents provides a solid foundation for in-depth understanding and rigorous contextualization of recent developments at the intersection of education and emerging technologies.

2 EDUCATION 4.0: CONCEPTS AND TECHNOLOGIES

2.1 DEFINITION AND CHARACTERISTICS

Education 4.0 is an educational approach that proposes the holistic integration of digital technologies in the teaching and learning process. Its central focus rests on the personalization and individualization of the educational process, employing resources such as artificial intelligence, adaptive learning, and virtual reality to create more flexible learning environments adapted to individual needs. According to Lamattina (2023), Education 4.0 aims at the convergence between the real and digital worlds, using technology as a means to expand pedagogical possibilities and provide a more comprehensive educational experience. In this context, technology is perceived not only as a tool, but as an essential enabler for the expansion of educational horizons.

2.2 KEY TECHNOLOGIES OF EDUCATION 4.0

2.2.1 Artificial intelligence in education

Artificial Intelligence (AI) plays a key role in the structure of Education 4.0, enabling the analysis of considerable volumes of data and the creation of adaptive learning systems. According to the considerations of Silveira and Vieira Jr. (2019) and Figueiredo *et al.* (2023), these systems are not merely analytical; they possess the ability to dynamically customize the educational process based on individual performance and the specific needs of students. For these authors, artificial intelligence in education thus provides a unique opportunity to adapt content, resources, and pedagogical approaches in a highly personalized way. This personalization, in turn, is grounded in careful consideration of each student's distinct characteristics, abilities, and interests.

It is imperative to highlight that artificial intelligence transcends the function of an analytical tool; It emerges as a crucial enabler in optimizing the educational experience. This role transition, from mere analysis to an active and adaptive influence, is paradigmatic in that it shifts from the traditional

approach to education, centered on uniform teaching, to a student-centered model, where teaching is shaped and adjusted according to individual needs.

At the heart of this transformation, artificial intelligence not only offers efficiency in data management and analysis, but becomes a dynamic mediator between information, pedagogy, and learning, thus redefining the education landscape to meet the demands of an increasingly complex and interconnected society. This approach not only highlights the ability of artificial intelligence to catalyze educational evolution, but also underlines the need for continued research and critical reflection to ensure that this transformation is carried out ethically and effectively.

2.2.2 Adaptive learning

Adaptive learning, as a methodology fundamentally anchored in artificial intelligence algorithms, represents a significant advance in the search for effective personalization of teaching. The purpose of this approach is to dynamically adjust the content and learning activities according to the individual needs of each student. This approach aims to provide a more personalized and targeted teaching, contributing to the optimization of the effectiveness of the educational process. According to Johnson *et al.* (2016), this personalized approach provides students with a highly personalized learning experience, allowing them to advance at their own pace as well as address challenging concepts in a more individualized manner.

In this context, adaptive learning not only reflects the flexibility of the educational environment, but also reinforces the ability of technology to dynamically adapt to the specific needs of each student, thus promoting more efficient and meaningful learning in Education 4.0. The differential of this approach lies in its ability to adapt in real time to the specific abilities, pace of learning and challenges of each student. This personalization goes beyond simple content differentiation; It reconfigures the pedagogical structure itself, recognizing and attending to the various ways of learning. Adaptive learning, therefore, not only optimizes the effectiveness of the educational process, but also promotes more efficient and meaningful learning by recognizing and responding in an agile manner to each student's individual nuances.

Thus, by integrating adaptive learning, education is not limited to following a linear and uniform path, but becomes a dynamic ecosystem that constantly adjusts to offer a learning experience that is truly personalized and geared towards each student's individual success. This evolution represents not only a change in the educational approach, but a significant advance in the transformation of education into a more inclusive process aligned with the diverse needs of students in the 21st century (Costa *et al.*, 2021).

2.2.3 Virtual Reality and Augmented Reality in Education

Virtual Reality (VR) and Augmented Reality (AR) are immersive technologies that allow students to experience virtual environments and interact with objects and information in a more engaging way, transcending the limitations of traditional teaching. In the context of Education 4.0, these technologies are strategically employed to simulate real-world experiences, providing an innovative approach in facilitating the understanding of complex concepts.

As highlighted by Lopes *et al.* (2019), Tori, and Hounsell (2020), integrating virtual reality and augmented reality into teaching not only provides an engaging learning experience but also allows students to explore virtual environments and visualize abstract concepts in a more tangible way. This approach goes beyond traditional teaching, enabling deeper immersion in the content and thus transforming learning into a more engaging and interactive experience.

VR, through simulated three-dimensional environments, transports students to specific contexts, allowing them to explore and interact as if they were physically present. On the other hand, AR enriches the real world with digital overlays, providing an additional layer of information and context. Both technologies, by offering highly visual and interactive experiences, overcome the limitations of conventional teaching by making concrete abstract and enabling the practical manipulation of complex concepts.

Thus, the strategic use of virtual and augmented reality in Education 4.0 not only modernizes, but revolutionizes the way knowledge is transmitted, providing a learning environment more aligned with the requirements of Education 4.0. Therefore, these technologies are not merely tools; They represent portals to new dimensions of learning, empowering students to explore, understand, and apply knowledge in innovative and impactful ways. Tori and Hounsell's (2020) vision highlights not only the usefulness but the essentiality of these technologies for creating learning experiences that transcend the boundaries of the traditional classroom and prepare students for an increasingly complex and digitally interconnected world.

2.2.4 Internet of Things applied to education

The Internet of Things, also known as the Internet of Things (IoT), represents the interconnection of devices and physical objects, capable of collecting and exchanging data with each other. In the era of Education 4.0, the application of IoT in education has stood out in the creation of intelligent learning environments, in which devices and sensors collaborate to provide real-time information, enabling the personalization and adaptation of teaching, through the monitoring of students' progress and the provision of immediate feedback, for example (García-Peñalvo, 2018). This dynamic feedback, in turn, facilitates and enriches the learning process, giving it a more adaptive and interactive dimension.

The integration of IoT into Education 4.0 transcends simple data collection; It provides a transformation in the very dynamics of teaching. By providing instant insights into student performance, IoT contributes to a personalized approach, allowing for the early identification of individual challenges and the application of tailored educational strategies. In addition, by enabling the interconnection of various devices, IoT creates a more integrated and efficient educational ecosystem.

The strategic application of IoT in education not only modernizes the classroom but lays the foundation for a more dynamic and outcome-oriented educational experience. By connecting physical objects to the educational sphere, IoT bolsters not only data collection, but the ability to turn that data into actionable insights, thereby promoting a more student-centered, agile, and adaptive education. Therefore, García-Peñalvo's (2018) view highlights IoT as an essential element in building innovative and efficient educational environments in the 4.0 Era.

2.2.5 Online Teaching Platforms

Online teaching platforms emerge as essential components in the context of Education 4.0, providing a dynamic virtual environment for the provision of educational materials, interactions between students and teachers, as well as the monitoring of student progress. In this context, these platforms stand out by facilitating asynchronous learning, providing students with the flexibility to access content and use multimedia resources at their convenience.

Lamattina (2023) points out that online teaching platforms have become increasingly popular in Education 4.0, due to the flexibility of access to educational content and resources at any time and from anywhere, in addition to the possibility of interaction between students and teachers, allowing the monitoring of student progress. By facilitating asynchronous learning and the use of multimedia resources, these platforms transcend the physical barriers of the classroom, providing an education tailored to each student's individual learning style in Education 4.0.

This ubiquity and accessibility are essential to meet the demands of a digitally connected society, where learning is not constrained by limitations of time or space. Additionally, utilizing multimedia resources enriches the learning experience by providing a variety of formats that align with students' different preferences and learning styles.

The growing popularity of these platforms not only highlights the widespread acceptance of online teaching methods but also underscores the importance of providing students with an education that is adaptable and in line with today's demands. Thus, online teaching platforms are not only facilitators of learning, but transformative agents in the construction of a more inclusive, personalized and accessible education in the era of Education 4.0.

3 EDUCATION 5.0: CONCEPTS AND TECHNOLOGIES

3.1 DEFINITION AND CHARACTERISTICS

Education 5.0 is an educational approach that seeks to integrate advanced technologies, such as artificial intelligence, big data, and advanced virtual reality. This approach, combined with collaboration between students and the practical application of knowledge, has as its main goal to prepare students for the challenges and demands of the future. Education 5.0 focuses on developing essential skills, including critical thinking, problem-solving, and teamwork, developing essential skills such as critical thinking, problem-solving, and teamwork.

From the perspective of Felcher and Folmer (2021), Education 5.0 emphasizes the formation of individuals capable of adapting to rapid change and using knowledge in a practical and innovative way, in collaboration with others. They discuss how Education 5.0 can contribute to a more inclusive, ethical and productive society. Thus, this approach transcends the mere acquisition of information and technical skills, placing an emphasis on the effective application of knowledge in real-world situations and the ability to innovate in collaborative environments.

Education 5.0, therefore, not only recognizes the importance of advanced technologies in education, but also highlights the need to develop interpersonal skills and the ability to apply knowledge in dynamic contexts. By aligning with the demands of an ever-evolving world, this approach represents a breakthrough in preparing students to meet the challenges of the future, equipping them not only with theoretical knowledge but with the ability to adapt, innovate and collaborate in meaningful ways.

3.2 KEY TECHNOLOGIES OF EDUCATION 5.0

3.2.1 Advanced Artificial Intelligence

In Education 5.0, Advanced Artificial Intelligence (AAI) goes beyond traditional AI, using more complex algorithms for predictive analytics, autonomous decision-making, and refined personalization of teaching. This approach, as proposed by Yousuf and Wahid (2021) aims to establish an educational environment in which IAA not only adapts content but also anticipates individual student needs, resulting in a more sophisticated learning experience that is aligned with the demands of the ever-changing educational landscape. This predictive ability optimizes learning effectiveness while also preparing learners to deal with complex and dynamic challenges. Advanced Virtual Reality, on the other hand, transcends mere simulation, providing experiences that are virtually indistinguishable from the real world. This not only enriches learning but also develops practical and innovative skills.

In their article, Yousuf and Wahid (2021), thoroughly address the various applications of IAA in the educational context. Their study focuses on analyzing existing tools and platforms, examining market trends and research related to AI in education, as well as discussing the opportunities,

challenges, and limitations inherent in this technological integration in the educational field. In addition, they conduct a comprehensive review of the multiple applications of IAA in education, highlighting specific areas such as classroom monitoring and recommendation, smart tutoring, sentiment analysis, student retention and dropout prediction, as well as student performance assessment and ranking. The authors offer an exhaustive description of the platforms and tools resulting from research, highlighting significant advances achieved in this scenario. On the other hand, they critically recognize the limitations and potential challenges associated with the implementation of IAA in education, while identifying opportunities for future improvements. This reflective analysis serves as a solid foundation for subsequent investigations in the ever-evolving domain of e-learning, fostering a deeper understanding of the practical and theoretical implications of IAA in education.

3.2.2 Advanced Virtual Reality

The integration of Advanced Virtual Reality (VRA) into Education 5.0 represents a significant advancement of immersive educational experiences. Incorporating more advanced technologies, this approach seeks even more realistic simulations, providing learning experiences that go beyond conventional simulations. This educational paradigm, underpinned by cutting-edge technologies, aims to create virtual environments that transcend the traditional limitations of the classroom, providing immersive and challenging learning experiences.

Dantas and Andrade (2022) and Vidotto *et al.* (2022) contextualize RVA as an essential tool for overcoming the barriers of conventional teaching, emphasizing that this approach not only offers a virtual representation of the real world, but seeks to create learning environments that are virtually indistinguishable from reality. This total immersion, as discussed by Vidotto *et al.* (2022), goes beyond mere graphic representation, providing an experience that engages students in a deep way, stimulating their participation and engagement in the learning process.

Thus, RVA in Education 5.0 is not limited to the creation of realistic simulations; It fundamentally reconfigures the dynamics of the classroom, transforming it into an interactive and adaptable space. The contribution of authors such as Lamattina (2023) highlights RVA's ability to deliver personalized learning experiences, allowing students to explore concepts in a more tangible way that is tailored to their individual needs.

This educational transformation, driven by RVA, not only redefines how students interact with content, but also presents new possibilities for peer collaboration and knowledge construction by exploring social and collaborative interaction in RVA. In this sense, Dalgarno and Lee (2010) argue that technology not only enhances individual learning, but also creates opportunities for the development of social and collaborative skills, which are fundamental in Education 5.0.

3.2.3 Project-based learning and problem-solving

Project-Based Learning (PBL) in Education 5.0 represents a paradigmatic shift in pedagogy, redefining the role of students as protagonists in the learning process. This innovative approach puts them at the center of complex projects and real-world challenges, stimulating not only the assimilation of knowledge, but its practical application in authentic contexts.

For Thomas and Brown (2020), PBL in Education 5.0 provides students with valuable opportunities to apply their knowledge in real-world situations, promoting the development of practical and collaborative skills. This perspective underscores the importance of active learning, moving beyond the traditional paradigm of information transmission to a more engaging and participatory approach. Students are encouraged not only to passively absorb information, but to engage deeply with the material, promoting a more holistic understanding and lasting retention of knowledge.

Thomas and Brown (2020) shed light on the transformative dynamics of the "new learning culture" in Education 5.0. This culture transcends the physical boundaries of the traditional classroom, recognizing that learning is a ubiquitous phenomenon that occurs everywhere. The authors explore the transition from the stable infrastructure of the twentieth century to the fluid infrastructure of the twenty-first century, where technology plays a central role in creating and constantly responding to change.

When discussing the pillars of learning in the twenty-first century, Thomas and Brown (2020) highlight play, innovation, and the cultivation of imagination as fundamental elements. These pillars not only complement PBL but also enhance its effectiveness in preparing students for the dynamic challenges of the future. The forward-looking vision of these authors not only anticipates the evolution of learning, but also offers an achievable and scalable perspective that adapts to the ever-changing technology and the needs of the people involved in this process.

PBL, by promoting students' autonomy, presents itself as a pedagogical strategy that not only places them at the center of the learning process, but also increases motivation, satisfaction, and critical thinking and problem-solving skills. Helle, Tynjälä and Olkinuora (2006) highlight the fact that most articles on PBL are course descriptions focused on the implementation of individual courses, while substantial research on the topic is remarkably limited. This observation suggests the urgent need for further investigation, reinforcing the importance of curriculum professionals and developers reflecting on the purposes and possibilities of PBL together with students, setting realistic and clear goals.

However, the effectiveness of PBL requires a substantial transition in classroom dynamics and the role of the teacher. Ertmer and Simons (2006) propose that educators adopt a facilitator role, providing guidance and support to students as they navigate the challenges of the project. By presenting specific challenges associated with implementation, such as creating a culture of collaboration, adapting to ever-evolving roles, and structuring student learning and performance, Ertmer and Simons (2006) recognize the need for ongoing support for teachers. In this context, the authors offer practical

suggestions for overcoming these obstacles, envisioning a horizon in which more educators will recognize the potential of PBL as an effective instructional approach to cultivating students who are flexible thinkers and successful problem solvers.

3.2.4 Gamification and use of educational games

Gamification and the integration of educational games have been widely adopted as pedagogical strategies, seeking to engage students, make the learning process more captivating, and promote intrinsic motivation. These approaches incorporate game-like elements, such as challenges, rewards, and competition, with the purpose of stimulating active participation and long-term interest in students.

According to Gee (2005), gamification and educational games in Education 5.0 offer a playful and motivating approach. This perspective is based on the premise that such strategies allow students to learn in an engaging and interactive way. In this context, the importance of active and student-centered learning is emphasized, where students are not only passive receivers of information, but are instigated to engage deeply with the content. This paradigmatic shift reinforces the need to transcend the traditional model of knowledge transmission, promoting a participatory approach that encourages critical thinking and problem-solving. Gee's (2005) view emphasizes that gamification in Education 5.0 not only makes the learning process more attractive, but also creates an environment conducive to the development of essential skills for the 21st century, such as collaboration, creativity, and critical thinking. In this way, the effective integration of game elements into contemporary education represents a significant step forward in creating educational experiences that are more aligned with the needs and expectations of students in the digital age.

The approach explored by Kapp (2012), explores gamification in education as an effective tool for creating meaningful learning experiences. The author argues that, when implemented appropriately, gamification has the potential to promote learning through positive reinforcement and immediate feedback, which are inherent characteristics of games. This strategic approach can result in a significant increase in information retention and comprehension of teaching material.

Kapp (2012) highlights the importance of recognizing that not all games or gamification efforts are the same. The effectiveness of gamification in learning is intrinsically linked to the precise matching of instructional content with game-specific mechanics and thinking. In addition to theoretical considerations, the author offers valuable insights into how to create and develop gamification efforts. It presents a comprehensive model that guides the entire process of game design and gamification, providing a solid framework for those looking to effectively incorporate playful elements into educational contexts. Thus, Kapp's (2012) view highlights not only the potential benefits of gamification, but also underscores the critical importance of a thoughtful approach that is well-aligned

with educational goals. By offering practical and theoretical guidance, the author contributes significantly to the understanding and effective application of gamification as an innovative educational tool.

On the other hand, Deterding *et al.* (2011) explore the concept of gamification and how it relates to game design elements and the game experience, and warn that gamification should be used with caution in education. The authors argue that gamification can be a valuable tool for improving user experience and engagement, and propose a definition of gamification as the use of game design elements in non-gaming contexts. They discuss the origin of the term gamification and how it has been adopted and interpreted in different ways, highlighting the importance of "gamefulness", a state of mind that is evoked by the use of game design elements. In addition, they warn that gamification should be used with caution to avoid the "gamification" of learning, where the focus shifts from the course content to the game elements. Therefore, it is crucial for educators to maintain a balance between student engagement and the integrity of course content.

In conclusion, gamification and the use of educational games offer a promising pedagogical approach to Education 5.0, promoting student engagement and intrinsic motivation. However, it is important for educators to implement these strategies in an effective and considered manner in order to maximize their benefits and minimize any potential drawbacks.

3.2.5 Collaborative learning and social networking

Collaborative learning and the use of social networks have become increasingly present in Education 5.0. These innovative approaches not only encourage interaction between students, but also enable knowledge sharing, the exchange of ideas, and collaboration on projects, transforming the dynamics of the learning process. As emphasized by Dillenbourg (1999), collaborative learning transcends the mere transmission of information, offering students the opportunity to collectively construct knowledge. This shared construction takes place through collaborative dialogue and constant interaction with peers, reflecting the social and connected nature of learning in the digital age.

By exploring this theme more deeply, it becomes evident that collaborative learning is not just limited to the sharing of information, but encompasses the co-creation of meanings and the joint resolution of complex challenges. Interaction on social media, on the other hand, is not just a platform for communication; It's a dynamic space where ideas are shaped, contested, and refined in real time. This constant interactivity not only strengthens the social bonds between learners, but also contributes to the construction of a deeper and more contextualized understanding (Bedin; Del Pino, 2018).

In the academic context, this transformative approach challenges traditional conceptions of teacher-centered learning, giving way to a more horizontal and participatory environment. Student autonomy is promoted by encouraging self-regulation and the development of critical skills such as

independent thinking and reflective assessment (Dillenbourg, 1999). However, it is crucial to recognize the challenges inherent in this paradigm shift. Bedin and Del Pino (2019) point out that issues related to the privacy, security, and reliability of information shared on educational social networks, as well as the need to develop effective pedagogical mediation strategies, are aspects that deserve careful attention.

In short, collaborative learning and the use of social networks in Education 5.0 not only reflect the evolution of educational practice, but also promote a more holistic and student-centered approach, shaping education to align with the demands and opportunities of contemporary digital society.

3.2.6 Big Data Analytics in Education

The phenomenon of Big Data, characterized by the robust collection and storage of online data, plays a significant role in contemporary times, especially in the analysis of large volumes of data to guide decision-making. Mascarenhas and Pilan (2016) examine the application of Big Data Analytics in education, seeking to understand how data collection and analysis can personalize the learning process. The ability of Big Data to create personalized profiles based on correlations and searches on various platforms is highlighted, providing specific solutions for users of different services.

In addition, the authors highlight the widespread presence of computers in schools, which opens up opportunities for the implementation of data-driven strategies. The potential of Big Data Analytics in education is exemplified through cases such as intelligent assessment, personalized learning, and problem management, evidencing the ability of this approach to improve the efficiency and effectiveness of teaching (Mascarenhas; Pilan, 2016).

The application of Big Data Analytics in education makes it possible to extract relevant information to understand the individual needs of students, favoring the personalization of teaching. Data analysis enables teachers to understand the affinities, challenges and academic background of each student, contributing to the optimization of the teaching process and saving time in the development of supplementary methods. Mascarenhas and Pilan (2016) state that Big Data Analytics is intrinsically linked to the personalization of scalable teaching, providing a more efficient approach adapted to the individual characteristics of each student.

The results observed by the authors indicate that most schools have technological infrastructure, opening opportunities to implement Big Data to improve the educational process. Experiences in the USA demonstrate the potential of data in educational management, highlighting predictive analytics as an essential tool to anticipate trends and improve strategic planning. Practical examples, such as Smart Assessment and Personalized Learning, illustrate how Big Data can optimize education by identifying areas of student difficulty and personalizing the learning process.

Finally, Mascarenhas and Pilan (2016) point out that Big Data Analytics contributes significantly to understanding the individual needs of students. For them, this approach does not separate the student from the collective, but integrates their digital reality into the educational context. Therefore, teachers and facilitators have a reliable tool to adapt teaching methods according to the student's development, saving time in the development and application of complementary strategies to facilitate the assimilation of the topics covered in the classroom.

4 TEACHING PRACTICE IN EDUCATION 4.0 AND 5.0

The incorporation of Education 4.0 and 5.0 implies significant challenges in teaching practice, demanding a proactive approach from educators. The complexity of these challenges lies in the need for teachers to acquire new digital skills, adapt traditional teaching methods to the digital environment, deal with the diversity of students' abilities in relation to technologies, and ensure equity in access to digital tools. In this scenario, teachers need to stay up-to-date on rapid technological changes and effectively incorporate educational technologies into their pedagogical practices. Therefore, it is imperative that teachers not only become familiar with emerging technologies, but also understand how to effectively integrate them into their pedagogical practices, overcoming the initial barriers that may arise in this transition process.

Technological dynamism imposes on teachers the constant demand for updating, since the rapid evolution of digital tools requires agile adaptation. The successful integration of these technologies is not only a matter of technical skills, but also of a change in mindset, where the teacher takes on the role of facilitator of the learning process, promoting more collaborative and participatory teaching environments.

However, despite the challenges faced, the adoption of Education 4.0 and 5.0 brings with it a number of possibilities and benefits for teachers. The use of emerging educational technologies not only enriches the teaching-learning process, but also provides personalization of teaching, access to a wide range of educational resources, and the creation of dynamic and interactive learning environments. In this sense, Aureliano and Queiroz (2023) and Souza (2020) point out that emerging educational technologies provide educators with the opportunity to tailor teaching to students' individual needs and create engaging and interactive learning experiences.

The transformative potential of these technologies is also highlighted by Lamattina (2023), who underlines the exciting possibilities that open up for teachers, from enriching teaching with interactive resources to personalizing learning. In addition, the research by Felcher and Folmer (2021) corroborates the relevance of integrating emerging educational technologies into teaching practice, pointing to promising results, such as a positive impact on student motivation, engagement, and

performance. This finding indicates the effectiveness of these approaches in the educational context, highlighting the importance of careful and strategic implementation.

Several authors have shown positive results in the adoption of Education 4.0 and 5.0, both for teachers and students. Teachers report significant increases in student motivation and engagement, improved digital skills, greater autonomy and self-confidence. In turn, students showed greater interest and active participation in learning, in addition to developing fundamental skills for the 21st century, such as critical thinking, collaboration, and problem-solving (Lamattina, 2023; Aurelian; Queiroz, 2023; Felcher; Folner, 2021; Souza, 2020).

Despite initial barriers, Education 4.0 and 5.0 have the potential to reduce educational inequalities. By providing equal access to resources and learning opportunities, these approaches can significantly contribute to building a more equitable and inclusive educational base.

5 IMPLEMENTATION OF EDUCATION 4.0 AND 5.0 BY EDUCATIONAL INSTITUTIONS

The Adoption of Education 4.0 and 5.0 represent an important milestone in the transformation of the educational system, preparing students for the challenges of contemporaneity and driving innovation and technological development. This approach, in addition to reshaping the dynamics of the classroom, contributes to the reduction of educational inequalities by enabling broader access to resources and learning opportunities. Lamattina's (2023) vision highlights that Education 4.0 and 5.0 have the potential to drive social transformation, enabling students for an increasingly digital and globalized society.

Teachers play a key role in this scenario, and it is essential to provide them with the necessary skills to exploit the full potential of emerging educational technologies. In this context, Vidotto *et al.* (2022) point out that the successful implementation of these approaches requires commitment and adequate investments in terms of technological infrastructure, educational resources and, especially, in the continuous training of teachers.

Teachers play a key role in the successful implementation of the Education 4.0 and Education 5.0 approaches, and it is essential to equip them with the necessary skills to fully exploit the potential of emerging educational technologies (Felkel; Dickmann, 2022). Vidotto *et al.* (2022) highlight the importance of commitment and adequate investments in technological infrastructure, educational resources and, especially, in the continuous training of teachers.

Relevant authors point out that the effective implementation of these approaches requires dedication and investments in different key areas. Regarding technological infrastructure, thinkers such as Lamattina (2023) and Felcher and Folmer (2021) highlight the need to provide schools and educational institutions with a solid technological base, ranging from internet access to devices, educational software, and virtual learning environments.

In the field of educational resources, it is essential that Education 4.0 and Education 5.0 are supported by up-to-date and relevant materials. Felcher and Folmer (2021) underline the importance of content that stimulates crucial skills such as critical thinking, creativity, and problem-solving. In addition, the continuous training of teachers is highlighted as an essential pillar, emphasizing that educators have a crucial role in educational transformation and that investing in continuous training is essential for them to adopt innovative practices and integrate technology effectively.

In addition to the aspects directly linked to the classroom, institutional support is a crucial facet, as indicated by different scholars. Institutional commitment is not limited to financial investments; It also includes the need for supportive education policies, committed leadership, and effective collaboration between schools, government, and the private sector. This comprehensive approach reflects the understanding that educational transformation demands a strategic and collaborative vision that goes beyond the confines of the classroom and extends to the broader scope of the educational institution and society as a whole (Lamattina, 2023).

Concrete examples of initiatives that incorporate emerging technologies into educational practice illustrate the possibilities offered by these approaches. In 2017, a partnership between the Brazilian startup VR Monkey and the Catavento Cultural and Educational Museum, located in the state of São Paulo, allowed visitors to explore Brazilian prehistory through a virtual experience. During the 32-minute exhibition, visitors were guided through different landscapes of Brazil in the Triassic and Cretaceous periods, where they were able to meet and interact with about 20 species of dinosaurs that inhabited the Brazilian territory millions of years ago. This multisensory experience provided learning and entertainment in a unique way, being suitable for children, adolescents and adults interested in learning more about the country's prehistory (Kayatt, 2016; France; Soares, 2015).

Similarly, the Romeu & Julieta studio created a pioneering project in South America called "Palmeira 1914", which uses virtual reality to teach the history of the city of Palmeira das Missões, in Rio Grande do Sul. The project rebuilt the city in the year 1914, based on historical curation and technology, to offer an immersive experience to players. Through virtual reality goggles and controls, players can interact with the environment and participate in traditions of the time. The project attracted great interest, with more than 500 people experiencing history during a four-day exhibition (Telles, 2021; France; Soares, 2015).

Another example is the integration of virtual reality in Brazilian public schools through the Google Expeditions program. This program provides students with immersive experiences in different scenarios, stimulating exploration and innovative educational experiences, such as visiting the seabed, historical sites, and even other planets (France; Soares, 2015). These initiatives illustrate how emerging technologies can be effectively applied to enrich the learning experience, making it more engaging and interactive.

These case studies underscore the importance of collaboration across sectors, including private and public initiatives, and startups, in the search for innovative solutions. They show that the successful implementation of Education 4.0 and 5.0 is not just a technological upgrade, but requires a holistic approach that involves strategic investments, continuous teacher training, and synergistic partnerships to maximize the positive impact of these transformations on the educational landscape.

In summary, the successful implementation of these approaches requires a concerted effort, with a focus on training teachers and creating an educational environment conducive to innovation and the effective use of technology.

6 FINAL THOUGHTS

Throughout the analysis developed in this chapter, we follow the trajectory of education, exploring the significant advances provided by emerging educational technologies, notably in the context of the approaches called Education 4.0 and 5.0. The differentiation between these two educational models was carefully outlined, understanding their nuances and highlighting the significant impacts on the educational scenario. Particular emphasis has been placed on the key technologies involved, their implications and influences on the way we learn and teach.

When reflecting on teaching practice in this new educational paradigm, we are faced with intrinsic challenges and possibilities. The presentation of results obtained by teachers and students highlights both the complexity and the transformative potential of this transition. Exemplary educational institutions, which adopt Education 4.0 and 5.0 as pedagogical practice, were mentioned, giving concreteness to the concepts discussed.

In view of the above, it is possible to conclude that the advances provided by these approaches are undeniable, offering unique opportunities for learning, personalization of teaching, effective collaboration among students, and access to diversified educational resources. However, in the midst of these achievements, critical challenges arise, such as the need for continuous teacher training, ensuring equity in access to technologies, protecting student privacy, and establishing clear ethical guidelines for the use of emerging educational technologies.

To advance in the implementation of Education 4.0 and 5.0, it is necessary to continuously invest in research and development of educational technologies, combined with the continuous training of teachers. It is recommended that educational institutions establish partnerships with technology companies, promote collaboration among teachers, and encourage the creation and sharing of quality digital educational resources. In addition, it is important to involve students as active agents in their learning process, providing them with opportunities to explore and create with technologies. This active participation contributes to the construction of essential knowledge and skills for the 21st century.

It is worth noting that the adoption of these technologies raises ethical issues and concerns related to student privacy. The responsible use of personal data and the collection of sensitive information require clear policies and guidelines to ensure the full protection of students' rights. In addition, it is important to promote digital literacy and awareness of ethics in the use of technologies, both on the part of teachers and students.

In summary, the full realization of Education 4.0 and 5.0 demands not only technological innovation, but a full commitment to up-to-date pedagogical practices, supported by ethical guidelines and privacy policies. It is in this context that the effective transformation of the educational landscape is outlined, providing a dynamic, equitable and responsible learning environment for present and future generations.

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Bloom's taxonomy and its applicability to collaborative learning in distance learning

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ABSTRACT
This article proposes an analysis of the categories of Bloom's Taxonomy that prove to be more effective in implementing collaborative learning in the context of distance education. Conceived in the 1950s by psychologist and educator Benjamin Bloom, Bloom's Taxonomy serves as a widely used pedagogical tool, playing a fundamental role in guiding the planning and evaluation of the teaching and learning process. This approach divides learning objectives into three distinct domains (cognitive, affective, and psychomotor), establishes a hierarchy outlining a progressive cycle of learning. The structure encourages students to master each level before advancing to subsequent stages, thus creating a progressive learning framework. The integration of collaborative learning with Bloom's Taxonomy provides a conducive framework for planning teaching activities that promote mutual learning, as well as stimulate knowledge construction and the development of social and teamwork skills. The methodology adopted for this study involved a thorough literature review, emphasizing works that highlight the relevance of Bloom's Taxonomy as a tool centered on the learning process. Among the identified advantages, the ability of this taxonomy to effectively guide the cognitive and affective development of students stands out. However, the literature review also exposes some limitations in the use of Bloom's Taxonomy, especially when applied to distance education. The absence of physical contact between teachers and students emerges as a significant challenge, complicating the assessment and monitoring of student performance. Thus, this chapter emphasizes the critical need for educational institutions to consider such amplified disadvantages in the context of remote teaching, emphasizing the strategic importance of implementing adaptive approaches to mitigate these limitations.

Keywords: Teaching methods, Distance education, Learning, Bloom's Taxonomy.

1 INTRODUCTION

Collaborative learning represents a teaching-learning process, conceived under the premise that learning is inherently a social process, in which individuals actively interact to achieve shared educational goals. This concept is aligned with cognitivist theories, which outline the learning process as the acquisition of knowledge, changes in cognitive structures, and the formation of significant relationships between new problems and those previously solved (Sevalho, 2017; Adams, 2015). In this context, the present discussion proposes to explore the interaction between collaborative learning and Bloom's Taxonomy, highlighting how this convergence offers a framework for the promotion of meaningful learning and the construction of knowledge.

Bloom's Taxonomy, developed by Benjamin Bloom in the 1950s, is an essential tool for teaching planning and evaluation, categorizing learning objectives into six distinct cognitive levels. According to Costa *et al.* (2014), the bottom-up classification of these levels, namely: knowledge, understanding, application, analysis, synthesis and evaluation, provides a hierarchical structure that allows educators to identify specific learning objectives and develop activities that engage students in different stages of critical thinking and reflection. This structured approach empowers teachers to guide students' cognitive development progressively and coherently.

Bloom's Taxonomy, also known as the Taxonomy of Educational Objectives, transcends the cognitive domain, incorporating affective and psychomotor dimensions. This educational strategy, originally conceived as a tool to categorize learning objectives, was later revised in 2001 to incorporate changes in education by replacing nouns with verbs in the cognitive domain and including an additional dimension of knowledge. This evolution was crucial to maintain the relevance of the Taxonomy in the face of educational transformations. In 2009, it was updated to adapt to digital methodologies, taking advantage of distance learning technologies to improve the construction of knowledge (Torres *et al.*, 2022; Ferraz; Belhot, 2010).

The synergy between collaborative learning and Bloom's Taxonomy emerges as a promising field of research. The combination of these elements provides a pedagogical structure that fosters not only the acquisition of knowledge, but also the development of social skills and the promotion of mutual learning (Rocha *et al.*, 2023). In the specific context of distance learning, it is crucial to understand which categories of Bloom's Taxonomy demonstrate greater applicability, considering the nuances of the virtual environment and the specific demands of collaborative learning. Thus, the present article aims to analyze and provide insights into the specific categories of Bloom's Taxonomy that stand out in the effectiveness of collaborative learning in distance learning.

2 METHODOLOGY

To meet the proposed demand, a systematic literature review was conducted, conducted in order to analyze and understand the knowledge previously addressed and experienced by researchers specialized in the subject. This analysis was based on the review of scientific articles available in electronic databases, including national and international scientific productions. The systematic approach provided a comprehensive view of the existing academic contributions on the pertinent topics, enabling a critical deepening and a solid foundation for the present discussion.

The literature review was conducted with specific criteria, aiming to identify relevant contributions to the understanding of the relationship between Bloom's taxonomy, distance learning, learning strategies and collaborative learning. The careful selection of key terms, such as "Bloom's taxonomy", "distance learning", "teaching and learning", "learning strategies" and "collaborative learning", allowed a precise delimitation of the scope of the review, ensuring the inclusion of studies that directly address the themes in question. This systematic method of literature search and selection was essential to identify relevant studies and establish the conceptual basis for the subsequent discussion.

In the theoretical basis, we carry out a concise and analytical approach to the main concepts and definitions related to Bloom's taxonomy, distance learning, learning strategies and collaborative learning. This approach allowed for a deeper understanding of the theoretical underpinnings underlying the topics discussed, providing a solid context for the critical and reflective analysis to be conducted in the final conclusions of the chapter.

The final considerations allow not only the synthesis of the main insights extracted from the analyzed studies, but also the identification of gaps in the existing knowledge, indicating possible directions for future research. In this way, Bloom's Taxonomy emerges as a tool of undeniable relevance for distance learning, being able to structure and measure students' skills, thus promoting meaningful learning and aligned with the contemporary demands of education.

3 THEORETICAL BACKGROUND

Collaborative learning, as a pedagogical method, represents an approach in which students converge efforts to achieve a common goal in the learning process. This modality can manifest itself in several configurations, including the formation of small groups for discussion of topics or problem solving, the shared distribution of responsibilities for the execution of tasks or projects, as well as team collaboration in virtual teaching and learning environments (Torres; Ilara, 2014).

Based on the premise that social interaction is intrinsically associated with learning, collaborative learning is supported by a theoretical foundation that recognizes the active role of the student in the construction of knowledge. Unlike the independent learning approach, in which students

act in an individualized way to achieve learning objectives, collaborative learning provides an interactive dynamic that promotes dialogue, the exchange of ideas, and the collective construction of understanding.

Collaborative learning has numerous benefits, including improved social and communication skills, and increased understanding and retention of content. However, it is important to note that one of its main advantages is its ability to increase student motivation (Damiani, 2008). When they work together, they feel more involved in the learning process and more committed to the success of the group. As a result, there is an increase in student participation and involvement, leading to an improvement in academic performance. This situation is quite different from that of independent learning, in which students work individually to achieve learning objectives (Klein; Vosgerau, 2018; Lee; De Paiva, 2010).

By fostering interaction between students, this approach contributes to the development of social and communication skills, fostering an enriching learning environment. In addition, collaborative learning demonstrates the potential to intensify the comprehension and retention of content, which results from the active engagement of students in complex cognitive and social processes.

Among the benefits, the remarkable ability of collaborative learning to enhance student motivation stands out. By working together toward common goals, students experience a significant increase in engagement with the learning process, as well as a more intrinsic commitment to collective success. Such engagement results in a more active participation and a substantial improvement in academic performance, evidencing a differentiated dynamic compared to more individualistic approaches (Lourenço; De Paiva, 2010).

In addition to its central role in the educational context, collaborative learning makes notable contributions to the development of students' social and communication skills. By collaborating together to achieve common learning goals, students are compelled to communicate effectively, promoting the articulation of ideas and the collaborative resolution of problems. This interactive process provides the improvement of crucial skills, such as the ability to listen actively, express oneself clearly, and resolve conflicts efficiently, thus contributing to the integral formation of the individual (Borssoi *et al.*, 2021).

Another advantage of collaborative learning is its remarkable ability of this approach to broaden students' understanding and retention of content. By engaging collectively in the understanding and application of the study material, students evince a greater propensity to internalize and retain knowledge effectively. In addition, collaborative learning, by promoting an interactive and participatory dynamic, presents itself as a facilitator of the development of critical skills, such as

critical thinking and problem solving, which are fundamental for the cognitive and analytical development of learners (Klein; Vosgerau, 2018).

In a more systemic analysis, it is possible to categorize the benefits of collaborative learning into several dimensions. In the first place, the development of social and communication skills is highlighted, which are fundamental for the formation of full citizens. In addition, the methodology contributes to increasing student motivation and engagement, fostering active and involved participation in the educational process. In addition, there is an expansion of knowledge, since collaborative interaction provides a more comprehensive and contextualized approach to the contents. Although its advantages are visible and easy to observe, it is worth noting that. According to Klein and Vosgerau (2018), this methodology also has some disadvantages, such as:

- No guarantee of active participation of all members of the group, in view of individual characteristics such as shyness;
- Lack of equal conditions in the face of teamwork;
- Tendency for some students to follow the lead of one or more dominant members, rather than making their own decisions by contributing their ideas;
- It is more difficult to assess individual student performance when they are working in groups.

However, even in the face of its obvious advantages, collaborative learning is not without its challenges and disadvantages. Among the limitations identified, the lack of guarantee of active participation of all group members is highlighted, often associated with individual characteristics, such as shyness or reticence. In addition, the lack of a level playing field in teamwork can lead to disparities in enjoying the benefits of collaboration, creating challenges in terms of equity. The tendency for some students to follow the lead of more dominant members, instead of exercising autonomy in their decisions, and the complexity associated with the evaluation of individual performance when inserted in group contexts, stand out as challenges inherent to this pedagogical approach (Borssoi, 2021; Damiani, 2018; Klein; Vosgerau, 2018).

On the other hand, Bloom's Taxonomy represents a classification system that aims to categorize the cognitive abilities involved in learning processes, providing a hierarchical structure for the planning and evaluation of teaching. Composed of six distinct categories, each reflecting a gradual increase in cognitive complexity, Bloom's Taxonomy stands out as a valuable tool to guide pedagogical practices and provide a structured approach to the achievement of educational objectives.

The first category, "Knowledge," focuses on the ability to recall specific information and facts, including the process of storing and retrieving data. For example, memorizing dates, names, and definitions falls under this level of cognitive complexity. This early stage represents the fundamental

foundation for the development of more advanced cognitive abilities, laying the foundation for deeper understanding (Trevisan; Amaral, 2016; Ferraz; Belhot, 2010).

The second category, "Comprehension", according to Trevisan and Amaral (2016), Ferraz and Belhot (2010), transcends the simple retention of information, requiring students to be able to interpret and explain the underlying meaning. In this context, the emphasis is on understanding the relationships between information and its application in different contexts. For example, the ability to explain a complex concept or summarize a text requires effective comprehension, going beyond superficial memorization. In other words, this category is related to the ability to interpret and understand information and concepts, and is fundamental for collaborative learning, since students need to understand the information in order to discuss it and collaborate with their peers. As an example we have: discussing a text, sharing notes, summarizing what was read.

The third category, "Application", is directed to the practical application of information and concepts acquired in new or different situations. Students are challenged to utilize their knowledge in a functional way, demonstrating the ability to solve specific problems or apply scientific principles to real-world contexts. The solving of mathematical problems or the application of scientific theories in concrete situations exemplify this category (Trevisan; Amaral, 2016; Ferraz; Belhot, 2010).

The subsequent category, "Analysis," implies the ability to break down information into smaller parts to understand the interrelationships between them. Analysis demands a critical approach, allowing students to compare, contrast, and identify the constituent parts of a whole, as well as identify parts of a story or a system, for example. The development of this skill provides a deeper and more contextualized understanding of knowledge (Trevisan; Amaral, 2016; Ferraz; Belhot, 2010).

"Synthesis," the fifth category, focuses on the creative ability to combine information in a creative way in order to generate something new. Synthesis demands a high level of cognitive ability, encouraging students to design scientific experiments or create narratives from fragmented concepts, for example. This internship represents a breakthrough in the practical application of the knowledge acquired. And finally, the sixth and final category, "Evaluation," requires students to be able to judge the quality and value of information, as well as make decisions based on it. This category includes the critical discussion of the relevance of a text, the analysis of the veracity of the information presented, and the appreciation of the quality of a project, demonstrating a high level of cognitive maturity (Trevisan; Amaral, 2016; Ferraz; Belhot, 2010).

In summary, Bloom's Taxonomy provides a rigorous and hierarchical framework for the understanding and application of cognitive skills, being an essential reference for the design of pedagogical and evaluative strategies. This tool continues to be a substantial contribution to the educational field, guiding the design of learning objectives and enriching the educational experience.

Thus, Bloom's Taxonomy is a widely used tool for categorizing and describing learning objectives and teaching activities.

In Distance Education, Bloom's Taxonomy is often used in the development of online courses, programs, and teaching activities, and also in the evaluation of student performance. For Sevalho (2017), some of the most common uses of Bloom's Taxonomy in distance education include:

- Reference educational materials in order to assist in the definition of goals, objectives, and learning objects.
- Guide curriculum planning, teaching, and assessment.
- Establish performance standards for students in certain competencies.
- Develop teaching activities, assisting teachers in the selection of the content to be taught, as well as in improving the way of teaching.
- Establish criteria for evaluating the quality of educational material and distance learning.
- Develop teaching material, creating specific activities to facilitate the development of critical and creative thinking skills in students.
- Assist students in developing self-assessment skills in order to determine if learning objectives have been met.
- Identify areas where students need more guidance.

The Ministry of Education determines Distance Education as an educational modality. In addition,

> presented distance education as a form of teaching that enables self-learning, with the mediation of systematically organized didactic resources, presented in different information supports, used alone or combined, and conveyed by the various media. This is a reflection of a process of change in educational public policies in favor of the improvement of educational practices (Garcia, 2013. p. 92).

It is important to emphasize that, according to the author:

> The educational methods used in the distance modality need to take into account the existing technologies to provide an adequate education for learning. In the school environment, learning is influenced by students' individual characteristics, such as skills, competencies, ease of understanding and absorbing knowledge, and ability to concentrate, and is therefore affected by intellectual differences in students' ability (Garcia, 2013, p. 5).

Overall, Bloom's Taxonomy is a valuable tool for teachers developing distance learning courses and programs. It allows teachers to identify learning objectives and develop activities that engage students at different levels of critical thinking and reflection. Group work can be considered a collaborative learning practice. In this method, students are divided into small groups and work together to achieve a common goal. Each member of the group takes on specific roles and

responsibilities while working together with the other members to achieve the goal (Sevalho, 2017; Ferraz; Belhot, 2010).

With Bloom's Taxonomy, students have a frame of reference to help them learn collaboratively and develop critical thinking and reasoning skills. Thus, there are numerous advantages in the use of Bloom's Taxonomy, and Ferraz and Belhot (2010, p. 422) point out two of these advantages in the educational context:

1. Providing a basis for the development of assessment instruments and the use of differentiated strategies in order to enable, evaluate and stimulate the performance of students at different levels of knowledge acquisition;
2. Stimulus for educators, in a conscious and structured way, to help their students in the acquisition of specific skills from the perception of the need to master simpler skills (facts) in order to later master more complex ones (concepts).

Despite all the advantages listed, the biggest challenge faced in collaborative learning in distance learning is to create an online environment that encourages engagement and connection among students. This requires teachers to develop strategies that allow students to share, collaborate, and discuss effectively. In addition, it is also necessary for teachers to have enough knowledge to use these tools efficiently so that all students can reach their maximum learning potential.

4 FINAL THOUGHTS

The research undertaken in this investigation revealed Bloom's Taxonomy as a pedagogical tool intrinsically dedicated to the planning and evaluation of educational processes. Composed of six distinct cognitive categories, taxonomy plays a crucial role in identifying and delineating learning objectives, offering a conceptual framework for understanding how these objectives can be effectively achieved.

In summary, each cognitive category of Bloom's Taxonomy outlines specific goals that transcend the mere acquisition of knowledge. The category of critical thinking, exemplified by analysis, aims at identifying and understanding complex problems through discussion and collaboration among peers. Application, another category of critical thinking, proposes the practical use of the knowledge acquired in problem solving, evidencing the applicability of the categories in the promotion of more sophisticated skills.

The communication category, addressed in both the interpersonal and technological spheres, highlights the importance of developing communication and teamwork skills, as well as the use of technologies to access, evaluate, and share relevant information. This multidimensional approach aligns with the contemporary demands of digital education, incorporating collaborative and technological aspects into the learning process.

The category of metacognition, represented by self-regulation, emphasizes reflection on the learning process and the application of lessons learned in future situations. This approach not only enriches the educational experience, but also prepares students for self-regulation of their own learning, an essential competency in the context of collaborative learning.

Thus, Bloom's Taxonomy can be applied in a variety of ways in the context of collaborative learning in distance learning. Teachers can use it to plan collaborative activities that involve different levels of cognitive skills, as well as analysis, assessment, and creation. In addition, teachers can divide students into working groups based on the learning objectives and cognitive skills they want to develop. It can also be used to assess students' performance in group work and online discussions, allowing teachers to identify areas of strength for improvement by students, providing specific feedback to help them in their educational progress. It can also be used as a way to develop the ability to evaluate and judge one's own learning, which is fundamental for collaborative learning. For example, when working in groups, students can be encouraged to reflect on their own contributions and learning and how they can be improved.

The practical application of Bloom's Taxonomy in collaborative learning in distance learning emerges as a multifaceted challenge. The absence of physical contact between participants can be a barrier to effective collaboration and assessment of learning. In this context, it is essential to adapt pedagogical strategies, fully capitalizing on the potential of the technological resources available to mitigate such challenges.

In the collaborative learning landscape, Bloom's Taxonomy provides a valuable conceptual framework for the planning, execution, and evaluation of educational activities. Applying taxonomy allows teachers to strategically direct collaborative activities, incorporating different levels of cognitive skills, from analysis to assessment to creation. In addition, the formation of work groups based on learning objectives and desired cognitive skills represents an effective strategy to optimize collaboration and promote students' cognitive development.

The assessment of student performance in group work and online discussions, mediated by Bloom's Taxonomy, provides a systematic and insightful approach to identifying areas of strength and improvement. The use of taxonomy as an instrument for self-assessment by students, encouraging reflection on their own contributions and learning, represents an innovative application that promotes metacognition and self-knowledge, fundamental aspects in contemporary education.

However, even in the face of its undeniable benefits, the application of Bloom's Taxonomy to collaborative learning in distance learning requires careful adaptations and careful consideration of the challenges inherent in this particular context. Overcoming these challenges requires flexible pedagogical strategies, taking full advantage of the available technological resources and promoting

effective integration among participants. The effectiveness of this adaptation is crucial to ensure the effectiveness of the collaborative learning process in the virtual environment.

In view of the above, it was possible to verify that, despite all the benefits listed, applying Bloom's Taxonomy in collaborative learning in distance learning can be a challenge. The lack of physical contact between participants can hinder collaboration and assessment of learning. For this reason, it is important to adapt the strategy to ensure the effectiveness of learning and to make the most of the potential of the technological resources available.

Finally, the continued need for research, discussions, and in-depth study remains undisputed. These elements are fundamental to analyze the application of Bloom's Taxonomy in collaborative learning in distance learning and to evaluate its results in a comprehensive and reliable manner. Only through a careful and continuous analysis, supported by a solid basis of research and discussion, will it be possible to sustain and justify the adoption of Bloom's Taxonomy in collaborative learning, giving it credibility and reliability. This evidence-based approach represents a significant step towards an in-depth understanding of the effectiveness of this innovative strategy, aligned with the positive purposes and demands of 21st century digital culture.

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Female protagonism and organic management of productive backyards: Instagram as a tool for disseminating the implementation of the sustainable development goals of the 2030 agenda

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ABSTRACT

The United Nations 2030 Agenda is a plan to achieve a better world for all peoples and nations by 2030. This document was consolidated at the United Nations General Assembly in September 2015, in which 193 countries, including Brazil, established 17 sustainable development goals. In addition, Sustainable Development Goals (SDGs) 1 (eradication of poverty), 2 (zero hunger and sustainable agriculture), 3 (health and well-being), 5 (gender equality), 10 (reduction of inequalities), 11 (sustainable cities and communities), 13 (action against global climate change), 14 (life below water) and 15 (life on land) relate to productive backyards of family farming, due to the strengthening of sustainability and female protagonism, and SDG 4 (quality education), which was achieved according to the proposed activities, promoted an interaction between the Affirmative Actions for Diversity and Inclusion team (which receive support from the Dean of FCAV/Unesp) and the women farmers of the settlement of Córrego Rico (SP), capable of generating an exchange of knowledge for both. However, there is still a lack of access to information on this subject by the population. Therefore, social networks such as Instagram can help in the dissemination of this knowledge, so with this work we seek to apply it in posts about Family Farming, Female Protagonism, Agroecology and Productive Backyards, based on interviews with family farmers from the Association of Family Women Farmers of the Córrego Rico Settlement (A.M.A.A.R.) who are responsible for the management of productive backyards and were also consulted scientific articles and extracted pertinent information in an accessible language on these topics. Subsequently, the metrics of the posts (likes, comments, shares and saves) and the opinion of the followers were analyzed through the answers of a questionnaire that was created through Google Forms, to evaluate the contribution of the posts of the @amaar_projeto profile on Instagram, in which the content of these publications relates the daily life in the productive backyards of family farmers with the fulfillment of the objectives of the 2030 Agenda. Through the questions on the form, it was found that a large part of the respondents consider as "very important" the actions that A.M.A.A.R family farmers do in their productive backyards for the fulfillment of the proposed SDGs. Therefore, Instagram has proven to be an excellent tool to scientifically disseminate that the productive backyards of family farming contribute to the fulfillment of the Sustainable Development Goals of the 2030 Agenda, due to the female protagonism and the sustainable agroecological management that occurs in them.

Keywords: Women's management, Organic farming, ODS, Family farming.

1 INTRODUCTION

At the United Nations General Assembly in September 2015, 193 member states, including Brazil, consolidated the 2030 Agenda, in which 17 Sustainable Development Goals (SDGs) were

established to be met by countries by 2030. These goals are, respectively: SDG 1 - no poverty; SDG 2 - zero hunger and sustainable agriculture; SDG 3 - health and well-being; SDG 4 - quality education; SDG 5 - gender equality; SDG 6 - clean water and sanitation; SDG 7 - affordable and clean energy; SDG 8 - decent work and economic growth; SDG 9 - industry, innovation and infrastructure; SDG 10 - reduction of inequalities; SDG 11 - sustainable cities and communities; SDG 12 - responsible consumption and production; SDG 13 - action against global climate change; SDG 14 - life below water; SDG 15 - life on land; SDG 16 - peace, justice and strong institutions and SDG 17 - partnerships and means of implementation (UN BR, 2015).In view of the deadline for the execution of these goals, which is until 2030, in addition to the fact that current occurrences such as the high level of carbon dioxide (CO2) emissions, per capita, by developed countries and those with higher income (BARROS et. al., 2023) are contributing to global warming, it is urgent to intervene with a view to future perspectives to change this scenario. in which there is a scarcity of information for the public and resources to guarantee a dignified life with fundamental and universal rights in Brazil and other countries.

Family farming, according to Kageyama et al. (2013), is considered in three situations: settlers (establishment originating from the settlement project); exclusively family (execution of the work by the producer's family, without any other person hired) and family with a contractor (there is the hiring of an employee, but most of the work is done by the family in annual equivalents). Another interesting observation is that of Veiga (1991), in which he stated that this type of agriculture was essential for all central and peripheral countries to achieve economic success, as they needed to have an abundance of economically accessible food for a growing population, being flexible because they receive an income lower than that of the urban worker and produce food. In addition, this agriculture is fundamental for the Brazilian agricultural scenario, since according to Silva et al. (2021) 85% of Brazilian establishments belong to family groups, in addition to more than 13.8 million people residing in 4.1 million family establishments in the countryside, corresponding to 77% of the population living in the countryside.

Family farming, by producing safe, diverse and nutritious food, strengthens the food security of families and the community, as surplus food from family production is sold, exchanged or donated (CAMINHAS, 2020), when comparing this action with SDGs 2 (zero hunger and sustainable agriculture) and 3 (health and well-being), it is something consistent. In addition, this agriculture is the ideal place to develop sustainability, as there is a heterogeneous production of plant species (including medicinal plants) and animals, in which they combine different management without harming the environment so much. In this case, the use of fewer inputs and better use of natural resources (EHLERS, 1996), fulfilling SDGs 13 (action against global climate change), 14 (life below water) and 15 (life on land).

Productive backyards are also the *locus* of action of family farming, especially for women, because, according to Dias et al. (2020), they are spaces in the settlement in which female protagonism prevails, with a diversified cultivation of vegetables, medicinal plants and the raising of animals such as poultry and pigs. Family farmers produce a good part of the food that the family consumes, in addition to selling what was not consumed in agroecological fairs (the famous "feirinhas") in which it contributes to the family's income, related to SDG 5 (gender equality).

The contrast of cultivation in productive backyards, without or with low use of chemical pesticides, of different species of vegetables such as vegetables, cereals and fruits, contributes to SDG 1 (poverty eradication) because the surpluses sold in the marketing circuits of agroecological fairs contribute to the family income of the settlers; SDG 2 (zero hunger and sustainable agriculture) as family farmers make excellent management of edaphoclimatic resources in their crops; SDG 3 (health and well-being) since they grow medicinal plants in their productive backyards and have the knowledge, taught by their mothers, how to use them, in addition to the fact that self-consumption by families and the availability of food with nutritional quality and affordable value for customers, promote food security; SDG 8 (decent work and economic growth) from the Government's rural programs and credits such as the Food Acquisition Program (P.A.A.) and the rural credits of the National Program for the Strengthening of Family Agriculture (Pronaf), the commercialization and costing of production are ensured; SDG 10 (reduction of inequalities) since in productive backyards, women are valued for managing and marketing food, so they contribute to increasing family income and breaking structured machismo; SDG 11 (sustainable cities and communities) given that the management of natural resources for production is done in a balanced way, without causing impacts, or very little, to the environment in which they live; SDG 12 (responsible consumption and production) since food waste is applied to the soil to enrich it and prepare it for future crops, or provided for farmed poultry and pigs that will be consumed, sold or exchanged by households in the future; SDG 13 (action against global climate change) because the emission of carbon dioxide (CO^2) is in a system in which mechanization is not used excessively, nor is there or very little the raising of large animals such as cattle, local vegetation is present where there is no cultivation and, where there is a plantation, species are selected for the intercropping, aiming at the production of food throughout the year; SDG 14 (life under water) due to the no or little use of chemical pesticides in production, which if administered incorrectly can cause among many other problems such as the eutrophication of water bodies, leading to a disturbance in the aquatic ecosystem due to the lack of oxygen and, SDG 15 (life on land) due to the little use of pesticides or natural control options, It does not affect the population of animal species existing in productive backyards, such as bees and earthworms that perform fundamental work for crops, being respectively pollination, humus production and soil aeration.

Recently, the COVID-19 pandemic affected everyone and there was a need to adapt to distancing. In the same way, in the context of the University, there was this same need. In the work of Almeida et al. (2020), an example of exceptional and indispensable scientific dissemination in the Brazilian context of the pandemic is presented, in which one of the most active science communicators in the country, the biologist Atila Iamarino, who contributed to the formation of the Science Blogs Brasil collective, frequently used communication platforms such as Youtube, *Instagram* and *Twitter* to inform viewers about the different attributes of Covid-19, using language accessible to non-scientific audiences. Emphasizing university extension, which is the exchange of knowledge between the scientific community and other civilians, digital platforms such as *Instagram,* previously used, allowed social relationships to be maintained during the pandemic, becoming an indispensable technological resource in the academic environment as well. According to the research of Romão and Júnior (2022), in which they publicized the extension project "Semana Quitassato", in which they used the social network Instagram to publicize it, they realized that this platform played a fundamental role in attracting the public's interest in participating in the event and in the dissemination of science about the 17 Sustainable Development Goals of the 2030 Agenda. As a result, the intense participation of the public and the good development of the extension project remotely.

Therefore, in the present study the objective of evaluating the use *of Instagram as a tool to disseminate female protagonism and the organic management of productive backyards of family farming and how this helps in the fulfillment of the objectives of the 2030 Agenda, through* the Instagram profile *@amaar_projeto*, of an extension project of the Faculty of Agrarian and Veterinary Sciences (UNESP) Jaboticabal Campus, having as adjuvant the analysis through interviews and the daily life of the family farmers of the Association of Women Family Farmers of the Córrego Rico Settlement.

2 MATERIAL AND METHODS

2.1 INTERVIEWS WITH FARMERS IN CÓRREGO RICO - SP

The interviews were conducted with 12 female farmers pertinent to the female leadership of the rural community studied, because the knowledge and traditions of farmers and their families should stop being seen as only "influenced" by the knowledge of scholars in the area and start to be recognized as active subjects in the production of knowledge and understanding of the field. as defended by Freire (1983).

The interviews were transcribed and the results of the farmers' testimonies were analyzed with the support of the content analysis technique, following the three stages proposed by Bardin (2009). In the pre-analysis, the material was prepared (transcription of the interviews) and its floating reading, which consisted of a deep and repeated reading of the transcripts, to allow greater contact with the

material and knowledge of its content, ideas and concepts. The second stage, called exploration of the material, took place through the search for words and ideas repeated by the interviewees; and subsequently, in the third stage, we identified registration units, which, according to Bardin (2009), are the units of meaning that correspond to the "content segment to be considered as the base unit, aiming at categorization and frequency analysis". The content extracted from these interviews, therefore, was rigorously systematized in order to be disseminated on the *Instagram profile* (*@amaar_projeto*). Along with the dissemination, scientific texts (articles and book chapters) were added with simple and popular language. The *Canva app*, a free online graphic design tool, was used to create the posts. A total of 253 publications were made from March 2022 to October 2023, every Monday, Tuesday, Thursday and Friday.

Figure 1- Example of one of the posts made and disseminated on *Instagram* (@amaar_rojeto) based on the interviews conducted.

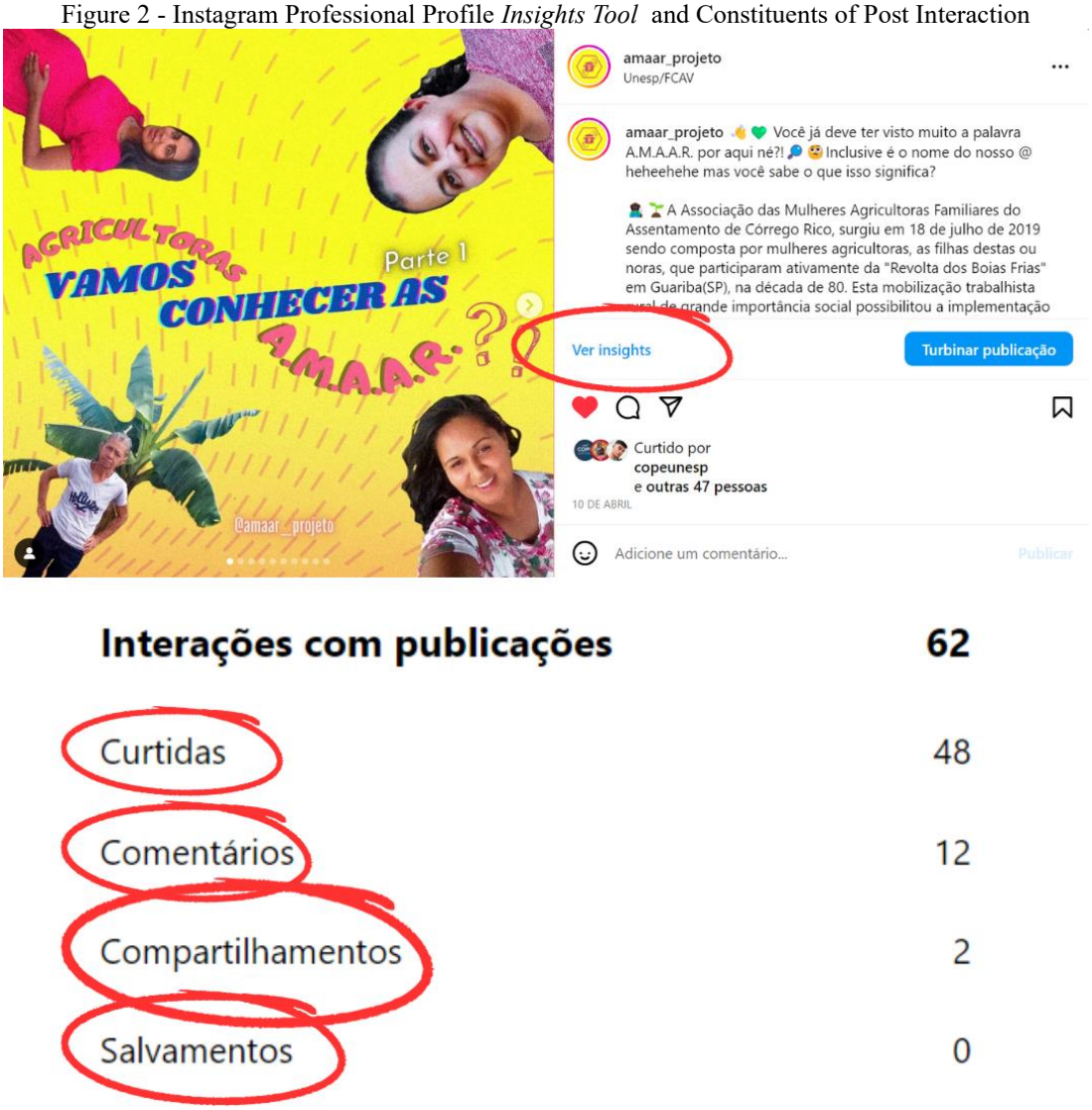


Fonte: *Instagram* (@amaar_projeto), 2023.

2.2 ANALYSIS OF POST METRICS

The metrics of Instagram profile posts *@amaar_projeto* which are likes, *comments*, shares, *and saves*, the five most relevant posts of 2022, the five most relevant posts of 2023, and the five most relevant posts in the period of one year were analyzed. Through the data provided by the *professional profile* insights tool on *Instagram*. None of these publications paid to the platform to be publicized.

Figure 2 - Instagram Professional Profile *Insights Tool* and Constituents of Post Interaction



Fonte: *Instagram* (@amaar_projeto), 2023.

2.3 VERIFICATION OF THE EFFICIENCY OF INSTAGRAM AS A TOOL FOR DISSEMINATING THE IMPLEMENTATION OF THE SUSTAINABLE DEVELOPMENT GOALS OF THE 2030 AGENDA THROUGH FEMALE PROTAGONISM AND ORGANIC MANAGEMENT OF PRODUCTIVE BACKYARDS

Through Google Forms, a survey was carried out aimed at the *followers* who most interacted with the profile posts, farmers, professionals in the area and undergraduate and graduate students of agricultural and veterinary sciences. In this questionnaire there were personal questions, such as: "e-

mail or phone", "what is your gender?", "what is your monthly income?", "what is your level of education?", "how long does the account take?" and six questions referring to the importance of female protagonism and the agroecological management of productive backyards of family farming for the implementation of the SDGs, They are divided into questions in the "multiple choice grid" format, which can be evaluated in five different levels of importance: 1 - very important, 2 - partially important, 3 - neither important nor insignificant, 4 - partially insignificant and 5 - very insignificant. The questions on the form consisted of: "1. Do you think that our *Instagram* posts demonstrate that family farming is related to: a) food for all, b) protection of the environment, c) favoring health, d) helping the family economically; " 2. Is it possible to see on our *Instagram* that women are very important in family farming? Why: a) women farmers take care of the management of productive backyards, b) women have mastered a knowledge of more viable plants for cultivation in productive backyards, c) women manage the household income for the purchase of food, d) women farmers are responsible for taking care of the family and productive backyards have a wide variety of types of food"; "3. We mentioned in our account sustainability, which is the ability to consciously use natural resources without compromising the well-being of future generations, is applied in food production by family farmers. This is because pesticides are not used, which protects: a) groundwater and water, b) the lives of bees and other pollinating insects, c) the health of the family and the community, d) the planet from climate change"; "4. In our posts we show that family farmers contribute to the practice of the 2030 Agenda, which is an important UN document to improve the planet. This is because these women: a) contribute to ending poverty, b) promote the consumption of organic food in their families and communities and also help fight hunger, c) help their families and communities consume safe and nutritious foods that are important for everyone's health, d) fight gender inequality at work, e) help to preserve water resources, f) work to reduce inequalities, g) contribute to the formation of a sustainable society, h) practice agriculture that avoids climate change, i) collaborate in the protection of animals and plants"; "5. On our *Instagram* account we talk a lot about female protagonism, which is when women in family farming stand out for: a) helping with the family's income, b) providing organic and healthy food with a wide variety, c) mastering a knowledge of more viable plants for cultivation in their productive backyards, d) helping to protect the environment, avoiding the use of pesticides, e) these mothers pass on to their daughters their knowledge about land management, f) sowing hope for a better world"; "6. On our Instagram account, we disclose that in productive backyards, women grow organic food that is sold at agroecological fairs, generating: a) an increase in household income, b) the purchase of safe and healthy food for the community, c) the fight against gender inequality and respect for women, d) respect for human rights and sustainability." It is possible through Google Forms to form graphs of the averages of the evaluations on the importance of the statements mentioned above, and this form was answered by 68 people.

Figure 3 - Form intended for the public



Source: *Google Forms*, 2023.

3 RESULTS AND DISCUSSION

3.1 ANALYSIS OF POST METRICS

The publications with the most *engagement*, which refers to how much the public is interacting with the "brand" and its content (Macedo, 2014) in 2022, at the beginning of the project, were, respectively, in 5th place "If the field does not plant, the city does not dine" published in September 2022, obtained 45 likes, 12 comments, 23 shares and 4 saves, totaling 72 interactions; in 4th place "Terra Rica Settlement: Rich Stream" from June 2022, which reached 74 likes, 23 comments, 6 shares and 2 saves, totaling 105 interactions; in 3rd place "That Richarlison is is a fact, but do you know who is the ace of the economy that strengthens Brazil-silll?" from December 2022, which reached 73 likes, 18 comments, 16 shares and 2 saves, resulting in 109 interactions; in 2nd place "Diversity and Inclusion Affirmative Action Team" of November 2022, with 69 likes, 18 comments, 23 shares, 2 saves, resulting in 112 interactions and; In 1st place "1st post of the page "Welcome!" of March 2022, with 108 likes, 22 comments, 33 shares and 4 saves, achieving 167 interactions.

Table 1 - Analysis of the metrics of the most relevant publications of 2022

POST	TANNED	COMMENTS	SHARES	BAILOUTS	INTERACTIONS
1st post of the page "Welcome!"	108	22	33	4	167
Diversity and Inclusion Affirmative Action Team	69	18	23	2	112
That Richarlison is is a fact, but do you know who is the ace of the economy that strengthens Brazil-silll?	73	18	16	2	109
Terra Rica Settlement: Rich Creek	74	23	6	2	105
If the countryside doesn't plant, the city doesn't dine	45	12	23	4	84

Source: *Authored by the authors*, 2023.

The publications with the most interactions in 2023, in the second year of the project, were, respectively, in 5th place "This Barbie is: Family Farmer" published in July 2023, obtained 80 likes, 14 comments, 10 shares and 3 saves, totaling 107 interactions; in 4th place "Janja's Outfit in Possession had details in golden grass made by artisans from Tocantins" from January 2023, which reached 88 likes, 11 comments, 8 shares and 1 save, totaling 108 interactions; in 3rd place "Family Farming Day" of July 2023, which reached 105 likes, 12 comments, 5 shares and 3 saves, resulting in 125 interactions; in 2nd place "Productive backyards and female autonomy" of July 2023, with 114 likes, 18 comments, 10 shares and 6 saves, resulting in 148 interactions and; in 1st place "Top 5 most produced fruits in the settlement of Córrego Rico" of February 2023, with 116 likes, 22 comments, 11 shares and 3 saves, achieving 152 interactions.

Table 2 - Analysis of the metrics of the most relevant publications of 2023

POST	TANNED	COMMENTS	SHARES	BAILOUTS	INTERACTIONS
Top 5 most produced fruits in the settlement of Córrego Rico	116	22	11	3	152
Productive backyards and women's autonomy	114	18	10	6	148
Family Farming Day	105	12	5	3	125
Janja in Possession's outfit had grass details made by artisans from Tocantins	88	11	8	1	108
This Barbie is: Family Farmer	80	14	10	3	107

Source: *Authored by the authors*, 2023.

The publications with the most interactions in the period of one year were, respectively, in 5th place "That Richarlison is is a fact, but do you know who is the ace of the economy that strengthens Brazil-silll?" of December 2022, which reached 73 likes, 18 comments, 16 shares and 2 saves, resulting in 109 interactions; in 4th place "Diversity and Inclusion Affirmative Action Team" of November 2022, with 69 likes, 18 comments, 23 shares, 2 saves, resulting in 112 interactions; in 3rd place "Family Farming Day" of July 2023, which reached 105 likes, 12 comments, 5 shares and 3 saves, resulting in 125 interactions; in 2nd place "Productive backyards and female autonomy" of July 2023, with 114 likes, 18 comments, 10 shares and 6 saves, resulting in 148 interactions and; In 1st place "1st post of the page "Welcome!" of March 2022, with 108 likes, 22 comments, 33 shares and 4 saves, achieving 167 interactions.

Table 3 - Analysis of the metrics of the most relevant publications in the period of one year

POST	TANNED	COMMENTS	SHARES	BAILOUTS	INTERACTIONS
1st post of the page "Welcome!"	108	22	33	4	167
Productive Factors and Women's Autonomy	114	18	10	6	148
Family Farming Day	105	12	5	3	125
Diversity and Inclusion Affirmative Action Team	69	18	23	2	112
That Richarlison is is a fact, but do you know who is the ace of the economy that strengthens Brazil-silll?	73	18	16	2	109

Source: *Authored by the authors*, 2023.

Although the engagement of the posts varied, it was possible to see that between 2022 and 2023 the number of interactions potentially increased. Because, in view of the 5th relevant publication of 2022 that has 84 interactions, in the following year the relevant post with the lowest sum of likes, comments, saves and shares reached 107 interactions. Soon, the content of the *Instagram* profile was recognized by *the algorithm* as relevant and was "delivered" to more people, so the engagement of the account *@amaar_projeto* increased.

Information about the agroecological management that occurs in *the locus* of family farming was published on the *Instagram* profile , and according to IFOAM (2006) this type of production ensures the sustainability and health of the ecosystems and organisms that compose it. In addition to seeking to maintain and increase soil fertility, avoiding the use of fertilizers and chemical pesticides, which contrasts with conventional agriculture usually by large landowners, in which it was seen in the administration of the former president of Brazil, Jair Messias Bolsonaro, that in the first half of the year, 103 dangerous chemical pesticides were released. With this reality, the eight goals of SDG 2 are in retrogression, which occurs for the first time since 2017 (Civil Society Working Group for the 2030 Agenda, 2023). This type of production also maintains the genetic variability of crops, considering that since 2017 plant and animal genetic resources for food and agriculture, protected in the medium or long term in conservation facilities, have decreased from 204,317 to 203,302 (Civil Society Working Group for the 2030 Agenda, 2023). Family farmers also take into account the social and ecological

impacts of the food production system and ensure food security and human well-being, and this penultimate item is very important, given that inflation had a small reduction in 2021 and new growth in 2022, with emphasis on rice, beans, fruits and vegetables. Data from the beginning of 2023 show inflation under control, which needs to be maintained to reverse the setback (Civil Society Working Group for the 2030 Agenda, 2023). Important information based on academic texts, associated with interviews with family farmers in the settlement of Córrego Rico (SP), incorporated and published in illustrative cards, with a simple and popular language, showed the public the work of family farmers. It is worth mentioning the publication entitled "Family Farming Day", in which it presented important information from the VII Civil Society Light Report on the 2030 Agenda, referring to Sustainable Development Goals 2 and 13, which are in due order "zero hunger and sustainable agriculture" and "action against global climate change", in which it was the 3rd most relevant publication of 2023, obtaining 125 interactions, in addition to the probable viewers who did not interact but had access to this important information.

3.2 VERIFICATION OF THE EFFICIENCY OF INSTAGRAM AS A TOOL FOR DISSEMINATING THE IMPLEMENTATION OF THE SUSTAINABLE DEVELOPMENT GOALS OF THE 2030 AGENDA THROUGH FEMALE PROTAGONISM AND ORGANIC MANAGEMENT OF PRODUCTIVE BACKYARDS

With the form, 68 responses were obtained from the *followers* who most interacted with the content published on the *Instagram profile (*@amaar_projeto*), from farmers (*with an emphasis on family farmers), professionals in the area and undergraduate and graduate students of agricultural and veterinary sciences. Concretely, 52.9% of the respondents identified themselves as female. In addition, other data generated from the questionnaire relate to the monthly income of those who filled it out, in which 76.5% of the respondents have an income of up to R$2.9 thousand and predominantly, the respondents have completed high school or incomplete higher education (51.5%).

The followers' responses indicated that the promotion on Instagram was able to publicize the adoption of sustainable practices by family farmers in productive backyards, which help in the implementation of the SDGs of the 2030 Agenda. In question 4, 98.52% of followers say that it is "very important" for family farmers to contribute to the practice of the 2030 Agenda because they promote the consumption of organic food in their family and community and help fight hunger. The other alternatives were: "help their family and community to consume safe and nutritious foods that are important for everyone's health.": very important (98.52%); "combat gender inequality at work.": very important (92.64; "They practice agriculture that avoids climate change.": very important (91.17%). These results are consistent with the studies by Arora et al (2019), Nunes et al (2018) and Sohn, Ardigo and Peixe (2022), demonstrating how social networks can help in scientific

dissemination.

Regarding item 1, in which he questioned whether the posts on his *Instagram* profile demonstrate that family farming is related to: food for all - 100% rated it as "very important"; protection of the environment - "very important" (95.58%), "partially important" (2.94%), "neither important nor insignificant" (1.47%); favoring health - "very important" (86.76%), "partially important" (11.76%), "not even important, nor insignificant" (1.47%); help the family economically - "very important" (95.58%) and "partially important" (4.41%).

Regarding item 2, in which she asked if it is possible to perceive on the Instagram profile that women are very important in family farming, why: farmers take care of the management of productive backyards - 98.52% evaluated it as being "very important" and 1.47% as "partially important"; women have mastered a knowledge of the most viable plants for cultivation in productive backyards - 94.17% ("very important") and 5.88% ("partially important"); women manage the household income for the purchase of food - 91.17% ("very important"), 7.35% ("partially important") and 1.47% ("neither important nor insignificant"); Female farmers are responsible for taking care of the family and productive backyards have a wide variety of food types - 97.05% ("very important") and 2.94% ("partially important").

Regarding item 3, in which he inquired whether sustainability was mentioned in the account and that this is applied in the production of food by family farmers due to the non-use of pesticides, which protects: groundwater and water - 100% determined as "very important"; the life of bees and other pollinating insects - 92.64% ("very important") and 7.35% ("partially important"); family and community health - 97.05% ("very important") and 2.94% ("partially important"); The planet of climate change - 88.23% ("very important") and 11.76% ("partially important").

Regarding item 4, in which it was questioned in the publications in which it was shown that family farmers contribute to the practice of the 2030 Agenda, due to: contribute to the end of poverty - was defined by 86.76% of the respondents as "very important", 11.76% "partially important" and 1.47% "neither important nor insignificant"; promote the consumption of organic food in their family and community and also help fight hunger - 98.52% "very important", 1.47% "partially important"; help their family and community consume safe and nutritious foods that are important for everyone's health - 98.52% "very important" and 1.47% "partially important"; combat gender inequality at work - 92.64% "very important", 4.41% "partially important" and 2.94% "neither important nor insignificant"; help preserve water resources - 91.17% "very important" and 8.82% "partially important"; work to reduce inequalities - 89.70% "very important" and 10.29% "partially important"; contribute to the formation of a sustainable society - 98.52% "very important" and 1.47% "partially important"; practice agriculture that avoids climate change - 91.17% "very important", 7.35% "partially important" and 1.47% "neither important nor insignificant"; collaborate in the protection of

animals and plants - 94.17% "very important" and 5.88% "partially significant".

Respectively, in item 5, it was questioned whether the profile talked about female protagonism, which is when women in family farming stand out for: assisting in the family's income - being evaluated by 94.17% as "very important" and 4.41% "partially important"; providing organic and healthy food with a wide variety - 89.70% "very important" and 10.29% "partially important"; mastering a knowledge of more viable plants for cultivation in their backyards productive - 94.17% "very important", 5.88% "partially important"; help protect the environment by avoiding the use of pesticides - 91.17% "very important" and 8.82% "partially important"; these mothers pass on to their daughters their knowledge about land management - 95.58% "very important", 2.94% "partially important" and 1.47% "partially insignificant"; Sow hope for a better world - 89.70% "very important", 8.82% "partially important" and 1.47% "neither important nor insignificant".

In the last item, the sixth question, readers were asked if in the profile *@amaar_projeto* it was disclosed that in productive backyards, women grow organic food that is sold at agroecological fairs, generating: increase in household income - evaluated by 97.05% of respondents as "very important" and 2.94% "partially important"; purchase of safe and healthy food for the community - 98.52% "very important" and 1.47% "partially important" important"; the fight against gender inequality and respect for women - 95.58% "very important", 2.94% "partially important" and 1.47% "partially insignificant"; Respect for human rights and sustainability - 92.64% "very important" and 7.35% "partially important".

The scientific information that has been transformed into publications on *Instagram*, in which they deal with the urgency of meeting the important Sustainable Development Goals of the 2030 Agenda, has the capacity to disseminate science through this virtual environment and has the potential to attract the reader to the world of science, promoting a feeling of integration with the current world and complementing formal education. in which it was confirmed by Lins (2019).

Therefore, almost 100% of the 68 respondents to the questionnaire agreed with the content that was provided to them on the Instagram platform, from the @amaar_projeto profile. In which, in the posts, the work that family farmers perform in their productive backyards was presented.

However, it is impossible to ignore that the work of family farmers suffers some impasses and does not reach its maximum development due to limitations, as mentioned by Moraes and Oliveira (2017), such as small-scale production, instability due to low managerial training, scarcity of scientific research in organic agriculture, lack of public technical assistance, greater demand for labor, financial difficulties encountered during the conversion process, difficulties in accessing bank credit, certification and monitoring of requirements, and negative environmental effects such as, for example, drift by neighbors who use pesticides.

4 CONCLUSIONS

According to the results obtained in the present study, it is concluded that *Instagram* is, in fact, an effective tool for the scientific dissemination that the productive backyards of family farming, through female protagonism and the agroecological management that operates, contribute to the implementation of the Sustainable Development Goals of the 2030 Agenda. Thus, it is possible for the followers of this social media, remotely, to acquire information regarding the urgency of meeting the SDGs of the 2030 Agenda and the ways to implement them.

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Instructional design and its contribution to the effectiveness of self-directed learning

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ABSTRACT
In a dynamic global context, self-directed learning emerges as an essential competency, requiring lifelong skills such as self-management, autonomy, responsibility, and self-discipline. This chapter discusses the interaction between self-directed learning and instructional design, emphasizing the pivotal role of the latter in effectively facilitating the self-directed process. The discussion is grounded in a comprehensive literature review, providing a theoretical overview based on contributions from renowned authors in the field. We address examples of educational institutions, highlighting successful practices of self-directed learning supported by instructional design, with a focus on the experience of the Open University of Brazil (UAB). Additionally, this chapter reflects on the methods employed by these institutions to optimize self-directed learning, showcasing the effective integration of instructional design into the curriculum structure. It is concluded that instructional design serves as a significant strategic partner in promoting self-directed learning, outlining guidelines for the selection of suitable educational resources and fostering student autonomy and self-management. Thus, this chapter contributes to a broad understanding of the synergy between self-directed learning and instructional design, offering valuable insights for professionals, researchers, and educators committed to promoting educational excellence at advanced levels of instruction.

Keywords: Instructional design, Self-directed learning, Autonomy, Self-management.

1 INTRODUCTION

The educational environment has recently undergone substantial transformations, driven in large part by the spread of new technologies and the growing demand for flexible and accessible

educational modalities. In this dynamic scenario, self-directed learning has proven to be an effective strategy, empowering students to take control of their own learning processes. However, successful implementation of this approach requires careful instructional design planning to ensure effectiveness in students' self-directed learning journey.

Self-directed learning, as outlined by Towle and Cottrell (1996), is a process in which the student plays an active role in his or her learning, setting goals and objectives, selecting and evaluating resources, and determining his or her own pace of study. This approach emphasizes the learner's responsibility and autonomy in the educational process, promoting the simultaneous development of self-management and self-discipline skills (Ganda; Boruchovitch, 2018). From this perspective, the learner is recognized as the central agent of his or her own teaching-learning experience, assuming full responsibility for all the steps involved in this process (Towle; Cottrell, 1996).

Self-directed learning, perceived as a skill that can be developed throughout life, stands out as an effective learning modality, allowing students to adapt their learning process to their individual needs (Campos, 2022; Schlochauer, 2012). This paradigm highlights the inherent flexibility of self-directed learning, highlighting its potential for personalization of the educational process.

On the other hand, instructional design as defined by Sanches *et al.* (2018), is a strategic process of planning and developing didactic materials aimed at facilitating teaching and learning. This process aims to ensure the effectiveness, efficiency and attractiveness of the materials, optimizing the achievement of the learning objectives by the student. In the specific context of self-directed learning, instructional design plays a key role in bringing the self-directed process to fruition.

In the context of self-directed learning, instructional design, according to Moore and Kearsley (2012), can positively influence self-directed learning by assisting in the selection of appropriate pedagogical resources and by creating an environment conducive to the development of students' autonomy and self-management. In addition, instructional design's ability to establish clear and achievable goals for students, as highlighted by Andrade and Santos (2020), enables learners to clearly understand expectations, effectively monitoring their own progress on the self-directed pathway.

Thus, this chapter proposes to explore the intersection between self-directed learning and instructional design, highlighting the theoretical and practical contributions of these components in the contemporary educational context.

2 CONTRIBUTION OF INSTRUCTIONAL DESIGN TO SELF-DIRECTED LEARNING

Instructional Design (ID), when properly configured, is a component of paramount importance in the optimization of self-directed learning, playing a crucial role in providing guidance and support during the teaching-learning process. According to the approaches of Mendes (2022), Macedo and Bergmann (2018) and Driscoll (2005), the need for instructional design to be designed with student

orientation is highlighted, aligning with their learning journey, and providing them with a clear structure for the effective conduction of the learning process.

A relevant strategy employed by instructional design in promoting self-directed learning lies in the creation of personalized learning environments. According to Kearsley and Shneiderman (1998), such environments allow learners to access learning content that is intricately tailored to their individual needs and interests. In addition to personalization, these environments have the ability to provide personalized *feedback*, constituting an effective tool for learners to monitor their progress and adjust their learning trajectory according to their specific goals and needs.

It is noteworthy that the creation of personalized learning environments, as suggested by Kearsley and Shneiderman (1998), represents a significant advance in the integration of instructional design with self-directed learning. This approach not only addresses the diversity of learners' demands and preferences, but also fosters deeper engagement and active participation, aligning with the fundamental principle of learner autonomy in the educational process.

Feedback plays a relevant role in the context of self-directed learning, as it enables the student to evaluate their own progress and make adjustments in their learning process. Nicol and Macfarlane-Dick (2006) highlight the importance of this element by emphasizing that *feedback* not only serves as an indicator of student achievement but also plays a crucial role in identifying areas for improvement, as well as identifying resources that can effectively contribute to educational development.

In this context, the full understanding and application of *feedback* in self-directed learning, as addressed by Nicol and Macfarlane-Dick (2006), contributes significantly to the student's self-development, by providing valuable insights for continuous improvement and personalized guidance, thus strengthening the learner's autonomy and self-management in the educational process.

The primary strategy employed by instructional design to support self-directed learning is the incorporation of educational technologies. As discussed by Souza *et al.* (2023), these technologies offer a wide variety of features and activities that make it possible for students to access autonomously, with the advantage of customization to meet their individual needs. In addition, educational technologies play an important role in providing immediate *feedback*, enabling learners to monitor their own performance.

In this context, the Virtual Learning Environment (VLE) stands out as a crucial piece, whose design must be meticulously planned to provide effective *feedback* to students about their progress and performance, as advocated by Obilor (2019). The VLE, by offering *feedback mechanisms*, not only stimulates reflection on the learning process on the part of students, but also instigates them to identify specific areas that require improvement. It is worth noting that adaptive systems, as described by Barbosa and Beserra (2015), have the ability to provide *feedback* in an automated manner, adjusting the complexity and content of instruction based on the student's individual performance.

As proposed by Mucundanyl (2021), assessment should be strategically planned to reflect the learning objectives set by the learner, allowing them to demonstrate their knowledge and skills in a meaningful and self-directed manner. The diversification of assessment strategies, such as self-assessment activities, individual or group projects, and the use of digital portfolios, enables learners to document their own progress and learning, providing a holistic and personalised approach to assessment in self-directed learning (Mucundanyl, 2021).

Thus, the integration of educational technologies, the effective design of the VLE and the careful formulation of assessment strategies converging with the principles of self-directed learning highlight the complexity and scope of the role played by instructional design in the contemporary educational context.

The University of Phoenix, located in the United States, represents an educational paradigm that prominently incorporates self-directed learning with the support of instructional design, evidencing an innovative approach in the distance learning scenario. Specializing in offering an extensive range of online undergraduate and graduate degrees, the institution embraces self-directed learning as one of its core principles, providing students with the opportunity to set their own goals, select appropriate resources, and set the pace of individual study (Molina, 2007).

The educational philosophy of the University of Phoenix promotes student autonomy by instigating them to take control of their learning process. This approach is made possible through flexible and personalized instructional design, as highlighted by Molina (2007). This personalization is evidenced by the use of multimedia and interactive resources, which are essential to allow students to navigate their educational paths according to their preferences and own pace.

The use of technological resources plays an important role in the implementation of this educational approach at the University of Phoenix. Information Technology (IT) tools, such as online learning platforms, discussion forums, and video conferencing, are key elements in delivering an engaging and personalized learning experience. These technologies enable synchronous and asynchronous interactions, providing students with access to teaching materials and support resources at any time and place, aligning with the principles of educational flexibility and convenience (Molina, 2007).

The technological approach adopted by the University of Phoenix aims to enhance the effectiveness and efficiency of the learning process. The emphasis on flexibility seeks to meet the diversity of student profiles and contexts, making education more accessible and convenient. According to Molina (2007), the institution emerges as a representative example of how the synergistic integration between self-directed learning and instructional design can transform educational dynamics, providing a more adaptable and inclusive educational experience within the scope of distance learning.

The University of British Columbia (UBC), situated in Canada, is recognized worldwide for its innovative approach to teaching and learning. Recognized for its comprehensive offering of undergraduate and graduate courses and programs, both face-to-face and online, UBC embodies self-directed learning as a core principle, giving students an active role in their own education. Under the tutelage of instructional design, UBC establishes a framework that empowers students to set individual goals, select pertinent resources, and move forward at their own pace, thereby fostering an educational experience tailored to individual needs (Lima Jr., 2018).

UBC's strategy to promote self-directed learning comprises several instructional design initiatives, among which the adoption of Open Educational Resources (OER) stands out. OER, teaching materials freely available on the internet, represent an innovative approach in enabling universal access to high-quality educational resources. UBC, recognizing the potential of OER, maintains an extensive online library that spans a variety of disciplines. It can be seen, therefore, that the integration of technology is evident in the virtual learning environment (VLE), as it provides students with the ability to access educational materials, interact with peers and teachers, and perform online assignments and assessments (Conrad; Openo, 2019).

Project-based learning represents another strategy adopted by UBC to promote self-directed learning. In this approach, students are challenged to apply the knowledge gained in the disciplines to projects relevant to their lives and careers. This practice not only encourages the practical application of the concepts learned but also nurtures students' autonomy and self-discipline throughout the learning process.

In summary, UBC stands out as an example of how instructional design can be skillfully employed to promote self-directed learning. The diversity of strategies adopted by UBC creates a learning environment that not only encourages autonomy and responsibility but also develops essential life and career skills for students. In this context, the university positions itself as a benchmark in the successful integration of advanced pedagogical principles and educational technologies to optimize the educational experience of students.

The University of Porto (UP), located in Portugal, stands out for actively adopting the approach of self-directed learning in its courses, notably evidenced in the Master's Program in Adult Education and Training (MEFA). The main objective of this program is to develop students' capacity for self-managed learning, based on the conviction that adult learners have the intrinsic ability to take responsibility for their own learning process. In this context, the role of the educator in PU is conceived as providing essential guidance and support for students' self-directed journey (Portugal, 2016).

The structure of MEFA at UP is designed based on pedagogical principles that foster critical reflection, problem analysis, and the development of self-management and self-discipline skills. This pedagogical approach aims to cultivate not only the assimilation of knowledge, but also intellectual

autonomy and the capacity for self-regulation in learning. The emphasis is on the creation of an educational environment that fosters the active construction of knowledge by students, thus aligning with the paradigm of self-directed learning (Portugal, 2016).

In order to effectively promote self-managed learning, UP adopts several innovative practices. Undertaking research projects is an outstanding strategy, providing students with the opportunity to apply the concepts learned in practical and challenging contexts. In addition, the institution actively encourages students' participation in academic events, such as conferences and workshops, to further enrich their educational experience and promote the exchange of knowledge.

In addition, UP invests in offering student support services to strengthen self-managed learning. Personalized tutorials and academic guidance are made available to assist students in their learning process, consolidating the institution's mission to be an active facilitator in the development of students' self-directed capacities.

In this way, the University of Porto stands out as an emblematic example of how self-directed learning can be successfully implemented in higher academic programs. By integrating theory and practice, promoting students' active participation in academic research and events, and offering personalized support, UP demonstrates a robust commitment to excellence in education and the development of self-directed skills in its students.

The University of Central Florida (UCF), in the United States, stands out for integrating the approach of self-directed learning into its undergraduate courses, notably evidenced in the Interdisciplinary Individual Studies (IDS) course. This program offers students the unique opportunity to design their own study plan, aligning it with their interests and professional goals. Although UCF provides guidance and support, it is paramount to emphasize that the responsibility for the learning process rests entirely with the student (UCF, 2019).

Parallel to the University of Porto (UP), UCF adopts pedagogical practices that foster self-managed learning among its students. Faculty at UCF are encouraged to employ teaching approaches that promote autonomy, such as the use of research projects, group discussions, individual assignments, and hands-on activities. These strategies aim to create learning environments that encourage student self-regulation, promoting active and reflective participation in the educational process.

UCF, similarly to UP, recognizes the importance of providing student support to strengthen self-directed learning. The university offers a range of resources, including tutoring services, career guidance, and academic counseling. These services are designed to complement the student's role as an active agent in their educational process, offering strategic support to enhance their self-directed skills.

In summary, both UP and UCF converge in incorporating the self-directed learning approach into their courses and degree programs. Both institutions stand out for encouraging students'

responsibility and autonomy in their own learning process, while providing guidance and support for their educational trajectories. This convergence reveals the global relevance and growing acceptance of self-directed learning as a vital component in the contemporary landscape of higher education.

The Lemann Foundation stands out as an exemplary institution in promoting self-directed learning, implementing innovative strategies and a hybrid educational model that incorporates advanced technologies. The institution has adopted a model that combines face-to-face classes with the prominent use of learning technologies, notably the LEARN platform. This platform not only provides content in various formats, but also provides an interactive environment, facilitating communication between students and teachers (Lemann, 2020).

The Lemann Foundation's hybrid model represents a contemporary approach that capitalizes on the synergy between face-to-face instruction and the strategic use of technological resources. The LEARN platform, by offering content in a variety of formats, not only meets diverse learning preferences, but also encourages student autonomy by allowing them to choose the most appropriate format for their learning style.

In addition, the Lemann Foundation adopts a student-centered pedagogical approach, reinforcing the active participation of students in their own learning process. This approach not only emphasizes the importance of student autonomy but also promotes the development of self-directed skills, which are essential for addressing contemporary educational challenges.

In the field of self-directed learning, the Lemann Foundation stands out not only for its commitment to educational innovation, but also for recognizing and incorporating learning technologies as catalysts for student autonomy and self-management. This initiative reinforces the idea that self-directed learning can be enhanced through innovative pedagogical approaches and the effective integration of educational technologies.

The Open University of the United Kingdom (OUUK) stands out as a higher education institution committed to providing high-quality distance education opportunities for everyone who wants and has the ability to study. OUUK's educational structure is characterized by the availability of various resources, such as printed study materials, online content, tutorials, and discussion forums. In addition, students are encouraged to progress at their own pace, tailoring the learning process to their individual needs. Educational support at OUUK includes individual and group tutoring sessions, providing personalized *feedback* and support throughout the learning journey (Maia; Meirelles, 2002).

OUUK's approach is based on the belief that self-directed learning is an effective strategy for lifelong learning. By adopting this practice, the institution seeks to empower students to become independent and autonomous in their learning, developing fundamental skills, such as critical thinking and problem-solving, that are essential for professional success. However, recognizing the challenges inherent in self-directed learning, especially for those less familiar with this approach, OUUK offers

ongoing support to students. This encompasses regular tutorials, personalized *feedback*, and technical assistance, ensuring that learners can overcome challenges and achieve success in their self-directed learning journey (Maia; Meirelles, 2002).

OUUK stands out as a benchmark in distance education and self-directed learning, reinforcing its commitment not only to the dissemination of knowledge, but also to the continuous development and autonomy of students in their pursuit of lifelong learning.

Finally, another institution that uses instructional design as a strategy to promote self-directed learning is the Open University of Brazil (UAB). UAB is a program of the Ministry of Education (MEC) that aims to democratize access to higher education by offering undergraduate and graduate courses in the distance modality. UAB is composed of a network of public higher education institutions that offer undergraduate and graduate courses in the distance modality throughout the national territory (Santos, 2011).

Self-directed learning is one of the guiding principles of the methodology adopted by UAB. In line with this principle, the institution implements pedagogical strategies aimed at student autonomy and independence. One of these strategies is the offer of virtual classes, which allow the student the flexibility to study at their own pace and at the most convenient times. In addition, UAB's courses are offered in a virtual learning environment and are meticulously planned to provide a flexible and personalized learning experience. Students have access to a variety of learning materials, including videos, texts, animations, educational games, and discussion forums. Autonomy is encouraged, allowing students to establish their learning objectives, select the most pertinent teaching materials and interact with peers and tutors through synchronous and asynchronous communication tools, search for information from different sources, compare them and produce a text or presentation that reflects their understanding of the subject (Oliveira, 2014).

Virtual discussion forums are a common practice at UAB, providing interaction between students and professors to exchange ideas and clarify doubts. This collaborative interaction stimulates the development of students' self-management and self-discipline (Oliveira, 2014).

UAB's instructional design includes several actions, from the elaboration of concept maps for the organization of knowledge to the provision of self-assessment activities, allowing students to monitor their own learning. Adaptive systems adjust the content and difficulty of instruction according to student performance. In addition, the assessment of learning is promoted through individual and group projects, written assignments, and presentations, encouraging critical reflection and the practical application of knowledge (Santos, 2011).

In summary, UAB adopts self-directed learning as a central pillar in its distance learning methodology, recognizing it as essential for the development of the student's autonomy and responsibility in their own learning process, preparing them for the challenges of academic and

professional life. The institution stands out as an exemplary model of effective integration between instructional design and self-directed learning in distance education.

3 FINAL THOUGHTS

In view of the above, the unequivocal conclusion emerges that self-directed learning is a paradigmatic approach that emphasizes the responsibility and autonomy intrinsic to the learning process. In this context, students assume full responsibility for planning, controlling and evaluating their own educational trajectory, outlining, autonomously, strategies for searching for information and resources. This learning modality undeniably proves to be highly effective for intrinsically motivated and self-disciplined students, although it presents considerable challenges for those who face difficulties in time management and maintaining intrinsic motivation. For this approach to be effective, careful instructional design planning is imperative, and it should be guided by the individual nuances of the learner and their learning trajectory. Additionally, the incorporation of learning technologies emerges as a valuable tool, providing personalized resources and activities, meticulously aligned to the individual needs of students.

Within the framework of an online course aimed at continuing education of professionals, self-directed learning reveals itself as a particularly auspicious proposal. The inherent advantages of such a modality include the flexibility of time and place of study, allowing students to adapt the course to their own needs and responsibilities. In addition, the continuous accessibility of the course, at any time, gives students the opportunity to shape their learning process according to their individual pace. However, it is imperative to consider that this learning modality requires a substantial investment of effort and self-discipline on the part of students, a determining element for successful performance.

In the process of designing said course, the instructional designer takes a crucial role in incorporating strategies and resources designed to assist students in setting learning goals, monitoring progress, and autonomous assessment. This professional, in a proactive way, can provide structured guidance for students to identify resources and sources of relevant information, in addition to developing activities that stimulate critical reflection and practical application of the content absorbed. In summary, instructional design designs a structure and offers direction that guides students through the intricate process of self-directed learning, giving substance to its effectiveness.

Therefore, the magnitude of instructional design in the implementation of self-directed learning is emphasized, highlighting its fundamental role in the success of teaching and learning processes in the context of distance education. In addition, educational institutions are urged to embrace flexible and personalized approaches, enabling students to take full control of their learning process, while providing the guidance and resources essential for the autonomous achievement of their educational goals. In this scenario, educational institutions emerge as essential facilitators in the cultivation of

autonomy and responsibility intrinsic to the learning process, thus shaping professionals endowed with the inherent ability to face the multifaceted challenges of the contemporary scenario.

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Innovations and challenges in the production of hard seltzers

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ABSTRACT
Hard seltzers, standing out in the global alcoholic beverage industry, are prized for their lightness, refreshing taste, and moderate alcohol content. Meeting the demand for healthier beverages, these low-calorie water- and cane sugar-based fermented beverages have gained popularity, especially with the growing concern for health and wellness. In the United States, following regulatory changes in 2016, the launch of the first hard seltzer marked the beginning of a new beverage category, with a notable increase in sales during the Covid-19 pandemic.
Production involves a careful fermentation process, with an emphasis on choosing the sugar source and using specific yeasts, such as Saccharomyces cerevisiae, to ensure quality and flavor. Sensory challenges are overcome with the addition of ingredients to enhance the taste while maintaining the healthy profile. The vital role of yeasts and the need for proper nutrition are critical to the success of the fermentation process. Hard seltzers, combining health, taste and innovation, promise a dynamic future in the beverage industry.

Keywords: Hard Seltzer, Alcoholic Beverages, Alcoholic Fermentation, Saccharomyces cerevisiae, Beverage Innovation, Yeast Nutrition.

1 INTRODUCTION

The production of alcoholic beverages has played a key role in the food and beverage industry, capturing a significant share of the global market. Among the various beverage categories, *hard seltzers* have emerged as a popular option, characterized by their lightness, refreshing taste, and moderate alcohol content. The growing demand for healthier alcoholic beverage alternatives with diversified flavors has driven the research and development of effective production methods, as most of the *hard seltezers* present in the Brazilian market are mixtures of various ingredients, such as grain alcohol, spirits, extracts, flavorings, and other products.

2 HARD SELTZER: MARKET AND DEMAND ASPECTS

The demand for drinks with fewer calories is growing around the world, this is because there is a greater concern about overweight, obesity, diabetes, and cardiovascular disease (Contreras-López et al. 2021).

Hard *seltzers* help meet this demand, being perceived as a healthier alternative to other alcoholic beverages. They have fewer carbohydrates than beers and have about 100 calories, while beers can reach up to 175 calories. (Harper, 2023). They are fermented beverages based on water, cane sugar and flavored, containing, predominantly, an alcohol content between 4% (v/v) to 5% (v/v). It is also necessary to use yeast nutrients to feed the yeast, which may contain, if necessary, the addition of acids and a stabilizing agent (Colby, 2020).

In the United States, in 2016, after the release of the TTB (Alcohol and Tobacco Tax and Trade Bureau*) regulation, which allowed the replacement of all malt used in the production of beer with sugar (TTB, 2015), the first* hard seltzer was launched on *the* market. The Mark Anthony Group launched White Claw (Colby, 2020), thus creating a new beverage that was categorized as beer according to American laws

In 2019*, hard seltzer sales in the United States reached $1.3 billion, accounting for 58% growth in the beer category (OGLESBY, n.d.). During the Covid-19 pandemic, the consumption of hard seltzer* was driven by generation X, with the concern of consuming healthier products and entertainment at home. Two examples of this growth are the sales of White Claw Hard Seltzer, which grew by *145%, and* Truly Hard Seltzer, *which grew by 614%, comparing 2020 compared to 2019 (IRI, 2021).*

3 THE PRODUCTION PROCESS OF HARD SELTZER

According to Colby (2020), there is a standard procedure for the production *of seltzer*, in which a solution of water and sugar is prepared by boiling or heating the solution so that the sugar is solubilized and the solution becomes homogeneous. Near the beginning of boiling, yeast nutrients are added. After boiling, after the solution has cooled, vitamins may or may not be added, and then the fermentation procedure begins.

First, it is important to select the right sugar source. Several options are available for the production of a *hard seltzer*, including dextrose, sucrose, liquid invert sugar, agave syrup, and honey, among others (LALLEMAND, 2020). The choice of sugar source can impact the speed of fermentation, with monosaccharide sugars tending to ferment faster (SCOTT LABORATORIES, 2021).

Fermentation is the most sensitive step in achieving success in the manufacture of a *hard seltzer.* It is possible to use brewer's yeasts or even yeasts for winemaking. The key to this success is adding the appropriate level of yeast and nutrients. It is common for fermentation to last between 8 to 11 days,

but if you do not have the right amount of nutrients available for the yeast, it can be even slower (COLBY, 2020).

Selecting strains that are suitable for fermentation is important, as yeast plays a vital role in the production of alcoholic beverages. Suitable strains will maximize ethanol yield and maintain the sensory quality of the beverage. In the production of alcoholic beverages, the strains of *Saccharomyces cerevisiae* are the most used (WALKER, STEWART, 2016).

After the fermentation of the water and sugar base, for the production of *a hard seltzer*, it is expected that it is colorless, with a neutral aroma and flavor, for this, after fermentation, cleaning is carried out, either by filtration, clarification or centrifugation. If the alcohol content is higher than intended, the solution is diluted in water. In the final stage, hard *seltzer* is mixed with flavors and acids and pasteurized. If pasteurization is not carried out, a stabilizer or preservative should be used. And so it will be ready for filling (Colby, 2020).

4 SENSORY CHALLENGES AND FLAVOR ENHANCEMENT

According to WILLIAMS, et al. (2022), the final taste of hard seltzer usually does not please most consumers due to negative sensory characteristics, and may have bitter and sour flavors. The addition of ingredients such as food-grade acidulants, mineral salt, flavorings, sweeteners, colorings, preservatives, emulsifiers, antioxidants, amino acids, caffeine, micronutrients, plant extracts, phytonutrients, buffering salts, stabilizers, thickening agents, vitamins, and their combinations can enhance the taste and attractiveness of a beverage. It has been observed that the inclusion of at least one mineral salt, selected from mineral bulks, trace minerals or their combinations, can improve the flavor profile of the beverage compared to a version without mineral salt added. In addition, combinations of at least one food acidulant, such as acetic acid, lactic acid, malic acid, fumaric acid, citric acid, tartaric acid, phosphoric acid, succinic acid, alkaline or alkaline earth metal salts, along with at least one mineral salt, can further enhance the flavor of the beverage. However, it's important to note that the inclusion of these ingredients can move the drink away from the category of healthy options.

5 THE ROLE OF YEAST: SACCHAROMYCES CEREVISIAE

Yeasts are unicellular eukaryotic fungi, and *Saccharomyces cerevisiae* are usually ellipsoids with a diameter of 5 to 10 µm (WALKER, 1998). Its properties, such as flocculation, fermentation capacity, osmotic pressure, ethanol tolerance, and oxygen requirements have a direct impact on fermentation performance (STEWART, 2016). *Saccharomyces* are able to use different sugars as a source of carbon and energy, preferentially consuming glucose and fructose (CARLSON, 1987), with glucose being the main source of carbon and energy (BEKATOROU et al., 2006). *Saccharomyces*

cerevisiae is one of the species most prone to fermentation, producing ethanol even with excess oxygen, in addition to exhibiting rapid rates of sugar consumption and ethanol production. *Saccharomyces cerevisiae* is also one of the few yeast species that can grow in anaerobic conditions with low nitrogen requirements. These physiological characteristics explain the aptitude of *Saccharomyces cerevisiae* for alcoholic fermentation (VISSER et al. 1990).

6 YEAST NUTRITION AND HEALTH

For its alcoholic fermentation, yeast essentially needs water. Mediums with high sugar content can cause osmotic stress, which would be the low availability of water, affecting your cellular physiology. In terms of temperature and pH requirements, most strains of *Saccharomyces cerevisiae* grow well in hot and acidic environments (WALKER, STEWART, 2016).

Unlike beer or wine fermentation, sugar-based fermentations have near-zero buffering capacity. As a result, the CO_2 produced by the fermenting yeast will react with the water to form carbonic acid (H_2CO_3) resulting in a rapid drop in pH in the absence of any buffer. To maintain optimal yeast health during fermentation, the pH should be kept between 3.5 and 4.0. This can be achieved by adding potassium bicarbonate (K_2HCO_3) as a buffer (LALLEMAND, 2020).

For the metabolic growth of yeasts, it is essential to have an adequate nutritional composition (WALKER, STEWART, 2016). These conditions are provided, for example, by malt mash, which is a source of nitrogen, minerals and most of the vitamins that yeast needs for good fermentation, such as riboflavin, inositol and biotin. Minerals such as phosphorus, sulfur, copper, iron, zinc, potassium, calcium, and sodium are also important for yeast. It is possible to improve the performance of yeasts, with nutritional supplements, ensuring that the wort contains the appropriate minerals and vitamins for fermentation (WHITE, ZAINASHEFF 2010). Yeast nutrients are generally divided into two groups, the basic ones being such as carbons, oxygen, hydrogen, and nitrogenous substances and the nutrients needed in small amounts, such as trace elements, macronutrients, and vitamins (VICTOROVNA, et al., 2021).

An important nutrient in yeast fermentation media is nitrogen, which plays an anabolic role in the biosynthesis of structural and functional proteins (enzymes) and nucleic acids, as well as playing a catabolic role in the production of flavor congeners, such as higher alcohols (WALKER, STEWART, 2016).

Oxygen is also an essential growth factor. After aeration or oxygenation before fermentation begins, the yeast membranes are enriched with ergosterol and oleic acid, as a consequence, the cells are much more fermentative and stress tolerant. It is important to pay attention to the oxygenation of the solution to achieve a good fermentation performance, it must be ensured that the fermentation media are adequately aerated or oxygenated before the start of anaerobic fermentation. For example,

brewers typically aim for 1 ppm of dissolved oxygen per degree Plato (P) in their wort before releasing yeast (WALKER, WALKER, 2018).

Careful attention to yeast nutrition is a prerequisite for achieving successful industrial alcoholic fermentations. Nutrient availability will have a significant impact on yeast growth, stress tolerance, and ethanol yields. Due to the lack of inadequate nutrition, problematic fermentations can arise. For example, stalled or slow fermentations can be the result of lack of oxygen, nitrogen deficiencies, mineral imbalances, and vitamin deficiencies (WALKER, WALKER, 2018). In this context, for hard seltzers that use a wort composed of water and sugar, the supply of nutrients is essential (SCOTT LABORATORIES, 2021).

7 FERMENTATION PROCESSES AND CONTROL

Industrial fermentations can occur in continuous and discontinuous processes (BAILEY, OLLIS, 1986). Discontinuous fermentations, or batch fermentations, occur in such a way that during the fermentation process nothing but oxygen is added (in aerobic fermentations), defoamers, and acid or base for pH control. So if no solution is added and there is no loss of liquid by evaporation, the volume of the solution remains the same (CARVALHO, SATO, 2001).

A process that is of great importance to industry and research is the fed batch fermentation, which has been used to regulate the growth of *Saccharomyces cerevisiae* since about 1900. This process occurs when nutrients are added to the fermenter during fermentation, and they remain there until the end of the process. The addition of nutrients can be done continuously or vary over time, and the addition of the wort can also be continuous or intermittent. The occurrence of variations in volume depends on substrate concentration and evaporation. This makes it possible to control the concentration of the substrate, directing the microbial metabolism to a specific metabolic pathway (CARVALHO, SATO, 2001).

8 CONCLUSION

This chapter offered a comprehensive overview of the production and market of hard seltzers, highlighting their rise as a popular alternative in the world of alcoholic beverages. The growing interest in healthier options, with fewer calories and differentiated ingredients, has put hard seltzers in the spotlight, especially in markets such as the United States, where we have seen a significant increase in sales and a remarkable diversification of the products available.

When it comes to production, we cover the essential aspects that make hard seltzers a unique drink. From the judicious choice of ingredients, such as different types of sugars and yeasts, to the challenges of fermentation and techniques to enhance flavor and sensory quality, every step of the

production process is crucial to ensure the lightness, refreshing taste, and moderate alcohol content that define these beverages.

Saccharomyces cerevisiae, in particular, play a central role in fermentation, highlighting the importance of a deep understanding of the characteristics and nutritional needs of these yeasts. Proper nutrition and control of the fermentation process are essential to achieving a high-quality product.

Looking ahead, the hard seltzers industry faces the challenge of balancing the demand for healthier beverages with the need to maintain an attractive flavor profile. Continued innovation in production techniques and ingredients will be key to meeting these expectations and maintaining relevance in the competitive alcoholic beverage market.

As the industry advances, research and development will continue to play a crucial role in exploring new flavors, more efficient production methods, and strategies to improve the nutritional profile of hard seltzers. The intersection of science, technology, and consumer preferences promises a dynamic and exciting future for this beverage category.

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Physical-chemical, thermal and mechanical performance of a polymer blend based on babassu coconut mesocarp starch

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ABSTRACT
The objective was to characterize the physical-chemical, thermal and mechanical properties of a polymer blend based on babassu coconut mesocarp starch, with the addition of glycerin, melamine/formaldehyde. The babassu coconut mesocarp was used as raw material and the plasticizers glycerin, melamine/formaldehyde were added. Thermogravimetric analysis (TGA), Differential Scanning Calorimetry (DSC), Fourier Transform Infrared (FTIR), Visible Ultraviolet (UV-Vis), X-Ray Diffraction (XRD), Scanning Electron Microscopy (SEM) and traction. The polymer blend showed non-homogeneous distribution with irregular and rough undulations, small differences in color and melamine concentrates, presence of starch residues, without pores and fissures. TGA revealed that the degradation ranges of starch and most organic compounds ranged from 210 ºC to 400 ºC. The DSC showed a predominance of endothermic events. The FTIR identified the starch present and the peaks of melamine and glycerin compounds. UV-Vis showed maximum lengths between 220 and 247 nm, and an accentuated shoulder at 281 nm referring to the electronic transitions of the double bonds present in melamine and starch. The blend is amorphous, with points of crystallinity due to starch and/or overlapping with melamine. The tensile mechanical behavior was of the ductile type. It is concluded that the proposed methodology for the formation of a polymer blend based on babassu coconut mesocarp starch showed good results for physical-chemical, mechanical and thermal properties, being an innovative product with possible potential for different applications.

Keywords: Biotechnology, Biofilm, Polymer blend, *Orbignya phalerata*.

1 INTRODUCTION

The palm tree *Orbignya phalerata* Mart. (babassu coconut) is a member of the palm family, present in several countries in Latin America. In Brazil, it is found most frequently in the North,

Northeast, and Midwest regions, mainly concentrated in the states of Maranhão, Tocantins, and Piauí (Da Silva *et al*., 2021; Da Silva Magalhães *et al*., 2022). This species plays an important social, economic, cultural, and environmental role, due to the diversity of products and by-products that can be used for edible and industrial purposes, especially the manufacture of soap, glycerin, paper, handicrafts, cosmetics, fuel, house covering, among others (Vale, *et al*. 2018; De Carvalho *et al*., 2020).

The babassu coconut is made up of three main parts: a fibrous outer layer that is called the epicarp, the middle layer of the mesocarp, and the inner layer of the endocarp, in which the almonds are inserted (Dos Santos *et al*., 2021). The mesocarp is light in color and can be easily reduced to dust and as it ages, it acquires woody stiffness and a reddish-brown color (Zuniga, 2013).

After the mesocarp is extracted, pulverized and resuspended in water, it can be used as a food supplement (Silva *et al*., 2019). Several studies also report its use in the treatment of infectious diseases, due to its proven anti-inflammatory and analgesic properties, being indicated as a healing agent (Batista *et al., 2006), in the treatment of menstrual pain (Sudre* et al., 2015), antitumor (Rennó et al., 2008), antithrombotic (De Lima et al., 2020*), antimicrobial (Barroqueiro* et al., 2016) and in the treatment of rheumatic diseases (Azevedo *et al*., 2007).

As it is an important source of starch, the babassu mesocarp has also been widely used, due to its physicochemical properties, as a thickener, stabilizer, and regulator of functional properties in the body (Da Silva *et al*., 2021). Studies also show its use for the development of biodegradable healing films (Araruna et al., *2021), in the treatment of chronic injuries (Martins* et al., 2006) and as an antioxidant, due to the presence of phenolic compounds (Nascimento et al., 2006).

Starch consists of two anhydroglucose polymers that are organized in a semicrystalline granular structure, with particle sizes ranging from 1 to 100 μm in diameter, being amylose and amylopectin. Amylose is characterized by being a linear homopolymer of α-D-glycopyranose units, joined by glycosidic α-1,4 bonds. Amylopectin, on the other hand, has a branched structure consisting of linear α-D-glucose chains joined by glycosidic bonds α-1.4 and α-1.6 (Farias *et al*., 2019).

In this context, the development of more efficient processes for the study of blends based on babassu coconut mesocarp starch has great biotechnological potential and has been widely used in the pharmaceutical and biomedical industries, due to its high availability, easy access, low cost, important physicochemical properties, such as biocompatibility, biodegradability and non-toxicity, in addition to being favorable for sustainability and biodiversity conservation (Santos, 2021; De Oliveira *et al*., 2022). In the production of these biopolymers, plasticizing agents, such as glycerin and melamine/formaldehyde, can be added to increase elongation and obtain a filmogenic dispersion (Grossman et al., 2007; Espinoza Ñaupari & Oscco Villegas, 2022). The material generated after processing can be analyzed by means of: i) physical tests, such as Scanning Electron Microscopy (SEM); ii) thermal, such as the Thermogravimetric Analysis (TGA) and Differential Scanning

Calorimetry (DSC) method; iii) chemicals, such as Fourier Transform Infrared (FTIR), Visible Ultraviolet (UV-Vis) and X-ray Diffraction (XRD); and iv) mechanical strength, such as traction.

TGA is a technique used to evaluate chemical, physical, and structural changes in a material due to a change in temperature by monitoring the reactions that occur during the heating process (Nurazzi *et al*., 2021). In this way, it detects the modification of the mass as a function of temperature and time, in addition to the carbonized residue, providing information on the thermal stability, oxidation and combustion of compounds.

DSC is a method that measures the thermodynamic properties of biomolecules and nanometer-sized materials by establishing a connection between temperature and the specific physical properties of substances. The instrument used for this technique determines the temperature and heat flux associated with material transitions as a function of time. Therefore, it measures an amount of heat that is irradiated or absorbed excessively, based on the temperature difference between the sample and the reference material (Naziris *et al*., 2021).

FTIR spectroscopic imaging is a promising technique to provide information on the total chemical composition of the material, in which for biological materials the macromolecular content of the sample, such as proteins, lipids, nucleic acids, and carbohydrates, is evidenced. For non-biological materials, such as polymers, FTIR spectra can be used to determine organic functions or inform about chemical changes through functional group analysis (Wang & Wang, 2021).

UV-Vis spectrophotometry is a suitable method to excite and ionize the medium when interacting with polymeric materials. One of the effects of this interaction is the breakdown of chemical bonds and/or the formation of free radicals, which can lead to cross-linking and conjugation of macromolecular chains. One can then observe the changes in the electronic structure, optical properties, and microscopic characteristics of the polymer surfaces (Sousa *et al*., 2019).

SEM is used to observe and analyze the visual characteristics of materials. This procedure provides three-dimensional and high-resolution images, demonstrating information about the structure, morphology, and topography of the sample's surface, and has been used in recent years as an important tool for the study of microstructures (Courson *et al*., 2021).

XRD consists of the emission of electrons at a target, generating the diffraction of energy photons in the order of X-rays capable of producing constructive interference at specific angles. This interaction makes it possible to measure crystallographic planes and the degree of crystallinity in materials (Silva *et al*., 2022). On the other hand, the mechanical strength of a material reflects the relationship between its response or deformation to a force that is being applied, being verified by methods that reproduce these conditions as closely as possible. Thus, among the factors to be considered are the nature of the force used and the duration of its application (Azevedo *et al*., 2016).

Thus, the present study aimed to characterize the physicochemical, thermal and mechanical

properties of a polymeric blend based on the starch of the babassu coconut mesocarp, composed of glycerin, melamine/formaldehyde.

2 METHODOLOGY

2.1 MATERIAL FOR ANALYSIS

The mesocarp of the babassu coconut was used as raw material, a product in powder form from the state of Maranhão, acquired directly from the company União Cultural de Arari, under the commercial name of Mesovital. The descriptions of the nutritional characteristics per 100 g, previously identified on the label of the industrialized product, were as follows: 245.41 Kcal, 70.11 g of carbohydrates, 0.74 g of fiber, 0.20 g of lipids and 1.65 g of proteins.

2.2 OBTAINING THE STARCH AND POLYMER

To obtain the commercial starch, 100 g of babassu coconut mesocarp was washed with 400 mL of distilled water, decanted it in a room atmosphere and then placed in an oven to dry for 24 h at a temperature of approximately 37 ºC. The average yield was around 35 g of mesocarp starch.

For the polymeric blend, masses of 0.3 g of melamine and 0.3 g of formaldehyde were measured, followed by 25 mL of distilled water, followed by controlled heating at 60 ºC in a water bath and under constant agitation until complete dissolution. Once this was done, a solution containing 3.0 g of babassu mesocarp starch, 0.9 g of glycerin, 25 mL of distilled water was added, and heating (approximately 80 ºC) was taken to a water bath under constant agitation until the polymer was formed, which lasted an average of 10 minutes. Subsequently, the solution was distributed on a plate and had a mass of 31.191 g. After drying using an oven under controlled temperature, the film was obtained from the starch of the babassu mesocarp, in triplicate. These procedures were performed at the Multidisciplinary Laboratory of UniFacid Wyden.

2.3 THERMAL TESTS

The thermal tests, TGA/DTG and DSC, were carried out at the Laboratory of Materials Treatment – Corrosion and Plasma (LabTrat), of the Federal Institute of Piauí (IFPI). The TGA and DTG procedure in the polymeric blend of starch from the babassu coconut mesocarp was conducted in a Shimadzu thermobalance, model TGA-51, using platinum crucibles. The mass of the samples was 3.56 mg in a nitrogen atmosphere at 50 mL.min-1 and an increasing heating rate of 10 °C.min-1, from 24 to 1000 ºC (Mothé & Azevedo, 2009).

The DSC in the polymeric blend of this research was performed in Shimadzu equipment, model DSC 60 PLUS, using aluminum crucibles. Sample masses of approximately 3.5 g were submitted in a

nitrogen atmosphere with a flow rate of 50 mL.min-1 and a heating rate of 10 °C.min-1, from 25 to 601 ºC (Watson et al., 1964).

2.4 CHEMICAL TESTS

The FTIR spectra of the samples were recorded in a Bruker spectrophotometer, *model* Vertex *70 (*Bruker *Optics) with a Total Attenuated Reflectance (ATR) device and using* the OPUS software. The analyses were performed in the wavelength range of 4000-500cm-1, with a resolution of 4cm-1 and 64 scans.

The method for the determination of XRD was performed in *an Empyrean PANalytical* equipment, using copper K radiationα (Cu) of 1.54 Å, voltage of 40 kV and current of 45 mA. The procedure was conducted in a continuous scan range of 4º to 90º, with a scan size of 0 to 0.02626, and *time per step* of 97.665 s.

As for UV-Vis, the absorption spectra of the blend were identified in Thermo Scientific's *Genesys* UV-Vis model 10S dual-beam *spectrophotometer*. The scan was performed in a spectral window from 200 to 1100 nm. FTIR and UV-Vis were conducted at the Bioelectrochemistry Laboratory of the Federal University of Piauí (UFPI) and XRD at IFPI's LabTrat.

2.5 PHYSICAL TESTING

The micrographs were obtained by a high-vacuum scanning electron microscope, model 440, Leo brand, equipped with Energy Dispersive Spectroscopy (EDS), used to observe the morphology of the surfaces of the samples of polymeric blend based on the starch of the babassu coconut mesocarp. As preparation, all samples of the polymeric blend were placed on a double-sided carbon adhesive tape and grounded with carbon ink fixed on an aluminum substrate (a kind of support to place samples in the instrument for analysis). Then, the surface of the samples was coated with gold nanoparticles through the *sputtering process*. Micrographs were obtained on the frontal surface of the polymers. The magnitude ranged from 100 to 20,000 x and the power was 10 kV. The SEM was carried out at the University of São Paulo (USP).

2.6 MECHANICAL TESTING

For the mechanical tensile test, a *Shimadzu Autograph AG-X universal testing machine at* 250 kN was used at the Materials Treatment Laboratory – Corrosion and Plasma (LabTrat) of IFPI, according to ASTM D3039 standards. The test on the specimen took place at a speed of 10 mm/min. Measurements of force, stress, displacement, strain displacement, strain and time were performed and a stress versus strain diagram was generated . Tests were conducted at room temperature.

3 RESULTS AND DISCUSSION

The starch recovered from the mesocarp of *O. phalerata*, the babassu coconut, had a good yield. The polymeric blend, whose main component is the starch of the babassu coconut mesocarp and has glycerin, melamine and formaldehyde as ligands, was successfully obtained (Figure 1).

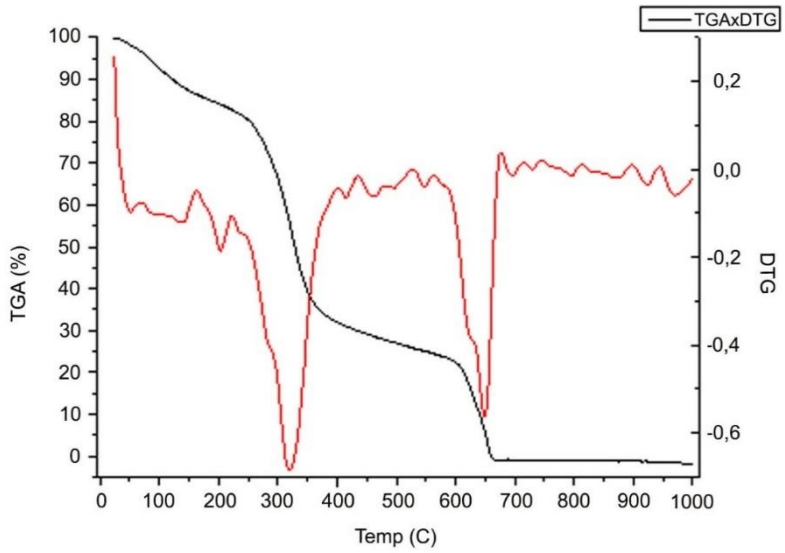
Figure 1 - Photographic record of the starch-based polymer blend obtained from the mesocarp of *O. phalerata.* Scale in cm.



Source: Authors (2023).

The TGA/DTG profile showed the mass loss due to the increase in temperature in three stages, as shown in Figure 2. In the TGA, it was possible to show that in the first stage, at a temperature ranging from 24 ºC to 200 ºC, there was the elimination of water and volatiles from the studied sample. In the second stage, above 200 ºC, there was a marked loss of mass related to sugars, characteristic of the degradation of the starch that makes up the babassu mesocarp. In the temperature range of 210 ºC to 400 ºC, the starches suffered the greatest mass loss, which can also be attributed to the degradation of the other organic compounds of the polymeric blend. And finally, there was the loss of mass related to melamine. Likewise, this fact was evidenced in the DTG curves, indicating that there are at least three peaks, in which the mass loss initially observed is attributed to the dehydration process; followed by the degradation of starch and, subsequently, of the other compounds. As shown in the DTG curves, the compounds have an unstable plateau, which precedes thermal decompositions after dehydration.

Figure 2 - Graph of the TGA/DTG profile of the polymeric blend based on starch obtained from the mesocarp of *O. phalerata.*



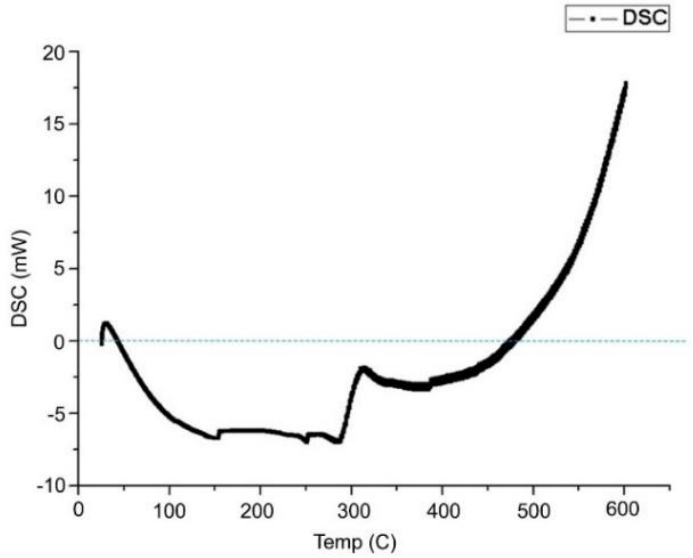
Source: Authors (2023).

The degradation process at high temperatures promotes the random breaking of the C-C bonds of organic molecules, affecting the molecular and/or polymeric chains of these compounds (Maniglia, 2017; Queiroz, 2018). Thus, the peak of approximately 350 °C for the starch degradation of the babassu mesocarp observed in the present study suggests that this polysaccharide contains large amounts of these organic compounds. When biomass is subjected to high temperatures (above 500ºC), it undergoes thermal decomposition of its chemical constituents due to the carbonization process (Santos, 2012).

In TGA/DTG, the peak temperature and the percentage of mass loss in each thermal event depend on the components and the crystal structure of the starch, through which it is possible to draw conclusions regarding the thermal stability of the sample, composition and stability of the compounds, as well as the final product (Denari & Cavalheiro, 2012). In the present study, the thermogravimetric analysis and its derivatives showed that the loss of mass related to moisture, volatiles, starch, glycerin and melamine occurred up to a temperature of approximately 600ºC.

As for the DSC, curves with defined peaks characteristic of starches that do not have a high degree of purity were observed (Figure 3). The thermogram showed a slight exothermic peak at approximately 50 ºC and a variation of endodermal peaks observed at about 75 ºC to 400 ºC. After 450 ºC, the sample showed a marked release of energy marked by a large exothermic event, possibly due to the fact that the sample had a lower purity content.

Figure 3 - Graph of the DSC profile of the starch-based polymer blend of the mesocarp of *O. phalerata.*

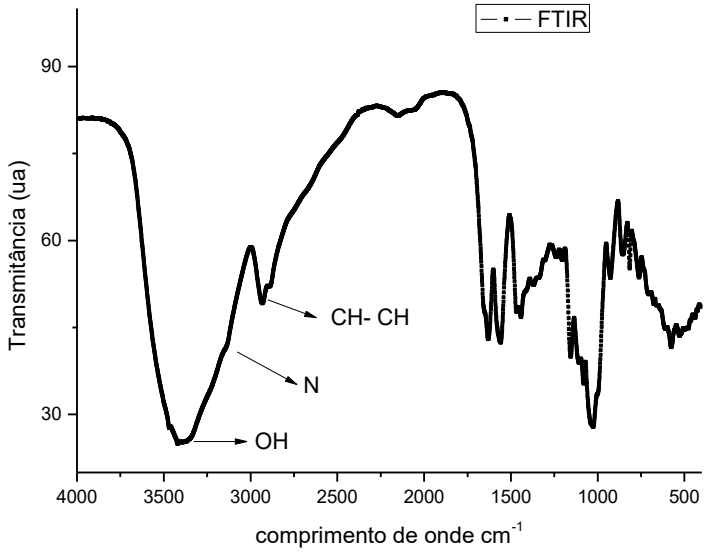


Source: Authors (2023).

According to Franco (2010), endothermic and exothermic enthalpic transitions occur due to changes in physical states (fusion, boiling, sublimation and vaporization) or chemical reactions, such as dehydration, dissociation, decomposition, oxidation and reduction. In general, the processes of melting, vaporization, and reduction produce endothermic effects, while crystallization, oxidation, and some decomposition reactions produce exothermic effects.

Regarding the FTIR spectra, Figure 4 shows the characteristic result of a polymer material with wide bands, due to the high molar mass of the polymer chains.

Figure 4 - Spectra in the infrared region of the starch-based polymer blend of the mesocarp of *O. phalerata.*

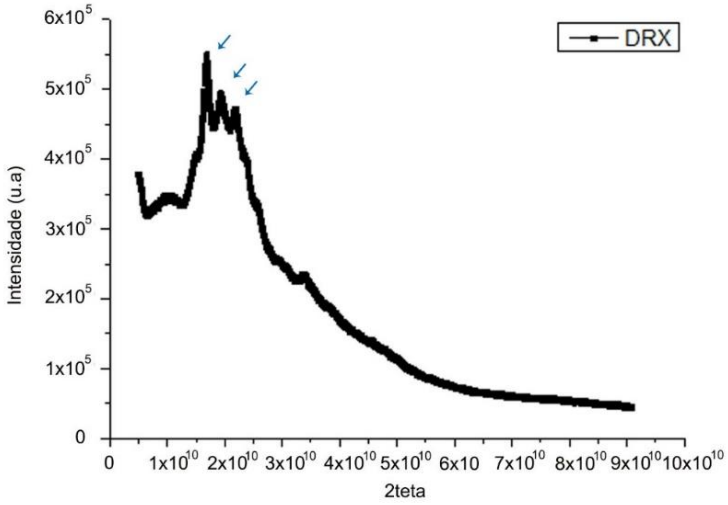


Source: Authors (2023).

This technique has been used to ascertain the starch present in the structures (Capron *et al*., 2007). Regarding the functional groups, the spectrum showed a wide band in the range of approximately 3470 to 3250 $^{cm-1}$ indicative of deformation of the OH bond of glucose monomers. Subsequently, the binding of CH-CH was observed in wavenumbers of approximately 2980 cm-1 to ^{2875} cm-1, corresponding to the starch striker, and N around 3100 $^{cm-1}$ referring to melamine. These data were approximated to those reported by Rodrigues (2021), in FTIR of the precursors of starch, melamine, urea and fertilizer composites. It is then presumed that it was possible to characterize the starch present and identify the expected peaks of the compounds inserted in the formation of the polymeric blend

The X-ray diffractogram, shown in Figure 5, was typical of an amorphous compound with small crystallinity points observed in three peaks, between approximately 17º and 25º.

Figure 5 - X-ray diphratogram of the polymeric blenda at the base of the O. *phalerata mesocarp amide*.

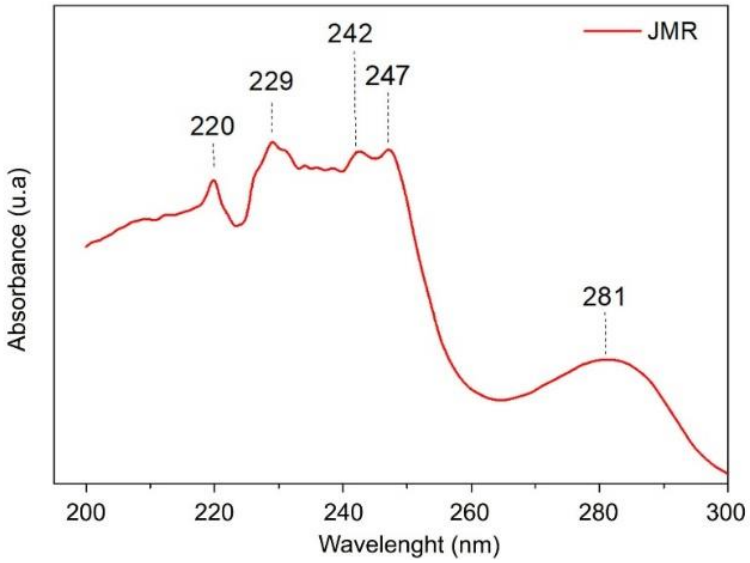


Source: Authors (2023).

In a study to obtain biodegradable composites from babassu coconut, the starch diffractogram showed peaks at 5.91º, 11.45º, 13.12º, 17.52º, 20.03º, 23.33º and 26.63º, characteristic of the type C pattern that is intermediate between types A (more compact, monoclinic arrangement) and B (less compact, hydrated center, hrxagonal arrangement) (Elfstrand *et al*., 2004; Moura *et al.*, 2021). As for melamine, in the tests for degradation of fertilizer composites containing urea, the peaks were between 15º and 30º (Rodrigues, 2021). Thus, the crystallinity points found in the polymeric blend of this study may be related to starch residues and/or overlap with melamine.

Regarding the UV-Vis analysis, the absorption spectrum showed maximum lengths between 220 and 247 nm and a steep shoulder at 281 nm (Figure 6).

Figure 6 - Absorption spectrum of the starch-based polymeric blend of *O. phalerata mesocarp*.

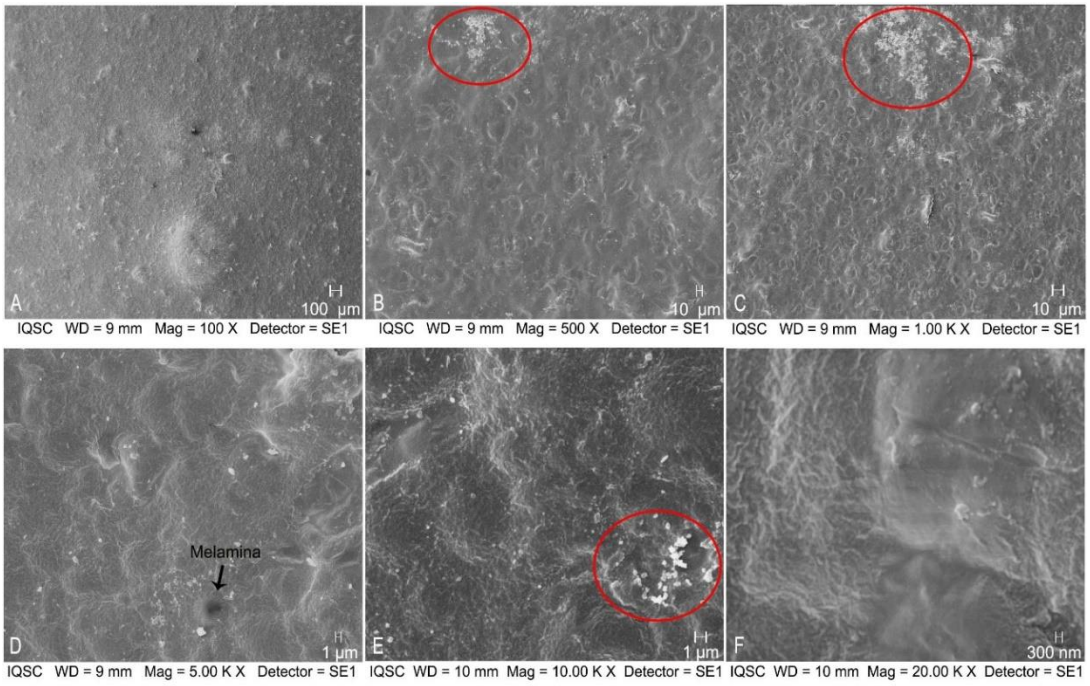


Source: Authors (2023).

The absorption spectra allow the deducation of electron transitions and thus obtain information to aid the recognition of molecular structures (Martinho, 1994). Corroborating these findings, absorption spectra with wavelengths between 200 nm and 260 nm have been identified for melamine, which may present a low-intensity shoulder at 250 nm (Zhang *et al.*, 2016; Correia Junior, 2019). In the free aqueous extract of the babassu coconut mesocarp, two absorption peaks were obtained, of 210 nm and 280 nm (Silva, 2017). This reinforces that the energy absorbed in the UV-Vis region for the polymeric blend of this research corresponds to the electronic transitions of the double bonds present in melamine and starch, as well as their interactions.

The micrographs revealed that the surface of the blend presented irregular and rough undulations, easily perceived in the images of Figure 7D, 7E and 7F, with differences in color in the film and melamine concentration (Figure 7D). The distribution of the polymeric blend was not uniform, and crossed lines (Figure 7F) and starch island residues, which are the white dots highlighted in the gray material (Figure 7B, 7C and 7E) were observed.

Figure 7 - SEM images of the starch-based polymer blend of the mesocarp of *O. phalerata* at magnification of 100 µm (A), 10 µm (B and C), 1 µm (D and E) and 300 nm (F). Red circle in B, C, and E indicate starch granules. Arrow in D points to melamine concentration.



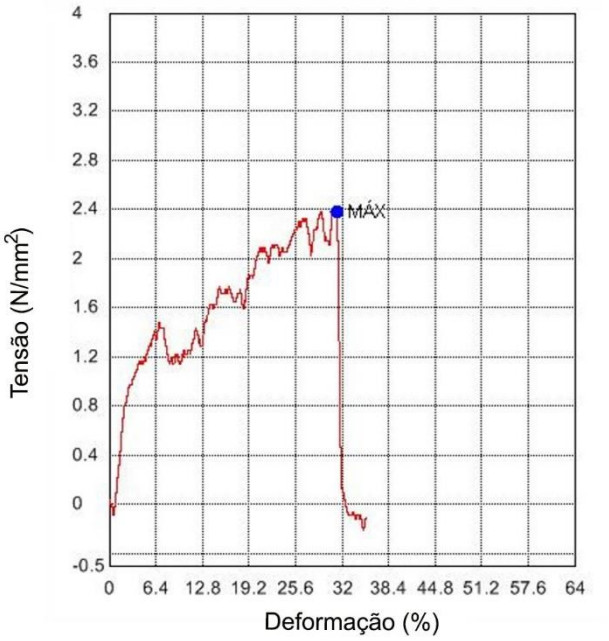
Source: Authors (2023).

This is due to: i) the drying process in an oven at a constant temperature of 37 ºC, indicating that the stirring and heating time were insufficient for the complete rupture of the starch granules, in agreement with Bastos (2010) in obtaining the thermoplastic starch films; ii) the binding capacity of glycerin in combination with melamine and formaldehyde, as mentioned in the tests by Zuo *et al.* (2015), who verified variations in the surfaces of the films due to the action of different plasticizers; and iii) the amount of glycerin used in the formation of the blend, as verified by Ramos Junior (2023), in a characterization of thermoplastic starch in which there was a decrease of such particles with the increase in the concentration of this plasticizer in the composition.

However, the starch of the babassu coconut mesocarp together with glycerin and melamine/formaldehyde were able to form a monophasic polymeric structure with only starch residues, different from the common biphasic arrangement of this polysaccharide, in which the formation of a continuous matrix composed mainly of amylose and a phase with swollen gelatinous granules is expected (Morris, 1990; Thiré, 2003). In addition, the presence of pores and cracks was not noticed, which is favorable for a slight permeability and resistance of the blend. In contrast to this finding, the SEM of babassu coconut epicarp fiber composites and different polymeric residues, using Urea-Formaldehyde (UF) resin as matrix, demonstrated porosity, cracks, and voids (Rodrigues, 2019).

The polymer blend has been tested in tensile strain up to 64%. The maximum strain was 31.25% at 2.35 N/mm2 of tension, under a force of 7.6 N and a maximum displacement of 13.44 mm (Figure 8). The ductile behavior demonstrated can be associated with good adhesion between the components.

Figure 8 - Stress versus strain graph for the starch-based blend of the mesocarp of *O. phalerata*. Blue circle indicates point of maximum strain and stress.



Source: Authors (2023).

These values are close to those found in the production of biofilm based on chitosan and glycerol, which also revealed ductile behavior, tension of 2.65 N/mm2, but greater elasticity, with maximum deformation occurring in 54.91%, being reached by the presence of the plasticizer (Machado, 2021). The proportion of amylopectin present in starch also alters the mechanical tensile behavior, as reported by Corradini *et al*. (2005) in comparative tests of thermoplastic starches derived from corn.

4 CONCLUSION

The proposed methodology for the development of a product based on the mixture of starch from the babassu coconut mesocarp with glycerin, melamine and formaldehyde, led to the formation of a polymeric blend with an inhomogeneous distribution presenting irregular and rough undulations, exhibiting small differences in color and melamine concentrates, in addition to the presence of starch residues. No pores and cracks. The test and the analysis of the data of the TGA/DTG curves identified and described that the degradation ranges of starch and most organic compounds was from 210 ºC to 400 ºC. Below this temperature, water and volatiles were degraded, and above melamine. From the DSC it was possible to infer that the molecular interaction allowed the predominance of endothermic events, with two exothermic peaks in the range of 50 ºC and after 450 ºC.

The spectra in the infrared region characterized the starch present and identified the peaks of melamine and glycerin compounds, which were the plasticizers used. The electronic transitions of the double bonds present in melamine and starch, as well as their interactions, showed maximum lengths

between 220 and 247 nm, and a pronounced shoulder at 281 nm. The polymeric blend is amorphous, with crystallinity points referring to starch residues and/or overlapping with melamine. The mechanical behavior was ductile due to the good adhesion between the constituents, with a maximum strain of 31.25% at 2.35 N/mm2 of stress.

Because it is an innovative product and because of the scarcity of studies in the area, all the tests conducted were compared to similar polymers with starches also coming from other sources and the use of different plasticizers. This comparison was of paramount importance to recognize the feasibility of using this polymeric biofilm. It is worth mentioning that it was a raw material that adds value to the babassu coconut production chain, cooperating with economic, social and environmental development.

Thus, in this work, the methodology proposed for the formation of the polymeric blend based on the starch of the babassu coconut mesocarp presented good results for the physicochemical, mechanical and thermal properties, with possible potential for various applications. However, comparative tests with different proportions of the components, their performance in more mechanical tests added to other physicochemical methodologies are necessary to elucidate the best composition and viability of the blend obtained from the mesocarp of the babassu coconut, being a future research of the main researcher.

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Italian conventions in Gomes' orchestral writing: A transnational possibility

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ABSTRACT
The mastery of Carlos Gomes over the Italian musical tradition can be elucidated by the success of his opera Salvator Rosa (1874), which, according to the author, was crafted in accordance with Italian taste. The Brazilian composer's journey in the realm of opera, marked by both triumphs and setbacks, is extensively documented in his biographies, yet remains relatively unexplored in investigations focusing on his music within a transnational context. This study seeks to present some procedures employed in Gomes's orchestral writing through the teachings of three widely accepted treatises in the teaching of musical composition in Italy, more specifically in Milan. They are: Il Maestro di composizione by Bonifazio Asioli, Corso di composizione musicale by Anton Reicha (translated by L. Rossi), and Grande trattato di strumentazione ed orchestrazione moderne by Hector Berlioz (translated by A. Mazzucato).

Keywords: Opera, Antonio Carlos Gomes, Orchestration, Transnacionality.

1 INTRODUCTION

The trajectory of Antônio Carlos Gomes, from his early studies in Brazil to his success on the stage of *La Scala*, reveals not only his technical mastery but also an ability to assimilate and reinterpret transatlantic musical traditions, specifically the Italian tradition. In the early 19th century, Italian teachings on orchestral composition—encompassing orchestration, instrumentation, and guidelines for the use of harmony and counterpoint in the distribution of instrumental parts—were distilled in translations of esteemed treatises from the classical period or publications of modern Italian treatises with essentially classical content. An analysis of these treatises reveals an orchestral organism primarily tasked with emphasizing the melody of the vocal line through well-known duplications [raddoppiamenti] – a topic we will explore further.

These treatises prioritize balance among orchestral groups without stifling the melody, demanding composers to maintain this tradition even as doors opened to transalpine innovations, and orchestras underwent transformations in their composition, with a consequent increase in instrumentalists and sonic mass influenced by the spectacle of French grand opéra. However, the preservation of melody—a key aspect of the Italian tradition—is present in the orchestral writing of the Brazilian orchestrator through abundant duplications.

Alberto Mazzucato[1], a music critic, aesthetics, and orchestration professor at the Milan Conservatory, and a significant figure in Gomes's education, advised that Italy's openness to French and German innovations should not lose sight of the sense of Italian melody but should unite with the evolved technique of transalpine composition. Analyzing this tradition means gaining a better understanding of the context and writing of a composer who absorbs this environment and secures his place in Italy during those times.

In 1870, Carlos Gomes conquered Italian stages with his opera *Il Guarany,* and in 1873, he ventured with *Fosca*—writing with greater elaboration and notable evolution for his style. The critical acclaim did not correspond to the acceptance of the Italian audience, which considered *Fosca* a disaster. Shortly thereafter, Gomes presented *Salvator Rosa* on stage, an opera written in Italian conventions that reconquered the audience, rescuing his image and yielding dividends unlike any other opera in his productions. In truth, *Salvator Rosa* was composed in a rapid attempt to restore the composer's name on stage and reclaim his image as a popular and celebrated artist in Italy.

His return to these Italian conventions may easily suggest a reaction to the complex composition of *Fosca*—difficult for Italians to understand—and a return to a more accessible writing, as in *Il Guarany*. Marcos Virmond's statement about *Salvator Rosa* is illuminating:

> It is a resumption of the *grand opéra* model similar to *Il Guarany* (1870), but revitalized, unprecedented, and with an enviable formal balance. This opera reveals Gomes as a composer who masters the techniques of Italian melodrama like few others but manages to give it a distinctive and personal touch (VIRMOND, 2007:18).

Already in *Salvator Rosa*'s orchestral makeup, we anticipate Gomes's intentions to undertake a writing closer to that Italian tradition. The composer opts for four horns in the same pitch, a set of trumpets without cornets, two timpani with changes in pitch by shorter and sufficiently spaced measures [accordatura] - a common procedure in classicism. Even *Il Guarany*, written three years earlier, hinted at a greater evolution in its orchestral makeup, employing cornets and paired trumpets in the brass section.

1.1 REPRESENTATIVE TREATISES: ASIOLI, REICHA, AND BERLIOZ

The initial years of Gomes in Milan are characterized by the coexistence of the appreciation of instrumental music—gradually gaining prominence with the establishment of instrumental music societies and adjustments in the orchestral ensembles of major Italian orchestras, particularly the increased number of string members in response to the arrival and affirmation of brass sections in the

1 Alberto Mazzucato (1813-1877) was a significant figure in Italian musical culture. In addition to being a music critic, composer, editor of the Gazzetta Musicale di Milano, and a respected pedagogue, he served as the maestro direttore and concertattore for the orchestra at La Scala di Milano, leading from 1859 to 1868. Special attention should be given to him, considering that he was also an influential figure in the education of the young Carlos Gomes in Italy, immediately following the completion of the Brazilian's private studies with Lauro Rossi.

orchestra[2] —and, on the other hand, the cultivation of the bel canto tradition, where the orchestra assumes greater importance as an accompaniment group to singing, enhancing and interacting with the melody in the voices of virtuoso singers—a tradition still cherished by a large portion of the theater audience and reflected in Gomes's writing. In the realm of orchestration, while treatises that emphasized maintaining the melody through an orchestra subservient to singers were still being published and used in the Milanese teaching system, another part celebrated the arrival of Berlioz's teachings in Italy.

At that time, as a student of Lauro Rossi and Alberto Mazzucato, Carlos Gomes encountered both sides of this experience, but it was the melodrama tradition that Gomes clung to when he sought to regain his popularity after the rejection of *Fosca*. Among the main orchestration treatises published and adopted in Milan by Gomes's professors, the most representative ones were *Il Maestro di composizione* by Bonifazio Asioli, *Corso di composizione musicale* by Anton Reicha (translated by L. Rossi), and *Grande trattato di strumentazione ed orchestrazione moderne* by Hector Berlioz (translated by A. Mazzucato). The first two reflect the orchestral tradition of their time, and the latter marks the beginning of the changes that would reach Gomes through Mazzucato. Although not all the mentioned documents were conceived in Italian soil, they were the models adopted and absorbed for the orchestral tradition in the investigated period, serving as an important record of the standard sought and taught before Gomes's arrival and during his stay in Italy.

Il Maestro di composizione—published in Milan around 1836—is among the main documents available for researching Italian orchestral music in the first half of the 19th century. It was conceived with the primary justification of providing the conservatory with Italian documents. We refer to the Conservatorio Regio di Milano, whose first director would be the treatise's author, contributing to the institution with several treatises on singing, harmony, solfeggio, counterpoint, and composition.

Well-illustrated with examples from orchestral literature, mostly from the classical period, the author's main concern lies in balancing the parts to highlight the melody. There are various guidelines for reinforcing the melody in strings or winds, with particularities for high, intermediate, or low tessituras in the orchestra.

> The melody of the vocal line, reinforced by wind instruments with upper octaves (and the same would happen if they were lower), gains the necessary strength to stand out above the deep, swift, and marked sounds of the quartet [strings], expressing the realistic situation of the actor[3] (ASIOLI, ca 1836: 54).

2 To the trumpet section, which in the classical period was limited to two members, now two cornets were added, following a trend in French orchestral music explained by Berlioz's treatise and, more significantly, by the staging of French operas on Italian stages. Additionally, a horn quartet and a trombone section were formed (with the addition of a cimbasso: an ophicleide, bombardone, or tuba), a section that in the classical period was essentially composed of only two members.
3 In the original: “La melodia del Canto rinforzata dagl' istromenti da fiato com ottave superiori, (e lo stesso succederebbe se fossero inferiori) acquista quella forza che basta per campeggiare sopra i suoni gravi, veloci e marcati del quartetto, il quale esprime la cruda situazione dell' Attore”.

And a little further: "[...] The melodic part of the bass, not very distinct due to the weight overlaid on the harmony, is reinforced by the composer with various upper octaves, where, due to this, it captures the listener's attention"[4] (Ibid.: 72).

Regarding *Corso di Composizione musicale* by Reicha, the document was initially published in 1817 and translated from French to Italian by Luigi Felice Rossi in approximately 1839[5]. In the treatise, the orchestra is also recognized as highly effective in creating effects, and the timbre of the instruments used is analogized strongly to the human voice. Even the term melody in the orchestra is replaced by the term canto—although the orchestral ensemble is not accompanying singers—demonstrating a continuous concern for this melodrama technique. Like Asioli, Reicha also emphasizes careful balance of the parts with the main purpose of not suffocating the melody—providing guidelines for doubling [raddoppiare] the melody line with other instruments. These are procedures widely distributed in Gomes's writing, as when he states and exemplifies: "Here, the singing part is performed by half the mass, with the aim of making it more apparent"[6] (REICHA, ca. 1839: 240).

These explanations of treatment to the melody by the orchestra gain space in other contexts, for example, when presenting the maintenance of the melody in its various meanings, sometimes needing brightness emphasis or relief of low parts (when the melody is in the bass) or color changes (timbres), demanding different attitudes for each desired result. According to the author:

> When the singing passage is in the bass, as in the following example, it is almost always avoided to duplicate with the upper part; however, if you want to make it shine more, you will almost always reinforce it by doubling it with the intermediate voices[7] (Ibid.: 241).

This concern in managing the melody is a procedure widely used by Gomes in his orchestrator career, especially in the early works of his Italian phase, such as in *Il Guarany* or *Salvator Rosa.* Throughout all of Gomes's production, we will also notice his care for melody grounded for various reasons: at certain moments, to reinforce intensity, in others, to enhance brilliance, and in others still, for experimenting with new timbres as seen in the treatises. Among the various examples in Gomes's orchestral writing for *Salvator Rosa*, there is also the first solo of the cello section in Allegro giusto. The instrument with strong correspondences to the baritone voice [voce di petto] is highlighted by bassoons and violas and, later, with the solo duplicated by the orchestra. There is no duplication of the

4 In the original: "[…] La parte melodica del basso non abbastanza distinta a cagione dell' ammasso sovrastante d' armonia, dall' Autore vien rinforzata con diverse ottave superiori onde richiamare su di questa l' attenzione dell' uditore".

5 In the document, there is no specific date provided.

6 In the original: "Qui la parte cantante viene eseguita dalla metà della massa, allo scopo di renderla più appariscente. In quest' ultimo esempio la parte grave, eseguita da un solo Fagotto, sarebbe troppo debole, e vorrebbe essere rinforzata o da un Contrabasso o da un Trombone".

7 In the original:"Quando il tratto di canto è nel Basso, como nell' esempio seguente, si evita quasi sempre il raddoppiarlo colla parte superiore; ma se si vuole farlo brillare maggiormente, lo si rinforzerà colle parti intermedie".

melody at this moment, however, it is visibly highlighted. Further on, we will have in *Condor* a probable intention of Gomes in uniting timbres. There is no need to ensure the intelligibility of the melody, as the strings are already in pp dynamics and in a stable fabric, without rhythmic or harmonic movement.

Regarding Berlioz's *Grande Traité*, the Gazzetta Musicale di Milano witnessed the arrival of the didactic work, announcing its content on April 5, 1846[8], and providing some clarifications on the importance of the document for that phase of Italian orchestration—still based on duplications of melodies. Detailed comments on each chapter of the treatise were made by the musicologist Luigi Ferdinando Casamorata, who, in criticizing the duplication of the melody by orchestral parts, emphasizes its justification in a time when singing did not yet have a well-established school or a well-defined art. With rare exceptions, this doubling procedure [raddoppiamenti] should be used, but with great caution:

> Before the melody took on distinct forms, when the singing part was essentially nothing more than an indifferent part of the real harmony, the instruments that often accompanied resorted to doubling this voice, either in unison or an octave [...], but when the melody began to acquire a decisive physiognomy, when the art of singing proper emerged, there was a need to free the singer from the constraint of instruments that kept him strongly chained[9] (GMM, 1846, V, No. 14).

2 CONCLUSIONS

In exploring the Italian orchestral tradition within the context of Carlos Gomes's work, particularly in his opera *Salvator Rosa*, a fascinating narrative of absorption, adaptation, and transnational resonance emerges. The Brazilian composer, immersed in the musical atmosphere of 19th-century Milan, unveils his ability to assimilate the principles of the Italian tradition, extending beyond purely Italian treatises and incorporating them into his own musical language.

The Italian tradition, characterized by the emphasis on melody and the subordination of the orchestra to the voice, finds resonance in Gomes's compositions. His *Salvator Rosa*, in particular, reflects not only technical mastery but also a profound understanding of the Italian aesthetics of the time. The emphasis on equalizing orchestral parts to enhance the melody, as highlighted in the treatises of Asioli, Reicha, and Berlioz, resonates vividly in Gomes's orchestration.

8 The date of this publication was provided by Ricordi and is disclosed in its catalog. The treatise was divided into seven installments and was published in the following order: 1846 (publication of installments 1 and 2) and 1847 (publication of installments 3, 4, 5, 6, and 7). Catalog available at: <http://www.ricordicompany.com/it/catalog/detail/14035>

9 In the original: “Prima che la melodia assumesse forme distinte, quando la parte cantante non era in sostanza che una indifferentemente delle parti reali dell' armonia, li strumenti che accompagnavano solevano spesso raddoppiare questa parte o all' unisono o all' ottava [...] quando però la melodia cominciò a prendere fisionomia decisa ed a sè, quando surse l' arte del canto propriamente detto, si senti il bisogno di liberare il cantante dall' impaccio degli strumenti che lo tenevano troppo a catena”.

Antônio Carlos Gomes had a solid career as a composer in 19th-century Italy. His formative years were marked by study, albeit in private classes, under the faculty of the Conservatorio Regio di Milano, leading to his proficiency examination and the attainment of the coveted diploma. Mastery of the Italian tradition was a fundamental, if not vital, ingredient for survival in the land of melodrama. The focus on this tradition must primarily consider the treatment of melody – the most exalted subject in the art of orchestration contained in the treatises adopted by the Milanese educational system during Gomes's time and the starting point for everything built upon that tradition.

This work concentrated solely on the platform of orchestral writing, presenting elements of Carlos Gomes's writing strongly aligned with the teachings of treatises that reflected the aspirations of that era. Gomes's orchestral writing went beyond the exaltation of melody, but examining this tradition means delving a little deeper into the context of the Brazilian musician in his early years on the peninsula, understanding some of the marks that would never leave his oeuvre.

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Metaverse and its possibilities in educational environments

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ABSTRACT
This article was prepared through a descriptive study that began with a bibliographic study on the importance and possibilities of the Metaverse in organizations and educational environments. The Metaverse has been one of the most talked about and discussed topics of the moment. This is because it presents itself as a collaborative and shared learning environment and because it is among the main educational trends of 2022, surpassing the technological sphere. It also gained a lot of attention in the news in 2021, when Mark Zuckerberg announced the change of the Facebook brand to Meta, also announcing that the company would invest in virtual reality. Despite all the notoriety surrounding the theme, the idea of Metaverse has been discussed for a long time. In this work, the focus of the study was to present the numerous possibilities of the Metaverse within the educational context, approaching something that goes beyond thinking about only online classes, considering that this technology reduces the border between what the student needs to know and the way how he will effectively learn about a certain subject. Thus, the bibliographic research of this article was developed from material already prepared, consisting mainly of scientific articles and documentary research carried out through blogs, videos and websites on the topic addressed.

Keywords: Metaverse, Education, Collaborative learning, Virtual environment.

1 INTRODUCTION

The Metaverse has been one of the most talked about and discussed topics of the moment. This is due to the fact that it stands out as a relevant educational tool, positioning itself as one of the main trends in the educational scenario from 2020 onwards, going beyond the technological sphere. This

shared virtual environment, which merges the boundaries between online and offline, is configured as an integrally digital platform capable of recreating physical experiences (Conceição et al., 2023). The approach of Silva and Pereira Jr. (2013) delimits the Metaverse as a space conducive to distance learning, as well as to the complementation of conventional disciplines, providing students with the opportunity to acquire knowledge beyond the limits of the classroom, notably in extracurricular activities.

The understanding of the Metaverse as an educational platform gains prominence when observed from the perspective of the generation of "digital natives". This generation, composed of individuals who were born and raised in the age of the Internet, demonstrates a natural affinity and ability to interact effectively in digital environments (Souza; Tonelli, 2012). This generation's inherent familiarity with the dynamics of the Metaverse highlights the potential acceptance and integration of this innovative technology in the educational context. However, it is worth investigating how the Metaverse can be effectively incorporated into the Distance Learning (DE) environment in Brazil, considering the educational nuances and specific needs of this modality (Conceição et al., 2023; Carmen, 2021).

In this context, this chapter proposes a more in-depth approach to the potential of the Metaverse as an educational tool. To this end, a comprehensive literature search was conducted, incorporating critical analysis of scientific articles and the evaluation of materials available on the Internet, including blogs, videos and educational websites specialized in the subject. This methodological approach aims to provide a comprehensive and grounded view on the role of the Metaverse in the contemporary educational landscape.

Thus, it is necessary to recognize that, although the Metaverse arouses enthusiasm and positive expectations, its adoption in the educational context entails challenges and ethical considerations. Issues related to accessibility, equity in access to technology, privacy, and security must be carefully examined to ensure that the transformative potential of the Metaverse is harnessed in an ethical and inclusive manner.

In summary, this chapter aims to contribute to a deeper understanding of the Metaverse as an educational tool, highlighting its potentialities and challenges in the context of distance education in Brazil. By integrating theoretical and empirical perspectives, it seeks to offer a solid basis for future research and for the effective implementation of the Metaverse as an enriching resource in the contemporary educational process.

2 THEORETICAL BACKGROUND

The COVID-19 pandemic has caused an unprecedented disruption in the global education landscape, making remote learning a reality. The health restrictions and social isolation, resulting from

the pandemic crisis, have projected educational technologies to the center of attention, highlighting, among them, the Metaverse as a crucial tool in the urgency of Distance Learning (DE). The acceleration of this transition highlights the need to explore and understand the Metaverse as an innovative educational platform in response to the challenging dynamics of contemporaneity (Serra et al., 2022; Flores et al., 2021; Carreira et al., 2023).

The term "Metaverse" was coined in 1992 by Neal Stephenson, an American writer, in the context of his science fiction novel "Snow Crash". In this work, Stephenson outlined a 3D virtual environment, conceiving the migration of human interaction to a fully virtual world. Although it originated in a literary context, the spread of the term gained greater prominence initially in the realms of computer games and video games. Subsequently, large corporations began to invest significantly in virtual reality, seeking to provide immersive and personalized experiences to consumers, consolidating the Metaverse as a concrete expression in technological environments (Ventura, 2022; Gabas, 2021).

The Metaverse can be defined as a shared virtual reality technology, standing out for its ability to recreate physical experiences in a collective, collaborative, and shared digital environment. Its primary purpose is to integrate online and offline reality, adopting omnichannel strategies (multi-screens) and employing various tools to reduce the gap between the physical and virtual environment, providing an improved user experience (Bassette, 2023; Carmen, 2021). Cardoso's (2015) conception corroborates this definition, by considering the Metaverse as multi-user virtual platforms equipped with graphical interfaces in three dimensions, also called virtual worlds.

In this context, the relevance of the Metaverse in education during the pandemic stands out as an innovative approach to address the challenges posed by the abrupt transition to remote learning. The in-depth understanding of this technology, its history and applicability contributes to a more solid foundation in its integration into the contemporary educational scenario, promoting an enriching dialogue between the academic literature and emerging practices in the field of education and technology.

The Metaverse, as a digital environment, acquired remarkable visibility in 2021, especially with Mark Zuckerberg's announcement about Facebook's rebranding to Meta and planned investments in virtual reality. Despite the recent prominence, it is crucial to recognize that the conception of the Metaverse has been a topic of discussion for a long time (Alves, 2021; Mascarenhas, 2021).

The essence of the Metaverse lies in the creation of a new world, providing interactions between individuals, brands, businesses, virtual properties, and educational institutions. Differentiating itself from conventional mouse or cell phone interactions, which take place on websites and social networks outside of an immersive context, the Metaverse enables fully immersive interactions within the virtual environment. This striking feature redefines the way users explore and participate in digital reality.

The fundamental differentiator of the Metaverse is its integration with physical reality, empowering interactions in three-dimensional environments. A practical example is the experience of visiting a store in 3D using virtual reality glasses. In this context, users, through avatars, can walk inside the bookstore, pick up the book, flip through the book, go to the counter and make the payment, all in the context of the Metaverse.

The educational environment would also be no different in the search for optimization, popularization and development of tools aimed at blended learning. The use of the Metaverse in the educational context aims to create a more attractive, sophisticated, and efficient education model compared to the face-to-face model. That is, this approach not only addresses a pressing need, but also offers substantial benefits by reconfiguring the way learning is conceived, shared, and absorbed. In other words, the Metaverse not only represents a paradigmatic shift in digital interaction, but also presents itself as an innovative tool with the potential to transform education, providing a more engaging and efficient approach for learners of all ages.

The Metaverse has presented itself as a necessity in the educational environment, driven by numerous factors, especially the school's responsibility to prepare its students for the challenges of the future job market. In a scenario in which organizations intensify their virtual economic activities, and the provision of services and commercialization of products increasingly occurs in virtual environments, educational institutions demand new teaching methodologies that provide the training of students for this new reality. This implies the need to prepare professionals capable of facing the challenges inherent to these new virtual environments, ranging from new management concepts to innovative manufacturing models.

In the educational field, teachers are faced with the constant challenge of providing an assertive learning experience to students. However, the Metaverse offers a potentially transformative solution by allowing the development of training environments that replicate, as faithfully as possible, the skills that learners need to master and the practical experience that they will actually face.

The Metaverse, therefore, emerges as an innovative means to enhance students' preparation for an ever-evolving job market. Through the immersion provided by these virtual environments, students have the opportunity not only to acquire specific skills, but also to develop a deeper understanding of the complexities and demands associated with new business models and virtual dynamics. The strategic use of the Metaverse in the educational process thus represents a proactive and efficient response to the growing digitalization and virtualization of economic and professional activities.

When we approach the interaction between the Metaverse and Education, we transcend the mere conception of online classes, entering a revolutionary and transformative domain. Not only does the Metaverse offer a platform for the learning experience, but it also proves to be an innovative solution for addressing challenges such as engagement and dropout by providing a practical and

authentic approach. In essence, the Metaverse acts on reducing the boundaries between the knowledge that the student needs to acquire and the effective methods by which he internalizes information about a given subject.

In the Metaverse, learning takes on a collaborative perspective, allowing for the creation of environments that can be shared among students, resembling parallel realities. Interacting with objects in the Metaverse provides a more natural learning experience, as students actively participate in the environment that surrounds them. This environment facilitates collaboration between students located anywhere in the world, transcending language barriers and sharing experiences in a universally accessible way.

Within this universal design context, students not only interact with the content but also collaborate effectively with their peers, contributing to a global and inclusive learning environment. The Metaverse, therefore, not only dissolves the traditional limitations of distance learning, but also opens doors to a new era of learning, where collaboration transcends physical boundaries and educational experiences become immersive, participatory, and truly global.

As we focus on Education, it becomes evident that the potential of the Metaverse is truly limitless. But what would those benefits be? Basically, there are three groups of objectives that enable a profound reconfiguration of learning experiences, namely:

2.1 ACCESSIBILITY

The Metaverse transcends geographical barriers, eliminating the need for physical travel to access educational venues and institutions. This results in an exponential increase in inclusivity, providing easy access regardless of location. Reducing the costs associated with physical travel not only makes education more accessible, but also expands learning opportunities for individuals in diverse parts of the world, creating a more inclusive and global approach to education.

2.2 22ST CENTURY SKILLS DEVELOPMENT

The Metaverse emerges as a catalyst for the development of crucial skills for the contemporary digital environment: both hard and soft skills. By optimizing high-level digital and technical skills, the Metaverse demands greater discipline and autonomy from the student, while simultaneously promoting remote connection and empathy. This means that, in addition to empowering students with essential skills for today's market, the Metaverse also contributes to the formation of more autonomous and connected professionals, ready for the challenges of the digital landscape.

2.3 PROMOTION OF MOTIVATION AND FOCUS:

Even for students who are not considered digital natives, those who still have an outdated school perception, the Metaverse provides a dynamic, engaging, and motivating learning experience. By inserting students into 3D environments, the Metaverse elevates interest, focus, and motivation by offering high-quality content in an innovative way. This approach revitalizes the perception of traditional teaching and broadens the participation of students who might otherwise feel disengaged in conventional educational settings.

This proposal, although bold, reflects a significant change in education, representing a communicational frontier that fundamentally alters the way people learn, work, communicate and interact. The first steps taken in this direction indicate the creation of unprecedented and unimaginable learning experiences, pointing to an educational future filled with limitless possibilities.

3 FINAL THOUGHTS

In view of the above, we consolidate the understanding that the Metaverse represents a futuristic vision that innovatively combines the real and virtual worlds, converging the Internet and a series of technological innovations, from holograms to devices such as virtual reality glasses, to the epicenter of human connections. In this virtual universe, avatars, holograms, virtual reality, and technologies such as virtual glasses are designed to enhance and centralize human interactions.

The central motivation driving the Metaverse is the maximum reduction of the perceived distance between what is viewed, for example, on a mobile screen, what occurs on a computer, and the effective interactions in the user's physical space. So, the intrinsic purpose is to enhance the user experience, using virtual reality as a tool to recreate these physical experiences in a more powerful way, promoting fluid integration between online and offline environments through omnichannel strategies.

In the educational sphere, the Metaverse triggers a significant transformation, making learning experiences more accessible and dynamic. The ability to carry out, in real time, text and audio conversations, interact with virtual objects, demonstrate constructions, conduct experiments, present ideas in a playful, clear and concrete way, creates a highly interactive and enriching educational environment. This technological advancement offers numerous possibilities for the improvement of teaching by providing a diverse range of educational experiences.

The Metaverse, although still in the development phase, reveals gigantic potential by integrating the real and virtual world in a synergistic way. In the educational field, this convergence means overcoming borders, allowing schools to cross geographical boundaries and establish interactions and teaching with students from anywhere in the world. What was once considered a

privilege for some becomes, with the effective implementation of the Metaverse, an accessible reality intrinsic to the global educational process.

We conclude, therefore, that the Metaverse represents not only a technological evolution, but a revolution in human interactions and education, promoting a new paradigm that redefines the way we teach, learn and connect globally. Its potential, still in the exploration phase, points to a future where the boundaries between the real and virtual worlds become increasingly permeable, providing more inclusive, innovative and enriching educational experiences.

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The practice of environmental education starting from the extension program Humaniza Bosque Carlos Belarmino (HBCB), Guarabira, Paraíba

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ABSTRACT
Geographic Science has an assorted and diverse scope of analysis. One of the characteristics of geographic studies are the practices that can come forth from many contents studied in the classroom. Research and extension projects, in addition to enriching learning, favor the expansion of practices in relation to the environment in which students are included. The Humaniza Bosque Carlos Belarmino – HBCB extension project initially arises with the aim of managing and conserving an area within the Centro de Humanidades (CH) of the Universidade Estadual da Paraíba – UEPB. Currently, the project has become a program that houses more than 50 people, including teachers, students and volunteers, developing the topophilia of those who regularly visit these spaces. The program has 8 Environmental Education – EA projects taking its practices to more than 20 schools and communities, located in several municipalities polarized by the CH. The objective of this article is to present the practice of EA from the HBCB/CH/UEPB Extension Program. The methodology used was participatory and shared, with the scheduling of visits to interested schools and communities, as well as the activities developed within the HBCB space. The space has been well used and the proposed practices have had excellent acceptance from the university community and surrounding communities, who have become interested in applying EA practices in their municipalities, schools, streets and houses. In this way, it is understood that the extension work developed in the HBCB/CH/UEPB program contributes to strengthening education, developing sustainable environmental practices, strengthening the human/environment link, through topophilia.

Keywords: Geography, Environmental Education, Topophilia, Sustainability.

1 INTRODUCTION

The twenty-first century has intensified and deepened discussions on environmental issues and problems. An attention permeated, in large part, by proposals for management and management of practices in relation to nature. Oliveira (2017, p. 8) tells us that "new ways of imagining, thinking and doing Geography have emerged, based on the experiences, both objective and subjective, that the human being has of everything that surrounds him".

It is pertinent to point out that, currently, the world's population has become mostly urban. This is present in the techniques of manipulation and transformation of spaces, which mirrors the material cutouts impregnated in the landscape. For Moreira (2020, p. 67) "the progress of development of human societies is a continuous storage." The risks arising from this undue and predatory action culminate in the collapse of spaces and the consequent affectation of social groups.

This theme gains global strength from proposals developed with the aim of mitigating the negative impacts in relation to environmental practices. During the Rio 92 conference, the 179 member countries signed agreements for the protection and management of the environment. In this way, validated by the United Nations, the 2030 Agenda and the Sustainable Development Goals (SDGs) were implemented. (GARCIA and GARCIA, 2016)

This makes us reflect on the spatial dynamics, and question our role in this dynamic in relation to the landscape. Moreira (2020, p. 101) ponders: "space is socially saturated and now it is necessary to restructure it, in order to accommodate the broader scale of complexity that invades it". In this sense, landscapes take on new dynamics and formats, their uses and functionalities depend on the time and the group that interacts in the place.

In addition to all the environmental problems already known and faced, in 2020 we were surprised by a brutal pandemic, which forced the world to rethink the way we act in space. As Tuan (2005) writes, a landscape of fear was established, establishing rules of coexistence and isolation. The fear of disease dictates the organization of society, since, unlike a natural disaster, disease generates an atmosphere of panic and suspicion.

In this context, the world is reorganizing and restructuring itself in this new century, to meet the dynamics provided by an increasingly aggressive society with unbridled levels of consumption. This harmful perspective that presents itself, especially with the practices in relation to the landscape, requires a new way of thinking and organizing spaces for collective use. "A Geography of lived spaces recognizes and seeks to reveal the role of intermediation of everyday life and spatial representations" (Serpa, 2019, p. 84).

Thinking about ways to slow down environmental impacts leads small local groups to devise strategies for the control and sustainable use of these spaces. Awareness involves education that

involves environmental issues and dynamics, making human groups understand that they are an active part of the dichotomy protection/destruction of the environment.

Thus, in 2019, Humaniza Bosque – HB was created, designed and organized by professors Dr. Carlos Antônio Belarmino Alves and Dr. Luciene Vieira de Arruda. Initially, with the proposal of management and conservation of the vegetated spaces of the Humanities Center – CH – Campus III of the State University of Paraíba – UEPB. In 2020, during the pandemic, Professor Carlos was affected by Covid-19 and died, which led to the change of the initial name to Humaniza Bosque Carlos Belarmino – HBCB, in his honor.

Today, with 4 years of activities developed, it has already been possible to expand its scope to other areas, involving teachers, students, schools and part of the community in its area of operation. The course of Letters and Pedagogy, as well as the technical-administrative part of the CH, are also involved in the activities of the HBCB.

In its initial phase, the HBCB program had only two projects to be developed. Over the years, even in the midst of a pandemic, there has been an exponential growth in activities and participants, which has led to the transformation of initial projects into an Extension Program, with 8 projects under development and more than 50 people involved. In this context, the objective of this article is to present the practice of EE from the HBCB/CH/UEPB Extension Program.

2 METHODOLOGY

The purpose of this article is to bring a connection between education and practices in relation to landscape. For Oliveira (2021, p. 10)

> Teaching, as professionalism, is composed of dimensions that complement each other in a non-hierarchical way. From the initial formation, it is important to understand that there is knowledge that is specific, that is the basis, that permeates the understanding of how to teach a certain geographical content, which is articulated in the relationship between theory and practice, school and university.

Thus, the main objective of HBCB projects is to establish sustainable practices in relation to landscapes, boosting the practice of theoretical contents seen in the classroom, its applicability in the social context, in addition to geographical practices and processes.

The methodology is fluid and varies according to the theme of each project, taking into account the perception and experience of the actors involved in the processes. The dynamics used for this work had phenomenological bases, from the perspective of topophilia, with a focus on issues related to the lived space. For Tuan (2012, p. 135/136) "topophilia is a neologism, useful when it can be defined in a broad sense, including all the affective ties of human beings with the material environment".

The research is conducted by each advisor individually, but the basis for the development of the studies, the literature, the research and the work developed, are structured in the dynamics, environmental problems and sustainable use of the natural environment.

3 THEORETICAL FRAMEWORK

Environmental issues have been a matter of concern in our society. The increasingly aggressive practices of use of natural resources show the need to stop and look at the current established dynamics. Moreira (2020) warns that geographic space is produced and, therefore, nature has the concreteness of social production, which transforms and dimensions it as a socio-spatial category.

The reflection on the theme proposed here tells us that we are increasingly disconnected from nature and the reality that presents itself. The perception about the dynamics established by human groups with the landscape demonstrates that they believe in a subservient nature. It's as if we no longer belong to the ecosystem and can control it at will. To Olive Tree *apud* Marandola Jr., Cavalcante (2017, p.27):

> In order for environmental perception to occupy a prominent place among the current priorities, we need more research and methodological studies. We need to develop an environmental awareness by developing an ethical and affective attitude towards the environment.

The environmental dynamics were completely changed in 2020, when we were surprised by an event never seen before: the Covid-19 pandemic. Nature, while showing signs of exhaustion, struck human groups quickly and violently.

> And that forced the world society to remain in social isolation. Suddenly, the entire structure of a routine was changed, giving the impression that one of the gears in the wheel of life had been broken or damaged and we were faced with a new perspective that we never imagined living (Belizário *et al,* 2020, p. 275).

The human groups were stunned and frightened, not knowing how to deal with this strange new situation that presented itself. According to Tuan (2005, p. 166):

> In a natural disaster such as a flood, the authorities and the populace were fighting an external natural enemy. In an epidemic, human beings themselves were the greatest cause of fear. The terror of contagion could so disturb reason that, to those in good health, the sick seemed not only victims of the disease, but the perpetrators.

In addition to all the issues to be thought about in terms of sustainability, there is unbridled consumption, large-scale waste production, air and water pollution. reveal a dangerous component to the collapse of the environment. It is necessary to think about strategies that aim to mitigate the indiscriminate use of natural resources. Arruda *et al* (2020, p. 283) tell us that:

> The search for alternative and renewable energies is also already a reality, such as solar and wind energy. All that is needed is for the idea to be adopted by government agencies and large construction companies in their engineering projects; that the works take place through an interdisciplinary team, also involving sociologists, environmental engineers, geographers, biologists and ecologists, in search of environmental balance. An awareness process will be necessary for a change in attitudes and values to occur, in order to support the industry committed to the environment and despise those that are against sustainability. It is necessary to make it easier so that the next generations can adapt to conscious consumption and the return that will be given to nature. Thus, the conscious consumption of water and the reduction and disposal of garbage, two of the greatest current concerns.

Reinforcing the above-mentioned thought, it is necessary to raise awareness among agencies and entities for the adoption of control measures for the use of natural resources. In addition, it is necessary to apply policies in educational environments that work on the importance and awareness of students for environmental issues, involving them, whenever possible, in the organization of spaces close to them within the community. It is up to teaching environments – schools, courses and universities – to teach human values, environmental care and sustainable practices in relation to the landscape (Arruda and Lima, 2018).

Thus, EE strategies were designed to work with university students as a vehicle for information and action in favor of sustainability.

4 RESULTS AND DISCUSSION

The theme proposed in this article articulates education, sustainability and environmental perception. It is necessary to create spaces for debate, "in a dialogue that includes reflection for Geographic Education to contemplate the physical-natural theme, in an inseparable way" where connections are established through the perception and experience of physical factors and the social actors involved (Oliveira, 2021, p. 09).

The path taken for the implementation of the HBCB was arduous and full of difficulties. From this perspective, the activities of the Humaniza Bosque – HB project were initially conceived. Born in 2019, it aimed to afforest, manage, and manage the spaces of UEPB's Campus III, based on the perception that "environmental impacts are the result of a vast exploitation of green areas and that they are not rehabilitated in the same proportion as degradation" (Silva, 2022, p. 14).

> Concerned with reversing the situation in which the planet finds itself, at the end of 2015 the UN launched the 2030 AGENDA, that is, a global agenda aimed at sustainable development between 2015 and 2030. The main instrument of this new agenda is the 17 SDGs, shown in figure 2. These goals were created through a process of consultation, listening to several countries around the world. The 17 goals are linked to 169 goals and 231 indicators that, by 2030, should be discussed and worked on with the three sectors of society: social, economic, and environmental (Silva, 2022, p. 20).

Deepening this discussion and applying the bases to the reality we have, we worked in an unused area of the HC where the implementation of techniques to vegetate the place and encourage its use by the students began.

In photographic record 1 we present: (a) Front part of the CH/UEPB and initial planning of HB, October/2019; (b) Sustainable Development Goals; (c) HB logo; (d) first activity at HB, in October/2019.

Photographic record 1

a)



b)



c)

PROJETO
HUMANIZA
BOSQUE

d)



Source: Program collection, 2019.

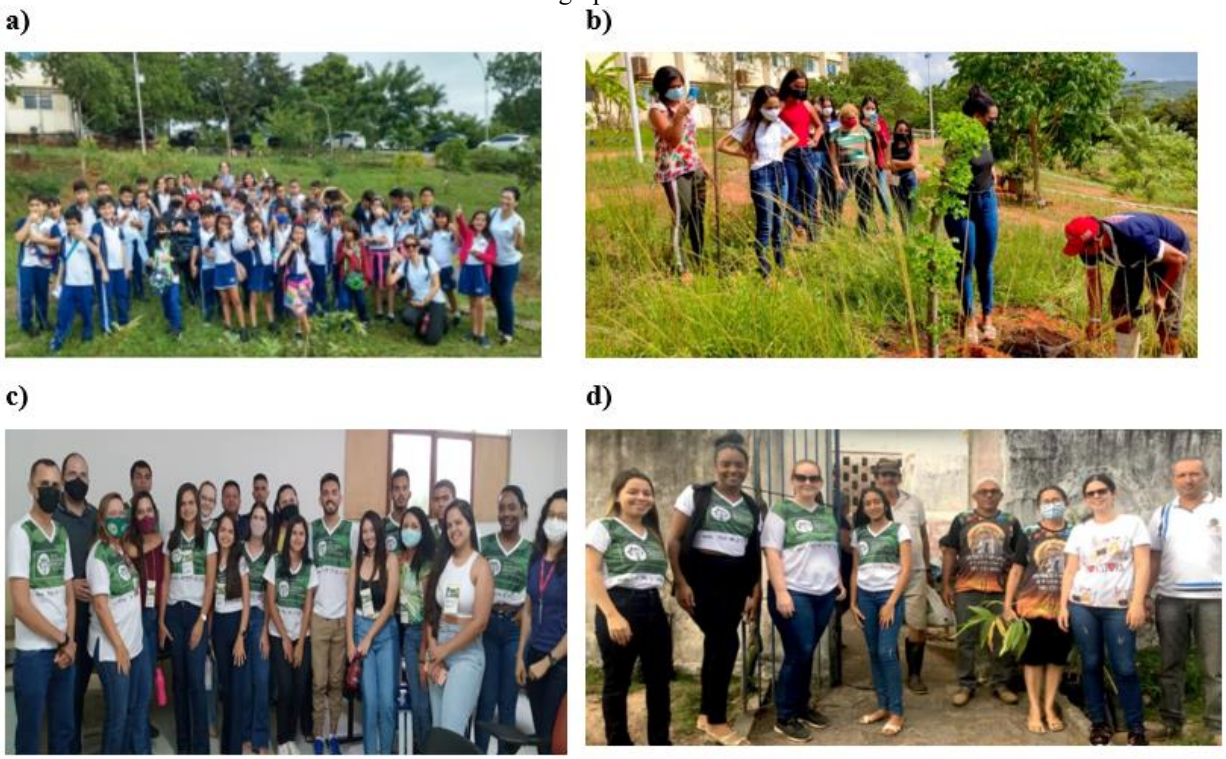
Based on the images above, the EA project began, initially involving a small part of the Geography course and some scholarship holders and volunteers. Also in 2019, we were able to articulate a partnership with several schools to bring the ideas worked on in the HBCB spaces to them.

Planting, management of unused spaces, creative economy, environmental awareness of the students, were some of the initial goals worked on during this period. Unfortunately, in 2020 and until mid-2021, there was an interruption of extension activities at the university. Because of the implementation of social distancing, practical activities were suspended and the greatest concentration was on the theoretical aspect.

In 2021, we resumed practical activities, mainly receiving schools as visitors, as well as visiting some of these schools. In addition to maintaining the HBCB spaces, each project articulates and enables its demands. In photographic record 2, we have (a) Visit of the students of the Nossa Senhora

de Lourdes School in the city of Guarabira; (b) Planting of crab seedlings (*Spondias purpurea*), with the HBCB/CH/UEPB team, in 2022; (c) Record of the activities developed as a result of the 1st Humaniza Bosque Extension Seminar, in 2022; (d) Visit to the E.M.E.F Walfredo Cantalice da Trindade school - Sítio Serra da Jurema Pirpirituba-PB, for the recycling and planting workshop of one of the plant species donated for the afforestation of the school environment, in 2022.

Photographic record 2



Source: Programme collection, 2021/2022.

In 2022 and 2023, the activities intensified and the number of project members increased, which made the activities more and more dynamic. In photographic record 3, we have some more of the activities developed. Images: (a) literary soirée of the Free Books Project, 2022; (b) exchange of books from the Free Books Project at Pracinha Prof. Carlos Belarmino; (c) EA action at ECI Francisco Pessoa de Brito, Araçagi/PN; (d) work awarded at the VIII Extension Seminar – first place in the environment category, Edylma Thais da Silva Floriano, scholarship holder of the 2022/2023 quota; (e) inauguration of the **HBCB Cinema,** during the celebrations of the 4th anniversary of the foundation of the forest; (f) part of the team and family of Professor Carlos Belarmino attending the celebrations of the 4th anniversary of the HBCB.

Photographic record 3

a)



b)



c)



d)



e)



e)



Source: Program collection, 2022,2023.

In the images above, we have some of the activities developed, leading the student to participate and act with social/environmental practices, socializing knowledge and bringing the local community closer to the knowledge and practices developed in the academy.

Currently, the HBCB Program has 7 projects with scholarships and each of them, with at least 8 volunteers, added to the number of teachers and external participants, we have more than 50 people working in the aforementioned program. Chart 1 shows the diversity of relevant topics addressed from an environmental perspective, directing the participants to see these practices that are beneficial to the natural environment as a future possibility for education.

TABLE 1: List of Projects Linked to the HBCB/CH/UEPB Program

No.	PROJECT TITLE
1	BIOGEOGRAPHY AND ORCHID GARDEN OF HUMANIZA BOSQUE CARLOS BELARMINO (HBCB), OF THE HUMANITIES CENTER OF THE STATE UNIVERSITY OF PARAÍBA: Nature and Culture in Species Selection
2	LITERARY READING, ENVIRONMENTAL PRACTICES AND THE SYMBOLIC/CULTURAL CONNECTIONS CREATED FROM THE HUMANIZA BOSQUE CARLOS BELARMINO (HBCB), FROM THE HUMANITIES CENTER OF THE STATE UNIVERSITY OF PARAÍBA
3	FREE BOOKS: THE PRACTICE OF READING IN THE SPACES OF HUMANIZA BOSQUE CARLOS BELARMINO (HBCB) CAMPUS III OF UEPB
4	APPLICATION AND SOCIALIZATION OF THE METHODOLOGY OF CREATIVE ECONOMY AND CLEANER PRODUCTION IN THE INFRASTRUCTURE OF HUMANIZA BOSQUE CARLOS BELARMINO (HBCB), OF THE HUMANITIES CENTER OF THE STATE UNIVERSITY OF PARAÍBA - UEPB
5	ENVIRONMENTAL PRACTICES BASED ON THE SUSTAINABLE DEVELOPMENT GOALS (SDGS) IN PUBLIC SCHOOLS AND COMMUNITIES IN THE STATE OF PARAÍBA
6	SOCIALIZATION OF ENVIRONMENTAL PRACTICES FROM HUMANIZA BOSQUE CARLOS BELARMINO (HBCB), FROM THE HUMANITIES CENTER OF THE STATE UNIVERSITY OF PARAÍBA - UEPB
7	SPACE FOR EXPERIENCES IN TEACHER TRAINING AT HUMANIZA BOSQUE CARLOS BELARMINO (HCBC) OF THE HUMANITIES CENTER OF UEPB

Chart 1 reveals the multiple possibilities of addressing environmental issues within Geography. It is important to remember that the scope of geographic analysis crosses its own borders and dialogues with several other human and social sciences. Established knowledge needs to create connections and involvement of learners with the environment in which they live. The HBCB program aims to discuss and teach through a multiplicity of perspectives, the importance of interdisciplinarity and transversality in the contents that students work on inside and outside the classroom.

5 FINAL THOUGHTS

The Humaniza Bosque Carlos Belarmino (HBCB) program made it possible for those involved to know and experience the use of different learning resources and techniques, making the teaching-learning relationship more pleasurable, working beyond the contents, human values, interspersing experiences and practices that dynamize a more humane look at environmental issues.

It is understood that the public university has the duty to encompass within its walls, the entire community that is around it. This is only possible if there is an articulation of activities that allows the interweaving of knowledge constituted by science and common sense. This dynamic is only possible through trans and interdisciplinarity. This activity allows the understanding that theory and practice, when well worked, make learning interesting and relevant.

The Brazilian model of education has flaws and deficiencies that discourage the development of quality education. Seeking to minimize the fractures generated by precariousness in teaching, especially in the public sphere, teachers adopt techniques that facilitate learning and internalization of content.

The practices developed by HBCB, in these 4 years of activity, allowed a strengthening of relations between the academy and the community, bringing a perception of the lived space and its dimensions. The activities seek to discuss and question environmental practices that allow for the articulation of a more humane world, with a more careful look at the environment and its multiple interactions. "We live in a time of deep evaluation of our modern-capitalist myth, which praises the new all the time, sometimes forgetting to discuss our links with (good) preservation" (Haesbaert, 2017, p.37).

Regarding environmental issues, it is necessary to create processes and alternatives that minimize the impacts of this bad relationship that human groups maintain with the environment. One way to enhance this dissemination of sustainable knowledge and practices is to adopt strategies that involve the educational niche. This partnership works as a vehicle for the propagation of more balanced environmental teachings and practices.

The links between society and nature need to be re-established. Only through an environmental dialogue based on education will we be able to lay the foundations of understanding for the propagation and strengthening of the environment. The involvement of the community in sustainability practices in relation to the natural environment has strengthened ties and boosted possibilities for the expansion of sustainable practices.

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Sustainability in polymeric materials: A review on basic concepts, socioeconomic challenges, and innovations in the field of nanotechnology

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ABSTRACT
This text was prepared collaboratively by the students of the undergraduate course in Nanotechnology at the Federal University of Rio de Janeiro (UFRJ), under the mediation and guidance of professors Lizandra Maurat and Ana Catarina Gomes, as part of the summative and formative evaluation processes of the discipline "Sustainability Applied to Polymeric Materials". The use of this active methodology intended to fix and summarize the topics covered in class, in addition to disseminating and discussing the theme, through an integrative review of fundamental concepts, socioeconomic challenges and advances related to the context. The growing need for research, study and basic knowledge of the physical chemistry of polymers was highlighted here, in order to conceive classifications and discussions in terms of sustainability, considering the complexity of the interactions between polymeric materials, society and the environment. This paper highlights the ecological and socioeconomic complications associated with these materials, as well as discusses emerging innovations in nanotechnology as potential solutions. It was possible, by integrating all the subjects, to link a comprehensive understanding of the topic, highlighting the importance of innovative approaches to overcome the challenges of the application and evaluation of polymeric materials, nanostructured or not.

Keywords: Sustainability, Polymers, Nanotechnology, Active Methodologies, Materials Science Teaching.

1 INTRODUCTION

1.1 POLYMERIC MATERIALS - INTRODUCTION, HISTORY & CLASSIFICATIONS

In 1823, Mackintosh, an English researcher, made an important discovery when he realized that rubber could be dissolved in coal naphtha. This solution allowed the use of rubber, after solvent evaporation, to coat fabrics and make them waterproof [1]. Between the years 1820 and 1824, Thomas Hancock pioneered the development of the first polymer blends, combining natural rubber with gutta-percha [2]. But the first registration of the term "polymeric" occurred between 1832 and 1833, with the Swedish-German chemist Jöns Jacob Berzelius, who attributed this classification to substances formed by repeated molecular units, in particular, compounds with high and multiple molecular weights.

However, the term "polymer" only became better known and began to be widely used after 1922. The word, chosen according to the structural characteristic of the material, is of Greek origin (*Polus+Groupers*) and means "many parts" [3, 4, 5]. Charles Goodyear's contribution, in 1839 in the United States, was fundamental. He found that natural rubber acquires elasticity when mixed with sulfur and subjected to heating, a process known as vulcanization. This discovery revolutionized the rubber industry, giving it desirable properties such as increased strength and durability [6]. Over the years, other significant milestones in the evolution of polymers stand out, starting in 1846 with the patent for gutta-percha insulated conductor cables. The emergence of plasticized cellulose nitrate by the Hyatt brothers in 1870-1872 and the development of the first inflatable tire by Dunlop in 1888 marked notable advances. The year 1907 witnessed the creation of Bakelite, the first thermosetting synthetic polymer, by Leo Baekeland. The 1920s, as already mentioned, brought fundamental concepts, such as Staudinger's proposal on polymer molecular chains. Subsequent discoveries included the synthesis of PVC in 1912, polyethylene in 1933, and nylon in 1934. Notable advances continued in the following decades, culminating in the discovery of stereospecific polymerization by Ziegler and Natta in 1954. Evolution persists, with the current emphasis on the development of new engineering materials through blending, compatibilization, and the creation of new polymers [7].

Professor Eloisa Biasotto Mano played a fundamental role in the history of Polymer Science and Technology in Brazil, dedicating her career to the pioneering development of this area in our country. His impact can be traced back to the early years of his academic training at the National School of Chemistry of the University of Brazil, where he graduated in Industrial Chemistry and Chemical Engineering. Professor Eloisa's entry into the field of polymers occurred in 1954, when she assumed the position of Chemist-Technologist at the Rubber and Plastics Laboratory of the National Institute of Technology. Recognizing the need to enhance her knowledge, she pursued training in Polymer Science at the University of Illinois, USA, under the guidance of the renowned Professor Carl S. Marvel. This international experience was crucial to enriching his understanding of polymers. Back in Brazil, Professor Eloisa, now Full Professor of Organic Chemistry, introduced polymerization practices in laboratory classes, arousing students' interest in the universe of plastics and rubbers. In 1968, he led the creation of the Polymers Group, which became the embryo of the Institute of Macromolecules of the Federal University of Rio de Janeiro (IMA), being a pioneering initiative in the country [8].

The IMA, conceived by Professor Eloisa, has become a multidisciplinary center of excellence in polymer studies, with researchers from different areas. His tireless effort to overcome financial and bureaucratic challenges resulted in the construction of the institute's building in 1978, marking the beginning of a new phase. In addition to consolidating the IMA as an international reference, Professor

Eloisa promoted international meetings, such as the IUPAC International Symposium on Macromolecules, and the Polymer Seminars (SEMPOL), strengthening ties between Brazilian and foreign researchers. His legacy also includes an impressive scientific production, with more than 200 published works, 6 invention patents and the supervision of more than fifty theses. His impact on polymer science has been recognized with national and international awards, culminating in the Grand Cross of the National Order of Scientific Merit awarded by President Fernando Henrique Cardoso in 2000. The Professor Eloisa Mano Award, created by the Brazilian Polymer Association in her honor, highlights the enduring legacy of this remarkable scientist and educator [8, 9].

Once the history of these materials is understood, it is possible to deepen the chemical-theoretical knowledge: polymers are macromolecules obtained by the addition or condensation of monomers - micromolecules of low molecular weight with the ability to react and unite with identical or similar molecules. Paraphrasing the late Professor Eloisa Mano, it is highlighted: "all polymers are macromolecules, but not all macromolecules are polymers". The union of one or more types of monomers (polymerization) results in long chains, formed by repetitive portions, covalently linked to each other, which are called "meros" - fundamental structural units of polymers. The number of associated groupers (degree of polymerization of the molecule) is quantified numerically as the polymeric molar mass, to which the most diverse physicochemical and mechanical properties are associated. These materials are popularly known as plastics, rubbers, and fibers. Resins are very viscous polymeric liquids, of intermediate molecular weight; and oligomers are very low molecular weight polymers [5, 10,11].

The distinguishing characteristics of polymers begin to manifest themselves in the order of 10^3 and become more noticeable as the molar mass increases, and can reach the order of millions. Most polymers used in industry have a molar mass in the tens or hundreds of thousands. In the literature, three main types of molar mass are commonly mentioned - the numerical mean (Mn), the ponderal mean (Mw) and the visvimetric mean (Mv). The discrepancies in the values of the average molecular weights, Mn, Mw and Mv, result from the processes used to obtain them, since they are influenced by the polymolecular nature of the polymers. Several methods are employed in the determination of molar mass. These include terminal group analysis, cryoscopy, ebullioscopy, vapor pressure osmometry, membrane osmometry, gel permeation chromatography, light scattering, ultracentrifugation, and viscometry. Each approach offers a unique perspective, exploring different properties and behaviors of the substance to provide an estimate of its molar mass [5].

The complex integration of information on chemical structure, properties, applications, and manufacturing conditions shows a range of possibilities for this type of material, justifying its extensive use and emphasizing the constant need for evolution and expansion of its study [5, 11].

Polymers can be obtained through different media and various precursor sources. They can be found in nature (such as elastin, collagen, proteins in general, polysaccharides and nucleic acids) or obtained in laboratories (such as polyethylene, polypropylene, polystyrene and polyurethanes), thus being divided into two major groups: natural or synthetic. Depending on the organisms involved in the synthesis or the raw materials used, they can also be distinguished into subgroups such as: fossil, vegetable, animal, bacterial, fungal polymers, etc. Listed below are some criteria and types of polymer classification [5, 11, 12, 13, 14 , 15].

a) origin
   - Natural Polymer
   - Synthetic Polymer

b) Number of Types of Monomers
   - Homopolymer
   - Copolymer (2 or more different types of groupers)
   - alternate
   - random
   - en bloc
   - Grafted

c) Chain Interaction Type
   - Linear Chain
   - Branched Chain
   - Cross-linked chain
   - cross-linked chain

d) Method of preparation
   - Addition polymer
   - Condensing Polymer
   - polymer obtained by modification

e) Chaining Type
   - head-tail polymer
   - Head-to-head polymer
   - Cauda-Cauda Polymer

f) Configuration of the atoms in the chain
   - CIS Polymer
   - polimero trans

g) Tactility of the chain
   - isotatic polymer

- Syndiostatic polymer
- Atative polymer

h) functional group present in the structure
- polyesters
- polyamides
- polyalcohols etc.

i) fusibility and/or solubility
- thermoplastic polymer (softening occurs by increasing temperature and solidification, through cooling, in a reversible procedure)
- thermoset polymer (they are not moldable, but degraded by the action of temperature)

j) Mechanical behavior
- Plastic (rigid or flexible)
- Elastomer (rubber)
- fiber (flexible, cylindrical body, with small cross-section and high aspect ratio; it is formed by linear, longitudinally oriented macromolecules and resists temperature variations between without a substantial change in mechanical properties)

k) degradability
- Biodegradable
- they do not degrade at an observable rate under environmental conditions.

Polymerization processes present the most diverse technical possibilities, in terms of materials and methods, which makes their variables responsible for the final properties of the polymeric material. The conditions for obtaining polymers are of great importance, not only with regard to the molecular characteristics, which interfere in their daily and industrial application, but also with regard to the peculiarities of the process of synthesis, processing and reuse or recycling, which reflect on the final destination, viability and socioeconomic competitiveness of the material [5, 11].

Generally speaking, polymer preparation methods vary in terms of reaction type or mechanism, formation of micromolecular byproducts, and chain growth velocity. Polyaddition is, as the name suggests, the direct union of monomers, forming covalently linked carbon chains, from 3 blocks of reactions (initiation, propagation and termination), which occur successively or simultaneously, without the formation of by-products. In this type of polymerization, the degree of polymerization and the reaction rate are high, with the immediate formation of polymers, as observed for polyethylene, polystyrene and polymethyl methacrylate. Condensation polymers differ from addition polymers in that they incorporate atoms of diverse elements, such as oxygen, nitrogen, sulfur, and phosphorus, into the main chain. In addition, polycondensation consists of a single reaction, but given in stages, in which there is no distinction between the beginning of polymer formation and macromolecular growth; The

conversion is high, but the growth of the chain is slow and statistical, reaching a significant molecular weight after intercondensation of the smaller segments. The resulting molecular weight is usually an order of magnitude lower than that obtained in polyaddition. Examples of condensation polymers include polyethylene terephthalate - PET, polyvinyl acetate - PVAc and PA-6.6, polyhexamethylene-adipamide. In cases of aldehydic monomers or lactamas, polymerization occurs by the carbonyl or opening of the lactam ring, introducing heteroatoms into the chain, as in polyoxymethylene and polycaprolactam. Some polymers, such as polyurethanes, combine characteristics of both reactions. In addition, there are polymers (such as polyvinyl alcohol - PVAl) whose production is only possible through the modification of a pre-existing polymer (PVAc, in the case of PVAl), without a combination of monomers for its formation. And, in terms of polymerization techniques, there is the possibility of obtaining polymers in homogeneous medium (mass or solution polymerization) or heterogeneous (in slurry, suspension, emulsion or interfacial polymerization) [5, 7, 10, 16].

Although there are widely exploited industrial polymeric materials such as natural rubber, an excellent elastomer obtained by bleeding rubber tree latex, most of the polymers with sufficiently satisfactory properties to be commercialized on a large scale are produced from petroleum derivatives. Seeking a more sustainable way to obtain polymers, there are "green" alternatives to the use of fossil polymers - using modified or improved natural polymers (such as nanocomposites) or even adapting the route of obtaining a fossil polymer to make it less aggressive, with less toxic intermediates, using less energy or generating less waste for the environment [11, 17].

1.2 INDUSTRIAL & EVERYDAY POLYMERS

Due to the breadth of the concept of polymers and the varied properties they can possess, human society has sought them out and adapted to their presence. The application of materials to human development, in any area whatsoever, has been limited by a few classes of materials for most of human existence, until recently, with the production of human-made polymers altering the scales of what is possible and practicable. Nature offered polymers of use long before we started synthesizing anything, however. Disregarding the polymeric aspect of proteins and DNA itself, we still have starch, cellulose and natural rubber as polymers used by humans over the years to facilitate life. [1, 2, 4].

Our understanding of natural polymers was essential to a technological breakthrough. In the nineteenth century, vulcanized rubber allowed scientific achievements and advances in convenience and urban mobility. To this day, vulcanized rubber is one of the most common polymers in the routine of most human beings [1, 5, 6].

Looking at the human synthesis of polymers, their introduction into society has taken an accelerated momentum, with their presence becoming more and more pronounced as we approach the point of analysis of the current moment. The appearance of synthetic fibers in the textile industry was

well marked by the successful application of Nylon®, producing clothes by the end of the 30s, and soon being absorbed in other areas, such as the military and industrial. This pattern of development followed by application in multiple areas is repeated over the decades for various polymers that are still used today [4, 18].

Modern life as it is understood by the majority of the global population is unthinkable if we remove the action of polymers on it, as their participation is denoted in the most important and diverse areas of application: packaging, automotive industry, electronics industry, health sector, civil construction, textile industry, aerospace sector, food industry, energy production and storage, recycling, sanitary engineering, among others. Some examples of the most commonly used polymers include polyethylene (PE), polypropylene (PP), polystyrene (PS), polyvinyl chloride (PVC), Teflon (PTFE), polyethylene terephthalate (PET) and nylon (polyamides in general) [2, 12, 19, 20, 21, 22, 23].

1.3 POLYMER CHARACTERIZATION

Polymer analysis encompasses a diverse set of analytical techniques and methods employed to identify the physical, chemical, and mechanical properties of a specific material. Characterization involves the evaluation of several properties that delineate their structure, behavior, and applicability; and aims to evaluate these materials in relation to: chemical structure, viscosity, microstructure, color and opacity, thermal resistance and response, mechanical properties, average size and distribution - chain and particle, surface charge, morphology and surface, solubility in water, biological compatibility, degradability in various media, pharmacokinetic and pharmacodynamic evaluation, antimicrobial, antioxidant and gas and vapor barrier activity [23, 24, 25, 26, 27].

Molecular weight determination, or molar mass, can be performed by methods such as size exclusion chromatography (SEC or SEC/HPLC), mass spectrometry (MS) and viscosimetry, while particle size analysis is performed via SEC or dynamic light scattering (DLS). To identify the chemical composition and structure of polymers, which are crucial aspects for their properties, techniques such as carbon or hydrogen nuclear magnetic resonance (C13 or H1 NMR) and Fourier transform infrared spectroscopy (FTIR) are used. Morphology and surface analysis can be conducted using microscopy techniques, including scanning electron microscopy (SEM), transmission electron microscopy (TEM), and atomic force microscopy (AFM). Mechanical properties such as tensile strength, bending, hardness, and toughness are evaluated through specific tests, guided by the standards of the American Society for Testing and Materials (ASTM), while thermal properties are investigated by techniques such as thermogravimetric analysis (TGA) and differential scanning calorimetry (DSC). The electrical or insulating performance is tested through the dielectric constant and dielectric resistivity. The rheological behavior, which highlights the response of the polymer to flow under tension, is analyzed by techniques such as capillary rheometry and Torke, Haake. Optical properties, such as light

transmittance, reflection, and absorption, are evaluated using UV-vis spectroscopy and near-infrared absorption spectroscopy. In packaging applications, the ability to block gases and liquids is examined through permeability and diffusion techniques to characterize barrier properties. Analysis of crystal microstructure and surface chemical composition, relevant in adhesion and coating applications, is conducted using X-ray photoelectron spectroscopy (XPS) and X-ray diffraction (XRD) [28, 29, 30].

These approaches provide a thorough understanding of the properties of polymers, contributing to their effective application in a variety of areas. The characterization results from the combination of several of these techniques, depending on the specifications of the material with which one works, the time and apparatus available, as well as the proposed application and final destination, which, in turn, will delimit the specific properties that are desired to be obtained and that are, therefore, necessary to be evaluated. From this, it is possible to design the properties and behavior of the material under different conditions.

1.4 (BIO)DEGRADABILITY OF POLYMERS

Biodegradation is the organic conversion of polymer into biomass, water, carbon dioxide and other gases. Biodegradable polymers are a contribution to a sustainable future. Concern about environmental pollution and the negative impacts of plastic waste on our planet, especially in the oceans, has led to an increase in research and development of new materials. Biodegradable polymers are materials capable of being broken down by living microorganisms into natural by-products that are harmless to the environment. They are an alternative that has received prominence as an approach to reduce environmental problems associated with traditional polymers, which can persist in the environment and other living things for several years. Even synthetics are designed to meet the needs of consumers and industry while maintaining the desired properties, but with a shorter life cycle, being more environmentally friendly. There are several classes of biodegradable polymers, which can be obtained from renewable sources, such as starch, cellulose, proteins, PLA and PHA, or from non-renewable sources, such as synthetic polymers designed or modified to be biodegradable [12, 14, 15, 17, 31].

The biodegradability of a material is influenced by several factors, including its chemical structure, the environment to which it is subjected, and the conditions of the microbiota around it. Biodegradable polymeric materials degrade faster under specific conditions of humidity, temperature, pH, and the presence and amount of certain gases, metals, and microorganisms. Thus, biodegradable polymers end up becoming more suitable for applications in which their final disposal occurs in natural environments, which is the case of various bags and packaging, especially food [32, 33, 34].

Taking into account the information presented, it is important to emphasize that biodegradable polymers cannot be listed as the solution to all problems related to "plastics", because biodegradation

depends on a number of factors, such as the polymeric structure required (such as aliphatic chains with tertiary carbon, unsaturation between carbons and hydrolyzable functional groups - ester bond, amide, acetal), maintenance of balance in the composting ecosystem, the availability of suitable microorganisms and the condition of the polymer in question. In some cases, biodegradation may not occur, with the obstruction of the process in the initial fragmentation stage, resulting in the formation of microplastics, which can have severe environmental impacts, with damage of unknown size [35, 36, 37, 38, 39 , 40].

The most important thing when it comes to this topic is to educate consumers about the benefits and limitations of biodegradable polymers, so that the possibility of degradation is not lost or this concept is confused with that of recyclability, which does not imply biodegradability or vice versa. Recycling, on the other hand, consists of transforming discarded materials into new products or raw materials. Awareness is key to preventing materials from being wrongly disposed of, contaminating recycling and composting systems, while they should be properly disposed of at the end of their useful life, reducing waste, saving natural resources, and minimizing socioeconomic and environmental impacts [35 - 40].

It is worth mentioning market factors that hinder or even make polymeric biodegradation difficult or even impossible: soiling with impermeable or toxic materials, the presence of other polymers with a non-degradable chain in the matrix and the insertion of additives in its composition, such as vulcanizing agent, accelerator, catalyst, activator, antioxidant, filler (reinforcing or inert), plasticizer, stabilizer, dye, lubricant, etc. curing agent or sponge agent [12, 15, 39].

As the demand for sustainable solutions for single-use polymeric materials (such as masks, cups, straws, cutlery, plates) grows, there are continuous advancements in research and industry that make biodegradable polymers play a significant role in reducing the environmental impact caused by plastic materials. However, the most effective approach to polymer-related environmental challenges is a combination of reducing the rampant use of disposables, effective recycling, and ultimately responsible adoption of biodegradable polymers where possible and appropriate. Biodegradability represents a step towards a more sustainable future, but it requires a collective commitment from society, industry and governments, to ensure that costs are affordable for all and thus social and environmental benefits are achieved and maintained.

The evaluation of polymeric degradation can be conducted by monitoring the growth of microorganisms, following the consumption of the substrate, gauging the consumption of O2 and the release of CO2, observing and measuring the changes in properties (physical/chemical/structural) or even employing mathematical modeling to make predictions that contribute to the study of degradation kinetics [12, 35, 40].

1.5 POLYMER RECYCLABILITY

Given the global increase in the improper disposal of polymers, especially plastics, recycling emerges as another promising way to address this problem. However, it is imperative to recognize that the conventional recycling process, adopted on a large scale, proves to be ineffective. Even when implemented at a scale below its maximum capacity, it faces significant challenges in the economic and logistical spheres, highlighting the pressing need for more robust and comprehensive strategies [38, 41].

The recyclability of a polymer is determined by the possibility and ease with which it can be reintroduced into the processing cycle, either with simple thermomechanical changes (formation of pellets and the like for new production), with the reuse of the chemical structure, with the reacquisition of a valuable product used in the polymer, or simply with the recovery of part of the energy spent to achieve the final product [18, 36, 38].

In general, fusibility is the crucial factor for the thermomechanical recyclability of a polymer. Thermoplastics, for example, can be thermally remodeled without significant loss of properties, making it possible to reuse them. The difficulties of thermo-mechanical recycling tend to be the industrial additives that compromise the process and prevent the use of a polymer in an application that requires higher purity; as well as the misuse or sloppiness in the disposal of the material (with lack of cleaning or incorrect direction), adding impurities and affecting the entire process. An additional obstacle in polymer recycling is the establishment of a well-defined upper limit for the amount of recycled material allowed in certain products. In some cases, the use of recycled material is even prohibited due to the specific nature of some articles made with polymers (such as in hospital materials), which imposes significant restrictions in certain areas [42, 43, 44].

Other forms of recycling, however, rely on the use of parts (monomers, additives, raw materials), rather than considering the final chemical structure of the polymer. Among these, chemical recycling seeks to transform polymers into basic production materials, generally for a subsequent polymeric synthesis, or for the reacquisition of other products (usually petrochemicals). The determining factor of this process comes from the vulnerability of the polymer to the most common techniques, such as hydrolysis [41, 45, 46].

Energy recycling of polymers involves the controlled burning of plastic waste to generate heat or electricity. This process includes collecting, sorting, and pre-treating the plastics before burning or pyrolysis, where thermal decomposition occurs. The heat generated is then used to produce steam, which powers turbines to generate electricity. Although it is an alternative to plastics that are difficult to recycle mechanically, energy recycling faces criticism due to the possible emission of pollutants, highlighting the importance of emission control technologies. This approach is seen as secondary, and

it is preferable to prioritize reducing the use of plastics and promoting more sustainable recycling methods [47, 48, 49].

1.6 POLYMERS - HEALTH & TOXICITY

The duality of polymers is evident, since these materials are frequently mentioned in the scientific literature and in the mass media, sometimes as executioners, sometimes as the ideal artifice for various purposes. When disposed of quickly and improperly, polymers can accumulate, persist in nature for many years, generate microplastics, disperse, or even become carriers of toxic agents, contributing to environmental pollution and posing threats to human health and biodiversity. However, this same class of materials exhibits remarkable potential when applied responsibly - they are increasingly used as a matrix for food packaging, cosmetics, and biocompatible bases for implants, prostheses, medicines, contact lenses, dressings, sutures, utensils for clinical management (tweezers, pouches, masks, gloves, drains, *etc*) and diagnostic devices. Their versatility in terms of properties make them fundamental in the creation of increasingly innovative and efficient products [2, 4, 5, 27, 34, 35, 37, 50].

In today's landscape of urban populations, efficient time management is crucial, driving the steady growth of the market for ready-to-eat products with single-use packaging. Strict sanitary standards in some areas, such as food and health, for example, favor the adoption of single-use plastics that minimize risks to the consumer. Despite some unfavorable aspects, polymers emerge as a very advantageous and versatile economic solution, justifying their wide use, especially in single-use disposable products or limited reuse. The polymers in this group are classified as *commodities* - such as low-density polyethylene (LDPE), high-density polyethylene (HDPE), polypropylene (PP), polystyrene (PS) and polyethylene terephthalate (PET). Manufactured on a large scale, with low individual added value, but high socioeconomic importance since they are consumed in significant quantities; Commodities are intended for generic uses, without lacking high technology or advanced and distinctive properties [4, 5, 51, 52, 53].

The prevalence of polymers in the form of bags, films and containers based on mixtures, blends and composites for food transport, handling and storage raises investigations on the migration of compounds to food, with emphasis on the study of microplastics, monomers and oligomers that can detach from the packaging structure and interact with its content and the environment. Global regulatory authorities such as the Food and Drug Administration (FDA) in the United States, the European Medicines Agency (EMA) in the European Union, the National Health Surveillance Agency (ANVISA) in Brazil, and the National Administration of Drugs, Food and Medical Technology (ANMAT) in Argentina, set migration limits to ensure safety in this context. Still, punctual and extreme conditions of temperature, pH, and humidity can lead to accelerated fragmentation and degradation of

polymers, impacting the environment and human health more directly. The release of toxic substances can also occur in certain circumstances, such as during the burning of plastics, resulting in emissions of gases that are harmful to fauna and flora. In addition, when plastic degradation leads to the formation of microparticles and nanoparticles that are ingested by living organisms, this issue represents a major environmental and public health challenge. Widely used polymers, such as polyethylene and polypropylene, exhibit low intrinsic toxicity when isolated and not subjected to extreme heat, but the presence of dyes, fillers, and monomer residues can introduce fatal elements into their risk equation, especially when the mode of use and disposal are not properly managed [18, 35, 51, 52].

It is understood, therefore, that the possible toxicity of polymer-based materials is influenced not only by the composition of the matrix and the additives used during manufacturing. The assessment of the risk intrinsic to each material and the prediction of the possible risks associated with its use also depends on the specific application conditions - such as time, mode and intensity of use - in addition to the disposal environment. Namely, plastic products such as baby bottles, toys, bottles, and even food can coatings based on polycarbonates and epoxy resins present a primary risk related to their improper use and disposal (mainly involving burning or exposure to radiation and excessive heat). The release of substances used as plasticizers or intermediates in the production of artifacts, such as phthalates (BBPs) and bisphenol A (BPA) is a dilemma since these represent potential endocrine disruptors, also related to obesity, asthma, type II diabetes, cardiovascular diseases, and have been associated with adverse effects on the reproductive health of adults and impacts on the neurological and behavioral development of children and adolescents (such as attention deficit, hyperactivity and disorders within the autism spectrum), posing risks to both human health and the environment, especially marine beings [54, 55, 56].

Therefore, while most other *commodity* polymers are considered inert (i.e., they do not react spontaneously with a range of everyday materials) and even the ingestion of microplastics can be considered harmless, this relative inertia definitely does not imply the total absence of possible unwanted effects, especially after the improper disposal of plastic waste into complex ecosystems such as rivers, lakes, oceans, and landfills. In addition, environmental pollution from the dispersion and accumulation of tons of plastic waste is increasingly becoming a global concern, with potential negative impacts on aquatic and terrestrial ecosystems. Polymers from a biological synthesis or from a natural and renewable source are a more viable option when thinking about sustainability and possible toxicity. However, its mechanical properties and high cost often lead to technical and economic unfeasibility. Thus, it is necessary to rethink and balance their use in everyday life, considering the reconciliation of good management of *commodity* polymers, reuse and recycling, because even though many biopolymers and biodegradable polymers seem to present a lower risk to ecosystems, if their management and disposal are not done correctly, their degradation is affected (or

even impossible) and there can still be human and environmental contamination. especially due to the other components added in its formulation [12, 18, 36, 38, 57].

Thus, although many studies are underway to understand globally and specifically the impacts associated with polymers, it is evident that the topic is dynamic and subject to constant revisions. Continued research and implementation of effective regulations are crucial to minimize the risks and harms associated with these materials. Proper management of polymers, from their production to their disposal, is crucial to mitigate their possible negative impacts and optimize their beneficial applications, seeking a sustainable balance between the benefits and challenges associated with these materials.

1.7 SOCIAL IMPLICATIONS AND ECONOMIC ASPECTS AROUND "PLASTIC"

The presence of plastic materials in human society has reached a very high level in recent years and is already significantly altering the way society and the economy develop. The consumerist cultural model currently disseminated is constantly related to the massive global production of waste, resulting from the continuous search for the consumption of futile and rapidly obsolete objects, causing a serious and accelerated loss of natural resources, in addition to the accumulation of garbage, especially of a polymeric nature, in inappropriate places. This indicates that, despite the role of plastic waste in the environmental problem, the cultural aspect is the main motivator for this reality, associated with the excessive and unnecessary application of packaging and other disposables [38, 58, 59].

Plastic lifecycle management requires a comprehensive approach that encompasses education and awareness. Society needs to understand not only the negative impacts of rampant plastic use, but also the importance of responsible disposal and recycling. And governments play a crucial role in implementing public policies aimed at this issue. Educational programs and campaigns are vital to promote awareness from childhood, emphasizing the need for reduced consumption, proper disposal practices, and valuing recycling as an effective means of reducing the environmental footprint. In addition, governments have a role to establish more effective regulations and incentives, which in fact favor sustainable business practices and the promotion of extended producer responsibility [18, 36, 59, 60].

In general, world leaders have been escaping the discourse that blames the action of consumers for companies and have been seeking to impose greater action and responsibility on them, with the proposal of applying reverse logistics so that, armed with the knowledge of processing their materials, they can properly dispose of the products, through the application of a domestic return network. Such policies do not exempt society from the need for greater education on the subject, because regardless of the quality of the reverse logistics network, the active cooperation of the population will always be necessary [59, 60, 61].

The work of garbage collectors in developing countries reveals a situation of social disparity that stimulates informal recycling work, mitigating the impacts of plastic waste, since it not only redirects the material, leading it to the recycling chain to which it should have already been inserted, but also transforms it into a source of income and subsidy for less affluent people. Currently, many countries have been seeking to organize and refine the actions of these individuals, in order to provide them with better living conditions and so that they can make an even greater positive impact on the issue of the absorption of reusable resources unfortunately trivialized as common waste [36, 38, 42].

The global recycling rate of plastics reached levels of less than 10% in 2022, highlighting the need for additional efforts to promote sustainable practices and reduce the environmental impact of improper disposal. An increase in the total volume of recycled material in the current socio-economic conditions, however, has its strength reduced by the reality of the cost-benefit of recycling. In most industries that use a base material that can be replaced by recycled material, the difference in acquisition costs and process adequacy does not tend to be significant enough for the transition to be seen as favorable. Thus, the socioeconomic weight of polymers does not allow recycling to be consolidated as a viable alternative in a comprehensive way, in addition to recycling on a domestic scale. The challenge lies in the need to develop economic strategies that make the adoption of recycled material more attractive to large industries, promoting the reduction of environmental impacts without compromising efficiency and competitiveness in the market. Therefore, it is imperative to invest in research and innovation aimed not only at improving recycling technologies, in order to reduce associated costs, aligning environmental benefits with economic demands, and thus enabling an effective transition to more sustainable practices [36, 47, 49, 60, 62, 63, 64].

The development of biodegradable plastic materials, nanosized particles and composites based on nanotechnology represents a promising frontier in the biomedical, textile, electronics, food safety and everyday products in general, seeking multifaceted alternatives, with more effective and ecologically friendly applications compared to conventional polymers. However, the cost associated with these materials with innovation and a higher degree of aggregate technology is still a challenge, hindering their large-scale adoption and sometimes making them inaccessible to certain sectors of the population until their sale is cheaper[12, 15, 32, 33, 34, 65, 66, 67].

From a social point of view, the poorest communities in particular face challenges related to polymers with greater gravity, such as the lack of access to advanced resources for public health and food security; and environmental pollution resulting from the inappropriate use and disposal of already popularized materials, which are deposited in dumps and landfills, most of the time strategically positioned in suburbs and marginalized areas. Homeless people and the poorest individuals are the most affected by health issues related to the plastic sector - diseases arising from the accumulation of garbage and lack of access to basic plastic materials (clothes, masks, sanitary pads, diapers, disposable

dishes, *etc*.), especially living in precarious conditions of basic sanitation. Therefore, the implementation of public policies that encourage sustainable practices, as well as the creation of infrastructure for the popularization of basic and advanced plastic materials, selective collection, and recycling, are key to addressing these social issues [37, 44, 52, 59, 61].

In short, the issue of plastic involves a complex interconnection between economic, social and environmental factors. The search for effective solutions requires a holistic approach, integrating technological innovations, education, and public policies that aim at a balance between social well-being, economic development, and environmental preservation.

1.8 STANDARDS AND CERTIFICATIONS IN "GREENER" POLYMERS

The definition of "green polymer" is not taken as a consensus, but in general, a material is termed "green" comparatively - when it is considered more sustainable than an analogous material, in relation to one or more aspects - raw materials, adjuvants used in synthesis and processing, energy expenditure associated with production, recycling or degradability [68]. Therefore, even if a polymer is today named "green" by an author, it is still liable to generate waste and pollution throughout its entire life cycle and can probably still be optimized.

Biodegradable polymers can be considered green because they do not persist in nature; ideally, they are broken down by living beings, reducing them to simpler substances, such as water, carbon dioxide and biomass, which are reintegrated into the environment. The adhesion, blending, and gradual transition to biodegradable polymers raises challenges in terms of regulation and standardization. Establishing consistent standards is essential to ensure that biodegradable polymers meet expectations regarding their application, degradation, and safety [12, 15, 32, 68].

The technical standards of the Brazilian Association of Technical Standards (ABNT) evolve and adapt over time. In addition, local standards can be developed to complement national rules and meet specific environmental and industrial needs. However, among the current standards related to sustainability in polymers, applied in the national territory, the following stand out:

a) ISO 14001: defines the requirements for environmental management systems and can be applied to companies that produce sustainable polymers.
b) ABNT NBR ISO 14044: deals with the assessment of the life cycle of products, including polymers, to assess their environmental impact.
c) ABNT NBR 15575: specifies the requirements for the performance of residential buildings and may be relevant for the construction of buildings that incorporate sustainable polymeric materials.
d) ABNT NBR 15448: defines the requirements for the environmental labeling of products, which may be relevant for sustainable polymers that wish to obtain eco-label certifications.

e) ABNT NBR 16173: establishes guidelines for the management of social responsibility in organizations and can be applied to companies that produce sustainable polymers.

The international standard generically used to evaluate the biodegradability of various products and materials is ISO 14855, also known as "Determination of the ultimate aerobic biodegradability of plastic materials in an aqueous medium - Method by analysis of evolved carbon dioxide." This standard specifies methods for evaluating the aerobic biodegradability of plastic materials in aqueous media. It addresses procedures for determining the amount of carbon dioxide released during the biodegradation of samples under controlled conditions. There is not yet a single, unanimously accepted international guideline exclusively for biodegradable polymers and their final products. Entrepreneurs and authors of polymeric studies and innovations use biodegradability standards according to their context and needs, selecting specific points or combining topics of greater relevance from several standards in order to fully address all the necessary aspects of the topic. The following are some of the most relevant international standards and certifications:

f) EN 13432 (Europe) - sets out the requirements for compostable and biodegradable packaging. It defines criteria for the biodegradation, disintegration, compost quality, and environmental impact of compostable products.
g) ASTM D6400 and ASTM D6868 (United States) - address the requirements for biodegradable and compostable plastic products.
h) ISO 17088 - provides guidelines for the determination of the biodegradability and disintegration of polymers under controlled composting conditions.
i) OKCompost certification (awarded by TÜV Austria) - indicates the compostability of products and packaging, including biodegradable polymers.
j) Seedling certification (granted by Din Certco) - indicates that a product is compostable according to EN 13432.

Notable examples of green polymers include PLA (poly(lactic acid)), obtained from corn starch or sugarcane, which is biodegradable and commonly used in packaging and disposable products. PHAs (polyhydroxyalkanoates), produced by bacteria through the fermentation of sugars, are fully biodegradable and find application in a variety of plastic products. PBS (Polybutyric Acid) is another biodegradable green polymer, often sourced from renewable sources such as sugarcane and used in packaging. PEF (Polyethylene Furanoate), derived from plant biomass, is considered a more sustainable alternative to PET and used in beverage packaging. These examples represent the diversity of green polymers that seek to reduce the environmental footprint of the traditional polymer industry [12, [15, 32, 68]].

1.9 LIFE CYCLE ANALYSIS OF POLYMERS

The life cycle shows the stages that the product or material goes through throughout its process, from obtaining the raw material to its production, final application and disposal, evaluating the impact that each phase has and making it possible to evaluate and make decisions about sustainability related to that product [69].

Life Cycle Analysis (LCA) emerges as a fundamental tool in the evaluation of polymers, standing out as a systematic approach to measure environmental impacts throughout all phases of a product's life cycle. In the context of polymers, which play an essential role in modern industry, LCA offers a holistic perspective, from the extraction of raw materials to the final disposal of the product, taking into account factors such as quantitative and energy demand, source of production, biodegradability and recyclability. This comprehensive approach allows the identification of critical points in the polymer life cycle, contributing to process optimization and the reduction of environmental impacts [60, 69].

The LCA process comprises four key steps. In the first stage - definition of objectives and scope - the purposes of the analysis are established, outlining the extent of the study and identifying the limits of the system, as well as the main functions of the product under analysis. Next, the life cycle inventory stage involves a thorough compilation of all inputs and emissions associated with the product life cycle. This phase encompasses the collection of data related to raw materials, energy, transportation, and industrial processes, providing a comprehensive view of the system's inputs and outputs. The third stage, environmental impact assessment, translates inventory data into environmental impacts, considering several categories, such as natural resource consumption, greenhouse gas emissions, and air and water pollution. The use of mathematical models and specific indicators helps to quantify these impacts. Finally, the results interpretation stage aims to analyze the results in light of the defined objectives and scope, highlighting critical areas and identifying opportunities for improvement. This interpretation guides decision-making aimed at mitigating environmental impacts throughout the product's life cycle, contributing to more sustainable practices [60, 62, 63, 69].

The LCA of polymers therefore considers important aspects such as the energy embodied in the different stages of production, greenhouse gas emissions, the generation of solid and liquid waste, as well as other relevant environmental indicators. The comparison between different polymers through LCA provides a solid basis for sustainable decision-making in the selection and development of these materials, considering not only the physical and mechanical properties, but also the associated impacts. This proactive approach is essential in the search for solutions that minimize the environmental footprint of polymer production, promoting the transition to more sustainable practices [62, 69].

However, persistent challenges in polymer LCA include the complexity of global supply chains and the variation in production practices between different regions. In addition, the incorporation of social factors in the evaluation is still an area under development, aiming at a more complete view of the sustainability of polymers. Overcoming these challenges requires collaboration between industry, researchers, and policymakers to develop guidelines and standards that promote robust and equitable LCA for polymers [60, 62, 63, 69].

1.10 CHALLENGES IN THE USE OF POLYMERS

The use of polymers is a great challenge, as it is necessary to evaluate the entire production process in order to always aim for better efficiency with low environmental impact, as well as an awareness for the people who use them [60, 63].

For better efficiency, evaluating and improving stages of your production process is essential, as it is possible to minimize effects such as waste, use of toxic components, reduce energy expenditure and greenhouse gas emissions and thus mitigate the environmental impact associated with these practices. And all this becomes possible with studies on technologies and process optimization, developing more sustainable ways for their production or even in relation to their raw material, finding more eco-efficient alternatives [60, 63, 69].

Although the improvement of processes is a big step that we are getting closer to the path of sustainability, just optimizing production and disposal in an industrial way is not enough, it is also necessary to make people aware as a whole that it is necessary to have better environmental education. Promoting practices such as responsible use, correct disposal, conscious consumption and reuse makes it more possible to make the life cycle of this material more sustainable [70].

The combination of this process optimization, the awareness of a better use for this material and the implementation of the necessary recycling infrastructure is an extremely important step to deal with the challenges in the use of polymers. Collaboration between these pillars becomes essential to significantly change usage practices, making them more sustainable and ensuring human and environmental preservation.

In addition, nanotechnology is also emerging as a promising tool to drive sustainability in the field of polymers. By adding particles at nanometer scales, it is possible to achieve controlled modification of the properties of polymers, giving them improved performance and sustainability characteristics. The use of nanoparticles in polymers can improve their mechanical strength, durability, and even make them lighter, thereby reducing resource consumption. In addition, nanotechnology offers opportunities for the creation of more efficient biodegradable polymers, contributing to mitigating the problem of persistent plastic waste. The ability to develop more energy- and resource-efficient nanomaterials opens doors to more sustainable production processes while enhancing the

properties of polymers, providing innovative and environmentally friendly solutions to the challenges faced by the polymer industry [50, 52, 65, 67, 71].

1.11 CIRCULAR ECONOMY AND POLYMERIC MATERIALS

In times of social changes in the search for sustainability, the concept of circular economy has been employed as a way to assist in the issues of polymeric materials. The term circular economy is usually attributed to Pearce and Turner (1990), in a publication where they expose the idea of an economic model that challenges the current linear model, one that takes concepts of conservation of physics and seeks to apply them in the socioeconomic sphere, so that, in short, circular economy is a system in which each end of the process is the beginning of a next process. extending the application of what is produced to the maximum possible, integrating acts and social awareness for the maintenance of the system, thus reducing the exploitation of natural resources and the volume of waste [37, 44].

When we bring the scope of the concept to polymeric materials, the challenges already exposed regarding environmental education are again relevant, considering the need for adequate socio-environmental integration and proper disposal. And, even if the social issue were properly applied, there is a need to create adequate processes and materials for the maintenance of this type of model. This need has been addressed with a new way of thinking about the polymer research and development process. With their *design* being done with the circular economy in mind, advances such as the production of virgin polymers from renewable or recyclable materials coordinate with the preference for energy with a lower carbon footprint, as well as the possibility of reinserting the product into the economic cycle with recycling [37, 38, 61].

Other approaches to the issue try to alter the production processes already known for the acquisition of sustainable qualities to the final product, such as the proposal for catalytic alteration of polyethylene that seeks to maintain its mechanical properties as much as possible, but allow an easier degradation to monomers. In the face of these innovations, it is hoped that polymers in general will be adequately reimagined, or that their techniques of use, recycling, processing, use and disposal will be renewed to compose an eventual sustainable condition [32, 40, 72].

1.12 NANOTECHNOLOGICAL INNOVATIONS FOR SUSTAINABLE DEVELOPMENT

As already mentioned, nanotechnology can provide great advances to help preserve the environment, bypassing several challenges in the use of polymers. The following are some of the main potential benefits of nanotechnology for sustainable development [22, 23, 24, 25, 50, 52, 65, 67, 73, 74]:

a) Prevention of pollution or indirect damage to the environment: catalytic nanomaterials can be used to increase efficiency and selectivity in industrial processes, which results in greater use of raw materials, lower energy consumption and less waste.
b) Treatment of pollutants: due to their large surface area, nanoparticles have adsorption properties of metals and organic substances. Therefore, these particles can be used to remove such substances. Redox or semiconductor properties can be used in the treatment of water and industrial effluents, based on the chemical or photochemical degradation property of organic pollutants.
c) Pollutant detection and monitoring: Nanosensors are more selective and more sensitive for the detection and monitoring of organic and inorganic pollutants in the environment. These advances provide better control of industrial processes and earlier and more accurate detection of contamination in the environment, in food and other products for human use.
d) Use of nanocomposites: the creation of nanocomposites is used to modify characteristics of existing materials, for example, incorporating fillers to increase the stiffness and strength of biodegradable polymers, opening the possibility for these to be used in place of conventional polymers.

Careful consideration of the use of nanomaterials, in accordance with the principles of nanotoxicology, is imperative to ensure that the benefits of nanotechnology are not compromised by potential risks to human health and the environment. Nanotoxicology is a discipline that investigates the adverse effects of nanomaterials, and in this context, their application in polymers requires a cautious approach. When using nanocomposites in polymers for various applications, it is crucial to evaluate the potential toxic effects that nanoparticles may have. Nano-sized particles have unique characteristics that can influence their interaction with biological systems, raising concerns about potential impacts on health and the environment. Therefore, it is essential to carry out specific nanotoxicity studies for nanomaterials incorporated into polymers, considering aspects such as size, shape, chemical composition, and solubility [71, 75, 76].

Nanotoxicology research provides valuable insights into the mechanisms of interaction between nanomaterials and living organisms, enabling the development of risk mitigation strategies. Potential toxicity should be carefully assessed, with the underlying mechanisms clarified. To this end, different approaches can be used. Firstly, experimental toxicology, which consists of conducting in vitro or in vivo experiments (including clinical studies). However, the respective advantages and limitations of in vitro and in vivo models are discussed, as well as some issues associated with experimental nanotoxicology. Perspectives for future developments in the field are also proposed. Secondly, computational nanotoxicology can be used to predict the toxicity of nanomaterials. Establishing stringent regulatory guidelines and safety standards is critical to ensure the safe

application of nanotechnology in polymers. Thus, careful consideration of the use of nanomaterials, coupled with a proactive approach in identifying and mitigating potential risks, is essential to promote the safe and sustainable advancement of nanotechnology in the field of polymers [71, 75, 76, 77].

2 FINAL THOUGHTS

The present review addresses a wide range of topics related to sustainability in polymer materials, highlighting key concepts, socio-economic challenges, and notable contributions in the field of nanotechnology. By exploring the history and classifications of polymeric materials, the crucial role of these materials in our society, both in the industry and in our daily lives, became evident. Considerations on polymer biodegradability and recyclability underscored the importance of sustainable approaches to address the environmental impacts of plastic.

The social and economic implications surrounding the use of plastic have highlighted the need for a holistic approach, which includes education, awareness, and public policy to promote more sustainable practices. The discussion on standards and certifications in more sustainable polymers emphasized the role of regulations in guiding more environmentally friendly solutions. The discussion on life cycle analysis provided a comprehensive understanding of the environmental impacts throughout the life cycle of polymers, underscoring the importance of informed decisions and waste management strategies. The challenges in the use of polymers have been recognized, encouraging the continued search for more sustainable alternatives.

When addressing the circular economy and its relationship with polymeric materials, it became clear that the transition to circular practices is essential to reduce dependence on non-renewable resources. Finally, nanotechnological innovations have been highlighted as promising catalysts for sustainable development, providing significant advances in the efficiency and properties of polymeric materials.

It is highlighted that the application of nanotechnology in polymers plays a crucial role in water and wastewater treatment, offering innovative solutions to optimize process efficiency. The creation of nanocomposites, resulting from the incorporation of nanoparticles into polymeric matrices, emerges as a promising approach to reduce the demand for materials, minimize costs and modulate general properties, including those related to the degradation of these materials. The presence of nanoparticles in polymers used in water treatment systems can improve the adsorption of contaminants, increasing the efficiency in the removal of pollutants and contributing to more effective purification processes. In addition, the mechanical strength and durability of polymers are improved, extending the life of materials used in water treatment equipment and wastewater management systems. Thus, the synergy between nanotechnology and polymers opens up innovative perspectives to address environmental challenges, promoting more sustainable and efficient practices in the treatment of water resources.

And, in a global landscape that demands environmentally conscious solutions, the convergence of historical knowledge, stringent regulations, technological innovations, and societal efforts is imperative to shape a more sustainable future for polymer materials.

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Psychomotricity as a predictive skill for the literacy process

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ABSTRACT

The study aims to investigate the importance of psychomotricity for the literacy process as a fundamental factor for the development of the child's cognitive, physical, emotional and social aspects. Through playful activities, children, in addition to having fun, create, interpret and interact with the world in which they live, considering the relationship between movement and learning, and the disharmony between them can be harmful to the child. Literacy is a complex process that involves skills, and among them are motor skills. In educational institutions, the greatest difficulties faced by teachers and students are in the process of acquiring reading and writing, and in cognitive development, where minimum conditions are necessary that constitute, among others, the structure of psychomotor education. Psychomotricity in the literacy process is fundamental for the construction of several concepts that serve as pillars in the learning process, and within its specific areas, it offers many intervention options so that children of literacy age can overcome any obstacles and achieve the proposed objectives and goals. The methodology consists of a systematic literature review, with the objective of finding the main researches related to the referred theme, using for data collection the main scientific networks of academic search in the area of education, such as, Portal of Periodicals of the Coordination for the Improvement of Higher Education Personnel (CAPES), in the Brazilian Digital Library of Theses and Dissertations of the Brazilian Institute of Information in Science and Technology (IBICT), Scielo Digital Portal and Google Scholar Portal, which resulted in ten papers addressing the subject of interest. However, after applying the inclusion/exclusion criteria, only six studies were listed to support a critical study on the literacy process and its relationship with Psychomotricity. As a result, the studies indicate that it is essential to introduce the psychomotricity theme in the classes planned for the routines of school institutions and the knowledge of teachers regarding the theme, in order to apply it correctly in their classes.

Keywords: Psychomotricity, Literacy, Apprenticeship.

1 INTRODUCTION

In current education, students who go through the literacy process, psychomotricity plays a fundamental role in making it occur with significant success, since the acquisition of reading and writing is not easy for teachers and students, considering the diversity of cultures brought by students to school. Thus, psychomotricity is present in almost all activities, and in addition to being an indispensable factor for the overall and uniform development of the child, as well as the fundamental basis for the learning process of individuals.

The general objective of this study is to investigate the importance of Psychomotricity for the literacy process as a predictive skill for the development of the child's cognitive, physical, emotional and social aspects. To this end, the following specific objectives contribute: to carry out a survey of the state of the art to identify scientific studies that correlate the themes of Psychomotricity and literacy; analyze the selected productions; and to understand how these researches address this relationship between such objects. As a problem question, we have as a starting point the following question: How can the development of predictive skills of Psychomotricity help in the literacy process?

The methodology used is based on a systematic literature review research, using for data collection the main scientific networks of academic search in the area of education, such as the Brazilian Digital Library of Dissertations and Theses, CAPES Journal Portal, Scielo Portal and Google Academic Portal, from the year 2015, in which ten studies were located, of which six were part of the analysis of this investigation. We used the following descriptors as search descriptors: "psychomotricity + literacy" and "psychomotricity + literacy + learning". As requirements for inclusion/exclusion of the studies for analysis, we considered the period of execution of the research from 2015 onwards and their nationality, i.e., those that were treated in Portuguese and English, which is why only six studies composed the data analysis.

Psychomotricity is characterized as an education that uses physical movements to achieve other more elaborate acquisitions, such as intellectual ones, and during the literacy process, the basic elements of psychomotricity are frequently used, and whose psychomotor development is poorly constituted, may present problems in writing, reading, graphic direction, and letter distinction (e.g.: b/d), in the ordering of syllables, in abstract thinking (mathematics), in grammatical analysis, among others.

Physical movements are very important for human development, transmitting feelings, emotions and thoughts, expanding the possibilities of using gestures and body postures, which will help the literacy process, considering that a good psychomotor development provides the student with some skills and a good school performance.

From the theoretical framework, obtained from the readings of authors such as Fonseca (2008) who in his book cites the three pioneers of psychomotor development: Ajuriaguerra, Wallon, Piaget, and the contributions of Ferreiro and Teberoski (1986), and Le Boulch (1982), it was possible to formulate the hypothesis that psychomotricity interferes in the school learning of students, as well as in literacy and integral development.

According to Fonseca (2008), psychomotricity can be defined as the transdisciplinary field that studies and investigates the reciprocal and systemic relations and influences between psyche and motricity.

For Emília Ferreiro and Ana Teberosky (1986), every child goes through structural levels of written language until they appropriate the complexity of the alphabetic system, but rather than thinking about methods, it is necessary to understand the learning processes that the child experiences when trying to reconstruct the representation of the alphabetic system.

For Le Boulch (1988), psychomotor education should be an indispensable basic education for every child.

Thus, the choice of the theme was necessary, due to the interest in discovering the reasons for the difficulties encountered in the literacy process, which are not linked to pathological issues, and end up becoming a huge problem in the stages of this child's life, and the importance of psychomotricity for this process. It is believed that teachers who have knowledge of psychomotor education can help their students in the process of acquiring reading and writing in relation to space and time. Through this research, we want to reflect on the importance of psychomotor education in the motor and cognitive development of children and their relationship with literacy. Next, a summary of the main theoretical elements involved is presented, followed by the final considerations obtained through data analysis.

2 THEORETICAL REVIEW

It is understood that psychomotricity and the literacy process are close as a dialogical and mutual relationship, and literacy is a reference for cognitive, physical and social development, in the case of psychomotricity, it serves to assist the first learning in literacy.

> The motor act cannot be conceived as the functioning of juxtaposed neurological systems, [...] They can only understand the action when we consider the starting point, the development and the purpose that this action aims to achieve. (AJURIAGUERRA, 1983, p.207)

The child in the literacy phase is moving, which for children are simple games, for psychomotricity are movements that will serve as a basis for the child to learn to hold the pencil, leaf through the notebook, define their laterality, differentiate the shapes of the letters, among other skills. Negrine (1986, p. 17) "[...] have demonstrated the existence of a strict relationship between the child's ability to learn at school and their possibility of neuromuscular performance, since it is through physical activities that they develop".

According to Mattos and Neira (2005), skills can be developed during routine activities, carried out in the child's private life, promoting higher psychological processes, through the acquisition of basic movements, such as reflexes and simple association, thus becoming aware of their body in an environment that relates location, orientation, conservation of distance, speed, among others, thus functioning as an artifice for an effective work in the teaching-learning process during the literacy of the student body, establishing a spatial structuring, lateralization and body notion, which are crucial aspects in the construction of their competencies and skills.

To teach a child to read and write, psychomotor work must be included for good child development, which will contribute to teaching and learning. It is essential that a child has a spontaneous, rhythmic, liberated and controlled motor skills, where the teacher leans.

The French pedagogue Seguin apud Holle (1979, p. 74) quoted that "No one can teach a child to read and write before his sensory organs function". Many teachers confuse this relationship between psychomotricity and literacy, thinking that the activities that are applied until today, such as stippling, copies of curves and lines for the training of children, are working on psychomotricity, but these activities do not develop the child's psychomotor, they only contribute to motor development, being only one of the skills, when psychomotricity proposes to work on the whole. It is essential to create situations in which the child can learn to control his body, to have flexibility and agility with his upper limbs, even before mastering the pencil, but these skills lose their meaning when performed in a decontextualized way, such as in the execution of repetitive exercises. The fundamental role of psychomotricity is to develop all the child's potentialities, linked to the context of the student's reality.

According to Ferreiro (1991, p.25), "It is essential to understand how the child arrives at the acquisition and mastery of reading and writing, and it is important to understand how learning takes place".

The studies also show the importance of working on the psychomotor prerequisites in early childhood education classes, as essential instruments for the significant construction of the concept of writing and reduction of students' illiteracy rates, where they highlight the need to identify learning difficulties related to psychomotor development and, based on these data, develop motor schemes in the first years of schooling as a prevention of learning difficulties.

According to Oliveira (2003), "From the moment the child is able to discriminate the various forms of letters and integrate the symbols, he will successfully reach the stage of visual organization, corresponding to the significant integration of symbolic materials with other sensory data". When the teacher does not work on the student's difficulties, it ends up harming the child's development in the future. Writing, in addition to requiring many skills, also requires a certain change of perspective in the face of the notion of reality, where the understanding of psychomotricity as a basis for a significant expressive work in literacy will guide the teacher in relation to the organization of his teaching practice, favoring the teaching-learning of his students.

> Psychomotor education should be considered basic in early childhood education. It conditions preschool learning, leads the child to become aware of his body, of laterality, of the situation in space, to master his time, to acquire skills of his gestures and movements. (LE BOULCH, 1997, p.35)

Modern life contributes to children arriving at school with motor deficits, where free play in the streets is now rare due to violence. Children have few opportunities to climb trees, and the games

and relationships between them end up becoming restricted to the school environment. In this sense, the school's responsibility multiplies with regard to providing spaces and activities that meet this demand for the needs of physical movements.

In this context, it is necessary for the teacher to have a good knowledge about psychomotricity, because the activities can be done in the classroom, even without a sports court and without the need for expensive tools and materials.

Considering the knowledge necessary for literacy and its relationship with the development of some psychomotor skills, we take as support the idea of movement present in the National Curriculum Reference for Early Childhood Education (RCNEI), as an indispensable factor for the broad development of the child so that through it he will strengthen the control of his own body. thus favoring the beginning of literacy. It is in early childhood education that the first drafts of literacy are made, which is why we highlight what the RCNEI presents on this theme: "Children move from birth, acquiring greater and greater control over their bodies and appropriating more and more the possibilities of interaction with the world". (BRASIL, 1998, p.15)

Therefore, the literacy teacher needs to know his student, without dissociating body and mind, and be attentive to the performance of the sensory organs in relation to the process of teaching and learning in the literacy phase. It is essential that the teacher understands how the child arrives at learning and mastering reading and writing.

2.1 PSYCHOMOTOR PREDICTIVE SKILLS FOR READING AND WRITING ACQUISITION

We can say that for children to be well literate, they need to have the skills of global coordination, fine motor coordination and hand-eye, body scheme, spatial structure, temporal structure, visual and auditory discrimination and lateralization well worked and defined. It can be said that these are the psychomotor bases of learning to read and write. Thus demonstrating the importance of adequate work in these phases of the child's development, and each one of them must be respected and according to the individual's maturation. Emotional and motor life are not isolated, one complements the other, guided by psychomotor elements.

When children arrive at school with most of these skills developed, they will hardly have problems in the literacy process. However, due to the various difficulties and the post-pandemic context, there is a large number of children who arrive at school without having developed them, and it is up to them to develop them.

Next, we will take a closer look at the concept and importance of each of these elements for the literacy process.

2.1.1 Lateralization

For Le Boulch (1982), "Laterality is the function of dominance, with one hemisphere having the initiative to organize the motor act, which will begin with the learning and consolidation of praxis". The environment in which we live was made for the right-handed, from the simplest objects such as scissors, rulers and some kinds of desks in classrooms to our writing, which is carried out from left to right and from top to bottom and this favors the right-handed. Faced with these factors, left-handers present several difficulties.

There are also cases of crossed lateralities, which can cause problems such as: difficulty in learning graphic direction, difficulty in learning the concepts of left and right, illegible writing, poor posture, difficulty in fine coordination, difficulty in visual discrimination, affective disorders and difficulties in spatial structuring.

According to Negrine (1986), it is during growth that the child's laterality is naturally defined, and can also be determined by social factors. The child needs to experience both sides without interference, they need to discover themselves.

2.1.2 Body Schema

The body schema refers to the awareness of one's own body, incorporating its postural and attitudinal parts both at rest and in movement. It is necessary for the child to understand it in order to be able to control his movements. From the awareness of one's own body in different positions, body mastery is the first element of behavior, it is through dynamic movement that one can control it and spatial perception.

For Le Boulch (1988) "The body schema is the fundamental basis of the adjustment function and the necessary starting point of any movement".

Children with a poorly defined body schema may present: deficiency of spatial-temporal structuring, slowness, poor motor coordination, lack of harmony in gestures, insecurity in relationships with others. The child who does not recognize the parts of his body ignores the bodily vocabulary, does not situate his limbs well when gesticulating because he has not discovered all the spatial possibilities of his body.

2.1.3 Spatial Structure

The child first perceives the position of his body in space and then of objects in relation to himself, and finally learns to perceive the relations of objects to each other. It is through space and spatial relations that we situate ourselves in the middle and that we live.

Le Boulch (1987) points out that factors associated with problems of lack of spatial structuring generate lack of interest in school subjects and lack of motivation for learning to read and write, thus hindering the student's teaching-learning process.

It can be said that the child has reached the stage of spatial orientation when he learns notions of situations, size, position, movement, shapes and quantity. Some of the consequences of poorly developed spatial structure are: difficulty in discriminating the direction of letters and numbers, ease in getting confused and lost, constantly bumping into objects, difficulty in spatial orientation on paper, in respecting the order and succession of letters and in obeying the meaning of reading, and in organizing and classifying numbers by mixing what is ten, hundreds and thousands.

2.1.4 Temporal Structuring

According to Almeida (2006), time is one of the most difficult skills to work with in early childhood education, given the difficulty of distinguishing, on the part of the child, real time from fictional time.

It is a very important skill, as it allows the child to recognize himself in space when moving, and also to trigger and follow his gestures, locate the parts of his body and situate them in space, being important for the process of adaptation of the individual to the environment.

De Meur (1984) and other scholars make an analysis of the main difficulties that can arise from a bad temporal orientation, in which we can mention: not perceiving the intervals of time, therefore, not perceiving the spaces between words; confusion in the succession and ordering of the elements of a syllable, as it distorts the graphic sequence of movements; and the non-distinction of the sound of the letters, among other difficulties.

2.1.5 Global Coordination

According to Oliveira (2003), "Global coordination or global praxis refers to the activity of large muscles, depending on the ability of postural balance.

If the child in the classes taught by the teacher, involving dance, is able to follow the associated and dissociated movements, has the right rhythm, a good balance, it can be said that he will present satisfactory global motor coordination.

2.1.6 Fine Motor Coordination and Hand-Eye

Fine motor skills are about manual skill and dexterity. The ability to pick up and handle different objects in different ways.

For Alves (2008, p.58) "It is a segmental coordination, usually with the use of the hand requiring precision in the movements to perform complex tasks, also using small muscle groups".

However, possessing only good fine motor skills is not enough. Therefore, it is also necessary to have good eye control, that is, vision following the hand gestures. We call this hand-eye or visual-motor coordination, which can be defined as the ability to coordinate vision with the movements of the whole body or parts, including walking, running, throwing, even the most refined such as cutting, drawing and writing.

2.1.7 Visual and Auditory Discrimination

We can understand visual and auditory discrimination as the ability to see, hear, and differentiate two figures, or two objects, or sounds when their differences are minimal, that is, an ability to perceive and process appropriately.

According to Oliveira (2009), a child who has visual discrimination difficulties may present confusion of symmetrical letters, may be confused in the writing of letters that have general and similar configurations and that differ in small details.

Auditory discrimination is the ability to perceive the difference between two or more sound stimuli, when auditory discrimination is effective, it makes the child not confuse the letters with sounds like "p" for "b", "s" for "z" and others.

3 METHODOLOGY

This study used a qualitative approach, based on the premise of generating knowledge for practical application, guiding the solution of specific problems involving local truths and interests (GERHARDT; SILVEIRA, 2009).

Regarding the objective, this study is classified as exploratory, as it sought to identify facts that contributed to the occurrence of phenomena. Exploratory research aims to improve hypotheses, validate instruments, and provide familiarity with the field of study. It is the first stage of a broader study and is widely used in research whose theme has been little explored, and can be applied in initial studies to obtain an overview of certain facts (GIL, 2002).

Regarding the technical procedures, a systematic literature review was carried out, using, for data collection, the main scientific networks of academic research in the area of education, being indispensable not only to define the problem well, but also to obtain an accurate idea about the state of the art of the aforementioned theme, its gaps and the contribution of research to the development of knowledge.

Seeking to answer the problem question, this study searched for scientific works, using for data collection the main scientific networks of academic research in the area of education, such as the Brazilian Digital Library of Dissertations and Theses, CAPES Journal Portal, Scielo Portal and Google Academic Portal, after the year 2015, which related the themes of psychomotricity and literacy. Ten

studies were located, of which six were part of the analysis of this investigation. We used the following descriptors as search descriptors: "psychomotricity + literacy" and "psychomotricity + literacy + learning". As requirements for inclusion/exclusion of the studies for analysis, we considered the period of execution of the research from 2015 onwards and their nationality, i.e., those that were treated in Portuguese and English, which is why only six studies composed the data analysis.

Chart 1 below shows the studies found and which, after using the inclusion/exclusion criteria, became part of the study sample for analysis.

Table 1: Sample composition - studies analysed.

1. Brazilian Digital Library of Theses and Dissertations <https://bdtd.ibict.br/>					
Title	**Year and Institution of publication**	**Purpose of the study**	**Methodology**	**Sample**	**Results**
Study 1: The body and the Factors Psychomotor as agents Participants in difficulties from apprenticeship reading and Written in School: Contributions from the Psychomotricity in a perspective Inclusive	2019. Dissertation – University Federal do Rio Grande northern	Investigate the Contributions from the Psychomotricity for students with Difficulties of apprenticeship in the acquisition of reading and writing.	Research-share	8 Subject	The intervention Psychomotor showed up effective, once that students went from a dyspraxic profile for eupraxic and Your Difficulties of apprenticeship Decreased.
Study 2: Competence in reading, writing, and performance psychomotor in School	2018. Dissertation-University Presbyterian Mackenzie	Investigate the performance psychomotor in a group of Students of the Teaching Fundamental I Classifieds in the Lower Levels of the Skills in reading, writing and arithmetic.	Research Exploratory	35 Subject	The Results pointed out that There was great Concentration of students with low Competence in the Evidence of reading, writing, and arithmetic were the same as Presented worst performance psychomotor.
2. CAPES Periodicals Portal <www-periodicos-capes-gov-br>					
Title	**Year and Institution of publication**	**Purpose of the study**	**Methodology**	**Sample**	**Results**
Study 3: The	2023.	Show how the	Research		It can be concluded

Importance of	Article-	Psychomotricity	Bibliographic	_____	how much is it
Psychomotricity	Alma/SFX	It can be			Important to have
for writing in the	Local	Developed			features and a
literacy	Collection	What are your			good
		resources and the			planning, the
		Function of the			in order for the
		teacher as a			Educators
		mediator.			children can
					Perform a
					work of
					quality and that
					benefit from the
					children, and how
					tool
					transformation
					in the life of this
					target audience
					enriching the
					Same
					culturally and culturally
					socially.
3. Scielo Brazil Portal <www.scielo.br >					
Title	**Year and Institution of publication**	**Purpose of the study**	**Methodology**	**Sample**	**Results**
Study 4:	2020.	Evaluate and	Study	80	Comparing the
Occurrence of	Article-	sort	transverse	Subject	groups, the
Processes	Rev. Codas	School	Observational		students with
cognitive of		Dyslexic	analytic		dyslexia
reading and writing, and		Visual			Presented
Skills		recital			performance
perceptual visuals		that, subtypes of			lower in all
in schoolchildren		o Dyslexia			the tests, in the
with Dyslexia		development			with regard to the
Visual		They are not			Skills
		differentiated in the			Predictors
		Most			psychomotor
		diagnostics and			Essentials for
		that the same			Reading and
		focus on a			writing.
		approach			
		Widespread.			
4. Google Scholar <w ww.scholar.google.com.br >					
Title	**Year and Institution of publication**	**Purpose of the study**	**Methodology**	**Sample**	**Results**
Study 5: A	2016.	Present and	Research	_____	Or
Importance of	Article-	Discuss the	Bibliographic		development
Psychomotricity	University	Importance of			psychomotor
in the process of	State	Psychomotricity			contributes to the
literacy	Brazil	for the			apprenticeship
	(Unesp)	development			of writing and
		of the child,			reading
		mainly			Showing that
		Related to			work at
		Process of			

		literacy			child is
		Emphasizing the			essential in your
		body like			learning and
		big			literacy
		Instrument in the			In order to
		Process of			construction and
		apprenticeship.			Global Training
					of the human being.
Study 6: A	2018.	Analyze the	Research		At the end of the
Psychomotricity	Article–	Contributions from the	Bibliographic	_____	research, it was
as the foundation of the	Epistems	Psychomotricity			possible
literacy	Transversalis	During the			Achieve the
		Process of			objective
		Construction of the			proposed
		writing			Demonstrating
		valuing the			So the great
		Importance of the			importance that
		body and the			the
		Movement in the			Psychomotricity
		Findings of the			exerts on the
		writing and reading.			Life of a
					student and his
					Help in the
					Process of
					Construction of the
					writing.

Source: Prepared by the authors, 2023.

Analyzing the studies, it was possible to verify that the six studies point to an intrinsic relationship between Psychomotricity and the literacy process. In Study 2, the level of performance of the subjects investigated in the reading, writing and arithmetic tests was consistent with the performance in the psychomotor test. An analogous result occurred in Study 4, which indicated that subjects with dyslexia, which is the specific learning disorder of reading, were the ones who presented the lowest performances in the tests that measure psychomotor skills. It is also evident that some psychomotor behaviors are especially intertwined with the skills investigated and the teacher's knowledge of the theme and how he inserts it in his planning. This is what Study 3 has shown, for example. And Studies 1, 5 and 6 found that psychomotor skills are predictors for the acquisition of reading and writing, as well as for learning in general. The studies and findings mentioned above are compatible with what the extensive literature has been pointing out about the relationship between Psychomotricity and literacy.

4 FINAL THOUGHTS

It was found that all the studies found point to a correlation between Psychomotricity and literacy. It was also possible to observe in the studies that psychomotor deficits can cause delays and difficulties in the process of reading and writing acquisition, demonstrating how much these elements

are intertwined with regard to full development and learning, especially of children in the literacy process.

Thus, it is evident the need for public policies that provide continuing education for teachers and that they have a sensitive look to perceive the needs of students and to be able to build new possibilities in the face of psychomotor difficulties and, in the most complex situations, to request the necessary specialized help. The school is expected to fulfill its social function, which is to guarantee the knowledge, skills and values necessary for the formation of the individual.

In this sense, this research sought to emphasize, from a systematic review of the literature, the correlation of Psychomotricity with literacy, specifically the predictive skills for the acquisition of reading and writing, evidencing through the researched studies, that there is not a single and singular concept, but rather, several perspectives on Psychomotricity.

Psychomotricity is thus presented as a science that intends to transform the body into an instrument of relationship and expression with the other, through the movement directed to the being in its totality, in its motor, emotional, affective, intellectual, and social aspects, considering man as unique, in constant evolution and essentially an interactive being.

Finally, it is worth mentioning that there are few scientific studies found on the theme and period of interest. Given the importance of this object of study, it is inferred that further studies from the perspective of Psychomotricity and its correlation with literacy should be developed, seeking to increase the scientific knowledge we have about this phenomenon, especially that contemplate the reality of Brazilian public schools. The present study will enable the beginning of other analyses so that this theme occurs frequently in research around education and especially in teaching practices.

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SEVEN
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Intersubjective implications of language in early childhood education

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ABSTRACT

A study from observation finds two elements as precepts in the practice of initiation to teaching in undergraduate students of primary education:
1.- the precept that thought is produced from the action that imprints the sensory experience; and product of that operation is learned by way of copy, what things are as the senses capture it universally.
Another precept revolves around the use of indiscriminate language, verbiage more typical of an instructor than of an educator. The novice teacher conducts himself with conceptual instructions as an exacerbated instrumental use, in a linear way and without considering a certain degree of development of abstract thinking that the 6 to 8 year old infant does not achieve yet.
It is offered to understand from the teaching addressee and with multidisciplinary contribution (psychology, neuroscience and pedagogy) that the infant by age that lives, has full sense of pleasure-pleasure as energy that touches the emotional field in the intersubjective relationship. In teaching-learning, pleasure-pleasure contains the desire that is conjugated in two directions (that of the infant and that of the teacher). Emotive energy, cathexis, transits the logical and the emotional, operates selectively discarding uninteresting information by inhibition of the synaptic pathways which, in schooling, is presented as a form of predisposition or defense mechanisms. Hypothetically, each enunciation and its intrinsic form issued by the teacher, triggers in the child a way and degree of anxiety, stress, anguish, underlying what is described as learning problems.

Keywords: Cathexis, Desire, Inhibition, Pleasure-pleasure, Learning disabilities.

1 INTRODUCTION

The content of this text emerges from observations of the work carried out as an initial practice in the teaching profession by some undergraduate students in primary education. The context is located in semi-urban and rural communities in the vicinity where students carry out introductory teaching practices and takes place in an official teacher training institution, that is, a Normal School in the State of Jalisco, Mexico, where I work as a teacher, and in specific part, the research work is deduced from an official commission issued by the Management of the Institution. whose commission decrees the role of supervising the *initial teaching practice of* students who are in the fourth or fifth semester of the Bachelor's Degree in Primary Education, which gives the opportunity to gather field data. On the other hand, the collection of observable data extends to student forums in which data are presented that remain untreated for analysis or with treatment very close to the surface of the record. The data they present are limited to a personal and empirical experience. Finally, as a third instance of data collection, a part of research teaching takes place, becoming a research tutorial function for the interns in the

degree process where they ordinarily work on data collection and processing, taking care of their analysis and interpretation.

So, the study that begins with the collection of information on the work of supervising the practice of novice teachers led to distinguish and assess challenges that the profession faces in real work, and this challenge is not framed in a single stage of observations, it extends to several years.

In reference to the dimension of reality, it is placed in some primary schools limited to contents of observation of language and development of thought in pupils with whom the students of the said degree work. An inductive research process has been initiated, in which the data, due to their complexity and nature, present the need for multidisciplinary theoretical-explanatory contrast. In view of these observable data that are synthesized in this paper, the objective has been proposed: To study how language has a performative function in which thought transforms things into concepts and in the meaning that are put into play in the teaching-learning process.

1.1 INTERSUBJECTIVE IMPLICATIONS OF LANGUAGE IN EARLY CHILDHOOD EDUCATION

Faced with some communicative problems oriented to the analysis of practices of initiation to the teaching profession found in a field study, it has been proposed to investigate the implications of language in children's schooling, for this we proceeded from assuming language as a double implication or bidirectional sense. On the one hand, the use of language as a vehicle medium of ideas that induces the world in learning and materializes in concepts is observed, and on the other hand, as a return of the concrete subject, the signifier is analyzed where *the learner emerges as a subject of the practice of language*, that is, in the mediation in which *he is* present from his narrative. His full word.

2 DATA OBSERVABLE FROM THE DIMENSION OF REALITY BY MEANS OF A DESCRIPTIVE STUDY; INDUCTIVE PROCESS

As an ongoing inductive process of field observation, two elements have been found that are presented as precepts that underlie and guide the practice of initiation to teaching in undergraduate students of primary education. The observation takes place in the same curricular training process in which undergraduate students in education put into play and develop communicative skills within the framework of their initiation practices to the teaching profession. Where critical implications have been presented, even in the terminal stage of his career. Specifically, what is dealt with here has been limited to cases in their intersubjective relations of communication for teaching to children from 6 to 8 years of age.

The cases that have been taken to guide exploratory research are those in which the didactic sequences present an overload of activities for infants in the form of pragmatism that exceed or limit the pauses to exercise required in the gradual development of thought. Synthesizing field observation,

the exercise of teaching reveals indicators on which they base their teaching exercise under certain precepts cultivated by a certain traditional fraction. The precepts that have been taken as categories are two that are deployed below to define as a problem statement and from there, from the observable indicators, proceed to an exploratory documentary study with the aim of deducing some explanations.

2.1 PRECEPTS REGARDING THE ACQUISITION OF LEARNING.

As one of the precepts that in some traditional cases still prevails is the precept that thought operates, emanates or is produced *from action* as *something that imprints sensory experience*. That, as a product of its operation of thought, reality is known as a copy of the census-perceptible material reality. That is, things are as the senses unquestionably and universally apprehend them.

In Assuming that knowledge is built with the contact and manipulation of objects, the routines of teaching work are structured loaded with activities to start from the experience the knowledge that has to be expressed with the content of words as evidence that they have learned. But in the infant who begins primary school at 6 years of age, it is dissociated between operating or manipulating and saying as an expression of knowledge. Undoubtedly, this operates in some way, since it corresponds to the biological part that determines us as an organism that permanently encloses symbiosis by adapting to its environment, but this places us like the rest of the animals, it is like this only to a certain extent, because contrasted with documented theoretical studies it is offered that: "Thought is linguistic by its nature, Language is the instrument of thought." (Petrovsky, 1980, pág. 205)Thought operates and unfolds in language, which metaphorically fulfills the role of the railroad on which the railroad moves. We think by means of language, ideas are constructs and conveyed by language and, therefore, more than in the sensory, experience is lived in language. We also have in theory Vygotsky's talk of an interrelation between language and thought. (Kozulin, 2000)

2.2 SOCIAL LANGUAGE PRACTICES IN TEACHING

Another category that emerges from the observables to be presented in this paper refers to the precepts and conceptions of teaching practices, around the linear and protagonist or authoritarian use of language as *an indiscriminate* instrument.[1] From the analysis of what has been observed, it can be seen that the use of language in the classroom is more typical of the instructor than of the educator. The novice teacher conducts himself with explanations or conceptual instructions as an exacerbated instrumental use, in a linear way and without considering a certain degree of development of thought or capacity for abstract mobility that the child of 6 to 8 years of age has not yet achieved;Ordinary

[1] indiscriminate in adherence to Oxford language definitions. *That it does not distinguish some people or things from others or differentiate between them*.

language practice in school classrooms appears to be structured in linear ways. hierarchical and vertical, they are closer to imperatives than to constructive dialogue.

This observation can be deployed a bit in the descriptive, let's see. Students of 5 semester of bachelor's degree in primary education and who practice with children in 3rd, 2nd, and even in some cases with 1st grade of schooling, it is recurrent, ordinary and common in their practice to issue orally instructions to the infants, to *take their book,* to *read it* and answer or fill in the empty spaces that the instructions ask for by default... It has also been found in these students that when they orally address indications or instructions to the whole group, at the end of these indications, the children get up from their desks and go to ask questions even in the space occupied by the teacher in the process of training because they did not understand the initial indications, also some constantly come to ask if what they have just begun to trace is correct.

The observed content has also been triangulated with the narratives of experiences in the students' forums when they report on their actual fieldwork. They report difficulty in getting children to understand instructions. And from the field study, it is synthesized that the educator generally assumes that language is a tool to express our thoughts, since from the ordinary precepts in which, consciously or not, he supposes that language in orality conveys the ideas it exposes. In this way, at the base of his work, the *teacher believes that, by developing in language and with it, what he speaks will be understood, that* his ideas or knowledge that he wants the pupil to assimilate are assimilated. It seems to assume uncritically that memory operates by passing perceptual data elevating to abstraction through language and that in this way the listening infant learns, he does not understand it as a complex process of abstract elaboration.

Returning to the inductive approach from which this study has originated, the observable data show that, in their uses of a word, the *meaning* is not always and in any case the one kept by the academic or formal conceptualization, which in the school framework presumes universal character, but the way in which it relates to the intersubjective uses and experiences in a concrete community. For example: In the initial observation of this work, in rural communities it was found that in their ordinary language practice infants present very specific words and ideas. It corresponds to what has been said theoretically that the word does not have a single meaning, since it evokes and imprints different things in each social context, which can lead to the establishment of several meanings.

Now, this field study from descriptive data offers some specific contributions, such as the fact that the meaning that is taken from uses and experiences (more phenomenologically speaking) is not only accompanied by the *meaning* of expressions or words, but that the implementation of language is inseparably accompanied by *feelings.* In fact, sense and feeling are both inseparable in the ordinary practice of language within the framework of the observed. To this end, it is noted here that in this part *the sense* is not given *of feelings in a single direction, but in a game* of feelings, of dissents and

partiality. As it is in binary logic affirmative *and negative, or, as the* positive or negative sense that can be exemplified as between an agreement and a disagreement. On the other hand, in the meaningful elaboration between a sign and signification, absolutes are not necessarily presented. In this theme, dimension and context of reality that an observer can read and interpret, it is offered to understand that dialectical opposites enclose an infinity of intermediates in the gradual structuring of meaning.

From studies in general that are found as antecedents, it is explained that, in a subject, the passage from external data to internal assimilation, as well as in the perception of the language emitted by another, when processing data into concepts is elevated to abstraction where, with memory data already contained (the faculty of association or relating and correspondence between data) words take on meanings or meaning. But what is now proposed here is that, in this faculty and process, the intersubjective practices of language that have been addressed to account for linguistic meaning, there is another dimension to analyze, something more to explore, to understand how meanings are achieved, reached, constructed. From these precepts and forms, a psychic configuration is implied, a role is played in the process of personality formation; in intersubjectivity meanings are generated. But how does that happen? How is the signified linked to the signifier? What is it, what can it be, or in what way does something become significant to be learned in the schooling child?

So much for the inductive part, which does not yet offer a finished answer to these questions, but a state of critical evidence that demands to be investigated, given this a proximal exploratory study is undertaken. Now I am open to presenting as a deduction some data offered by the theoretical collections or some studies that have addressed contents involved here, this for the purpose of support in the analysis and interpretation of the observable data in a third moment. As descriptive study data, it is addressed in the next section, under a deductive methodological logic, and as a spiral in which it is taken up again with triangulations or theoretical-conceptual contrasts.

3 EXPLORATORY STUDY IN SEARCH OF AN EXPLANATION BASED ON DOCUMENTED DATA; THE DEDUCTIVE GAIT

In this space, the objective is to gather documented data from studies in various fields that have an impact and offer elements to, in a multidisciplinary way, such as theoretical dialogues, approximate comprehensive deductions in greater depth possible. For this reason, it starts from the most general to end with something that responds and contains resources to guide what is posed as a central problem in the cultivation of the human, which is cognition in the intersubjective relationship and language.

3.1 PHYLOGENY AS A MEMORY OF OUR SPECIES

Of the most universal and identity-based documented, it is considered theA memory that determines us as humans and provides what is possible in global cohabitation, so it is closed in common

from phylogeny as the history of our species that determines us by Developments in terms of *Natural drift* product of autoopioesis invariance and adaptation (Maturana & Varela, 1984, pág. 77) Throughout the biological world, the human is distinguished by the nature of the brain, in the brain, the neuronal interconnections and what it keeps of history in language according to its origin in the form of gender and identity properly human (Chomsky, 1992), from there we associate as genetic expression and we attend to the changes experienced throughout the history of a species, constitute phylogenetic or evolutionary dynamics. Phylogeny is a succession of organic forms sequentially related by reproductive relationships. From this we have by way of explanation why at birth, the human brain has connection patterns built following genetic instructions, of vital activity. "We could say that today the brain works like that of our ancestors" language is possible to learn and operate or navigate through in thought because it pre-exists as a language. (Meanes & Niro, 2018, pág. 43)power in each new being of our species.

That way we get closer to Explain that, the most universal and primal data set of the species refers to the fact that the The brain has a hereditary memory, as well as organizing principles of innate knowledge (knowledge not as contents, but as forms, potency "information"). This is what phyletic memory refers to (Fuster, 2020)that as a species it stores the millenary information located in the central nervous system, such memory as a phylogeny is universal or common to the genus; materially allows each organism in the limbic brain to operate by selecting and discriminating data according to its identity; It offers the possibilities of scope and forms of the other memories such as working and short-term memories. A documented example and as a heritage is in which all structuralism was deployed, what Levi Strauss cited in (Hallpiken, 1986) finds that in the various cultures there are *Structures* that keep universal principles that are not learned as content, but as containers: "Form is defined in opposition to a content that is external to it; but the structure has no content: it is the content itself..." Lévi-Strauss quoted on the continents, unlike the contents seem to be(Pouillon, 1968, págs. 1-24) *Forms* to order or read and operate in relation to man and reality.

Language is already potentially in the millenary memory of the species and occupies a specific material place in specific areas of the central nervous system, which, when put into play from birth, should only be operated under the propitious conditions in which it gradually fills contents.

Since phylogeny is the most universal and primitive, it is taken as a starting point for explanatory approximations or possible orientations from phyletic memory, it is deduced that The knowledge or learning that the educator seeks is made possible by the potential as a container from which it can be deduced as content. We could deduce that language, socialization, and learning are potentials that only need to be deployed in environments that are conducive and appropriate according to age, degree of development and context. In which the same development is permeated as a universal form of the human race. That is, if we extend the explanation we are looking for to unitary gestalt

observation, we have that, in every human case, its learning to operate is self-referential to its identity, it produces itself and with its own resources, as autopoietic machines, so that the species, a culture or an individual produces itself as a unit, so that, Language and mental operations are structured from phyletic memory. In this case, language is not recommended to be taught with linguistic-syntactic rules, but in the social practices of language because it pre-exists potentially; equipped to reproduce the species, its identity. So to educate is to humanize what we are as a species. On the other hand, if the observation is shortened to an inductive dimension, we find not gender similarities, but specific differences, then it is feasible to find that the observed unity is constructed and gives diverse destinies, which recursively contributes to the diversified construction of a distinguishable reality. See.(Maturana & Varela, 2004, pág. 69)

3.2 THE ONTOGENETIC REALM IN LANGUAGE AND KNOWLEDGE

Encrypted, mounted or on phylogeny, is our ontogenic being and knowledge, that is, based on the universal data of our phyletic memory, the existential or practical dimension is erected in each individual story that from the first experiences in the world the mind/brain acquires a personal memory. Integral in them, as relevant performative experiences, the linguistic ones in their environment (family, culture, society) are self-produced by constituting ontogeny each individual or particular being. Materialized in an individual, this ontogenetic part contains continuous structural transformation, on the one hand, it occurs in him without interruption of his identity or his structural coupling to his environment and, on the other hand, it follows a particular course selected in his history of interactions by the sequence of structural changes that have triggered him. Thus, in the ontogenetic realm (Maturana & Varela, 1984, pág. 85)The knowledge of an individual, like any organism, is constituted or formed from what it is nourished and is nourished phylogenetically by what the species determines it.

We also have in this self-construction that "in practice there are differentiated systems that operate allopoietically" (Cortés, 2014, pág. 294) In contrast to self-reference in autopoiesis, "Informational hetero-references are the presuppositions of operative self-reference and vice versa" (Neves, 1996). So, topologically Self and heteroreferences, for us humans and in this work he places it in cultural memories, culture is a co-producer of the reality perceived and conceived by each one. In this way, ontogenic self-organization feeds back or develops in a dynamic with the environment. This part of the environment testifies to history in the ways in which individuals in archaic societies were formed, who have a very rich empirical/rational knowledge of the physical, animal, and vegetable world from which they found their art, their technique.

Delimited from the general to culture, knowledge is organized according to models and patterns present from before birth that permeate, hierarchize, reject ideas and information, as well as according

to mythological meanings and imaginary projections. And so the *Reality as a social construct* where the existential, Learning, meanings and imaginaries are organized according to patterns of the context in which one lives, since "Learning is first of all a process embodied in existence itself", and this in other terms also corresponds to what they say "(Pegueros, 2018, pág. 201)(Maturana & Varela, 1984)There is an inseparability between what we do and our experience of the world with its regularities." "The preservation of life is, in this sense, an expression of knowledge, a manifestation of proper conduct in the domain of existence. Aphoristically speaking: to live is to know. And to know is to live." . More est(Maturana & Posken, Del ser al hacer, 2004, pág. 38)Biology contributions, we extend with this:

> "The foundation of the biology of knowledge is in the observer's recognition as constitutive of what is observed – from this unitary epistemic perspective, to live is to know – and the greater the structural plasticity of an organism, the greater its capacity for intelligent behavior in interaction with others. In this way, the human experience manifests itself in a relational space." (Rocca, 2016, pág. 2)

For now, in order to explain the relational or individual interactions within the social mass, observation and analysis are positioned towards the environment in which individuals operate and that guides or triggers a certain degree of determinations external to the contents of thought, to the particularities of experience and knowledge or their ontogeny. To elaborate a little more on this explanation of how information operates structuring with demands from the environment, it seems convenient to delve into language practices.

3.3 SOCIAL AND LANGUAGE PRACTICES

The social environment from birth provides guidelines, from upbringing and the most basic forms of learning are inculcated. Combinations of relationships are facilitation for gradual assimilation that leads to the accommodation of models by imitation,[2] this phenomenon put as a social system that permanently cultivates its future generations offers the elements to reproduce its identity in education or transmission of culture as an autopoietic system.

The words and their contents with which they communicate, refer to the real, the adults, constitute the initial precepts of culture. We live in a world whose objects of communication are located not only according to their position in space and time, but also according to their position in the speakers' own world as symbolically indicated by the sound pattern that represents them in the language we speak. From an early age, we are inserted into a particular family and social environment; There we learn their language or the system of signs that prevails (Borjas, 2007)(Borjas, 2007). For

[2] For the subject *of imitation,* it is suggested to see the work entitled *The Formation of the Symbol in the Child: Imitation, Play and Dream.* By J. Piaget

this reason, it also corresponds to the *Habitus* in which individuals internalize and respond to cultural patterns, as

> "It is the habitus that ensures the active presence of past experiences which, recorded in each organism in the form of patterns of perception, thought and action, tend, more surely than all formal rules and all explicit norms, to guarantee the conformity of practices and their constancy over time." (Bourdieu, 2009, págs. 88-89)

In this context, ensuring a certain standardization of communicative or intersubjective social practices necessarily encloses the meanings of the community of belonging or cultural initiation. "These imaginary social meanings are embodied in, and instrumented by, institutions ... But not only institutions of power, economic, family, language itself" . (Castoradis, 2004, pág. 26)

This is common to all cultural learning, because the meaning that language contains and keeps an intimate correspondence with the context and with cultural precepts. As early as the middle of the last century and with a very serious study, Vygotsky and Luria found that "For the illiterate peasants, speech and reasoning repeated the patterns of their practical and situated activity" (Vigotsky, 1995, pág. 29). Without waiting for the conclusions, it seems very important to mark the correspondence between these antecedents and what the field study with which this research begins confirms, since it is found that school-age children present language content with very specific references.

In this way, associated with the concept *paradigm* We understand how patterns guide everything from concepts to ways of interpreting reality. Edgar Morin says that "individuals know, think and act in accordance with paradigms culturally inscribed in them." Systems of ideas are radically organized by virtue of paradigms that select, hierarchize, and reject ideas and information, based on imaginary meanings and projections. (Kuhn, 1971)(Morin, 1999, pág. 8)But it is convenient from this moment to notice something that later unfolds as models, patterns or guidelines "The paradigm is unconscious, but it irrigates conscious thought, controls it, and, in that sense, is also subconscious."

As in science, also in the learning process of infants there is a "social construction of reality" as a correspondence with cultural precepts as a construct. (Berger & Luckmann, 2001)In fact, traditionally, as a theoretical antecedent, it is found in the studies and collections of language research focused on cognitive explanations from logical-rational intelligence.

A significant generalization of teaching, is based (with abbreviated data) on the fact that the higher brain functions that language occupies are common to all learning that we have already seen that occurs only from phyletic memory, but not total in the experience of each individual. This will be rolled out later. For now, this emphasis and tradition limited to the only rational cognitive function is found as an example in documented words that emphasize and indicate historical valuation of evolution, among the many statements it is said that:

> "With the formation of articulate language, there was an essential change in the cognitive processes of the individual... It was only with the appearance of the word that man was able to abstract himself from such and such properties as objects, and to distinguish the relations existing to things as distinct from the things themselves." (Spirkin, 1986, pág. 62).

In fact, a sensible view that is shared is this one from the well-known work of when he recapitulates and says: "everything we have said about the essence of the use of language makes it clear that the use of language implies thought". Indeed, but the comprehension of meanings that are closely linked with their material carriers in the given language. L (Schaff, 1998, pág. 143)The faculty is phylogenetic, and the process of abstraction demands for understanding a function of social adaptability in the ontogenetic as a history of variations in the individual. It has been recognized since Thorndike, who as early as 1920 proposed intelligence as a person's ability to understand and manage among other people "to engage in adaptive social interrelations." In this sense, we have that the different human tasks give rise to experiences as an intellectual knowledge, but what this treatise proposes is that it is also inseparably in the emotional flow and in the various ways of living experiences in the intersubjective relations that unfolds in the next subtopic. (López, 2007, pág. 18)

3.4 FROM THE SUBJECTIVE AS BELONGING TO INDIVIDUALITY TO THE INTERSUBJECTIVE AS RELATIONAL IN THE COLLECTIVE COMMUNITY

The correspondence of cultural precepts as a social construct, and individual learning necessarily takes place in the very place of reality. "Human existence is a relational existence, therefore it occurs in the particular psychic domain which is the domain of human existence." (Maturana H. , 1995) This relational and psychic space is contained in what has already been stated that, Learning is primarily a process embodied in existence itself. Such proper conduct in the domain of the existence or preservation of life is an expression not only of knowing, but also of recognizing, what is said or cursed lies in the realm of the psychic, in the personal significance in relation to those who coexist. And for this, the contributions of Symbolic Interactionism initiated by Blumer in 1938 can be helped to some extent, which are synthesized in its three basic premises of this approach:

> 1. Humans act with respect to things on the basis of the meanings that these things have for them, or in other words, people act on the basis of the meaning they attribute to the objects and situations around them. 2. The significance of these things derives, or arises, from the social interaction that an individual has with the other actors. 3. These meanings are used as a process of interpretation carried out by the person in his relation to the things he encounters, and are modified through this process. (Blumer, 1968)

The contribution offers to contemplate the interaction between the actor and the world, giving great importance to the actor's ability to interpret the social world. Symbolic interactionists conceive of language as a vast system of symbols. Words are symbols because they are used to signify things, and they make all other signs possible. Acts, objects, and words exist and have meaning only because

they have been or can be described through the use of words. On the other hand, regarding the relevance of language regarding the fact that words are symbols, we also have to: (Rizo, 2004, pág. 6)

> "Words constitute operations in the domain of existence as living beings of those who participate in language that result in the flow of bodily changes, postures and emotions of these having to do with the content of their language." (Maturana H. , 1995, pág. 21).

The foregoing leads us to understand that in the different human endeavors, experiences are conceived as an intellectual knowledge, but these ways of living are inseparable from experiences in the emotional flow. Since, as a species, we keep a set of structures that direct emotions and behavior. This It is invited to be understood as a binding individual-society process, something like an interactive and retroactive link. In *Subjective Transit* to the collective is the proposition that the *Selective dynamics, contains itineraries* of dialectical correspondence *from the intrapsychic, interpsychic to trans-psychic*. In the intrapsychic, the introjection of socio-cultural elements occurs individually. For this we can help for a proximal explanation the words of Alex Kozulin referring to Vygotsky "inner speech becomes a zone of psychological contact between culturally sanctioned symbolic systems, on the one hand, and private [language] and images, on the other." (Kozulin, 2000)

For our explanatory purposes, it is proposed that this relational space, those itineraries in which the human experience is contained, which conjugates the social environment and the individual dialectically in a circular and retroactive way, is understood as a *connection* It is an intersubjective relationship that emanates, makes possible and fosters the meaning of language. That is, the *connection* integral to understanding, to assenting to experiences; It makes it possible to have conviction or agreements by reaching consensus when presenting a topic or idea that is shared as an a priori. In the existential practice of individuals there is naturally an articulation with the social environment that is in the immediate experience already given and the coordination of consensual actions with others (Maturana & Varela, 1984). This is what we propose here to call *connection*, which is the basis for the articulation of words as unitary parts in their articulation with more words and other subjects with whom we speak and share meanings.

There is something else that is proposed, the connection is applied to refer to a more ethereal dimension, not only at the level of fact, observable and empirical, but also at the gestalt facultative level. The *connection* As a faculty, it is what makes it possible for them to make sense between what is said or thought from the individual and the precepts that keep the meanings in the communities or contexts in which they speak. Well "The various human pursuits are distinguished both by the dominance of the experiential in which the actions that constitute them take place, as well as by the emotional flow involving," (Maturana, 1995). From this, the concept proposed as *connection*, it fosters contemplating the emotional part that moves the desire of the subject, present at all times in every

decision of our existence and is lived in the psychic realm because, "human existence is realized in language and the rational from the emotional". and in this way it allows us to move forward by explaining the intersubjective itineraries. Now we give way to integrating the emotional. (Maturana H. , 1995, pág. 23)

3.5 THE INSEPARABLE EMOTIONAL CHARGE

Now more, in the connection as a psychic fit in the understanding of meanings or also understood as isomorphic to molecular bond, in the intersubjective relations, its significant weight keeps the emotional part. Already Heidegger spoke in the apprehension of the world that there are "two intimately intertwined constitutive modes: the affective disposition on the one hand and understanding on the other." (Leyva, 2012, p. 156) we also have (Goleman, 2021) who deploys a broad propositional study led to the category of emotional intelligence.

Another reference which since the end of the last century has impacted the way of understanding education and has referred to these same precepts, is what (Morin, 1999, p. 5) says. In this sense, the addition that is offered hypothetically is that in this inter-subjective operational body the emotional charge (socio-emotional) is presented, which dynamizes and links the private or intra-psychic with the collective or public.

In intersubjectivity, the interpsychic part, we can identify what the following quote says: "In truth, different psychic spaces cause different ways of touching, smelling, seeing, being moved, moving, growing, getting up." Different psychic spaces associate and correspond to different emotional states in shared bonding relationships, such as assenting or dissenting, for example. It is worth noting that:(Maturana H. , 1995, pág. 54)

> "All reasoning occurs as an operation in the coherences of language from a primary set of coordinations of actions accepted or adopted, explicitly or implicitly, a priori. But, it turns out that everything accept *a priori* It comes from a particular emotional domain in which we want what we accept, and we accept what we want, with no other foundation than our desire that is built and expressed in our accepting." (Maturana H. , 1995, págs. 23-24).

In the social practices of language, as we have been saying, as the *connection* in intersubjective relations, for example, the meaning of expression is implied and to a large extent determined by the emotive psychic energy. Whereas, in coexistence, the most concrete and unitary form of emotional expression are words, and it can be witnessed from an observable way in which it is experienced or manifested in behavior.

The emotional charge that is inseparably imprinted and simultaneously is proposed here to refer to it with the concept *Cathexis, term* that Lacan used. (Lacan, 2003, Vol. I)to understand it as an emotional psychic energy; A link between a feeling and emotional meaning to an idea, object, or person which is simultaneously printed as an experience. This emotive charge as a dynamic energy in the

intersubjective relations of language, in addition to conveying ideal contents, meanings, experiences or knowledge, favors the articulation of words with each other to form sentences or sentences with *sense* What we understand as syntax (a logical order with a general character) this sense is accompanied by a more subtle dimension closer to the term feelings, sensitive feelings that allow us to see more the unconscious implication, and subconscious that lies in the desire of the subject. And so, in the structural coupling of coexistences as intersubjectivity that connects through language, in its unitary way materialized in words, there is a very subtle dimension of *sense.* In this way, what is spoken can become learning that is inseparable from the bond that is given in the encounter Always emotionally charged.

Now, moreover, through the social practice of language, a *connection* with humanity in general, not only with the empirical human being as part of the sensible world, but ["humanity in his person"] is an end in itself, it is thus that the person is created in his dwelling place, (that is, the moral person), it is the ever-present articulation between the individual and the context, between local practices and the universal realm. (Kanz, 1993)In fact, learning is the process by which individuals modify their behavior to adapt to the culture.

Based on what has been documented and what has been abbreviated here, the *cathexis* or dynamic energy aims to understand or assume that *comprehension as a requirement in learning does not lie exclusively in the cognitive, but in part contains an emotional foundation*. Lack of comprehension does not correspond symmetrically with lack of understanding or faculty that is only logical-rational. We propose that *cathexis* underlies and implies disagreements as indicators of the unpleasant, of disagreement, it mobilizes the phobic that becomes manifest in defense mechanisms or rejections in individuals towards what is not their own, what is alien or unknown, which in the ordinary is expressed as that which *has no meaning for it.*

The emotional charge that we refer to with the term *Cathexis*, is inferred and proposed as an explanatory approximation of the motor of particular interests in intersubjective relations, tastes and preferences, acceptances or feelings and dissents; Cathexis as energy is expressed in openness, disposition, reception, as well as in rejection, disagreement as an implicit instance Where they get paid *Meanings or Senses* Ideas put into words. Whether speaking or listening, reading or writing, we are continually carrying out processes of *signification*, which are processes of inference that have an interpretative but hypothetical character, and go from being hypothetical or possible to true, real or significant until it is observed materialized, in facts, or as a working memory, in an executive evidence. For, like every process of signification, it establishes a triadic structure: the index (sign) that mediates between what it indicates or signifies and the interpretant; the interpretant who relates the sign or index to an object which indicates or signifies; the object that founds the relationship between the sign and the interpretant. As they point out (Conesa & Nubiola, 2002), the relationship between words and

objects is neither magical nor immediate, it is mediated by the subject who interprets the signs. "Given that the informative performance of the pedagogical community is always a function of the linguistic competence of the recipients", and in this sense he also says, it is necessary to recognize "the essentially cognitive, interpretative, inferential character of language" that in (Bordieur & Passeron, 2014, pág. 167)(Norbert, 2000, pág. 78)The linking frame of language gives meaning to an idea, object, or person.

Here it is necessary to contemplate that, between words and things given in an intersubjective relationship, the emotional part marks significant destinies. A concrete example, when the infant is given the command to read, when he executes the reading and performs a mechanical ocular and motor exercise, a degree of stress, anguish or anxiety is simultaneously imprinted, rather than interest or disinterest.

As a relational phenomenon that travels between inter, intra and trans-psychic itineraries in intersubjectivity, it offers then that the emotional part encloses a proximal link or propitiates it, in addition, in language, it is decisive for the meaning of learning. Using as an example the Lacanian position between the "full word" and the "empty word", the specific weight of the "empty word" is distinguished. *Cathexis*. The difference between the *Full Word*(pleine) and the "*Empty word*(vide) lies in the fact that the full word presents itself with an emotional charge, closer to the enigmatic truth of the subject's desire, articulates the symbolic dimension of language, while the empty word articulates its imaginary dimension. (Lacan, 2003, Vol. I)

To take another explanatory step, the *Cathexis* It underlies like a drive of desire, Hegel understood desire as the desire for recognition by the other, he says "Every human desire, (...) is ultimately a function of the desire for recognition." (Kojéve, 2006, pág. 66). That is to say, desire is a key point for man to be a man, because this can only happen before the eyes of the other. Now, the subject's desire for this field of educational theory is presented in its two directions, in that of the teacher to teach and in the infant to learn, but this is only a superficial, external, socially justified part in which the meaning of the conduct of the school framework with the one who orders it is established. It forbids him, protects him, judges him as long as it qualifies him and even punishes him.

In this regard, we hypothetically propose that each statement and its intrinsic form issued by the teacher, triggers the child in a way and degree of anxiety, stress, anguish or impression that corresponds to the field of emotional intelligence. In this said, the transitive itinerant relation of subjectivation guides, permeates or guards destiny in the infant given to its age and plastic nature by cathexis. The one that can occur or accompany anxiety, stress, anguish in the forms and degrees of tolerance-intolerance as indicators, corresponds to the fact that "Anxiety occurs when there is a conflict between either the inner desires and impulses on the one hand, and the outer world on the other... between inner impulses and one's own consciousness" highlighting the presence of conflict within the emotional realm, This category as a degree of tolerance-intolerance is implied in the itinerant

relationship already mentioned where desire is conjugated in its two directions (that of the infant and that of the teacher). (Goleman, 1996) (Wolff, 2010 , pág. 25)

What the observer describes as learning disabilities, *problems with comprehension or assimilation,* It is only the judgment from the adult's reading, the continent of the precepts that we initially proposed, in which the practice of the educator is enclosed. However, under the axiom that every possible theory, hypothesis of action or implementation of teaching is necessarily based on a theory of learning or nothing is guaranteed of success in the teaching profession. Thus, the object of this work is to see from the point of view of the recipient of the teaching. The infant, as far as age is concerned, lives more fully the sense of pleasure-displeasure in an essential part to consider: cathexis, presented as energy that touches the boundaries of the emotional realm, is a form of predisposition that is not specifically a problem of IQ, rather, by defense mechanisms, as Freud summarized observations that, "mistakes in reading and writing can be applied to children." *Oral lapses are not surprising at all* ... The... The reader's current situation determines the outcome of his mistakes." (Freud, 1996, págs. 822-827. Libro I)Now materialized as a form of struggle for the intra-psychic stability of the school child, he experiences a form or degree of stress, since "the whole of our psychic activity tends to pleasure and avoids displeasure." (Autiquet, 2002, pág. 59) where the brain, as we mentioned in the phylogeny section, can concentrate energy and discard the information lacking interest, this occurs by biological operating mechanisms through the inhibition of the synaptic pathways of this information, by proper function of areas such as the frontal orbit, the amygdala. Let's see.

3.6 FINAL EXPLANATIONS WITH THE HELP OF CONTRIBUTIONS FROM NEUROLOGICAL SCIENCES

Energy Emotional that touches boundaries between logical-rational thinking and emotional intelligence in The brain, phylogenically selective, discards uninteresting information by inhibiting synaptic pathways, by a process called habituation, the function of areas such as the frontal orbit, the amygdala, the hippocampus, etc. In general, the limbic system in the intrapsychic is understood as the judge that determines the value for what is worth being learned and what is not, according to the pleasant or painful sensations that each situation produces in us.(Ortega Loubon & Franco, 2010)

Neurological sciences provide that the orbitofrontal cortex has a function as an exit valve for *emotional* orders to areas of the frontal lobe responsible for planning and creating strategies. Therefore, **it has an important role in the regulation of impulses that come from the limbic system** and pass only part of these signals, those that will serve to define the subject's objectives well.

Specifically, the hippocampus has the ability to facilitate and store memory traces with important consequences such as pain or pleasure. The hypothalamus, in its function of homeostasis,

regulates appetite; It responds to pleasure to pain as an efferent, as it regulates the autonomic nervous system in emotional responses to excitation of the central nervous system.

To extend and deepen the explanation, afferent arousal by the nervous system generates a state of pleasure-displeasure, which becomes evident and we refer to the degrees of stress that the infant experiences or experiences when the teacher assigns or decrees a task, a question to answer, (any indication) that is, to the These same principles Let's bring our explanation closer to what is found and applied as defense mechanisms or indisposition to work. The experience of living an unpleasant sensation such as *frustration* (Cordón, 2009)It becomes observable as resistance to tasks or other-oriented learning content for teaching purposes. When asked evidence of learning to assess or You are put to the test. Frustration for some children can be a paralyzing phenomenon, or a target for an unconscious defense mechanism in the future.

4 CONCLUSIONS

As part of the conclusion, the word in its symbolic invocation is created from the order of relations between men, not only in formal language as a linguistic-syntactic structure in which the rules orient. Language and learning are social practices, embodied in transgenerational or phyletic memory, on the one hand, and on the other, of an ontogenetic process as individual history. In this, the emotional charge is inseparable both as a determinant and, to some extent , unconscious, where the interactive forms, although they are updated in each socialization event, keep meanings from their own life stories (ontogeny), which takes refuge from their first family environment, then school, and both mark antecedents to the social sphere as structuring sources of their personality picture or psychic configuration. Therefore, here it is considered that one of the duties of the educator is to recognize and discern the moments that mark destinies, for example, when leading in the pact that implies assigning the roles of sender and receiver since the *connection* has implications for the forms of meaning or sense of learning. The *forms of relationship become* central space for analysis, as well as the act, product or execution of what is requested.

For an educator whose work ordinarily consists and insists on transmitting meanings from adults to children, it is worthwhile to first understand how he himself reproduces and limits to a pragmatic dimension the meanings and imaginaries on which his heritage is sustained, understood not only as a sum of experiences, but as a way of being-being and constructing his world. For both in speaking and in listening, in reading or writing, we are continually carrying out processes of signification, of inference that operates a hypothetical and interpretative character, but without separating the instrumental from the cognitive content and the emotional part that implicitly encloses desire. In this way, we are permanently in a continuous inter-subjective operation when reading reality, in which emotional intelligence is poured into and is always present in the contagion of a subject, the

interest, the meaning that a placement acquires either as a didactic route for the teacher or as a learning content, it is a process in which things are discriminated against and valued, giving a conception of the world. In summary, it is offered to contemplate education as a complex phenomenon that moves from intra-subjectivity, inter-subjectivity, to trans-subjectivity in which there is *a* qualitative connection that can be attributed to the emotional field of motivation as a motor that drives action and keeps destinies in the form of learning and forms of children's meaning.

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SEVEN
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Pedagogical practice and the film "School of Rock": Possible dialogues on teacher mediation

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ABSTRACT
Teacher education in Brazil has been a subject of great interest to researchers who are dedicated to finding solutions to problems arising from the neoliberal ideology that promotes precariousness of teaching work and dismantles national education. Joining efforts in the resistance against this reality, we aim to combine art with education, in order to, through the film "Escola do Rock" (2003), analyze a pedagogical practice. Thus, we identify the stages that marked the protagonist's action, culminating in a general analysis of the experience portrayed in the film, dialoguing with authors who defend a progressive education. The result was the elucidation of a teaching practice centered on mediation. We observed that the film can contribute to the training of teachers, by recording the stages for an education that acts in the sense of mediating knowledge, privileging dialogue and historical contextualization and promoting the critical problematization of the contents to reach the maximum potential of the students.

Keywords: Teacher training, Teacher mediation, Cinema.

1 INTRODUCTION

School education in Brazil and student performance are issues that have been addressed by teachers for decades. Aware that school education, at all its levels, is imbricated in the political actions of a country and put into practice by groups that install themselves in power (FREIRE, 2019), we recognize, in advance, that numerous education reform initiatives in Brazil, starting in the 1980s and accelerated after 2016, aim to adjust school activities to the training of labor to serve capital, in its current neoliberal strand (FREITAS, 2018).

That said, it is important to clarify that this article is aimed at a progressive education, which resists against the emptying of school education for children, young people and adults, and also against a precarious training of teachers, adopting a practice that makes sense to students and leads them to reflect on the knowledge historically systematized by human beings (SAVIANI, 2019).

In this sense, there is a vast bibliography that points the way to a pedagogical practice that directs students to reach their maximum potential and teachers to a critical training that allows them to establish promising dialogues with their students (SAVIANI, 2019, FREIRE, 2002, 2019, GATTI, 2016, TARDIF, 2014).

The film "School of Rock" (2003), by telling the story of a failed musician who impersonates a teacher and ends up directing the students to form a rock band, may, at first, pass for a late afternoon distraction, being just another empty work, without critical content. However, the pedagogical practice presented in the film has the potential to elucidate, through example, a path to teaching-learning that removes the centrality of the teacher as a mere narrator of content (FREIRE, 2019), and shifts it to a situation of mediation, which respects the knowledge that students and teachers bring with them. Such mediation puts this knowledge in dialogue so that learning takes place effectively. The film brings an educational approach that places the teacher as an ally of the students, enabling a transformation in the teaching method, where both teacher and students start to draw a mutual dialogue in favor of a learning that makes sense and achieves satisfactory aspects of teaching and learning.

Thus, making use of a qualitative approach, the ideas brought in the film "School of Rock" (2003) will be analyzed in order to elucidate a fruitful pedagogical practice, based on the theoretical foundation of several authors who discuss teacher training and pedagogical practice, contributing with reflections for a progressive and critical professional performance.

2 THEORETICAL BACKGROUND

Cinema is a widely used resource within the classroom. However, the film is often nothing more than entertainment without a debate about the work and its content. As a result, students and teachers end up sticking to a conservative and non-critical education. Freire (2019) calls this type of teaching "banking pedagogy", where only a certain class has access to cultural training and denies the same conditions to the marginalized class.

Even if there is a certain limitation, cinematographic works can be resources that promote discussions about society and life. In line with Cardoso *et. al.* (2021), cinema enables the construction of critical thinking and can contribute to the person seeing the problems that are around them and affect the relationships between society, the environment, and the world. A work has the capacity to reveal what capitalist ideology tries at all costs to hide.

We can say that, like other artistic works, a film can awaken sensitivity and reflection on social relations, promoting a critical look. However, for this, it is important that there is a mediation, since the same work can also suffer ideological influences, so it is important that in the discussions based on a cinematographic work there is a theoretical basis that raises the questions to be asked about the reality we live in. (CARDOSO, 2021).

According to Adorno and Horkhmeire (1985), there is an ideological current aimed at masking the truth and manipulating the population through the arts. The thinkers of the Frankfurt school call this maneuver the Culture Industry, where the films reproduced are intended only to amuse and distract the spectator, preventing him from being able to unveil what capitalism hides. Therefore, it is not

enough just to present a work to the student, it is necessary to make their perception go beyond the aesthetic and the story presented in the film. In the same direction, Pereira *et. al.* (2021) warns that without a problematization and a critical approach, any film is nothing more than an entertainment tool.

When we talk about presenting films as a pedagogical resource, we aim to understand the importance of offering a possibility for future teachers to be able to identify the problems that affect society, as Gonçalves *et. al. said.* (2020). Cinema allows the person to perceive the situation that affects the social classes and identify the problems, questioning the reality posed in an attempt to transform the environment in which one lives. Faria *et. al.* (2021) also points out that films bring a different language and, therefore, allow for a more pleasurable pedagogical practice.

3 METHODOLOGY

It is a research with a qualitative approach that, according to Minayo (2010), allows an approach that studies the research object and relates it to the researcher. The analysis of the film "Escola do Rock" (2003) was based on the observation of the pedagogical practice carried out by the teacher's character, the reactions and actions of the students, as well as other characters linked to the school management and families. Having identified the stages that marked the pedagogical practice, we discuss it and the consequences arising from it, culminating in a general analysis of the experience portrayed in the film, dialoguing with authors who defend a progressive education. It is intended, therefore, to achieve a greater understanding of pedagogical practices that remove the centrality of the class exclusively from the teacher, who passes as a transmitter of knowledge, to a teacher who relates to the students, mediating learning while building activities that make sense to the students, transforming and transforming themselves in this process.

4 ABOUT THE MOVIE "SCHOOL OF ROCK"

The film "School of Rock" is a 2003 work, directed by Richard Linklater and has as its protagonist Dewey Finn (Jack Black), a rock musician who is in serious financial problems and lives in favor at the house of a friend, a teacher who was also a musician. At one point, the phone in the apartment where they both lived rings and Finn answers. On the other end of the line was a principal offering her an elementary school teaching position and Finn soon impersonates his friend, taking the job. Her idea was to just get paid and let her students do whatever they want in the classroom.

What the musician didn't expect was that among his class there were erudite musicians and when he realized the potential of the students he began to teach music, but changing the musical style, focusing only on rock. His goal was to get children to participate in the state music festival, and so he goes on to teach not only the practice but also the history of rock. However, the school was recognized for its conservative and traditional stance, and this stance was demanded by the students' fathers and

mothers. The situation worsens when the musician is unmasked, but he manages to teach the class how to work as a team and make compositions that stood out from other bands in the contest.

5 PEDAGOGICAL PRACTICE IN THE FILM ESCOLA DO ROCK (2003)

Throughout the film "Escola do Rock" (2003) we can perceive several elements that dialogue with a pedagogical practice that take into account the closest relationship between the teacher and the students, breaking the conservatism where the teacher is the holder of knowledge and repeats the content of the textbooks and the students are reproducing boxes of this content (FREIRE, 2019).

In the first moment, we see that the musician perceives the potential that exists in each student, realizing that, with guidance, they can go down another path and raise their skills even more. Thus, he leads students to rehearse rock songs with the aim of taking them to a state music festival. But the teaching was not only based on training, the teacher also bridges the gap between the students' knowledge of (erudite) music and their experience with rock.

Thus, to further improve teaching-learning, the protagonist brings a historical context about rock, teaching the importance of this style for society, through analogies about life. In practice, he shows what rock is, musical ability and, with that, convinces students to form a band and rehearse. We can see the professor's explanation of how much rock music is against convention. Through a critical social discourse, he shows that, despite a convention that guides human beings and determines what is right or wrong, music makes it possible to break with certain values, being considered a misdemeanor.

By being clear about his approaches and the purpose of the activity, he takes advantage of the experiences of each student, inserting everyone in the project, distributing functions according to the skills found, but always directing the actions towards the same goal.

The teacher uses dialogue and music teaching to promote a dynamic and pleasurable practice, giving meaning to what is being done in the classroom, even if his goal is to convince students to participate in the festival. To encourage even more, he delivers CDs of musicians and rock bands, making the students pay attention to the aspects that should receive more attention according to their musical abilities. But, in addition to teaching the students, the protagonist needs to show the school administration and the parents, who are conservative and traditional, that the activity has transformed the lives of the students. children. Thus, the film shows the teacher's path of mediation and the change of the entire school social group through rock music and a practice that breaks with plastered teaching.

From the analysis made above, we see that the film exemplifies in detail a pedagogical practice that reconciles teaching knowledge that, for Tardif (2017) involves important aspects, having a personal nature; social; cultural and temporal and, in this way, the teacher's knowledge is related to his/her school work and the guiding principles that help to understand the daily life of his/her activities.

In addition, the work also dialogues with a historical-critical pedagogy that presents a dialectical

reality, where teachers and students are able to observe relationships from a critical bias and that, through intervening actions, awakens questioning thinking, making the subject seek ways to transform reality (SAVIANI, 2015).

It is also possible to find elements of liberating pedagogy, which, according to Freire (2019), is the pedagogy built together with the oppressed class, allowing the students who are part of this class to reflect on what and those who oppress them, seeking ways to free themselves from the bonds imposed by the oppressors. From the teachers' point of view, the practice stamped in the film also enables reflections on the knowledge necessary for teaching practice that Freire (2002) addresses in his pedagogy of autonomy, when he argues that "there is no teaching without dissent" (FREIRE, 2002, p.23), that "teaching is not transferring knowledge" (FREIRE, 2002, p.52) and that "teaching is a human specificity" (FREIRE, 2002, p.102).

6 FINAL THOUGHTS

The film "School of Rock" (2003), despite explicitly presenting social and economic conflicts, is rich when it deals with the mediation of the teacher in the classroom. We saw that, through a pedagogical practice that respected the abilities and active participation of the students, the protagonist was able to achieve his goal and make his class learn to work as a team and still follow what they believed, confronting the conservatism that was imposed by the school and the parents.

As an art that supports education, the film brings the possibility of contributing to the training of teachers, because it elucidates a pedagogical practice that aims to transform teachers in mediators of knowledge, privileging the path of dialogue and historical contextualization and promoting the critical problematization of the contents.

There is, therefore, even in a cinematographic context of fiction, the elucidation of the role of the teacher to be a mediator of an approach within the classroom that breaks with the plastering created by the capitalist system, allowing the teaching process to be carried out together with its students, enabling the construction of more critical thinking about the problems that affect society.

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Contemporary educational perspective: Teacher success or failure?

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ABSTRACT

This article brings a reflection on teacher training in the face of an interconnected society, where information is made immediately, reaching the most different community groups, directly and abruptly inducing School Education. During teacher training, most of the time they do not learn how to work with so many challenges, with uncertainty and the unexpected, which are consequences of current events, and often their professional function masked by situations that involve the student requires the teacher to act with multitasking. The cultural and family differences that are poured into the school end up inciting under the teaching work a veiled anovelling of situations that stand out from their primary attributions, that of teaching, which generates an excess of overload in the exercise of the profession and in addition to countless demands. The school community, in turn, seems to forget that the teaching work has the human being as an instrument, which makes the pedagogical act intricate, as it is essential to welcome several students in their entirety and not only in pedagogical issues, understanding that other issues such as emotional ones are directly linked to learning. We present here through a bibliographic review this analysis with a descriptive-analytical character, which involved collection, systematization of reports produced with this theme and it was observed such discrepancy and with a technological world, the teacher still needs to compete in turn gets sick, without realizing it and without having the necessary support to deal with so many adverse circumstances, where technology should be treated as its ally and a tool for diversification methodological, but it is causing difficulties in carrying out their hard and daily work.

Keywords: Education, Teacher Training, Technology.

1 INTRODUCTION

Teacher training is the subject of several debates and researches, and it has never been something more necessary in the face of the scenario that teachers find in their work. Remembering that the teacher's work material is the human being should be a reason for reflection on what would be the basic requirements for a professional who works with the subjectivity and uniqueness of individuals.

In the face of so many challenges, the teacher's professional function is often masked by situations that involve the student and require the teacher to multitask. The family cultures that lead to the school end up creating a tangle of events under the teaching work that ends up preceding their primary role, that of teaching, which places on the teacher an overload of demands.

Among all the professions, teaching has at its disposal, within a classroom, several individuals who receive curricular information, but still have to consider their cultural and developmental differences. While the teacher is working with twenty, thirty, forty individuals at the same time, the other professions such as lawyers, doctors, have their work limited to one to one.

It should also be considered that most students nowadays have access to instant information and are interconnected to the world wide web, through the internet, in the use of technologies, which can be positive, as well as if used without selectivity can still make the teaching work more complex.

But wouldn't teaching be of great importance for the educational formation of the being and his constitution as a citizen, aware of his duties and rights? Would this be the case of a small number of students so that the teacher could better understand his work material and thus contribute to its better development?

It should also be reflected that the teacher often does not have the exact dimension of his work and what the results are, since the student stays with the same teacher for only one school year, and it is not possible for the teacher to follow the development of this teacher throughout life.

Therefore, this article seeks to reflect on the current approach between the teacher and this new demand, considering access to information and technologies as part of a process, where the teacher needs to have connectivity with the interests of their students and their specificities.

2 DIGITAL SOCIETY: THE NEW CONTEMPORARY EDUCATIONAL SCENARIO

We live in the digital age. Everything involves technology and information. Knowledge and access to both technology and information has never been so instantaneous. Globalization has affected the way school education is structured and the teaching work is developed. Giving the impression that "everyone" has access to information at the same time and in the same way. In this process, which occurs all over the world, there is the scientific-technological revolution, whose reflections are also noticeable in the classrooms and brings to the teaching work an agglomeration of questions and uncertainties. (MOREIRA & KRAMER, 2007).

When we consider LÉVY:

> In general, they consider me an optimist. They're right. My optimism, however, does not promise that the Internet will magically solve all of the planet's cultural and social problems. It consists only in acknowledging two facts. Firstly, that the growth of cyberspace is the result of an international movement of young people eager to experiment, collectively, with forms of communication different from those that the classical media propose to us. Secondly, that we are experiencing the opening of a new space of communication, and it is up to us alone to explore the most positive potentialities of this space in the economic, political, cultural and human spheres. (LÉVY, 1997, p. 9)

The fact that access to digital technologies and the internet contribute to globalization has left the perception that digital technologies would be the "lifeline" for society and the planet, but we have

seen, as Lévy shows us, that ICTs should not be considered as the solution to all the problems of global society. but as a tool that can contribute to such a process, when used for a constructive purpose.

In many situations, the teacher is between the teaching technologist and the social agent (VEIGA & AMARAL, 2006). Sometimes having his role added to others and behaving as a multitasking professional, in the face of the sea of information and technologies, which are increasingly accessible, the teacher becomes at times a mere agent who operates technology and at times a professional capable of transforming society, contributing to the mediation of knowledge and seeking that his student becomes the protagonist of his own story. using technology and access to information in their favor, as a tool for instrumentalization and transformation.

In the face of this digital and globalized society, there is a perception of uniformity of access to technology, as if the best and most modern technologies were accessible to everyone, everywhere on the planet, with the same quality and the same clarity. This clearly associates education with various aspects, among them poverty. (BARRETO, 2011).

According to BARRETO:

> "... information and communication technologies (ICTs) have been recontextualized in educational policies and practices, especially with regard to the "poor" in peripheral countries. Through a critical discourse analysis, it aims to capture the dialectical relations between the symbolic and the material dimensions, mediated by the imaginary. It also includes clues to resize reading and other language practices developed in classrooms, in order to overcome the hegemonic perspective of technological substitution." (BARRETO, 2011, p. 349).

The reflection proposed above makes us wonder if technology and information distributed around the globe would be equal, disregarding underdeveloped, developing and developed countries. Based on this assumption, we understand that also within schools, technologies should be distributed in a uniform way with quality standards, both in access and equipment, leading globalization to all.

Of course, it doesn't exactly happen that way. Barreto (2011) clarifies that inclusion-exclusion in series, ranging from digital to social, as if the market included externality and if inclusion were not forced by this absence. On the other hand, even if the assumption of the existence of the excluded is accepted, it is as if it were possible and even simple to move from one pole to the other.

Understanding that socially there is inclusion-exclusion, as it would not happen with the digital one. This scenario that we see clearly within schools, we can think of the reality lived within schools, where in many cases each computer is divided between two or three students, and according to BARRETO, 2011: "a computer for each one could work as a necessary springboard to jump", which would certainly bring quality to the use of ICT and contribute to a better development of the student.

Considering MOREIRA & KRAMER:

> "Many curricular reforms refer to the school through centrally defined models, designs and policies, assuming that it is possible to forcibly change the real, with

> decrees, projects, benchmarks or parameters, without changing conditions and practices and without involving the actors in the process" (MOREIRA; KRAMER, 2007, p. 1054).

It can be seen that within the above, the issues of curricular reforms and access to technology are universalized and defined as parameters to be followed in all regions, regardless of the geographic location and situation of the local community, but variations occur that often end up excluding individuals as if they were not allowed to have the same opportunities as others.

Preto & Pinto (2006, p.21) clearly states that the individual often feels interconnected with the rest of the planet, just because he knows what happened on the other side of the globe, but this feeling brings a false sense of inclusion. The various types of media, in turn, contribute to the propagation of this feeling, leading to the impression that "we are all equal".

This movement of digital and information technologies, in turn, brings a "consumer perspective", reflecting on all segments, including education and culture, valuing the individual performance of the being. (PRETO & PINTO, 2006).

We then have an individualistic construction where the individual would not need anyone or any mediating source, being able to consider here the role of the teacher, to leverage their knowledge, because through digital resources, they would access what they need at any time and time, having the world in their hands.

We then need to reflect on this new teacher for this new education, considering that the challenges are many and that many times the teacher needs to put himself in the student's shoes to better understand their reality and which tools are influencing their behavior and, therefore, learning.

3 TEACHER TRAINING, TECHNOLOGY AND PEDAGOGICAL PRACTICE

We have a completely different educational scenario, due to the use of digital resources as explained earlier. Teachers, in turn, need to have training that gives them subsidies so that they can better understand and meet a growing demand of individuals who, even in a precarious way, have access to digital technologies and make use of this access to standardize behaviors and concepts, which directly influences the teaching work.

Imbernóm (2004) tells us that "the concept of profession is neither neutral nor scientific. It is ideological and contextual, so being an education professional from now on will mean participating in people's emancipation." It is clear that nowadays "being a teacher" involves competencies and skills that end up not being established, due to the complexity of the work.

According to VEIGA (2008):

> "In the formal sense, teaching is the work of teachers, the set of functions that go beyond the task of teaching classes. Conventional training functions, such as having a good knowledge of the discipline and how to explain it, have become more complex over time and with the emergence of new working conditions."

From the two authors exposed, it is possible to perceive the complexity of the teaching activity requires a training that contemplates the new molds in which the school is inserted, as well as its clientele and the diversity that involves the composition of a student with attentive eyes and restless minds, stimulated by the access to digital technologies, where in turn it takes them to the world of the internet. connecting people from all over the globe and disseminating different forms of experiences, behaviors and values.

We must also consider that teacher training has become a mercantilist and business product (DINIZ-PEREIRA, 2015). Several undergraduate courses are offered, contributing to a scenario of simplification of teacher training, as if it were something to be dealt with by an instruction manual. Of course, the courses that are offered must be considered with the commitment to really contribute to teacher training, we cannot generalize, everything depends on the choices made by the future teacher.

Considering the history of teacher training, NOVÓA (1992) informs us that:

> "Teaching became a profession thanks to the intervention and framework of the State, which replaced the Church as the entity responsible for the protection of education. This complex change in the control of teaching action has acquired very specific contours in Portugal, due to the precocity of the dynamics of centralization of teaching and the functioning of teachers."

It can be seen that the transformations in teaching are prior to all this technological movement, but they have not ceased to constitute a challenge in preparing a professional to deal with human resources as a work tool, against the background of uncertainties and often the lack of material resources necessary for their work.

The use of technologies, as already seen, should not be thought of as a lifeline, but rather as a tool that can contribute to the teaching work. This new teacher for these new times, must in turn have as a partner in his work digital technologies, which influence his students in all shapes and forms.

Thinking of a class that involves students and awakens in them the desire to continue within the walls of the school is a challenge when considering the conditions of inequality found in different corners of the country, where access to the internet is often precarious or does not exist.

In the words of Freire (2001, p.80):

> [...] One of the priority programs in which I am deeply committed is the ongoing training of educators, because I understand that educators need a serious and competent political-pedagogical practice that responds to the new physiognomy of the school that is sought to be built. (FREIRE, 2001, p. 80).

Teacher training has permeated the center of discussions and debates, especially when it comes to the diversity of work material that this teacher receives, as well as the family cultures and the different communities that make up the school.

Cunha (1999, p.27) shows us that teacher training is always in check, due to the new demands and challenges that are part of their work, influenced by these conditions by the time, the transfers made by the family to the school and the productive logic of the market, which ends up influencing even the culture.

A marketing concern with knowing how to do and not knowing how to be and live together has been reflected in the conditions in which teachers must work with their students, where values and ethics, in most cases, are replaced by knowing how to do and execute, without questioning the process and understanding it.

This whole scenario means that the teacher is always looking for new pedagogical practices that are able to meet a cultural multiplicity and with digital resources, which in turn cause rapid changes and propagate new ideas or models to individuals who are often not prepared to reflect on the resources they have and what would be the best way to use and apply them in their daily lives in a way that to contribute to its development and consequently to base its knowledge on solid foundations, which would subsidize the continuity of the construction of this knowledge, which makes the human being always unfinished and in constant mutation.

In the search for pedagogical practices that consolidate their performance and reach their students, the teacher looks for different paths and also tends to surpass himself every day, modifying his structures, in a constant coming and going, where everything, every day, is different, changed. On these changes, HAGEMEYER (2014, p. 437) makes us reflect:

> "With the globalization of markets and the evolution of technologies, the world has witnessed the reordering of capitalism on a planetary scale and the development of mass communication mechanisms such as computer graphics, cinematographic and television, capable of creating fantastic imaginary realities and attractive forms of virtual leisure. Such mechanisms exert significant power in the minds, values, attitudes and interests of children and young people in schools, and are adjuncts to the acquisition of scientific, artistic and informative knowledge to which they will have access in schooling through the mediation of teachers."

The different scenarios in which teachers should act invite a reflection on teacher training and what their competencies would be, in the face of so much diversity. BERGMANN & SILVA (2013, p. 1006) draws our attention to this reflective process:

> "As researchers, we assume a relativistic ontological view, insofar as we believe that the world is made up of multiple realities; we adopt a subjective epistemological view, which implies believing that meanings are constructed through social interactions; and, finally, we take a naturalistic methodological view, as we believe that knowledge can be constructed through naturalistic procedures. "

It is up to the teachers to understand that the reading of the world precedes the reading of the word, which brings the reflection that when receiving their students, the teacher must be prepared to consider the reading of the world that this student has, how he sees the world that surrounds him, how

he relates to the group in which he is inserted. Understanding the history of this subject will help to create strategies that improve the work with this student and create activities that support their actual development, which will reflect in the regular classroom that the student attends, and certainly beyond the walls of the school.

Considering Paulo Freire's words, there is a need to build a "repertoire of anxieties, dreams, desires..." [which constitutes] "One of the advantages of such work is that the research methodology itself makes it pedagogical and conscientious" (1991, p. 32).

Therefore, we must be clear that teacher training requires the creation and organization of situations that problematize reality, taking into account the data of objectivity-subjectivity of the subjects and their circumstances.

4 TENSIONS, DEMANDS AND PROFESSIONAL DEVALUATION

In the face of so much diversity, challenges and uncertainties, the teacher ends up being a receiver of tensions and demands. It should also be considered that their performance scenario becomes adverse due to low salaries and the devaluation of their position as a professional, where there is a lack of adequate structure and physical resources to perform a better job than what they already perform.

According to TARDIF & LESSARD (2011), "the productive system is the heart of society and social relations". So you have a capitalist idea that the teacher should also produce in series, a set of pieces as if they were stacked bricks and for a single purpose.

However, this capitalist conception brings frustration to the teaching work, because it must be considered that the tool of the teacher's work is the human being, a tool that is always under construction, therefore something unfinished.

Teachers are then subordinated to the productive sphere, as if they were building something that will be finished and delivered ready for a certain purpose or use. When faced with this structure, the teacher sometimes feels like an element of a production chain.

Teachers are then in the role of executors of tasks and determinations that were thought of in a higher sphere, without considering the specificities of a procedural work, where the teacher will not have a finished product to deliver, but rather an unfinished individual with paths to be traveled.

TARDIF & LESSARD (2011) makes us reflect on what would be the role of the teacher in a society that is constantly changing, and consequently there is a change in ethical and existential values. The authors also remind us that education is in the background of the daily performance between teachers and students.

Consequently, all this situation has produced occupational diseases that compromise the teacher's performance and health. Hypólito & Grishke (2013, p. 511) clarifies that: "Often, for some

authors, the activity of service or immaterial labor was characterized as unproductive labor because it was not directly linked to the production of material goods."

Considering the above, the teacher ends up not being professionally recognized for not delivering something ready to society. This can also justify the low salaries and the often discouraging conditions for the development of teaching work, with the lack of physical space, furniture and adequate teaching material.

All these situations contribute to the teacher's discomfort, often making him sick, which consequently directly influences his work, because we cannot forget that the hidden curriculum is a constant within the school space, and the students themselves end up reading a discouraged, unmotivated, frustrated and saddened teacher. which directly influences the relationship between this teacher and the students.

Paulo Freire elucidates us when he says that "if my commitment is really to the concrete man, to the cause of his humanization, of his liberation, I cannot do without science, nor technology, with which I am equipping myself to better fight for this cause" (2007, p. 22)

Considering all the complexity of the teaching work, we understand that this professional needs to have an initial and continuing education that equips him to manage the various situations that will be faced by him, both in pedagogical issues and in relationships. Therefore, these teachers need to have an adequate environment to develop their work, with sufficient materials for their methodologies, pedagogical management support and professional appreciation, so that they feel established as professionals.

5 CONCLUSIONS

With what has been exposed through the literature review, we realize that the complexity of teacher training goes through several paths. Among them, the technological agglomeration that we have in the face of a globalized society that instantly accesses information from the most different contexts.

Thus, this technological access reaches the classroom, where the teacher must seek methodologies that make him attractive to his students. Competing with games and the most different media, we have a teacher with an immense workload, without the ideal conditions for his work, aspects that do not contribute to his professionalization.

With so many obstacles and a growing demand for work, the teacher has affected his health, which makes him an individual who cannot meet the demands of a capitalist society, who expects production and a ready product, forgetting that the human being is something unfinished and in constant transformation.

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Chemistry experiments as a differentiator to improve teaching-learning

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ABSTRACT

This work was developed with underprivileged girls between 10 and 15 years of age enrolled in public schools in the city of Apucarana, State of Paraná, Brazil, hosted by NGOs. The proposal involved improving the participants' learning in mathematics, physics and chemistry. To gain the interest of this audience, the project carried out scientific experiments such as: chemical chameleon, atmospheric pressure, balloon, lemon stack and pH with cabbage. These experimental practices were involved in explanations and resolutions of exercises involving everyday life. The main doubts involved mathematics that were carried over to chemistry and/or physics exercises. Resolving difficulties in mathematics proved to be a differentiator in boosting interest in other areas, such as chemistry and physics. Among the experiments carried out, it was observed that the chemical chameleon and the pH with cabbage were better evaluated by the participants. The scientific experiments carried out helped to bring university students closer to underprivileged girls in the local community. However, the work promoted opportunities for academics to apply theoretical knowledge and develop and improve themselves as professionals.

Keywords: Underprivileged girls, Scientific experiments, Teaching-learning.

1 INTRODUCTION

The COVID-19 pandemic highlighted significant losses in terms of the quality of teaching and student learning in general. In the case of students in situations of social vulnerability and with economic difficulties, the damage was undeniable (REIS, 2022).

In Brazil, the COVID-19 outbreak occurred in the 2020 and 2021 school years, disrupting face-to-face teaching. This led to irretrievable losses in teaching and learning. In low- and middle-income countries, losses in children's and adolescents' education were extreme: about 70% of ten-year-olds could not read or understand a simple text, compared to 53% before the same year. (REIS, 2022; COELHO & REIS, 2022).

Brazil had high school dropout rates before the pandemic period and the main causes identified by the researchers were related to lack of family structure, unemployment, malnutrition, school, difficulties in assimilating content, among others. (QUEIROZ, 2001; SANTOS, 2020; FERREIRA et al., 2020; ANDRADE *et al*., 2022; GARÇAO et al., 2021).

Regarding the pandemic period, the few data already available show that as student poverty increased, the time spent on studies was lower, either in terms of amount of exercise or time spent on schoolwork (NERI, 2022). A fact that corroborates the widening of social and educational asymmetries. Social vulnerability also collaborates to obtain unqualified work from those who explore the crianças in infância até os que desmotivam projetos e perspectivas prossionais (GOMES & PEREIRA, 2005; RODRIGUES *et al*., 2021).

Regarding the pandemic period, the few data already available show that as student poverty increased, the time spent on studies was lower, either in terms of amount of exercise or time spent on schoolwork (NERI, 2022). A fact that corroborates the widening of social and educational asymmetries. (UTFPR, 2020).

In view of these facts, the face-to-face extension project was developed to recover the teaching-learning of needy young people in situations of social vulnerability, hosted by a non-governmental organization that requested support from the UTFPR to establish a parallel with the classroom, complementing other issues related to the main difficulties of practice experienced in the classroom.

This project was carried out with needy and vulnerable girls with the main objective of clarifying doubts in physics, chemistry and mathematics, promoting integration between students and professionals.

2 METHODOLOGY

The project was carried out at the NGO's facilities on a weekly basis, with the aim of clarifying doubts in the field of physics, chemistry and mathematics regarding the content of the schoolwork of the girls in care. The work was carried out with individual assistance and/or small groups of children depending on the level of difficulty. (PARANÁ, 2019).

To encourage learning, scientific practices and/or experiments were carried out such as: chemical chameleon, atmospheric pressure, balloon, lemon pile and pH with cabbage.

To perform the chameleon chemical experiment adapted from ROYAL SOCIETY CHEMISTRY (2022) the following materials were needed: a 100 mg potassium permanganate tablet (purchased at the pharmacy); water, three teaspoons of confectioners' sugar; one teaspoon (disposable spoon) of sodium hydroxide (caustic soda), two disposable 500 mL cups, and two wooden chopsticks.

The tablet was crushed in a disposable cup (pack 1) with the help of a wooden stick and 300 mL of water (violet solution) was added. In the other glass (container 2) 300 mL of water and sugar

were added, after homogenization sodium hydroxide (colorless solution) was added. With the solutions ready, the liquid from container 1 was transferred to container 2, confirming the different colors (purple, green, and brown).

When performing the experiment at atmospheric pressure, the following was required: a straw and a glass of water. First we fill a glass with water to about a third of its capacity, then we take the straw and immerse it in the water by applying light pressure to the tip of the straw with our index finger. This experiment combined knowledge of physics and climate as a function of pressure (SEARA DA CIÊNCIA, 2019) with hands-on activities in pipetting laboratories. (ABNT, 2007).

In the balloon experiment (SODRE *et al*., 2019) the following were needed: a plastic bottle, a bladder, vinegar and baking soda. The procedure of the experiment was carried out as follows: about a third of vinegar was added to a small 237 mL PET bottle and then two dessert spoonfuls of baking soda were added to the bladder. Chemical reactions between the reactants filled the bladder.

To start the lemon battery experiment (FRAZETO *et al*., 2016) the following materials were used: two lemons, a copper wire, two copper coins, two zinc nails and a voltmeter.

Initially, the lemons were squeezed to increase the availability of liquid in direct contact with the clove and coin by inserting a zinc nail and a copper coin into each of the lemons. A copper wire was then attached to the coin and nail with the help of alligators. The energy of this system was measured with the help of a voltmeter.

In a practical pH indicator with red cabbage juice (PRADO *et al.*, 2019), it was possible to identify basic and acidic substances. Red cabbage water (obtained by heating 200 g of chopped cabbage with enough water to cover it for 20 minutes) tested materials such as: bleach, vinegar, wine, water and alcohol.

3 RESULTS AND DISCUSSION

The doubts of the girls welcomed in this project focused on mathematics, with the main subject being polynomials. According to Rodrigues & Magalhães (2012), problem solving is a very effective methodology for teaching mathematics, as it provides a mobilization of knowledge to find a solution, thus causing the student to want to learn more.

In this search, the student learns to put together strategies, reason logically and check if their strategy was valid, which contributes to the maturation of cognitive structures (RODRIGUES & MAGALHÃES, 2012).

The chameleon chemistry experiment was a very important topic in chemistry, as it teaches us clearly and objectively about the variation in the NOx of chemical elements. The phenomena of oxidation and reduction are very present in everyday life, through which we can differentiate, for

example, whether a food is acidic (e.g., lemon) or basic (e.g., pineapple) in pH values (AQUINO *et al*., 2016).

Explanations of the chameleon practice involved the violet permanganate ion (MnO_4^-), which when reduced to a manganate ion (MnO_4^{2-}), changed the color of the solution to green, which when reduced again became a brown solution. due to manganese dioxide (MnO_2), as evidenced by chemical reactions (AQUINO *et al*., 2016):

$$MnO_4^- + 4H^+ + 3e \rightarrow MnO_2(s) + 2\ H_2O$$

$$MnO_4^- \xrightarrow{+e} MnO_4^{2-}$$

For elementary school children, this experiment allowed the use of positive and negative numbers with a colorful approach (DOLZ, 2018).

In the atmospheric pressure experiment, children could be observed associating the physical concept with the use of a pressure cooker to cook food and high or low blood pressure in the human body. These interactions make it possible to integrate scientific knowledge into the real world of the project participants (SEARA DA CIÊNCIA, 2019).

By definition, we know that atmospheric pressure is the force exerted by the mass of gases in the atmosphere on a given surface; We can also contextualize it by highlighting that when we are at sea level we are under the action of high atmospheric pressure, since the amount of gases above us is greater, unlike what we have in a mountain, that is, low pressure (LONGHINI & NARDI, 2009; SEARA DA CIÊNCIA, 2019).

This also applies to climate, for example, in the atmosphere, low air pressure is associated with the formation of many clouds, with rain and ultimately with adverse weather conditions, with thunderstorms. On the other hand, high pressure is identified as areas with blue skies or few clouds, with lower humidity in the air, with dry weather, without rain (LONGHINI & NARDI, 2009).

The concept of pressure demonstrated with the straw and thumb demystified the concept that pipetting in the lab is difficult or beyond the professional possibilities of the children in this project.

Filling the bladder without the use of the lungs, because the baking soda reacts with vinegar (acetic acid) to produce carbon dioxide, allowed us to visualize effervescence, gas retention (by the globe) and discussions about CO_2 in the environment. (CUNHA & SCALCO, 2013).

In addition, the students noted some practical uses of these ingredients, such as the fact that baking soda and vinegar are used for household cleaning (degreaser) with the ability to kill some bacteria (due to their low pH).

The lemon battery experiment was extremely important for the development of current scientific knowledge and allowed students to integrate the knowledge of electricity present in homes, in machines and even in the human body.

Chemistry (electron) and physics (electricity) could be integrated with biology (biochemistry) and economics (cost of the electric bill) in addition to reinforcing concepts of positive and negative numbers in mathematics since the electrons contained transit from the negative pole to the positive pole, lighting up the LED lamp (BROWN *et al*., 2005).

In this battery (FRAZETO *et al*., 2016) the closed loop oxidizes the zinc while the copper is reduced, i.e. there are zinc ions ($Zn\ 2^{+}$) that pass into the solution (lemon pulp) that can be neutralized by the citrate ions. (Ionization of citric acid, bitter taste of lemon). The movement of the loads managed to generate enough power for the LED.

The pH results with the red cabbage juice were easy to identify, since in the vinegar we obtained a pink color that indicated an acidic pH, i.e. around 2; when the wine is introduced, we observe a pH around 8, indicating that it is slightly alkaline (dark blue color); with alcohol, a pH around 8 was observed, also slightly alkaline (dark blue color); with water, the pH was 7, indicating that it is neutral (light blue color); With sanitary water, the pH recorded was between 12 (light green) (DOLZ, 2018).

The explanation of the pH indicator experiment was made because the variation of its scale is up to 14, differentiating the value 7 as the neutral value as well as the values below (acidic) and above (basic) of this level.

We can observe numerous applications of pH, as well as in our body the gastric juice in our digestive system is around 1.5 to 2 on the pH scale, this contributes to better digestion and favors the absorption of food, among other examples. Remember that a very basic or very acidic pH can cause great damage to our skin and/or health (DOLZ, 2018).

The project managed to attract the attention of students by employing simple experiments that can be replicated by students, as easily accessible and widely marketed materials were used. Between the experiments, a greater chemical interaction of the chameleon and pH with the cabbage was observed.

Experiments combined with the learning of chemistry, physics and mathematics can be a differentiator for the assimilation and integration of the contents covered.

4 FINAL THOUGHTS

This project was planned to improve the teaching-learning of the subjects covered in the classroom, in addition to providing additional information such as the scientific experiments carried out, comprehensively benefiting the participants, facilitating their student trajectory and opening horizons for new stages.

Outreach projects involving college students and public school elementary and high school students have the potential to enhance the personal growth of graduates and children and youth in need, generating citizens more capable of facing future challenges.

The scientific experiments of chameleonic chemistry, atmospheric pressure, balloon, lemon pile and pH with cabbage turned out to be a differentiator in learning and a facilitator in the integration and interaction of students with the university students and professionals involved.

The work provides an opportunity for academics involved in the subjects (chemistry, mathematics and physics issues) to excel, improving their ability to contextualize in a simple and multidisciplinary way (exercises and scientific experiments) the learning needs of disadvantaged girls in situations of social vulnerability. addressed in this project.

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The higher education of law in Brazil: The freedom of chair as an instrument of effectiveness to the fundamental right to education

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ABSTRACT

The general objective of this article was to present Education as a fundamental right, considering the freedom of professorship as an instrument for the effectiveness of this right. Education that leads the individual to the exercise of citizenship and to the development of the human person invokes freedom in teaching and learning. Highlighting legal education in Brazil, this article also presents the various reforms that have impacted to some extent the content and form of education in the country. The theoretical foundation was divided into 3 sections: i) education as a fundamental right in the Brazilian legal system; ii) legal education in Brazil, reforms and curricular guidelines; iii) university autonomy and freedom of professorship. The research problem consisted in identifying whether the freedom of professorship can be conceived as an instrument of the fundamental right to education. Using a hermeneutic method, the hypothesis initially raised is verified, which gives a positive answer to the problem.

Keywords: Fundamental right to education, Normativearches, Principles, Curriculum Guidelines, Freedom of Chair.

1 INTRODUCTION

Education is a fundamental and constitutionally guaranteed right, and it is a subjective right. In the case of the Brazilian legal system, there have been several changes and evolutions until the current model proposed in 1988, indicating and guaranteeing space for free thought and the plurality of ideas and knowledge.

Essential for the development of the human person, education has certain parameters, established milestones, guidelines and curricular bases that point to the paths to be pursued by society and the State.

In the Brazilian case, since 1934, education has gained space in the constitutional text. Curriculum guidelines have undergone true evolutionary processes (not necessarily positive) throughout history. In the case of legal education, it jumps from a small class of privileged people to

an expansion in its access, invoking reflection on the quality of education in the country, highlighting here the aspects related to the teaching of Law.

In 1963, with the establishment of the Statute of the Brazilian Bar Association, through Law No. 4,215, the professional internship and the bar exam began to assume an important role in the search for a better quality in legal education.

Currently, there are about 1,400 legal courses in operation in Brazil. If, on the one hand, the country has democratized access to higher education, especially in an area of knowledge previously so preponderantly occupied by a social elite, the apparent excess of courses, vacancies and diffusion of these authorizations have called for reflection and demanded a series of reforms over the years, to a certain extent seeking to reposition the type of professional and even citizen who is delivered to society after the years in law school.

This article sought to present Education as a fundamental right, but, above all, to position the freedom of professorship as an instrument for the effectiveness of this right to education. The premise is that education that leads the individual to the exercise of citizenship and to the development of the human person invokes freedom in teaching and learning.

After presenting the normative aspects, principles, guidelines, curricular bases and general aspects of the teaching of Law in the country, this scenario is confronted with university autonomy and freedom of professorship. In this meeting, the general objective of this work is to reflect on how the freedom of professorship is demarcated by norms and guidelines, but at the same time enjoys such freedom that it provokes individuals to autonomy and emancipation.

2 EDUCATION AS A FUNDAMENTAL RIGHT IN THE BRAZILIAN LEGAL SYSTEM

In previous constitutions, Brazil treated Education in a somewhat more concise way, compared to the CRFB/88. The first Brazilian constitution dealt with only one article, providing that "Primary education is free to all citizens" (art. 179, § 32). In the Constitution of 1891, few substantial changes were made, stipulating the competence of the National Congress to legislate on higher education (art. 34, XXX), the provision of promotion in the country for "the development of letters, arts and sciences", the creation of institutions of higher and secondary education in the States (art. 35, 2nd and 3rd), and the establishment of secularism in education (art. 72, § 6) (Brazil, 1891).

The first Constitution to address the issue of education was the Magna Carta of 1934, which, like the Constitution of 1988, delegated to the Union the competence to outline the guidelines of national education. It also created the figure of the National Education Plan, fostered private education through the granting of incentives, defined percentages for linking revenues for investment in education, created compulsory primary education, among others (Vieira, 2007).

Regarding the main changes brought about by the 1937 Constitution, also known as the Estado Novo Constitution, Cury (2005, p. 23) summarizes:

> The Constitution of 1937 removed the attachment of taxes to the financing of education, restricted freedom of thought, placed the State as a subsidiary of the family and of the segment proven in the provision of school education. In public schools, the richest should assist the poorest with a *modest and monthly contribution to the school fund*. The relationship between education and dictatorship is paradigmatic here: threats of censorship, restrictions of various kinds, insistence on youth organizations under the guise *of physical training and moral discipline in the fields and workshops* (art. 132), imposition of patriotism and the allocation of professional education *to the less favored classes* (art. 129).

Enacted after the end of the dictatorship, the 1946 Constitution sought to bring the essence of the 1934 Charter. However, it brings some novelties, namely: the reference to official education and the return of religious education, but with optional enrollment (art. 168).

With regard to the 1967 Constitution, conceived during the dictatorial period, most of the guidelines brought by the 1946 Constitution were maintained, but it suppressed the allocation of public funds for education and made free primary education compulsory from 7 to 14 years of age (Cury, 2005, p. 24).

Currently, education is included in the list of Social Rights of the Constitution of the Brazilian Federative Republic[1], alongside rights such as health, housing and security. Social rights are characterized as second-generation (or dimensional) rights, which are rights that concern "positive, real or concrete freedoms" (Moraes, 2020, p. 105), which value the equality of individuals and, for this, conditions are required from the State for their effectiveness.

Education can be understood both from a broad and a narrow conception. In a broad sense, it can be conceptualized as all the acts that can be performed to promote the development of the human being. In this sense, the Law of Guidelines and Bases of National Education (LDB) (Law No. 9,394, of December 20, 1996) establishes in its article 1*, caput*, that "education encompasses the formative processes that take place 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).

Article 205 of the 1988 Constitution states that education is the right of all and the duty of the State and the family, emphasizing the collaboration of society, aiming at the full development of the person, preparation for citizenship and qualification for work (Brasil, 1988). Thus, education, when analyzed in its broadest sense, should be guided by the collaboration between the Government, family and society for the best development of the student.

[1] Art. 6 The following are social rights: education, health, work, housing, leisure, security, social security, the protection of maternity and childhood, assistance to the destitute, form of this Constitution.

In the strict sense, education "means instruction, specialization, skill or habit formation" (Vianna, 2007, p. 07), and can therefore be better classified as school teaching. Education, as a state duty, has been elevated to the status of a fundamental subjective right (article 208), so that it is the duty of the state to offer free compulsory education, which, according to item I of article 208 of the 1988 Constitution, is that from 4 (four) to 17 (seventeen) years of age. It is also ensured that it is made available free of charge to those who do not have access to education at the appropriate age.

From its characterization as a fundamental subjective right, the right arises for the individual to demand from the State the provision of education, under penalty of the "non-provision of compulsory education by the Government, or its irregular provision", importing the responsibility of the competent authority (art. 208) (Brasil, 1988).

In fact, the creation of means to combat the State's incompetence with regard to the realization of education as a universal right, as well as the lack of quality of education, is based on the achievement of the objectives set forth in article 214 of the Constitution. To achieve these objectives, the 1988 Constitution lists the guiding principles of education in article 206 (Brasil, 1988).

All federative entities are responsible for the achievement of the above-mentioned objectives, since the Brazilian Magna Carta established concurrent competence for the entities (Union, States and Municipalities) to legislate on education (art. 24), in order to better adapt the offer of education to their regional and budgetary peculiarities, etc. However, if the Union legislates on general norms, the effectiveness of laws enacted by other entities in what is contrary to the law is suspended national. (art. 24, §4) (Brasil, 1988).

The CRFB/88 provided for the enactment by the National Congress of a National Education Plan, which, under the terms of article 214, "caput", has a ten-year duration and aims to "articulate the national education system in a collaborative regime and define guidelines, objectives, goals and implementation strategies to ensure the maintenance and development of education at its various levels, stages and modalities" (Brasil, 1988). These actions should take place through the integrated action of the public authorities of the different federative spheres.

One wonders about the classification of the effectiveness of constitutional norms related to education. They definitely cannot be conceived as mere programmes. On the other hand, it is somewhat naïve to believe that the mere provision of these rights and guarantees in the constitutional text is sufficient for their implementation. In this regard, Pontes de Miranda (1987, p. 348, *apud* Vianna, 2007, p. 76-77), when commenting on the 1967 Constitution, makes the following criticism that remains valid today:

> The naivety or indifference to the content of the statements with which the constituent legislators launch the rule 'Education is everyone's right' reminds us of that Spanish Constitution in which it was decreed that all 'Spaniards would be', from that moment on, 'buenos'. Education can only be a right for all if there are enough schools and if no one is

> excluded from them, therefore if there is a subjective right to education and the State can and must provide the educational provision. Otherwise, it is to deceive with articles of Constitutions or laws. Solving the problem of education is not about making laws, which are still excellent ones; It's opening schools, having teachers and admitting students.

In any case, the CRFB/88 establishes in its article 211 that all entities will organize their education systems in a collaborative regime, with the States and the Federal District being responsible, as a priority, for elementary and secondary education, while the municipalities will also be responsible for elementary education and early childhood education (Brasil, 1988). The Federal Government has, in turn, the competence to organize the federal education system and, under the terms of article 55 of the LDB, to allocate resources to the maintenance and development of the higher education institutions it maintains (Brasil, 1996).

From the above, it is possible to perceive the concern of the 1988 Constituent Assembly in dealing analytically with social rights in its text, especially education. However, previous constitutions did not always have the same commitment to teaching.

Thus, it can be seen that the Magna Carta of 1988, in addition to welcoming in its text the main contributions brought by the other constitutions in favor of education, was the one that was most concerned with teaching, bringing an extensive list of rights, principles and establishing the binding of public revenues for the realization of this right.

3 LEGAL EDUCATION IN BRAZIL, REFORMS AND CURRICULAR GUIDELINES

Legal courses were created in Brazil through the Letter of Law of August 11, 1827, sanctioned by D. Pedro I, which designated the cities of São Paulo and Olinda as its headquarters.[2] Until then, the sons of the Brazilian aristocracy studied in Europe, mainly at the University of Coimbra (Tisott; De Oliveira, 2020). In 1892, the Faculty of Law of Minas Gerais was created and only in 1920 the first University, that of Rio de Janeiro (Silva, 2000).

In recent years, there has been much discussion about the growth in the number of law courses. In this regard, Silva (2000) explains:

> The indiscriminate proliferation of law schools in recent decades has been seen by many critics as a serious problem, arguing that, in many cases, they would be courses created without the slightest care for quality, which would be throwing a large number of unprepared professionals into the professional market.
> If we compare the statistics of the IBGE (1964) and the MEC (1974, 1976, 1985a, 1985b), as well as those of Pastore (1972) and Niskier (1996), we will see that the teaching of Law in Brazil, in the middle of the last century, had only two courses, in São Paulo and Recife, totaling 584 students in 1854.

[2] Article 1 - Two courses in legal and social sciences shall be created, one in the city of São Paulo, and another in Olinda, and in the space of five years, and in nine chairs, the following subjects:

The number of undergraduate law courses increased from 235 in 1995 to 1,203 in 2017, which, according to a study carried out by the OAB in partnership with FGV, represents the availability of more than 7 million vacancies in this period (OAB; FGV, 2020).

In 2013, the Ministry of Education suspended the accreditation of new courses and, at the end of 2014, after the issuance of Normative Ordinance No. 20/2014, imposed new, stricter rules for the accreditation of new undergraduate courses in Law. In addition, it made it a necessary condition for accreditation "to obtain a Preliminary Course Concept (CPC) equal to or greater than 4, with a minimum score of 3 in each item evaluated" (OAB; FGV, 2020, p. 104). However, in 2018 alone, 322 new undergraduate law courses were authorized, totaling 44,700 vacancies. In the first month of 2019 alone, the opening of 5 more courses was authorized, with 570 more vacancies (OAB, 2019).

According to the E-mec portal (MEC, 2020), there are 1,417 legal courses in operation in Brazil, which are territorially distributed as follows: São Paulo – 254 courses; Minas Gerais – 190 courses; Paraná – 101 courses; Bahia – 97 courses; Goiás – 75 courses; Rio Grande do Sul – 70 courses; Pernambuco – 69 courses; Ceará – 56 courses; Rio de Janeiro – 54 courses; Santa Catarina – 50 courses; Mato Grosso – 45 courses; Pará – 43 courses; Espírito Santo – 40 courses; Maranhão – 38 courses; Federal District – 34 courses; Piauí – 27 courses; Alagoas – 26 courses; Rondônia – 24 courses; Paraíba – 23 courses; Rio Grande do Norte – 20 courses; Mato Grosso do Sul – 19 courses; Tocantins – 16 courses; Amazonas – 15 courses; Sergipe – 15 courses; Acre – 6 courses; Amapá – 6 courses; Roraima – 4 courses.

In 2018, the Brazilian Bar Association, together with the Getúlio Vargas Foundation, carried out a quality check of law courses in Brazil, based on the performance in the National Student Performance Exam (ENADE/INEP) and the approval rate in the Bar Exam. Of the 1,212 courses eligible to participate in the research, only 161 received the "OAB recommends seal", "evidencing the deleterious effects of such indiscriminate openness" (OAB, 2018).

The National Education Plan (PNE), approved by Law No. 13,005/2014, which determines guidelines, goals and strategies for educational policy in the period from 2014 to 2024, established twenty goals for all levels of education. For higher education, goals 12, 13 and 14 stand out.

The curricular guidelines are of paramount importance, as they aim to contribute to the formation of critical professionals, that is, reflective and capable of using Law as an instrument of social transformation. Thus, in a nutshell, they aim to improve the quality of legal education in the country with the training of better professionals. A national curriculum guideline indicates the government's concern with quality education and always seeking to improve teaching, because the reflection of the bad professional working in the labor market, without the proper preparation that legal education should provide, ends up putting the citizen himself at risk.

Similar to Brazilians in Europe, who especially studied content related to rational natural law

and national legislation, aiming to meet the interests of the Kingdom of Portugal, the curriculum of the first law courses in Brazil, according to Bissoli Filho (2012), reveals the predominance of natural law, with the objective of training the elite that would come to assume the cadres of the state apparatus of the Empire.

The curriculum created by the law of 1827 was rigid, fixed the subjects to be taught over the years, and [3] the government maintained power and control over legal education (Tisott; De Oliveira, 2020). Gradually, the government adhered to the need for modernization and became more flexible until it reached the current model, undergoing numerous reforms.

Bissoli Filho (2012) clarifies that in the imperial period the first reform would have occurred in 1831, with the approval of the statutes of the Legal and Social Sciences courses of the Empire. In turn, the second reform would have occurred by Decree No. 1,386/1854, when it was established on classes, residences of lenses (professors) and inclusion of the disciplines of Roman and Administrative Law in the curriculum of the course. Finally, the third reform of legal education took place in 1879, by Decree No. 7,247, enabling the emergence of private colleges, freedom of attendance and the non-requirement of partial exams.

It is then in the republished period that the reforms in law courses were most voluminous. One of the factors for the change was due to the fact that after the Proclamation of the Republic, and throughout the so-called Old Republic, the important influence of legal positivism on the conception of Law was glimpsed (Bissoli Filho, 2012). In 1891, the fifth reform took place, through Decree No. 1,232-H, which enabled the decentralization of legal education in federal, state and private areas, with the expansion of legal courses in other locations.

In turn, in 1895, Law n.º 314 instituted the sixth reform of legal education, an opportunity in which a new curriculum was instituted with the introduction of the disciplines of Public International Law, Diplomacy and Military and Penitentiary Law. After the nineteenth century, in 1911 the seventh reform took place, by Decree No. 8,659, in which the Organic Law of Higher and Fundamental Education of the Republic was instituted, which had through Decree No.º 8.662 the regulation of law schools and a new curriculum for legal courses. (Bissoli Filho, 2012).

The eighth reform took place in 1915 (Decree no.º 11.530) and was responsible for imposing a new curricular reform on the Law course. In turn, the ninth reform of 1925 (Decree no.No. 16,782-A) now provides in article 57 that the course would be held in five (5) years and with seventeen (17) chairs, described in article 58 of the aforementioned Decree.

[3] 1st YEAR 1st Chair. Natural Law, Public Law, Analyze of the Constitution of the Empire, Law of people, and diplomacy. 2nd YEAR 1st Chair. Continuation of the material of the preceding year. Second Chair. Ecclesiastical public law. 3RD YEAR 1ST Chair. Civil national law. 2nd Chair. Right with the theory of criminal procedure. 4TH YEAR 1st Chair. Continuation of the right Homeland Civil. 2nd Chair. Commercial and maritime law. 5TH YEAR 1st Chair. Political economy . Second Chair. Theoria is the practice of the process adopted by the laws of the Empire.

In the Vargas Era, a reform took place: the tenth. Established by Decree No.º 19.851/1931, the reform tried to provide for the statute of Brazilian universities. During this period, the profile of the Bachelor of Law began to change. It is worth noting that Bissoli Filho (2012) points out that the swelling of higher legal education can already be seen at this moment. The reform of the Vargas Era lasted until 1961, when the Law of Guidelines and Bases of National Education was created in the period of the New Republic, originating from Law No.No. 4,024, of December 20, 1961, which resulted in a major milestone for national legal education.

Law No.º 4.024/1961 created the Federal Council of Education - CFE, which, in the words of Venâncio Filho, cited by Bissoli Filho (2012), had "the attribution of authorizing the operation of higher education schools that would enable bachelors to exercise technical-scientific professions". Added to this, due to the advent of this law, the eleventh reform of legal education was implemented in the following year, through Opinion No. 215 of the CFE, responsible for establishing the establishment of a minimum curriculum, as a necessary nucleus of subjects for cultural and professional training.

With the establishment of the Statute of the Brazilian Bar Association in 1963, through Law n.º 4.215, the professional internship and the bar exam began to assume an important role in the search for a better quality in legal education, which at the time was at a low standard and with a large number of courses (Bissoli Filho, 2012).

During the military regime, in 1968, the University and High School Reform was implemented, through Law No. 5,540, which culminated in the twelfth reform. In it, the expansion and privatization of law courses was visualized. Still under the military period, in 1972, the thirteenth reform was seen, through Resolution No.º 3 of the Federal Council of Education. Despite the changes, there was little change in qualitative terms in legal education, since the reforms focused on the professionalizing character of law courses, thus still maintaining a rigid curriculum (Bissoli Filho, 2012).

Traditionally, the curriculum was composed of dogmatic subjects, being a conservative and traditional education, since the academic ended up being restricted to the analysis of the validity of the norms. As a result, other issues such as corruption, impunity, human rights and the environment were not even discussed, and therefore it was not a question of training for citizenship (Silveira; Sanches, 2020).

In partnership with the Ministry of Education - MEC, the OAB held some seminars in Brazil in 1993, with the opportunity to participate in the academic and professional legal community. And it was from this process of reflection, research and evaluation that MEC Ordinance No. 1,886/1994 was issued, which established the new curricular guidelines and the minimum content for legal courses throughout Brazil, with mandatory status from 1996 onwards (Silveira; Sanches, 2020).

MEC Ordinance No. 1,886/1994, the fourteenth reform, contributed, in summary, to the

requirement of a minimum duration of 5 years for legal courses; made research and extension activities mandatory; established disciplines considered mandatory; provided for the bibliographic collection of each course; determined the obligation to defend an end-of-course monograph before the examining board and the Legal Practice Internship.

Despite the numerous modifications, "CES/CNE Opinion No. 507/1999 considered MEC Ordinance No.º 1.886/1994 as not received by the LDB of 1996" (Bissoli Filho, 2012, p. 31), causing the conditions that would lead to the fifteenth reform in 2004, which through CNE/CES Resolution No.9/2004, were guided by freedom, pluralism and quality in education (Bissoli Filho, 2012). The CNE/CES Resolution No. 9/2004 had an important impact, as it established the curricular guidelines of the undergraduate course in Law to be observed by the institutions in the pedagogical project.

More recently, Resolution No.No. 5, of December 17, 2018, being the newest to regulate the curriculum guidelines according to the website of the Ministry of Education. Thisresolution stems from CNE/CES Opinion No. 635/2018, approved on October 4, 2018 – Revision of the National Curriculum Guidelines for the undergraduate course in Law. Because of this, Resolution No.No. 5, of December 17, 2018 of the National Council of Education "Establishes the National Curriculum Guidelines for Undergraduate Law", applicable to both public and private educational institutions.

Thus, it is based on article 2 of this Resolution that educational institutions must set up the Pedagogical Project of the Course - PPC, indicating the requirements that must be observed. The Resolution also stipulated that the law course should guarantee the student a solid general, humanistic education, capacity for argumentation, interpretation and appreciation of legal and social phenomena, in addition to consensual forms of conflict settlement.

Other guidelines that indicate the change in the professional profile of the bachelor's degree are translated into the workload of undergraduate courses in 3,700 hours (art. 12), with 20% of the total workload for complementary activities and legal practice (art. 13), the concern with extension (art. 7) and also the initiation to research (art. 2, paragraph 3) (Brazil, 2018a).

Based on the joint reading with the principled and normative basis of the teaching of Law in Brazil, it is understood that curricular guidelines recently in force are in line and, above all, aim to meet the true reform of legal courses that have been widely attacked throughout their history, mainly due to the outdated strictly technical and bureaucratic training.

In view of the above, as can be seen, during the imperial period the creation of law courses had as its objective the training of professionals who could fill the state bureaucratic apparatus and sustain the model then in force. In the Republic, on the other hand, the expansion, decentralization and privatization of law courses was envisioned, causing the swelling of law courses and their low quality, causing the necessary discussion aimed at the improvements to be implemented by the courses.

Taking into account the curricular guidelines, it can be seen that only in the most recent reforms of 1994, 2004 and especially that of 2018, was there a greater concern with the quality of the training of bachelors, because a more critical and less technical training was sought, which helps a percussive analysis to the law operator when dealing with the complexity that his activity demands.

4 UNIVERSITY AUTONOMY AND FREEDOM OF PROFESSORSHIP

In fact, the Constitution explicitly enshrined education as a fundamental right. This is not a mere program, but the duty of everyone, including the State. Throughout our history, education in Brazil has undergone numerous changes in the norms that regulated it.

Paying attention to legal education in Brazil, it is possible to apprehend an initial moment of elitism in access, and a series of reforms and changes that followed, with the most varied purposes, but it is possible to infer that the most recent ones certainly indicate the attempt to seek an improvement in the quality of legal education in the country.

In the midst of so many reforms, alterations and historical moments, as was the case of the military dictatorship regime, this article intends to highlight the importance of the freedom of professorship. There are countless points that have been the object of reforms, in the most diverse historical moments. However, the freedom of professorship is, in fact, a true instrument for the effectiveness and realization of the fundamental right to education. An education that should not only be proposed for formal and professional aspects, but for the development of the human person and the exercise of citizenship.

Article 207 of the CRFB/88 establishes that "Universities shall enjoy didactic-scientific, administrative, and financial and patrimonial management autonomy, and shall obey the principle of inseparability between teaching, research, and extension." Generally speaking, autonomy is understood as the ability to be governed by its own laws. The autonomy of institutions, however, is not absolute, and is bound and legitimized by their specific social functions. This autonomy, therefore, is restricted to the purpose and purpose for which they were constituted, and in this case it is the functions of the University that underlie and define the nature of this constitutional autonomy (Durham, 2005).

Cunha (2005) argues that this almost millennial institution has undergone a series of reformulations and has served different purposes, depending on the time and country in which it is inserted. It is emphasized, however, that there is a common core of university institutions, an aspect present at all times and in all places, namely, the struggle for the diffusion and development of knowledge, without external constraints, in a true struggle for autonomy. The University becomes a normative institution, itself producing rights and obligations (Mancebo, 1998).

The Constitution established a specific regime for Universities. The university autonomy enshrined in the constitutional text is an instrument that aims and finds its limits in meeting the

purposes of these Higher Education Institutions, as well as in the observance of probity in the management of public resources (Schwartzman, 1988). Effective university autonomy invokes that universities should not be confused with other federal administration bodies, so that control over universities cannot mean or imply formalistic controls, routinely and bureaucratically exercised over the public administration of the state (Schwartzman, 1988).

The CRFB/88 sculpted in its text the autonomy of the Universities, in the classification of José Afonso da Silva (1998) as a constitutional norm of full effectiveness and immediate applicability. It should be noted, however, that this self-applicable constitutional prerogative has been exercised in a very limited way (Mancebo, 1998).

What is important to note is that the constitutional design of the Universities was conceived to give them a certain degree of self-management and definition of their programs and actions according to their purposes, which basically links them to teaching, research and extension, and to the activities inherent to the achievement of these deliveries. It is not yet possible to conceive of the possibility of controlling the ideas that circulate and rage within the University, a place of construction and deconstruction of knowledge and dogmas.

If it is true that education is a basic social right, enshrined in article 6 of the CRFB/88, and is also supported by the Universal Declaration of Human Rights of 1948, which states in article 26 that "Every human being has the right to education", it is also true that it is a true duty of the State, as established in article 208 of the Constitution.

In this context, the freedom of professorship is inserted, which enjoys comprehensiveness when inserted in an environment whose didactic-scientific autonomy was guaranteed in the constitutional text. Freedom of professorship understood as a set of rights, sheltered under the mantle of theoretical reflection, critical knowledge and freedom of expression in academia.

Article 5 of the Constitution ensures that "the expression of intellectual, artistic, scientific and communication activity is free, regardless of censorship or license". Article 206 of the same constitutional text stipulates that education shall be provided based on certain principles, such as the freedom to learn, teach, research and disseminate thought, art and knowledge, as well as the pluralism of ideas and pedagogical conceptions.

The Constitution of 1934 established in article 155 that "Freedom of professorship is guaranteed". The 1946 Constitution, in article 168, VII, replicated the provision. Even in 1967 there was in the constitutional text. In 1969 the expression ceased to be provided for in the constitutional text. There was no express provision in the 1988 Constitution, although several passages point to this guarantee.

Freedom of professorship is not only freedom to teach, but above all freedom to learn. The freedom to teach makes it possible for them to freely construct their pedagogical projects once the

general norms of education and the curricular guidelines have been met. The freedom to teach is both an institutional freedom and a teaching freedom, and in both cases it is limited by a set of other constitutional principles and guarantees and by the structure of the educational system (Rodrigues; Marocco, 2014).

These freedoms aim to ensure the pluralism of ideas and pedagogical approaches and the expression of academic points of view. They differentiate between freedom of teaching and freedom of opinion. The freedom to teach has its own contours and serves as an instrument for the right to education (Rodrigues; Marocco, 2014). According to Rodrigues and Oliveira (2019), freedom of professorship is the most traditional denomination given to academic freedom as teaching freedom, especially in teaching activities.

Sarlet and Travincas (2016) point out that the University is the space to nurture the debate, and it is necessary to regulate the relationships established there, since the market of ideas that it promotes is free in terms *of and not* in the absence *of* norms. And they conclude:

> On this point, the conclusion that we venture to enunciate here (knowing that this is a statement to be tested in the adversarial sphere) is that it is the condition of a teacher, and not his or her place of expression, that constitutes the determining factor for the coupling of conduct to the scope protected by the right to academic freedom. conceived as a whole. That being the case, the occurrence of the conduct at the factual level will require, at first sight, the concomitant protection of extramural freedom of expression (and, therefore, of academic freedom) and freedom of expression, given the competitive relationship established between the rights. It so happens that such competition is merely apparent, since it must be resolved in favor of the law with greater specialty, which is extramural freedom of expression (Sarlet; Travincas, 2016, p. 534).

Based on the freedom of the professorship, that is, the absence of ties *to logos* and free thought, it becomes possible to have space for consensus and opposition, inclusion of differences, tolerance of non-standard ideas and consequent exercise of citizenship.

By the way, the meaning and purpose of education as such a fundamental right lies in the search for qualification for work, in the preparation for the exercise of citizenship and in the full development of the person, in the exact terms of article 205 of the CRFB/88. It is, therefore, with the maximization of the freedom of professorship that we have an important instrument for the effectiveness and meaning of the fundamental right to education, in the plurality of ideas and thoughts, beyond the curricular guidelines and the walls of previously established standards, towards the very notion of dignity and full development of the human person.

5 FINAL THOUGHTS

It is unequivocal that education is essential for the development of human beings, so much so that the 1988 Constitution – also known as the Citizen Constitution due to its extensive list of fundamental rights and guarantees – dedicated, within the Title "On the Social Order", a Section to

deal exclusively with the right to education, being more precisely encompassed in articles 205 to 214 (Brasil, 1988).

The 1988 Constitution prominently enshrined aspects related to education. He wrote it as a true duty of the State. He indicated that it is the path to professional training, to the exercise of citizenship and to the development of the human person. Education here was also presented as a subjective right of the individual, hence the right to demand from the State the provision of education, under penalty of importing responsibility from the competent authority.

The curricular bases, guidelines and general norms surround a non-unrestricted or absolute freedom. The freedom to teach, and to a lesser extent the freedom to learn, is limited by the established parameters. It is certainly not to be confused with the limitation to ideas or thought. But, it should be noted, education enjoys a series of precepts that insert it into an activity worthy of planning and establishing directions to be pursued.

In the case of higher education in Law, the present work presented a historical evolution, highlighting the main reforms and changes. In this context, the constitutionally guaranteed university autonomy enables an environment of plurality of ideas, freedom of thought, freedom to teach and to learn. In this scenario, the control of the said, the control of the logos, of the idea that confronts, constructs or destroys preconceptions, becomes inconceivable.

Over the years, the country has had parameters and guidelines that sometimes indicated a more dogmatic teaching, and sometimes, as it was after a diagnosis headed by the OAB, for a teaching lacking critical knowledge and related to interdisciplinarity and human rights.

In this context, with several reforms and norms, the reflection that is launched here is that the teleological role of these normative frameworks. The hypothesis for this question presented is indicated in the constitutional text itself. Education is the right of all and the duty of the State and the family, and it must 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.

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