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DIGITAL CHILDHOOD: NAVIGATING THE EDUCATIONAL IMPACTS OF SCREENS

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ABSTRACT

This paper presents the development of a research project linked to the Stricto Sensu Program in Educational Sciences at the International Institute of Education and Research (IIEP) and the University for the Integration of the Americas (UNIDA), Ciudad del Este, Paraguay. The project's guiding theme is the investigation of the impacts of digital childhood that reverberate in the school environment. Children in early childhood education, from zero to five years old, tend to interact early and excessively with digital screens during a crucial phase of biological, neural, psychosocial, cognitive, motor, affective, and linguistic development. Educators express concerns about the consequences of this early technological exposure, particularly given that most children are shifting from playing to screens. The research project's literature review indicates that early and extensive screen time in early childhood education causes sleep and eating disorders, a sedentary lifestyle, obesity, difficulty concentrating and socializing, among other harmful effects. Conversely, technology, when combined, supervised, and planned in the classroom, provides and improves sensory activities, autonomy, and decision-making. Research like this helps avoid a one-sided and reductionist view, warning of future harm to child development, and providing guidance to the entire school community, redefining education.

Keywords: Early Childhood Education and Screen. Digital Childhood. Impacts of Screens.

INTRODUCTION

The age range for Early Childhood Education, established by the National Education Guidelines and Bases Law No. 9394 (Brazil, 1996), ranges from zero to five years old. In contemporary times, Early Childhood Education is comprised of a unique generation, born in an era of accelerated technological evolution amid an abundance of stimuli, and will grow up immersed in this constantly changing context. The internet, the digital universe, and artificial intelligence have become permanent parts of daily life, providing convenience and advancements in various areas. However, schools, as a significant representation of society, end up absorbing both the positive and negative impacts of this globalized scenario.

The educational community in general expresses concerns about notable changes in children's behavior, potentially related to excessive exposure or inappropriate use of digital screens, especially after the COVID-19 pandemic (SBP, 2019). Given this, relevant questions arise, such as: What are the implications of early, routine, and/or inappropriate use of digital screens on the neuropsychomotor, psychoemotional, and socioaffective development of children in early childhood education, and how do these impacts affect the school environment? Does this reality require pedagogical reformulation of school curricula to effectively address the challenges presented by the digital age?

Given the above, the research project developed hypotheses about the impacts of early, excessive, and/or inappropriate exposure to digital screens on the development of early childhood education children, in order to inform the master's dissertation. Once the results are collected, some guidelines can be adopted at the end of the research, as a preventative measure against potential negative impacts in the future and to broaden the critical perspective of educators, families, and the entire educational community.

METHODOLOGY

This study used a basic, qualitative and descriptive approach. The theoretical framework of the research project was based on a bibliographic survey through contributions from books, periodicals, articles, websites, Master's dissertations and Doctoral theses, national and international, in the following scientific databases: Capes, Scielo, Google Scholar, Google Academic, National Digital Library, Mojo e-books, Academia.edu and Redalyc.

The established time frame was ten years, although many authors with older works will be used due to the importance of the theoretical legacy, as well as the interdisciplinary and transdisciplinary content, in order to avoid a simplistic and limited view of Education.

The dissertation will conduct a cross-sectional field study in the municipality of Mauá, São Paulo, Brazil, through questionnaires administered to teachers who teach in public municipal early childhood education schools. The location chosen was based on the researcher's work in the aforementioned municipality. The questionnaire will consist of open-ended and closed-ended questions, such as: 1. The age group with which the teacher works; 2. The number of students in the group; 3. What technological resources are used in class and how often; 4. Indicate whether any positive or negative impacts or consequences are observed in the classroom due to the use of digital screens by students, and describe them; 5. Indicate whether there is a need for pedagogical reformulation resulting from the degree program with children in the digital age. If so, describe the possibilities.

The methodology used to analyze and discuss the results of the research project was based on Laurence Bardin's (2011) theoretical framework, “Content Analysis”.

PRESENTATION AND ANALYSIS OF RESULTS

Meaning of “screen” in the context of research

In the not-so-distant past, the word "screen" was limited to television. Screens have moved to pocket-sized mobile devices—cell phones, tablets, and smartphones —bringing convenience and serving diverse social strata and age groups. Although such advances have not yet been achieved in some Brazilian and global locations (Nobre et al., 2021). Given the above, it is necessary to direct and clarify the research on which "screen" is meant.

According to Fernandes, Eisenstein and Silva (2018), children have access to electronic devices at an increasingly younger age, not only at home but in different places, and are also born with the motor skills to handle touch screens. In other words, a routine situation is to see an adult handing their cell phone to a child, so that the child can be distracted and remain quiet , naming this situation as “passive distraction”.

Some Designations for the 21st Century Generation

There is no absolute consensus regarding the birth dates for each generation of the 21st century. Different sources may present varying dates, resulting in various divisions. The following dates were used from the Pew Research Center and excerpted from the ebook "Generations and Their Ways of Learning" (DOT Digital Group , 2023).

- 1946-1964 – Baby Boomers;
- 1965-1980 – Generation X;
- 1981-1996 – Generation Y (Millennials);
- 1997-2010 - Generation Z (Centennials);
- From 2010 – Alpha.

The Leading Digital Corporate Company in Education, DOT Digital Group (2023), indicates that if the terminologies of the Greek alphabet continue, after the middle of the 21st century the generations will be named Beta, Gamma, Delta and so on.

The socioeconomic and historical moment influences people's behavior, therefore, the terminology does not matter, but rather the understanding of the differences in how each generation relates to, understands and consumes technology (DOT Digital Group , 2023).

Neuroeducation and Transversality

The Brazilian Society of Pediatrics (SBP, 2019-2021) states that the first thousand days of a child's life are the most important for brain development. Therefore, it is imperative to include neuroscience in the discussion about the impacts of early and/or excessive screen time. Neuroscientist Lent (2019) points out that in the first three years of life, brain architecture undergoes several structural changes through genetically inherited factors and external stimuli, which become stronger the more frequent they are.

As Cosenza and Guerra (2011), cited in Crespi, Noro, and Nóbili (2020), point out, the human brain weighs twice its birth weight at the end of the first year of life. This is due to brain plasticity, which creates new connections or synapses. Although this occurs throughout life, the crucial phase occurs in early childhood, from zero to six years of age. Therefore, it is extremely important to study the impacts of early and/or excessive use of digital screens on a child's brain.

> It is observed that brain maturation in Early Childhood implies not only the creation of new connections between neurons through synapses, the acquisition and improvement of skills and the expression of distinct behaviors, but also the growth of brain mass, since, as Cosenza and Guerra (2011) explain, around birth, the human brain weighs around 400g and by the end of the first year of life, it will have doubled its mass, weighing around 800g. (Crespi, Noro and Nóbili, 2020, p. 13)

Andrade (2022) alludes to the idea that Neuroeducation arises from the interrelationship between Neuroscience,

Psychology, and Education, theorizing that children born in the 21st century treat their parents and educators as digital disciples. Neuroscientist Desmurget (2021) refutes this by arguing that the new generation may be experts in technology, but only for recreational purposes. His research found that, for the first time in history, the 21st-century generation is being born with lower IQs (Intelligence Quotients) than their parents. This contradicts his previous research, which indicated that this quotient tended to increase from generation to generation. The aforementioned author's scientific study analyzed three variables: the amount of time children used digital screens, their early use of them, and the quality of the content.

There are convergent and divergent notes among various authors regarding the excessive, early and/or inappropriate use of digital screens in Early Childhood Education.

Some authors who defend the use of digital screens in Early Childhood Education

Certain authors provide positive points regarding the use of screens, media and technologies in Early Childhood Education, even at an early age:

Jerusalinsky (2018) states that the sooner a child has access to technology, the sooner they will have ease and technological appropriation.

Sousa (2016) advocates that schools cannot fall behind the technological instruments offered by society and must evolve alongside technology.

Izilda, et. al . (2023), presents a paradigm shift, in which the teacher-student relationship was previously vertical and the student was only a listener. Through technology, the child becomes active in the process.

Estevam (2023) shows that working with artificial intelligence in Early Childhood Education stimulates protagonism, awakens motivation for discovery, making the child actively involved in the content through "gamification", elucidating that the child is born with the ability to work with smart technology , as they are part of an independent generation.

The Brazilian Society of Pediatrics (SBP, 2019) launched the Guidance Manual: Scientific Departments of Developmental and Behavioral Pediatrics and School Health: "Healthy use of screens, technologies and media in daycare centers, nurseries and schools", defining the healthy use of technological resources in the children's school environment.

Ferreira and Izequiel (Portal COLAB, 2021), defend the use of technology for children with Autism Spectrum Disorder (ASD) and Attention Deficit Hyperactivity Disorder (ADHD), proving it to be a strong tool for the development of this target audience.

Some authors who oppose the use of digital screens in Early Childhood Education

Many authors cite negative consequences regarding the early, excessive and/or inappropriate use of digital screens in Early Childhood Education, as we will see below:

Bozza (2016) proves that digital screens project a blue wavelength range that is harmful to human vision. This range, according to Kahn, et al., apud Sousa and Carvalho (2023), inhibits the production of melatonin, a hormone essential for sleep quality.

Young children cannot distinguish what they see on screens from reality. There is no associative cognitive perception for such action (Parky, 2017).

From the perspective of Mélo and Fink (2017), studies show that fine motor skills and psychomotor skills can suffer atrophying influences due to excessive use of screens in childhood.

Cardiovascular problems, reduced life expectancy, aggressiveness, depression, irritation, anxiety, language impairment, difficulty concentrating and remembering are consequences arising from the inappropriate use

of screens, highlighted by Desmurget (2021).

The Brazilian Society of Pediatrics (2019-2021) reports that children's media fills "voids," such as idleness, busy parents who don't play, who are often more attentive to their phones than to their children, lack of affection, and lack of entertainment. There is evidence of consequences generated by a lack of adult supervision regarding excessive screen use, leading to access to inappropriate content on the internet, abuse of privacy, and delayed schooling and child development (SBP, 2019-2021).

The PEBMED Portal and Polakiewicz (2022) address that excessive and/or inappropriate use of screens leads to hearing problems and/or decreased hearing capacity due to the use of headphones at high sound frequencies, postural disorders, risks of exposure to sexuality, nudity, extortion, abuse, computer vision syndrome, weight gain or loss.

Schamache, et al., (2021), recommends that the longer the time of exposure to screens, the shorter the time of exposure of children outdoors, thus, they lose contact with nature, consequently generating myopia due to lack of exposure to the sun, or visual syndrome.

Bozza (2016) describes cognitive delay, socio-emotional decline and attention deficit as arising from the negative impacts of the digital age.

Padmapriya, et al., (2021), point out that due to the post-pandemic confinement resulting from Covid-19, a sedentary lifestyle prevailed in children and consequently obesity.

A very serious and important contribution, mentioned by the authors Santos and Barros (2017), concerns addiction and/or dependence on electronic devices, since childhood.

Paiva and Costa (2015) point out that because screens are easily accessible, it is increasingly difficult for families to set limits on children, creating impatient human beings with increasingly early anxiety attacks.

The digital age has brought about a reduction in social ties and created the "digital other," making feelings of love and being loved impossible. The screen has led to the absence of real people and a lack of human interaction (Estigarribia, 2018; Fernandes, Eisenstein, and Silva, 2018).

With the increasing use of screens on an increasing scale, authors in consensus point out several negative consequences: delay in brain and motor development, lack of emotional control, lack of concentration, worsening of the prognosis of Attention Deficit Hyperactivity Disorder (ADHD), lack of memorization, psychiatric problems, speech and language delay (Fernandes, Eisenstein and Silva, 2018; Crespi, Noro and Nóbile, 2020).

In Carr's (2011) view, cited in Teixeira (2014), the attention demanded by the internet and computers further stresses cognitive abilities, reducing learning, comprehension, and the range of concentration, because each click opens up a range of possibilities for distraction. For every question posed, there is an answer on the internet; in other words, the screen is stealing human memory and intelligence.

Fernandes, Eisenstein, and Silva (2018) argue that family lunches, leisure time, toys, and traditional games have become scarce due to tablets and cell phones. Children easily trade imaginative, outdoor play, and interaction with other children for screens.

The incorrect use of technology can transform children into passive beings: mere spectators or characters dependent on the control of a game, that is, on artificial intelligence (Rinaldini, et al., 2012, apud Boeira, Carmo and Fachin, 2022).

Câmara, et al., 2020, highlight that excessive screen time during childhood can lead to harm in adolescence and adulthood, such as drug and alcohol addiction, family isolation, hyperactivity, self-harm, suicide, and lack of focus.

Recommendations from the main National and International Government Agencies and Organizations for Health

and Education

Determining the amount of screen time that children should use, as well as whether or not to allow early use, is a topic that concerns school educators. Therefore, it is important to stay up to date with the recommendations of experts from the main National and International Governmental Health Organizations and Bodies, such as: World Health Organization (WHO), Brazilian Society of Pediatrics (SBP), American Academy of Pediatrics (AAP), Canadian Pediatric Society (CPS) and UNESCO.

The World Health Organization (WHO, 2019) published a guide that cites several studies worldwide, providing indications on the use of screens for children up to five years of age, stating that up to one year of age, screens are not recommended and after two years of age, the recommendation is one hour of screen time per day.

The Brazilian Society of Pediatrics (2019-2021) released a Guidance Manual on Screen Use in Childhood, suggesting that babies under two years old should not have access to screens. Children between two and five years old can use them for one hour a day under supervision. The Brazilian Society of Psychology endorses the proposal, imposing limits and balance on screen use, which should be enforced by parents.

Comparing Brazil to other countries, the Canadian Pediatric Society (CPS, 2017) follows the World Health Organization's (WHO, 2019) recommendations regarding the time and age for screen time. According to Dubicka (2019), many countries have not established age limits for technology use, such as the United Kingdom, claiming that it does not have sufficient studies to define such a limit.

As Arantes and Morais (2021) recommend, the American Academy of Pediatrics (AAP) recommends that children under two years of age should not use screens. After two years of age, one hour of screen time per day may be recommended.

In the field of Education, the National Common Curricular Base/Ministry of Education and Culture (Brazil, 2017), which serves as a mandatory guideline for school curricula throughout Brazil, both in public and private institutions, establishes the use of technology by children in Early Childhood Education as a learning right, without mentioning the word “screen”.

Mathias and Gonçalves (2017), historically trace in a timeline, all the changes in conceptions of “child/childhood”, warning that with the advent of the digital era and technological appropriation, society is facing a new conception, in which the child abandons an entire universe of children's games and today has access to the same knowledge as adults, which is dubious, and may represent progress or risk, depending on the approach.

Melo (2023) corroborates this, mentioning that consumerism, advertising, commerce, and social media surround children with shiny electronic products and television characters, encouraging purchases so that each child has their own device. As a result, this leads to more screen time. This suggests a new concept of "childhood."

The COVID-19 pandemic and other variations have exposed contradictions that have long permeated Brazilian schools and other countries regarding the technological gap (Boeira, Carmo, and Fachin, 2022). Changes that had previously been slowly taking place and discussed with school closures were urgently imposed for implementation. Due to the rapidity of technological advances, the difficulty teachers have in keeping up with them is notorious. Dantas et al. (2020) argue that teachers do not receive training on how to work with new technologies with children, and when they do receive it, it is fragmented, resulting in a lack of didactics and a disconnect from reality, revealing the need for a renewed pedagogy. Training teachers with technological skills is different from applying them to the construction of educational processes .

The Global Education Monitoring Report by the United Nations Educational, Scientific and

Cultural Organization (UNESCO, 2023), entitled "Technology in Education: A Tool at Whose Service?", contains a series of observations regarding the gap between educational technology theory and practice, presenting both positive and negative aspects. The document discusses the following questions:

> Does technology democratize knowledge or threaten democracy by allowing a select few to control information? Does it offer limitless opportunities or lead to a future of no return dependent on technology? Does it promote equality or exacerbate inequality? Should it be used in the education of young children or does it pose a risk to their development? (UNESCO, 2023, p. 35).

The aforementioned Report "recommends that technology be introduced into education based on evidence demonstrating that it would be appropriate, equitable, scalable and sustainable" (UNESCO, 2023, p. 35).

State of the Art

To conclude this article, it is of paramount importance to present three key premises regarding the state of the art, which, undoubtedly, may appear as elements not previously assimilated by a considerable portion of readers.

1. International Classification of Diseases - ICD-11 Gaming Disorder (6C51)

The World Health Organization (WHO) updated the 11th edition of the International Statistical Classification of Diseases and Related Health Problems, ICD-11 , in 2018. It was adopted at the World Health Assembly in 2019 and came into force in 2022. Gaming disorder (6C51) is included. It consists of a behavioral pattern of dependence on digital electronic games or video games, which are very common in schools (OPA, 2022).

> Gaming disorder, predominantly online Gaming disorder, predominantly online is characterized by a pattern of persistent or recurrent gaming behavior ('digital games' or 'video games') that is conducted primarily through the internet and is manifested by: 1) impaired control over gaming (e.g., onset, frequency, intensity, duration, termination, context); 2) increasing priority given to gaming, to the extent that gaming takes precedence over other life interests and daily activities; and 3) the continuation or escalation of gaming despite the occurrence of negative consequences. The pattern of behavior is of sufficient severity to result in significant impairment in personal, family, educational, occupational, or other important social areas of functioning. The pattern of gaming behavior may be continuous or episodic and recurrent (ICID11, 2018, p. 167).

2. Nomofobia

The word "nomophobia" wasn't coined by a single person. It's a neologism formed by combining " no mobile" (without a cell phone) and "phobia" (phobia/fear). The term began gaining popularity in the mid-2000s to describe the fear, panic, outburst, or anxiety associated with the inability to use a cell phone. This condition is now very common in children, young people, and adults, causing pathological dependence (Spear, Egídio, and Cardoso, 2014).

3. Brazil ranks 3rd in the world in childhood screen addiction

The Brazilian Internet Steering Committee (CGI) and several media outlets released research by the British contact lens company Lenstore Hub (2021) on childhood screen addiction in 2021 and subsequent years, considering five metrics. Brazil ranked third in the world, behind only children in the United Arab Emirates and the United States. According to other research by the same company along the same lines, 94% of Brazilians spend more than 10 hours a day browsing the internet, ranking second in the world and third among the countries that use social media the most (Lenstore Hub, 2021).

These are alarming figures, but the following question remains: how can we correct children if the example should come from adults?

The Federal Government launched a public consultation on the "conscious use of screens and digital devices by children and

adolescents", on the "Participa+Brasil" Platform, from October 2023 to January 2024, with the objective of producing a guide with guiding guidelines through contributions from civil society, parents, mothers and/or guardians, educators and family members; which demonstrates the importance and contemporaneity of the theme proposed in this research (Brasil, 2023).

CONCLUSION

In urban environments where technology is prevalent, educating children without the use of electronic devices is nearly impossible. The research's goal isn't to take smartphones and tablets out of children's hands, but rather to foster a healthier relationship between childhood and technology in the school environment.

The use of digital screens in early childhood education has both positive and negative impacts on schools. The benefits that technology brings to humanity and any educational system are undeniable. However, early, excessive, and inappropriate use can have adverse consequences for neuropsychomotor, psychoemotional, and socioaffective development, requiring caution, monitoring of use, time, and content accessed, and often requiring adjustments.

Another facet that technology brings to the school environment is the technical competence that educators need to appropriate digital resources for teaching, which goes far beyond simply mastering the equipment. Educator training in the 21st century must be holistic, addressing not only technical knowledge related to the content but also developing socio-emotional skills, digital competencies, and the ability to adapt to a constantly changing educational environment, connected in a web of learning.

Research of this nature provides the ability to prevent a univocal and simplistic perspective, anticipating potential harm to child development, while fostering guidelines for the entire school community, effecting a profound redefinition in the educational sphere.

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CURRICULUM VITAE AND THE GAP FOR TEACHER TRAINING IN HIGHER EDUCATION

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ABSTRACT

This article aims to analyze didactics in higher education and the pedagogical approaches presented in the curriculum. It explores the contribution of critical pedagogy to reflecting on the nuances of liberating teaching in a capitalist society. It also explores the importance of supervised teaching and learning as a stimulus for excellent learning. The research was developed through a bibliographic analysis of contemporary authors who discuss Didactics Applied to Higher Education.

Keywords: Curriculum. Didactics. Critical Pedagogy. Supervised Internship. Initial Training.

INTRODUCTION

The objective of this study is to analyze the teaching of didactics in higher education and the preparation of student-teachers to face the challenges of the teaching profession. It aims to understand how the teaching and learning process develops in higher education and the approaches developed by professors to meet the needs of students in the 21st-century knowledge society. It also aims to understand the changing profile of students who are dissatisfied with traditionalist didactics that merely transfer knowledge and do not accept questions. How can we transform the pedagogical curriculum to serve the social actors of this highly questioning knowledge society? The contribution of critical pedagogy, which encourages and supports critical and engaging teaching, provides a teaching-learning process that breaks with the coloniality that persists today.

DEVELOPMENT

Supervised internship and its contribution to initial and continuing education

The initial teacher training process for undergraduate programs addresses numerous issues, ranging from the curriculum to interactions with professors and classmates. Twenty-first-century society is very different from that of the 20th century. Behavioral changes mediated by technology and social media have shaped and are shaping the desire to seek and transmit knowledge. In-person social interactions are being redefined due to COVID-19, which has forced society to confront the importance of in-person interaction over virtual ones. The undergraduate program includes pedagogical practice that aims to strengthen theoretical teaching and learning.

> The reconfiguration of challenges related to teacher training drives new research on initial teacher training processes, which implies investigations focused on the development of training actions, exchanges and collective production of knowledge, practical experiences and reflections arising from lived experiences, that is, the processes experienced within the scope of training. (Macêdo and Romanowski, 2025, p. 2)

The importance of training courses also lies in providing practice in teaching, where theory and practice will be reinterpreted through the reading of the world during teaching.

> Indeed, initial teacher training processes play a fundamental role in providing differentiated ways of developing theoretical and practical knowledge, as this inseparability between theory and practice allows the student-teacher to be a participating subject in the professional learning process itself, understanding that training is effective in the professional's interaction with the reality and context of the educational field, a privileged locus for understanding and constructing teaching knowledge and skills. (Macêdo and Romanowski, 2025, p. 4)

Teaching at universities favors initial teacher training which, combined with practice, develops a critical sense for reflective action by providing the means to confront social inequalities resulting from the process of coloniality that still permeate actions in society.

> We understand that the relationship between universities and schools needs to be developed as a two-way street, that is, contributions are evidenced in exchanges, because, at the same time that learning materializes in facing problem situations, specific to the school context, enriching the training of the undergraduate, reflective moments are produced that involve school professionals, raised by the critical understanding of the causes and possible solutions to the issues present in pedagogical practice in which the clash with theory is fundamental. (Macêdo and Romanowski, 2025, p. 8)

To become a teacher, it is necessary to have the desire to be one and understand the importance of this profession that contributes to the development and improvement of another human being, be it a child, adolescent, young person or adult. Studying to become a teacher is an exercise in duality. There are times when the exercise will be individual and at others it will be permeated by partnerships. In this sense, the supervised internship is of utmost importance as it provides guidance during professional practice.

> Supervised internships, understood as practical work within undergraduate programs, with a

> workload, time, and space defined by law, express the mandatory practical experience in teacher training. This category of practice encompasses studies that reflect on the interrelationship between universities and schools, in the practice of learning to be a teacher, mediated by initial training and teaching practice. This provides the student-teacher with challenging experiences, through the unity of theory and practice and the opportunities to better understand the role of the teacher as an agent of change in the social context. (Macêdo and Romanowski, 2025, p. 10)

The need for student-teachers to enter the job market in response to the increasingly scarce workforce in the educational field means that universities prioritize specific knowledge, delegating less attention to teaching disciplines.

> Regarding the relationship between universities and schools, studies highlight criticisms of the development of this activity, such as the distance between these institutions, the emphasis on specific disciplines in the area to the detriment of pedagogical disciplines, the dichotomy between theory and practice, the lack of clear guidelines for the development of the internship, the decontextualization of professional training with the world of work, among others. (Macêdo and Romanowski, 2025, p. 10, 11)

We can understand that teacher training is significantly weakened when supervised internship is not conducted assertively.

> Thus, the internship becomes a tool for training institutions in the development of practices aimed at training future teaching professionals, so that the undergraduate student learns to be a teacher in the exercise of teaching practice, through teaching experiences that contribute to the construction of professional identity from initial training. (Macêdo and Romanowski, 2025, p. 11)

The importance of supervised internships for students lies in the proportion of their transformation, in their openness to new things, and in creating new possibilities for understanding the world that contribute to the process of decoloniality through teaching activities and theoretical teaching.

> In the process of becoming a teacher, the student-intern also develops autonomy, creativity, integration, participation, respect for others, and sensitivity to social and political issues, dimensions that involve their profession and human emancipation. (Macêdo and Romanowski, 2025, p. 12)

The internship in professional training provides the outline and autonomy for pedagogical practice, which is contemplated with interaction with more experienced colleagues, contributing to the otherness of the social subjects involved.

> Practice, when constituted as a teacher training process, can be considered a founding component of initial training, in which the knowledge and skills that support professional development and teaching identity are also developed and generated through practice. (Macêdo and Romanowski, 2025, p. 14)

Didactics in higher education or a gap in the subject offering?

The demands of contemporary times, combined with the demands of capitalism for high professional and technological performance in society, have contributed to the surge in demand for higher education programs. Consequently, the offering of courses at higher education institutions has increased the demand for university professors. To teach at these institutions, faculty are accepted with either a stricto sensu or lato sensu degree . The lato sensu curriculum does not always include the subject of didactics, which ultimately results in learning gaps in teacher training. This gap in academic training does not refer to knowledge itself, but rather to the way in which faculty convey the accumulated knowledge specific to their field.

> Add to the discussion the dynamics of modern life, in which higher education students have broad access to information and often need to balance their academic and professional activities, refusing to accept classes that fail to add value. The complaint we see from students is that their professors 'know the subject well, but don't know how to teach it.' That is, they are experts and master the teaching content, yet they fail to use the correct teaching techniques to help them understand. (Santo and Luz, 2013, p. 60)

To clarify the didactics:

> Didactics can be defined as a set of activities organized by the teacher aiming to favor the

> construction of knowledge by the student, without a normative or even prescriptive character, adjusting to the educational project of a society. (Santo e Luz, 2013 apud FIORE FERRARI; LEYMONIÉ SÁEN, 2007, p. 59)

Therefore, we can conclude that didactics is the way a teacher chooses to convey knowledge to students, using the techniques and approaches they deem most appropriate. Students' criticism of content delivery lies precisely in the didactics chosen by teachers, which do not always meet the needs of students in the knowledge society. This gap results from the fragility of lato sensu education , which does not always offer didactics instruction in higher education.

Santo and Luz (2013) claim that didactics is a matter of debate among several scholars and cite José Carlos Libâneo on this topic.

> [...] there is no such thing as a student in general, but rather a student living in a society determined, which is part of a specific social group and culture, since these circumstances interfere with your ability to learn [...] A good teacher who aspires to have good teaching skills need to learn every day how to deal with the subjectivity of students, their language, their perceptions, their life practice. Without this disposition, will be unable to pose problems, challenges, questions related to the content, a condition for obtaining a meaningful learning. (LIBÂNEO, 2001, p. 3)

University education sometimes presents itself with a traditionalist approach, with the teacher transmitting knowledge and leaving it to the student to memorize the content for assessments, resulting in a teaching-learning process without interaction, engagement, and critical sense from the students.

About traditional teaching (Santo and Luz, 2013 apud FREIRE, 2007; GIL, 2008 p. 62 and 63)

The practice of teaching in the traditional approach is limited to lectures taught by specialist teachers and the resulting memorization of the content by students. It is the teacher's responsibility to verify whether the content transmitted in the classroom has been rigorously reproduced in the few learning assessment tools available. Although these traditional concepts do not align with contemporary concepts, unfortunately, we still see them frequently adopted by university professors in their teaching practice, as they tend to reproduce 2 the traditional methods to which they were subjected during their own academic training.

The Portuguese word aluno has its origins in the Latin a (negation), lumnis, lumen (light) and reinforces the ideas of traditional pedagogy of passive and receptive teaching.

The teaching-learning process with a traditionalist approach adopted by university professors is a complex issue. It may be a methodological option and may also be the result of a learning gap in higher education, in the presentation of the pedagogical discipline that is offered in an incipient manner to adequately equip the student-teacher with pedagogical practice.

Critical Pedagogy

In 2021, if he were alive, Paulo Freire would be celebrating his 100th birthday. His work is a reference in numerous studies and a consensus among scholars regarding his contribution to the understanding of life and political emancipation, fostered through education. Freire was concerned with the liberation of consciences, and capitalism was the basis of his critique, believing that this mercantile logic constrains freedom of thought, objectifying social relations.

> Popular Education and Youth and Adult Education were the founding foundations of Freire's ideas, gaining visibility, and constituting important references for Critical Pedagogy. His theoretical and practical formulations propose an education for social transformation and the empowerment of individuals mediated by transformative practices and critical consciousness. Thus, Paulo Freire was not a mere spectator of the history of his people. Far from adopting neutral stances, he assumed the position of spokesperson for voices silenced by power dynamics, placing his work and his sociological, historical, and philosophical vision at the service of transforming unequal social structures. (Silva and Campos, 2021, p.

4)

Henry Armand Giroux, closely aligned with Paulo Freire's ideas, focuses on Radical Pedagogy, emphasizing the role of the teacher as an agent of social and political transformation. In the year of Paulo Freire's centenary, Giroux gave an interview to Silva and Campos (2021), where he recounts his friendship and intellectual affinity with Freire on social and political issues.

> [...] schools are the primary institutions for educating students for public life [...] that schools must function to provide students with the knowledge, character, and moral vision that build civic courage. (Silva and Campos, 2021 apud (GIROUX, 1999, p. 29) p. 8)

Freire and Giroux advocate for the autonomy of academia to foster critical thinking, a pedagogy centered on liberating consciousnesses to transform them into engaged social actors with the potential for social and political change. Giroux responds to Silva and Campos' (2021) question about curriculum and the role of the teacher:

> At the heart of Freire's work is this assumption that teachers are not only central to the pedagogical process but also that they must have control over their working conditions. At the same time, he points to the need for teachers to be critical, informed, willing to take risks, and to challenge the power of those who trade in injustice, produce a paralyzing indifference to social justice, and concentrate power in the hands of a few. (Silva and Campos, 2021, p. 10)

The curriculum is a blueprint for what the course is expected to present and teach students. As such, it is a living instrument that must be constantly revisited and, ideally, not rigidly implemented, preventing changes from occurring, to avoid falling into an authoritarian perspective. The interviewee continues to clarify the curriculum from Freire's perspective.

> Freire made clear throughout his work that curriculum is not a predetermined, lifeless catalog of methods. The latter creates dead zones of imagination, disqualifies teachers, and reproduces pedagogies of repression. Paulo's work provides theoretical indicators and a language that offers hope against a debilitating array of pedagogies that largely serve authoritarianism, especially in an era marked by the rise of right-wing populism and an updated version of fascism. (Silva and Campos, 2021, p. 10)

Giroux and Freire defend the autonomy of educational institutions, the freedom to develop curricula, and the creativity and quality of teaching provided by teachers, with the hope of effectively contributing to the democratic and liberating process provided by engaging teaching and learning.

FINAL CONSIDERATIONS

Initial training with supervised internships provides student teachers with unique opportunities to develop theoretical and practical learning alongside professionals already working in the education field. The exposure to everyday situations and the exchange of experiences enhance the intern's sense of belonging, preparing them for the challenges of a professional career, and underscores the higher education institution's commitment to developing academic excellence with professionals prepared for the demands of the knowledge-based society.

Critical pedagogy highlights the importance of curriculum, with an emphasis on pedagogical discipline, to foster the development of critical professionals who are well-prepared to serve and prepare social actors for the needs of the capitalist world. This study aims to contribute to research in the educational field, focusing on applied didactics for higher education.

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THE EFFICACY OF SOCIO-EDUCATIONAL MEASURES FOR MINORS IN CONFLICT WITH THE LAW AND THEIR RESPECTIVE COMMITMENT IN THE BRAZILIAN LEGAL SYSTEM

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ABSTRACT

This article aims to conduct a targeted study of the issues surrounding juvenile offenders who protest against the system. It will discuss whether socio-educational measures are truly considered an important tool for the resocialization of minors in conflict with the law, as well as the importance of family and society as a whole in the socio-educational process. In 1990, the Child and Adolescent Statute (ECA) was published. This document is considered the strongest protector of minors' rights and is also responsible for the implementation of socio-educational measures. These measures are educational in nature and have as one of their main objectives the resocialization of alleged minors in conflict with the law. The article also aims to conduct a study in relation to the preparation and implementation of socio-educational measures, given that the minor, according to the biological criterion adopted by criminal doctrine, is considered an individual who is still in the process of developing his or her personality, making it possible for the support network, that is, the State, family and society together to help the juvenile offender not to become a criminal when he or she reaches adulthood.

Keywords: Child and Adolescent Statute. Juvenile Offenders. Socio-educationa. Measures. Criminal Law. Family.

INTRODUCTION

This work has as its primary objective to present the problems involving juvenile offenders, discuss the repercussions related to the socio-educational measures adopted, the use of knowledge of the law and its respective applicability, as well as the effects surrounding the resocialization of minors in conflict with the legislation.

Juvenile offenders are often trapped in a vicious cycle of crime, both external (social and economic, etc.) and internal (family-related) situations. It's common for young people in this situation to engage in the same illicit behavior practiced by adults in their daily lives, turning them into offenders.

The Child and Adolescent Statute, better known to the public as "ECA," was established by Law No. 8,069/90 and is the special normative instrument responsible for the socio-educational measures imposed on those who commit offenses analogous to crimes before they even turn 18 (eighteen). The Brazilian Penal Code (CPB) explains in its article 27: "Minors under eighteen years of age are not criminally accountable and are subject to the rules established in special legislation." The ECA was based on the repressive and pedagogical binomial, given that the ECA, depending on the specific case, aims to warn and punish minors after they have committed a criminal offense, and diametrically seeks to reeducate them so that they will not commit any further acts analogous to crimes.

Based on the lessons learned from the ECA, a kind of analysis will be conducted regarding the implementation of its precepts and their consequences, taking into account all measures, from the most lenient to the most severe. The approach to these measures is pertinent, given that children and adolescents are living beings still in the process of maturing, and special care must be taken with them, as they are, for the most part, easy targets for manipulation by those seeking to introduce them to the world of crime. Therefore, since minors are still growing, it is quite possible to mold them into individuals who are not in conflict with the law.

Notwithstanding the provisions included in the ECA, there is a need to mention the importance of implementing a political approach, whose primary objective is to teach good manners, educate with good attitudes and seek to achieve the regeneration of juvenile offenders with a view to reintegration into social life, always having as a fundamental premise respect for the rights enshrined in the Magna Carta, in addition to having adequate proportionality for the application of socio-educational measures.

DEVELOPMENT

Law No. 8,069/90, the Statute of Children and Adolescents, also called

The ECA (Children's Statute), a special law aimed at protecting, safeguarding, and assisting minors, also protects minors under 18 (eighteen) years of age, and the Brazilian Penal Code (CPB) also includes those who are not criminally accountable.

On the other hand, article 3 of the ECA mentions the fundamental rights of young people, namely:

> Art. 3. Children and adolescents enjoy all fundamental rights inherent to the human person, without prejudice to the full protection provided for in this Law, ensuring them, by law or other means, all opportunities and facilities to enable their physical, mental, moral, spiritual, and social development, in conditions of freedom and dignity. Sole Paragraph. The rights set forth in this Law apply to all children and adolescents, without discrimination based on birth, family status, age, sex, race, ethnicity or color, religion or belief, disability, personal development and learning conditions, economic status, social environment, region and place of residence, or any other condition that differentiates individuals, families, or the community in which they live. (BRAZIL, 1990)

Through the ECA, children and adolescents became individuals capable of being held accountable for their own actions. In other words, with the advent of the ECA, minors became capable of recognizing their

responsibility for their actions. For many, the ECA made it possible to place children and adolescents as subjects of rights, in addition to having responsibilities within society, especially within the social environment in which they live.

The Honorable Federal Supreme Court (STF) in a recent newsletter number 1,136 discusses the fundamental rights and guarantees aimed at adolescents:

> In addition to the guidelines set out in SV 11, the need for the adolescent to use handcuffs must be assessed by the Public Prosecutor's Office and submitted to the Guardianship Council, which will issue a statement regarding the measures reported. (STF, 2024).

Furthermore, another extremely important point to be addressed is the fact that some prerogatives inherent to adults and those responsible for committing a typical, unlawful, and culpable act are also enjoyed by minors. An example of this is the fundamental constitutional right to due process, which guarantees the right to adversarial proceedings and a full defense, as well as the right to free legal aid, as stated in Article 141 and its paragraphs of the ECA:

> Art. 141. Every child or adolescent is guaranteed access to the Public Defender's Office, the Public Prosecutor's Office and the Judiciary, through any of its bodies.
> § 1. Free legal assistance will be provided to those who need it, through a public defender or appointed lawyer.
> § 2 Legal actions under the jurisdiction of the Children and Youth Court are exempt from costs and fees, except in the case of bad faith litigation. (BRAZIL, 1990).

Still regarding the prerogatives inherent to adults and minors, the Statute provides other important guarantees within its articles 110 and 111.

> Art. 110. No adolescent shall be deprived of his or her liberty without due process of law.
>
> Art. 111. Adolescents are guaranteed, among others, the following guarantees:
>
> I - full and formal knowledge of the attribution of an infraction, through citation or equivalent means;
>
> II - equality in the procedural relationship, being able to confront victims and witnesses and produce all the evidence necessary for their defense;
> III - technical defense by lawyer;
>
> IV - free and comprehensive legal assistance to those in need, in accordance with the law;
> V - right to be heard personally by the competent authority;
>
> VI - right to request the presence of parents or guardians at any stage of the procedure. (BRAZIL, 1990).

On the other hand, or rather, in the following article of the provision under discussion, socio-educational measures are listed for the purpose of disciplining minors in conflict with the law. Several measures are listed in Article 112, the most common being: the obligation to repair damages, supervised release, placement in a semi-liberty regime, and warnings, among others.

> Art. 112. If an infraction is verified, the competent authority may apply the following measures to the adolescent:
>
> I - warning;
>
> II - obligation to repair the damage;
>
> III - provision of services to the community;
>
> IV - supervised freedom;
>
> V - insertion into a semi-freedom regime;
>
> VI - admission to an educational establishment;
>
> VII - any of those provided for in art. 101, I to VI.
>
> §1º The measure applied to the adolescent will take into account his/her ability to comply with it, the circumstances and the severity of the offense. § 2
> Under no circumstances and under no pretext shall the provision of forced labor be permitted.
>
> §3º Adolescents with mental illness or disability will receive individual and specialized treatment, in a place appropriate to their conditions. (BRAZIL, 1990).

Regarding the ECA , Judge Doctor Vera Lúcia Galvão gives the following explanation:

> Under Brazilian law, minors under eighteen years of age are not criminally accountable. The law presumes that individuals under this age have not yet attained full capacity for understanding and self-determination, and therefore does not subject them to criminal penalties. Instead, the law establishes socio-educational measures for juvenile offenders,

> aimed at their rehabilitation and reintegration into society. (Galvão, 1993, p. 33-36)

Depending on the unlawful act committed by the minor, internment may be permissible. This is similar to a form of deprivation of liberty, given that the constitutional right to freedom of movement is curtailed. For many, internment is considered the most severe socio-educational measure possible, being used only when absolutely necessary and, above all, for a maximum duration of three (3) years. Therefore, internment is considered a form of "ultima ratio ," meaning it is only used when other measures are insufficient to resolve the issue at hand.

It is important to emphasize that the ECA was not created solely to correct or punish minors in conflict with the law; the statute in question goes much further, aiming to protect children and adolescents long before the " ius puniendi " in the form of socio-educational measures.

Criminal Non-Imputability and the Applicability of the ECA

Criminal non-imputability as gleaned from Article 27 of the Criminal Code: minors under 18 (eighteen) years of age are criminally non-imputable and are subject to the rules established in special legislation. Based on the provisions of Article 27 above, minors cannot be held criminally liable. However, non-imputability cannot be considered a safe conduct for committing unlawful acts, and thus, minors are not entirely exempt from liability.

Even if a minor is held accountable for committing an unlawful act, their non-imputability is considered absolute, and it can be stated that any question to the contrary, aiming to make a minor under 18 years of age accountable, is inadmissible. The legislator was guided by the strictly biological criterion, which considers that all minors under 18 years of age are non-imputable, regardless of their level of knowledge, discernment, experience, or economic status. In other words, according to the legislator, minors lack the capacity to assimilate the illegality of their acts.

The doctrinaire Rogério Greco, with his unique way of teaching, explains the biological criterion:

> Non-imputability due to natural immaturity occurs due to a legal presumption, in which, for reasons of criminal policy, the Brazilian legislator understood that minors under 18 years of age do not enjoy full capacity of understanding that allows them to impute the practice of a typical and illicit act. Therefore, the purely biological criterion was adopted (Greco, 2017, p. 533).

As consolidation of this criterion in Brazil, the Constitution states in its article 228: minors under eighteen years of age are not criminally liable, subject to the rules of special legislation.

The special legislation cited by the Magna Carta is the ECA:

> Art. 2 For the purposes of this Law, a child is considered to be a person under twelve years of age, and an adolescent is considered to be a person between twelve and eighteen years of age. (BRAZIL, 1990).

The applicability of the ECA is not only punitive; it must also adhere to the law's protective and educational aspects. Therefore, the ECA and its guidelines encompass both preventive and punitive situations. Furthermore, the special legislation for minors applies to those between 12 and 18 years of age, with rare exceptions for those between 18 and 21.

Another institute that can be covered by those under 18 and over 16 years of age is civil emancipation, that is, they begin to respond civilly for their actions, but not criminally.

Professor Cléber Masson gives the following explanation:

> Anyone under 18 years of age who is civilly emancipated, in accordance with art. 5 of the Brazilian Civil Code (CCB), continues to be unaccountable under criminal law, as civil capacity should not be confused with criminal capacity. (Masson, 2010, p. 436).

Minors, Socio-educational Measures and Criminal Law

The previous topic of this article showed the biological criterion adopted by Brazil, taking

into account whether the agent has the discernment to understand the illicit nature through his maturity (understood in mental development and experience) and biopsychic health (focused on the real capacity to understand the criminal act + mental health).

Thus, the State has the duty to manage, through norms and even impositions, actions to ensure a harmonious society. This duty creates for the State the prerogative to punish anyone who violates the imposed norms, thus rebelling against the State itself and, by extension, against society.

Professor Melo explains about legal offenses:

> We cannot speak of society without the existence of a system of control over the conduct of its individuals. Indeed, there would be no conditions for coexistence without a system of rules of conduct that must be observed by its members. They are, therefore, mechanisms for limiting human freedom, essential to maintaining order within society. (Melo, 2003, p. 80).

In the same vein, the doctrinaire Damásio says:

> Criminal law is generally responsible for protecting the highest or most precious values, or, if you prefer, it only acts where there is a violation of the most important or fundamental values for society. It is also a finalistic science because it acts in defense of society by protecting fundamental legal interests, such as human life, the bodily integrity of citizens, honor, property, etc. Social conscience elevates these interests, given their value, to the category of legal interests that require protection by criminal law for the survival of the legal order. (Jesus, 1999, p. 6).

It is clear that Criminal Law has as its scope the defense of society aiming at the protection of legal assets, above all, life.

> Criminal law's primary function is to protect essential legal interests necessary for social coexistence, according to values enshrined, expressly or tacitly, in the constitutional text. To fulfill this objective, criminal law must prohibit human actions aimed at and capable of harming or exposing fundamental legal interests to the risk of harm, or even prohibit omissions by requiring "possible actions that must be taken by everyone precisely to prevent the realization of such harm, or by those who, given their personal stance, have a duty to prevent such an outcome" through the threat of punishment, "for the purposes assigned to it (retribution, general prevention, and special prevention)" (C astro, 2003, pp. 71-72).

Socio-educational measures have the primary objective of effectively reintegrating the youth into their family and society, as well as preventing further unlawful acts. The effectiveness of these measures is undeniably linked to appropriate and effective care, which considers each minor's unique characteristics to promote the best educational and educational program for them. For socio-educational measures to be truly effective, it is crucial that there be family, social, and state involvement to constantly support and monitor the behavior of juvenile offenders.

In this sense, it is interesting to bring to light the teachings enshrined in Article 4 of the Child and Adolescent Statute, which states the following:

> Art. 4° It is the duty of the family, the community, society in general and the public authorities to ensure, with absolute priority, the realization of rights relating to life, health, food, education, sport, leisure, professional training, culture, dignity, respect, freedom and family and community life.
>
> Sole paragraph. The guarantee of priority includes:
>
> a) priority to receive protection and assistance in any circumstances;
>
> b) precedence of service in public services or services of public relevance;
>
> c) preference in the formulation and implementation of public social policies;
>
> d) privileged allocation of public resources in areas related to the protection of children and youth. (BRAZIL, 1990).

Regarding the State's responsibility, the public prosecutor and coordinator of the children and youth prosecutor's office in the Federal District, Dr. Renato Barão Varalda, explains:

> [...] countless children and adolescents live outside the most basic public policies, such as education, health, leisure, culture, security, etc. The lack of respect begins precisely with the lack of political will of the country's leaders not only to prioritize sufficient budgetary

resources to guarantee these fundamental rights, but also to execute them correctly.

Therefore, it is everyone's duty (family, State and society) to assist juvenile offenders in their resocialization, with the aim that they do not commit any further infractions analogous to crime.

FINAL CONSIDERATIONS

At the end of this scientific article, it is possible to observe that there are a myriad of situations surrounding minors in conflict with the law, the vast majority of which foster the minor's behavior. Certainly, even though they are not yet biologically developed, they can discern right from wrong—that is, know whether their behavior is criminal or not.

In this context, parental authority plays a significant role in the lives of minors, providing them, to the extent possible, with a good education and good principles. On the other hand, society plays an important role in welcoming minors with educational projects, as well as ensuring they feel part of society, etc.

The State, in turn, is responsible for implementing socio-educational measures and they do not have the sole and exclusive character of punishment. On the contrary, the State, through socio-educational measures, aims, above all, to reintegrate the young person into their family and society, in addition to ensuring that the young person no longer commits illegal acts analogous to crime.

It's also clear that, for many, impunity for juvenile offenders is reflected in the lack of enforcement, as is the case with adult offenders. Inexorably, no crime or infraction should go unpunished; however, when it comes to minors, everyone knows that a complete comparison cannot be made with adults. Responsibility must be given to minors, yes, but it's important that the State first restructure itself both as a public body and in its educational capacity, so that children and adolescents are no longer easy targets for criminals.

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INFORMATION SOCIETY: GLOBALIZATION AND TEACHER TRAINING

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ABSTRACT

This article focuses on the information society, which establishes globalization and teacher training. Distance learning has been consolidating itself each year in our country. However, this statement does not completely eliminate a thread of distrust regarding this new teaching method. Distance learning has already had its quality questioned in the educational field in terms of the didactics applied and, above all, in the quality of the training of its students and tutors. Several discussions, both pedagogical and political, and even marketing, have revolved around this topic. This presence has been increasingly constant in pedagogical discourse, understood both as the set of language practices developed in concrete teaching situations and those that aim to achieve a level of explanation for these same situations. In other words, ICT has been pointed out as a defining element of the current discourses of teaching and about teaching, although it prevails in the latter. In short, attributing all the current issues relating to teaching work to the presence, or even to a mode of incorporation, of ICT also contributes to obliterating the political analysis of current trends.

Keywords: Information society. Globalization. Teacher training. Education.

INTRODUCTION

Distance learning has been consolidating itself each year in our country. However, this statement does not completely dispel a thread of distrust of this new teaching method. Distance learning has already had its quality questioned in the educational field in terms of the didactics applied and, above all, in the quality of the training of its students and tutors. Several discussions, both pedagogical and political, and even marketing, have revolved around this topic.

In view of the context presented, the need for specific legislation for Distance Learning arises; such as Decree 9,057, of May 25, 2017, which revoked Decree No. 5,622, of December 19, 2005; and art. 1 of Decree No. 6,303 of December 12, 2007. As an example, let us consider Art. 4, which deals with educational activities in face-to-face environments, and Art. 9, which deals with the provision of elementary education in the distance learning modality. In both, we see the clear similarity between distance learning and face-to-face learning; which, at first glance, would be a huge educational advance. But not everything is a win-win situation.

Through a more in-depth analysis, we can easily perceive a bias towards educational and, above all, political fragility. When we talk about evaluations and defenses of distance learning coursework carried out in person at the headquarters of educational institutions, we automatically leave aside some of the differences in distance learning, which would be its pedagogical, geographic, attitudinal, temporal autonomy and, mainly: the leading role of students and others involved in the teaching-learning process. We perceive a setback in relation to the dynamics of distance learning, in favor of the interests of large businessmen in the educational sector.

More alarmingly, we highlight § 4 of art. 32 of Law No. 9,394 of 1996, the Law of Guidelines and Bases of National Education, as a backdrop to frivolously hide one of the greatest deficiencies in national education: the lack of teachers in several subjects. Decree 9,057, when in its Art. 9, highlights the provision of elementary education in distance learning in emergency situations, among others for students who are enrolled in the final years of regular elementary school and are deprived of the provision of mandatory subjects in the school curriculum, allows the shortage of teachers to be resolved with distance learning classes, deliberately taking advantage of an attribute of distance learning. Consequences?

Dismantling of public education; discrediting of teachers and the teaching profession and total subversion of the role of distance learning.

Given the problem, intriguing questions arise: Proximity between teaching modalities? For what purpose? To meet what demands? There is an urgent need for legislation in general to meet the real interests of society and our country.

In other words, from the perspective of "globalization" and "globalitarianism," a term coined by Ramonet (1999) to account for the kind of dictatorship of single-minded thinking that regulates ideological construction, schools must break with their current historical form in order to face new challenges. The aim of this paper is to analyze the determinations (concrete and assumed) and the meanings (hegemonic and in dispute for hegemony) of this reconfiguration, based on the discourses that introduce and justify current teacher training policies.

In the movement to reconfigure teacher work and training, another aspect seems to be the object of consensus: the possibility of the presence of so-called "new technologies" or, more precisely, information and communication technologies (ICT). This presence has been increasingly constant in pedagogical discourse, understood both as the set of language practices developed in concrete teaching situations and those that aim to achieve a level of explanation for these same situations. In other words, ICT has been identified as a defining element of current discourses on teaching and about

teaching, even though it prevails in the latter.

Currently, in the most diverse spaces, the most diverse texts on education have in common some type of reference to the presence of ICT in teaching. However, this presence has been attributed such diverse meanings that it does not allow for singular readings. Thus, although there is apparently no doubt about a central place attributed to ICT, there is also no consensus regarding its delimitation.

In short, the presence of ICT has been invested with multiple meanings, ranging from the alternative of overcoming the limits imposed by "old technologies", represented mainly by chalkboards and printed materials, to the answer to the most diverse educational problems or even to socioeconomic-political issues.

Aspects of the information society

After the "end of History" prematurely announced by Francis Fukuyama a few years ago, what is revealed here is the deception of the "end of space" of a small planet suspended in the electronic ether of our modern means of telecommunications (...). In the absence of an "end of History", we are witnessing the end of Geography (Virilio, 1999, p. 15-17).

As a corollary of "globalization", it is important to highlight the so-called scientific-technological revolution as an undue conceptual extrapolation, motivated by technological determinism (Leher, 2000). Thus, technologies may not be seen as historical-social productions, being displaced to the origin of changes that, in turn, support the concept of "information society".

To characterize the simplifications that underlie this society, I resort to the analysis undertaken by Mattelart (op. cit., p. 73):

> The imprecision surrounding the notion of information will crown that of the "information society". The premature desire to politically legitimize the hic et nunc reality of the latter will justify the scruples of epistemological vigilance. The tendency to assimilate information to a term derived from statistics (data/data) and to see information only where there are technical devices will become more pronounced. Thus, a purely instrumental concept of the information society will be established. With the social utopia of the concept, the sociopolitical implications of an expression that supposedly designates the new destiny of the world will be erased.

In terms of this instrumental rationality, it is possible to promote the decentering of the category "work" (Antunes, 1999) and even its "elimination", with the addition that this "does not mean the disappearance of human activity, which can take the form of the most diverse occupations" (Schaff, 1995, p. 42). It is also possible to announce a new, unipolar universalism, with the geoeconomic rearrangement of the planet around the values of market democracy. It is the techno-informational paradigm that, articulated with "globalization", allows reference to planetary society, based on the assumption of the absence of an identifiable center, borders and, even, leaders. Still according to Mattelart (op. cit., p. 172):

> The discourses that accompany the information society have established the principle of tabula rasa as law. There is nothing that is not obsolete. Techno-commercial determinism generates an amnesiac modernity and dispenses with the social project. Endless and limitless communication establishes itself as the heir of endless and limitless progress. (...) The very notion of complexity is perverted and transformed into an alibi. Any attitude contrary to this positivism is quickly labeled as technophobic or anti-modern.

In the "globalitarian" movement, choices are increasingly expressed through alternatives and exclusions. Impasses, such as those summarized by Eco (1977) in Apocalyptic and Integrated, acquire an updated version: plugged in or lost. In this substitution, in addition to the inversion of the movement, the relations between the terms, previously marked by "and", slide towards the single answer and the same fate. Without mediation.

In short, it is necessary to characterize the "information society" as an articulation of theoretical, economic and political enterprises.

And, when it comes to studies on technology and education, it is important to distinguish those that start from questioning them from those that assume such a society as a presupposition. Because it is precisely at the level of presuppositions and implicits that ideology operates in discourse.

Globalization and teacher training in the face of ict and distance learning

International organizations have forced, through the establishment of "conditionalities" for the granting of credits and the application of sanctions for their non-compliance (Fonseca, 1998, p. 41), the incorporation of ICT as a central element of any educational policy that is attentive to the transformations engendered by the so-called scientific-technological revolution and the needs of the economy. In the words of Barreto & Leher (2003, p. 39):

"A brave new world emerges with globalization and with the technological revolution that drives it towards a virtuous future". (...) Based on this premise, international organizations and governments echo the same proposition: it is necessary to reform education from top to bottom, making it more flexible and capable of increasing the competitiveness of nations, the only means of obtaining a passport to the select group of countries capable of competitive integration in the globalized world.

In this movement, a new educational paradigm has been announced. The announcement is recurrent on the MEC website, whose formulation, it is worth emphasizing, took the discourse of international organizations to its ultimate conclusion, placing technologies in the place of individuals. This paradigm consists of technological substitution and instrumental rationality, is inscribed in "flexibilization," especially in the precariousness of teaching work, and is consistent with market logic: the greater the presence of technology, the less need there is for human labor. In other words, it envisions fewer and fewer teachers and more and more students, on the grounds that the performance of the latter depends less on the training of the former and more on the materials used.

In the proposals of international organizations, "Internet access to 'universal knowledge,' which will necessarily have its source in existing knowledge monopolies, would solve not only the problem of the digital divide, but also that of the social divide" (Mattelart, 2002, p. 173). In these terms, the proposal for "technologies for all" is formulated as a way to overcome the so-called "digital divide." On the other hand, as Leher (1997, p. 138) states, the World Bank itself, in pointing out that the use of technologies is the "privileged instrument for inserting countries into the hegemonic flow of Time," also recognizes the impracticability of countries characterized by slow times (developing, peripheral, Southern) being inserted into the accelerated rhythm of central countries (Northern).

Thus, while new possibilities are touted, such as overcoming the digital divide, a kind of educational apartheid on a global scale is being instituted, based on its own reinterpretation. While the discourse deals with the democratization of access, social practices show that this kind of dividing line between the included and the excluded does not concern access or lack of access, but rather the ways in which it is produced and the meanings invested in it.

The simplifications and shifts that have characterized official distance learning proposals express the emptying of teacher training, progressively shifted to "in-service training" or even "retraining," since initial "face-to-face" training does not have the international funding allocated to ICT for distance learning, not even guaranteeing the right of access to technologies. In the virtual arms of public universities, in the current split training, ICTs are at the center, pedagogical considerations are on the margins, and fundamental issues are obliterated.

This hollowed-out training has also been marked by at least two important divisions. The

first concerns dichotomization: initial training versus continuing education, in a new guise. If, until the 1990s, the term "training" seemed to refer only to initial training, it now points to continuing education, the destination of almost all national and international investments. As Torres (1998, p. 176) states: "The very issue of initial training is being diluted, disappearing." At the same time, continuing education is restricted to "training," "coaching," and "retraining."

The second split corresponds to the modality: face-to-face vs. distance learning. In the face-to-face modality, current policies point to another split: teaching and research, disqualifying the so-called "European university model," which consists of the inseparability of teaching, research, and extension. And, with regard to ICT, the absence of specific investments and the meager budget allocation do not even guarantee the right of access. Meanwhile, in distance learning, among simplifications such as the mere transposition of classes to new media, access to ICT is restricted to the condition of users or consumers, and even this can be lost at the end of the process, given the material conditions of existence of the subjects in training and the remuneration they receive when they graduate.

Underlying these divisions is a way of objectifying ICT that does not involve analyzing the conditions of its insertion into pedagogical processes as a whole. Thus, for example, in initiatives that aim to enhance face-to-face processes through the use of ICT, such as in so-called "blended learning" courses, there is no resizing of teachers' workloads and remuneration to include the time spent reading students' texts in forums or discussion lists, responding to emails, etc. What the use of ICT, from the perspective of technological substitution, enables is precisely the opposite: processes of subcontracting, part-time work, and outsourcing.

In other words, the conditions necessary for educational appropriation of ICT are left out, since none of the groups are trained in working with them, which implies overcoming the seduction of supposedly intrinsic attributes, such as attractiveness, and not privileging only the interaction of subjects with materials. The horizon needs to be greater interaction: discussion (of the information collected and the processes experienced) to compare different (individual) paths, aiming at the (collective) production of integrative syntheses that go beyond specific planned content.

The proposal for initial distance learning, under the motto of overcoming geographical distances and social inequalities, has undeniable affiliations. From a political point of view, it is part of a set of structural reforms, even though the technological contribution is incipient and, from a technical point of view, there is no accumulation as assumed in various official statements, such as: "The goals of the Distance Education Secretariat are, therefore, to bring to public schools all the contributions that distance education methods, techniques, and technologies can make to the construction of a new paradigm for Brazilian education."

The new paradigm assumes the reduction of technologies to distance learning tools, excluding precisely the ways in which they are appropriated in teacher training and work. However, the identification of ICT with its foundation also constitutes a kind of metonymy. It must be recognized that they are important because they function as one of the vertices of the triangulation that allows the State to be minimal in terms of investment and maximal in terms of education management: centralized curriculum (curricular parameters and guidelines), intensive use of technologies (specific programs), and unified external assessment (SAEB, ENEM, ENC, and, even more so, SINAES).

Undoubtedly, in this triangulation, ICTs function as a link, promoting the connection between the ends and even breaking the teaching-learning unit, making possible a discourse that highlights only the second element of the pair, by pointing to learning independent of teaching. But they can only do so based on a specific conception of knowledge, content, and training, founded on the notion of

competence.

METHODOLOGY

This paper analyzes the theoretical and ideological constructs related to the precariousness of work and teacher training, considering the discourses that underpin current policies. To this end, it discusses: (1) information and communication technologies (ICTs) as a link between "globalization" and teaching work; (2) the way these technologies are inserted into the so-called "information society"; (3) the discursive materialization of such insertion; (4) the consequences of reducing technologies to distance learning strategies, highlighting the educational apartheid produced; (5) the key relationship between technologies and skills; and (6) the trends detected in the current context: skills-based training, emphasis on instructional materials, and the deterritorialization of schools, as well as counter-hegemonic proposals.

RESULTS AND DISCUSSIONS

In the words of Mattelart (2002, p. 9), the second half of the 20th century was marked by the "formation of beliefs in the miraculous power of information technologies." Even if, in principle, it seems naive, this latter movement is inscribed in a mode of objectification of ICTs inextricably linked to the concept of the "information society," to be analyzed in the following section.

Among the new discursive trends, "relexicalization" (Fairclough, 2001) deserves special mention. It consists of the use of terms historically associated with other activities and relationships as a strategy for legitimizing shifts in meaning, most often inscribed in the movement of "commodification" (idem, ibid., p. 255): "The process by which social domains and institutions, whose purpose is not to produce goods in the strict economic sense of articles for sale, are nevertheless organized and defined in terms of the production, distribution, and consumption of goods."

In the field of education, terms such as "consumers," "customers," "packages," "products," etc. have been recurring for some time. Currently, it is possible to verify that this recurrence has served to prepare the stage for the shift of education itself to the service sector, led by the World Trade Organization (WTO), under the terms of its GATS regulations.

Documents concerning teacher training, such as the National Curriculum Guidelines for the Training of Basic Education Teachers, at the higher education level, in teacher training and full undergraduate courses, explicitly state the commitment to reconfiguring work, with a view to the "information society":

With regard to the world of work, it is known that one of the decisive factors of production is now knowledge and control of the technical-scientific-informational environment, reorganizing the power derived from the ownership of capital, land, or labor. (Idem, ibid., p. 9)

With regard to teaching work itself, the "abandonment of the category of work in favor of the categories of practice and reflective practice" (Freitas, 2003, p. 1,096) has supported the use of expressions such as 'activities' and "teaching tasks." It is the discursive materialization of the emptying of this work, with the restriction of the teacher to the choice of teaching materials to be used in class, during which it is up to them to control the time students spend with these materials, conceived as commodities increasingly ready for consumption (Barreto, 2002).

The very designation "teacher" has given way to "facilitator," "animator," "tutor," "monitor," etc. And monitor, in its multiple meanings, can be a summary image of the precariousness of teaching work. Consulting the dictionary meanings of the word, it is possible to identify: (1) one who gives advice, lessons, who admonishes; (2) a student who assists the teacher in teaching a subject, generally in the application of exercises, in the clarification of doubts, etc., outside of regular classes; (3) an instrument that controls the operation of

equipment or a system; (4) a receiving device used to monitor the quality of video and/or audio during a broadcast or recording; and (5) a data output device on which information presented by a computer is displayed; the computer screen.

Taking the first and second meanings, if the teacher is placed as a monitor, who occupies the position of teacher? An explicit answer can be found on the website of the Secretariat of Distance Education, of the Ministry of Education (www.mec.gov.br/seed/linhas.shtm):

The lines of action of the Secretariat of Distance Education are based on the existence of a technological system—increasingly cheaper, accessible, and easier to use—capable of:

- Bring enormous educational and pedagogical potential to schools;
- Expand opportunities where resources are scarce;
- Familiarize citizens with the technology that is part of their daily lives;
- Provide flexible and personalized responses to people who demand greater diversity in types of education, information, and training;
- Offer means to quickly update knowledge;
- Extend educational spaces;
- And motivate professionals and students to learn continuously, at any stage of their lives.

In addition to semantics, there is a radical syntactic shift: it is the technological system, with its registered qualifications (price, accessibility, and ease of use), that occupies the position of subject capable of developing strategic actions. It is no coincidence that the reduction of technologies to distance learning (DL) proposals is also marked in the very name of the secretariat created to coordinate ministerial actions related to ICT.

It should also be added that, in the Houaiss Dictionary, the monitor is identified as "a person who organizes, administers, and guides classes of tele-students, promoting meetings, group studies, taking responsibility for enrollments, preparatory tests, etc." In other words, this meaning is not only legitimized but also established and documented in a reference work.

The third and fourth meanings point to an instrument aimed at control, a recurring term in the current "commodification" of pedagogical discourse. It is present in official programs and in research focused on them (André, 2004) also as regulation or management. This can be verified, for example, in the aforementioned Curriculum Guidelines, when explaining the most important task to be performed by teachers:

It is therefore urgent to incorporate the various information and communication technologies into the development of teacher training courses, preparing them for the noblest purpose of school education: the management and definition of ethical, scientific, and aesthetic references for the exchange and negotiation of meaning, which occurs especially in interaction and collective school work. Managing and referring to meaning will be the most important thing, and teachers will need to learn how to do this in real and virtual environments. (André, 2004, p. 25; emphasis added).

The above excerpt elucidates one of the apparent contradictions that underlie the relationship between technology and teaching. On the one hand, there is openness to the multiple, and on the other, the legitimization of the supposedly singular. Work is, at the same time (supposedly), expanded and reduced. Or, in broader terms, flexibility and democratization (supposedly) coexist with monopoly and control. After all, monitoring means watching, checking (something), with a specific goal in mind. In the new context, objectification and instrumental rationality, when combined, also serve to shift the discussion about specific goals in their multiple dimensions.

The fifth sense listed here accounts for the most visible aspect of the shifts that have taken place: the visualization of information on data

output devices. This is the core of the analogy: showing what processors and interfaces allow. Plugging devices into outlets and solving the expected problems. This has been the focus of training and capacity building promoted by national programs such as TV Escola and PROINFO.

Rejecting the analogy and reversing this situation requires the training of teachers in/through working with ICTs and therefore requires that they not be assigned the status of mere instruments for any purpose. Teachers who are not monitored by ICTs are also needed. After all, it is worth remembering that the monitor is, technically, peripheral.

To demonstrate that the solid core of the proposal to incorporate ICTs is skills, it is important to refer to the formulation of Labarca (1995), then a consultant to ECLAC (UNESCO), which starts from the following premise: the productivity of educational systems is low due to the intensive use of human resources and their corporatism, which protects the "teaching monopoly in the transmission of knowledge" (idem, ibid., p. 174). Continuing toward the purging of teachers, considered an expensive and inefficient technology, the author is quite explicit about the steps to be taken (idem, ibid., p. 175-176):

> Teachers are no longer the main repositories of knowledge and have become methodological consultants and facilitators of working groups. This strategy requires a reformulation of educational objectives. The development of key competencies (...) replaces the solid disciplinary training that had been the focus until then. The use of new educational technologies leads to the blurring of boundaries between disciplines, while at the same time redefining the role, training, and professional development of teachers.

In the same article, the author makes it clear that the proposals of international organizations do not change substantially for contexts in which access to ICT is more difficult. What is rescaled are the technologies themselves, with the use of printed materials, produced centrally and distributed to teachers, being advocated, provided they are accompanied by some type of variation around the instruction manual.

If, on the one hand, the notion of competence involves theoretical difficulties (Dias & Lopes, 2003), the assumptions made in competence-based training proposals are very clear: (1) teaching can be broken down into basic skills and competences; and (2) teacher training organized around these skills and competences corresponds to "desirable" teaching performance. In other words, it is the assumption that the whole (teaching work) is equivalent to the sum of its parts. Reductionism is inevitable, while sophistication can be greater, considering the new technological resources that can cooperate with competencies. It is in the articulation of reductionism and sophistication that the strategy of technological substitution is founded.

As for the clichés in circulation, it is possible to verify a significant shift from "you don't just learn at school" to "you don't learn at school," insofar as it refers to the trend of deterritorialization of the school. Not only is all the emphasis being placed on learning environments, but the texts already contemplate diverse "educations," materialized in the expressions "academic education" and "corporate education."

Returning to the starting point of this set of reflections, it is possible to affirm that the proposed deterritorialization cannot be thought of outside the parameters of the market and the assumption that schools must break with their historical form in order to face the challenges of "globalization." Rejecting this logic, the greatest challenge is to confront the attempt to erase the historical and social determinants of the school. In the words of Alves (2004, p. 218):

> Discussing the specific role of school today for various groups, their multiple differences and distances, becomes something pressing in this context (...) school is a unique and special space (...) a space and time to bring people together (...) it is necessary to recover the space of knowledge, which has nothing to do with the place of a certain technical competence.

What is at stake is not only competent discourse: "That which can be uttered, heard and accepted as true or authorized (these terms are now equivalent) because it has lost its ties

with the place and time of its origin" (Chaui, 1989, p. 7). It is, among other issues, the reduction of ICT to EAD, as a material form of "commodification". These are the contemporary clashes between the proposal of education as a commodity and its defense as a right and emancipatory practice.

CONCLUSION

From a discursive point of view, it is important to highlight and analyze the shifts in meaning that have marked language practices, as manifestations of new hegemonic conceptions. The first of these, to the extent that it is more general, concerns the way in which inequalities and differences are being treated. "Globalizing" allusions no longer include expressions such as: First and Third World; central countries and peripheral countries, etc. The references become the countries of the North and the South, as if the issues that distinguish them could be reduced to geographic coordinates.

In these terms, it is possible to support the triangulation described in the previous section. It is possible to intensify the use of the workforce through a supposed technological revolution and even produce evidence of the efficiency of the means for the established ends, since guidelines and parameters define the skills to be developed through the materials produced for this purpose, which are evaluated at the end of the process.

It is possible to state that, ultimately, ICTs are positioned as a structuring element of a new pedagogical discourse, as well as of social relations that, because they are unprecedented, support neologisms such as "cyberculture" (Lévy, 1999). At the other extreme, what new technologies support is a form of assassination of the real world, with the liquidation of all references, in games of simulacra and simulation (Baudrillard, 1991). In between, they can constitute new formats for the same old conceptions of teaching and learning (Moran, 2004), inscribed in a movement of conservative modernization, or, even, in specific conditions, establish qualitative differences in pedagogical practices (Barreto, 2001; 2002; 2003). In short, attributing all current issues relating to teaching work to the presence, or even to a mode of incorporation, of ICT also contributes to obliterating the political analysis of current trends.

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BREAST CANCER MORTALITY IN ELDERLY WOMEN IN SOUTHERN BRAZIL: AN OVERVIEW FOR THE PERIOD 1996 TO 2020

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ABSTRACT

Breast cancer is the leading cause of cancer death among women worldwide. Despite decades of medical initiatives and public policies, the disease's mortality rates remain high in Brazil. The aim of this article is to analyze breast cancer mortality in Southern Brazil among elderly women aged 60 to 80 years or older, over the period 1996–2020. Data were drawn from the Mortality Information System (SIM) of the Department of Informatics of the Unified Health System (Datasus), in accordance with the International Classification of Diseases (ICD), and from the Brazilian Institute of Geography and Statistics (IBGE). Breast cancer is considered the most common type among women in almost all Brazilian regions, except in the North, where cervical cancer ranks first.

Keywords: Breast Cancer. Mortality. Elderly women.

INTRODUCTION

Currently, the main causes of morbidity and mortality in the global population are noncommunicable diseases (NCDs). Cardiovascular diseases remain prominent, followed by neoplasms. Among these, breast cancer continues to lead in both incidence and deaths.

Breast cancer arises when there is excessive and disordered cell proliferation resulting from genetic changes that stimulate increased estrogen levels. Women are more predisposed than men due to a greater amount of breast tissue. Early prevention and detection measures should be adopted, as the disease has a high mortality rate.

Excluding non-melanoma skin tumors, female breast cancer is the most frequent cancer in all Brazilian regions, with an estimated risk of 81.06 per 100,000 in the Southeast; 71.16 per 100,000 in the South; 45.24 per 100,000 in the Center-West; 44.29 per 100,000 in the Northeast; and 21.34 per 100,000 in the North (INCA/MS, 2020).

Access to health services differs across Brazilian states; consequently, there is wide variation in mortality rates due to disparities in the timing of diagnosis, treatment, and follow-up.

Starting in the 1980s, Brazil developed public policies regarding breast cancer, notably through the "Viva Mulher" Program, introduced in 1998. During this period, the federal government began supporting actions for Breast Cancer Control aimed at reducing exposure to risk factors, improving quality of life for patients with this condition, and lowering mortality. All these objectives align with the current guidelines of the national cancer control policy published in Ordinance GM/MS1 No. 874 of 2013 and with the National Policy for Cancer Prevention and Control (INCA, 2015).

From the 1990s onward, changes in the clinical presentation and management of breast cancer cases emerged, including the implementation of screening with mammography, effective hormonal treatments, chemotherapy, and advances in surgery and radiotherapy (AUTIER, 2010).

In many countries, these innovations contributed to reduced mortality and increased survival from breast cancer.

Moreover, unlike what occurs in most developed countries—where there is an upward trend in incidence but a reduction in breast cancer mortality (SIEGEL et al., 2014)—studies conducted in previous decades indicated that breast cancer mortality increased in Brazil (SILVA et al., 2011; MARTINS et al., 2013; GIRIANELLI et al., 2014).

Thus, studies on this pathology have gained even greater prominence in the national context because Brazil is undergoing rapid population aging, which has directly increased the incidence and mortality of noncommunicable chronic diseases (PEREA et al., 2018).

According to the World Health Organization (WHO), the number of people over the age of 60 in Brazil will reach 2 billion by 2050. Therefore, it is imperative that the government implement public policies that efficiently serve the population when health issues and/or deaths occur.

Consequently, monitoring mortality trends over time and understanding future mortality patterns are relevant for planning and evaluating cancer control policies as well as for implementing early detection and treatment methods directed toward the most vulnerable areas.

Conceptualization and Risk Factors

Breast cancer is a multifactorial disease in which age is considered an important risk factor. However, other factors increase the risk of developing the disease, such as: obesity, physical inactivity, alcohol consumption, frequent exposure to ionizing radiation; reproductive and hormonal history (early menarche at age 11 or younger, nulliparity, first pregnancy after age 30, late menopause after age 55, use of hormonal contraceptives); and,

finally, genetic and hereditary factors: a family history—especially in first-degree relatives—of breast cancer before age 50; bilateral breast cancer; male breast cancer; a previous history of breast cancer/benign breast disease; a first-degree relative with ovarian cancer at any age; and genetic alterations, particularly in the BRCA1 and BRCA2 genes (INCA, 2019).

Cancer already represents a serious public health problem throughout Brazil. Widely disseminated knowledge shows advanced age as one of the main risk factors associated with this disease. Therefore, we must encourage and promote breast cancer prevention among women through sound nutrition, physical activity, judicious use of medications, and adherence to screening.

Diagnosis

The main signs and symptoms of breast cancer are a lump in the breast and/or armpit, which may be painless or cause breast pain, and skin changes covering the breast, such as retractions with an appearance similar to an orange peel; transparent or bloody nipple discharge, unilateral or bilateral.

For early detection of breast cancer, the Brazilian National Cancer Institute (INCA/MS) recommends:

- Annual screening with clinical breast examination for all women starting at age 40. This procedure is considered part of comprehensive women's health care and should be performed at all clinical visits regardless of age;
- Screening with mammography in women aged 50 to 69, with a maximum interval of two years between exams;
- Annual clinical breast exam and mammography starting at age 35 for women belonging to population groups at high risk of developing breast cancer;
- Guaranteed access to diagnosis, treatment, and follow-up for all women with abnormalities on exams.

According to INCA/MS, the following are defined as population groups at high risk for developing breast cancer:

1. Women with a family history of at least one first-degree relative (mother, sister, or daughter) diagnosed with breast cancer before age 50;
2. Women with a family history of at least one first-degree relative (mother, sister, or daughter) diagnosed with bilateral breast cancer or ovarian cancer at any age;
3. Women with a family history of male breast cancer;
4. Women with a histopathological diagnosis of proliferative breast lesion with atypia or lobular carcinoma in situ.

According to the Ministry of Health, the most effective forms of early detection are clinical breast examination (CBE) and mammography (MMG). Ultrasound may be performed as a diagnostic adjunct, and fine-needle aspiration (FNA) and core biopsy can provide sufficient data for clinical staging of the tumor and definition of treatment. However, many women at risk do not have access to these exams, as the health system in some parts of Brazil operates slowly and is extremely bureaucratic.

When breast cancer is diagnosed at an early stage ("in situ" cancer), the chances of cure are high, with 5-year survival reaching 97%.

The most widely used method for evaluating outcomes in oncology and even in epidemiology is patient survival. Mortality rates in historical series have high analytical significance, making it possible to discuss statistical techniques of survival analysis based on observations obtained from health service records (INCA/MS, 2018).

METHODOLOGY

An ecological, retrospective time-series study was conducted using secondary data collected from the Mortality Information System (SIM) of the Department of Informatics

of the Unified Health System (Datasus), analyzing deaths due to malignant neoplasm of the breast occurring in Southern Brazil from 1996 to 2020. Demographic data from the Brazilian Institute of Geography and Statistics (IBGE) were also used, based on census information (2000 and 2010), the 1996 population count, and population estimates for the remaining years.

To analyze temporal trends in mortality, the Joinpoint Regression Program was used. This program computes and analyzes rate trends in segments, providing models that summarize behavior over the period (National Cancer Institute, 2015).

The specifications used in the program were: model log(y) = b×x, where Y is the mortality rate and X is the year of death. Constant variance was assumed, with a maximum of four joinpoints. The joinpoint determination method used was Grid Search (LGS), and the model selection method was the permutation test.

Two-tailed tests were used for all calculations with a significance level of 5%. Epidat software version 4.1 (Epidat, 2014) was used to calculate confidence intervals and rate adjustments.

RESULTS AND DISCUSSIONS

The SIM (Mortality Information System) was important and contributed to this study. Information contained in death certificates is essential for describing the national mortality profile.

The World Health Organization (WHO), which compiles the latest available data for each country on deaths due to ill-defined causes (IDC), indicated a proportion of 10.14% for Brazil in 2015. Other South American countries—such as Argentina (16.66%), Ecuador (11.81%), Paraguay (14.41%), and Uruguay (15.96%)—have higher values than Brazil, whereas Peru (6%), Guyana (8.72%), Colombia (4.69%), and Chile (4.6%) have values below 10% for deaths due to ill-defined causes (WHO, 2019).

In Brazil, however, deaths due to ill-defined causes have decreased in recent decades across all regions, especially in municipalities outside state capitals.

Table 01 shows a gradual and marked decline in the percentage of deaths from ill-defined causes, indicating improved data quality recorded by the Mortality Information System. Nevertheless, there are still significant values for deaths from ill-defined causes in the North and Northeast regions, according to data from the Ministry of Health (Saúde Brasil 2005).

Regarding malignant neoplasms with unspecified primary site, women in all age groups studied (under 60; 60–69; 70–79; and 80+) had similar percentages, and all results decreased from 1997 to 2020.

Table 01: Indicators of information quality by age group in the South region between 1997 and 2020.

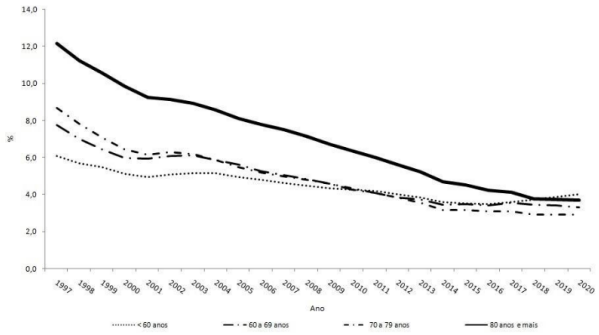
Sexo / faixa etária (anos)	Causas mal definidas (%)			Neoplasias malignas sem especificação de local – C80 (%)		
	1997	2008	2020	1997	2008	2020
< 60	6,1	4,5	4,0	3,8	3,4	1,8
60 - 69	7,7	4,8	3,3	3,9	3,5	1,8
70 - 79	8,7	4,8	2,9	3,9	3,6	2,1
≥80	12,1	7,1	3,7	4,4	3,6	2,0
Total	8,1	5,3	3,5	3,9	3,5	1,9

Source: Mortality Information System – SIM / Ministry of Health.

In Figure 01, there is a sharp decrease in the percentage of ill-defined causes in all age groups over the years, especially from 2014 onward.

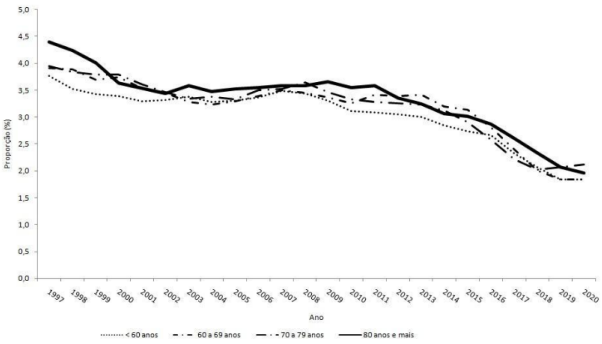
In Figure 02, the percentage of neoplasms with unspecified primary site is similar across all age groups in the early years up to 2016, with a subsequent decrease through 2020.

Figure 01 – Proportion of ill-defined causes in the South region by age group, 1996–2020.



Source for both figures: Mortality Information System – SIM / Ministry of Health.

Figure 02 – Proportion of neoplasms with unspecified primary site in the South region, 1996–2020.



Source for both figures: Mortality Information System – SIM / Ministry of Health.

Table 02 presents the crude rate and the rate ratio of breast-cancer mortality in the South region by age group in the periods 1997–2008 and 2009–2020. Mortality rates were calculated per 100,000 inhabitants/year.

Findings from this study showed a slight increase in breast-cancer mortality among elderly women in all age groups (60–69; 70–79; 80+). In 1997, women aged 60–69 had a crude rate of 46.45, with progressive increases in 2008 and 2009, reaching 49.11 in 2020. Women aged 70–79 had a crude rate of 74.03 in 1997, which decreased substantially in 2008, then rose again in 2009 and, despite a slight increase, reached a lower rate of 68.16 in 2020. Women aged 80 and older had a crude rate of 108.55 with a slight, progressive increase over the years, reaching 116.74 in 2020.

Analyzing the mortality rate ratio shows a slight reduction in the 60–69 age group, and a slight increase in the 70–79 and 80+ age groups.

Table 02: Crude mortality rate and mortality rate ratio for breast cancer in the South region by age group, 1997–2008 and 2009–2020.

Faixa etária (anos)	Taxa de mortalidade*				Razão da taxa de mortalidade (IC95%)	
	1997	2008	2009	2020	1997-2008	2009-2020
60 – 69	46,45	49,73	51,18	49,11	1,07 (0,92; 1,24)	0,95 (0,85; 1,07)
70 – 79	74,03	64,24	66,31	68,16	0,86 (0,73; 1,02)	1,02 (0,89; 1,17)
≥80	108,30	108,99	107,53	116,63	1,00 (0,81;1,24)	1,08(0,93; 1,26)
Total	62,05	63,12	64,43	65,66	1,01 (0,92; 1,12)	1,01(0,94; 1,09)
	**p<0,001	** p<0,001	** p<0,001	**p<0,001		

Source: Mortality Information System – SIM / Ministry of Health.

Note: * Mortality rate per 100,000 inhabitants/year; ** χ^2 for trends; # Significant rate ratio ($p < 0.05$).

Table 03 shows the mortality rate and mortality rate ratio for breast cancer in the South region by age group between 1997 and 2020. It presents the 95% confidence intervals for 1997, 2008, 2009, and 2020: in the 60–69 group, value of 1.00; in the 70–79 group, values of 1,59 (1997); 1,29 (2008); 1,29 (2009); 1,38 (2020); and in the 80+ group, values of 2,33 (1997); 2,19 (2008); 2,09 (2009); 2,37 (2020).

Table 03: Crude mortality rate and mortality rate ratio for breast cancer in the South region by age group, 1997–2020.

Faixa etária (anos)	Taxa de mortalidade*	Razão da taxa de mortalidade (IC95%)
1997		
60 – 69	46,45	1,00
70 – 79	74,03	1,59(1,34 - 1,89)·
≥80	108,30	2,33(1,89 - 2,86)·
	P<0,001	P<0,001
2008		
60 – 69	49,73	1,00
70 – 79	64,24	1,29 (1,11 - 1,48)·
≥80	108,99	2,19(1,88 - 2,55)·
	P<0,001	P<0,001
2009		
60 – 69	51,18	1,00
70 – 79	66,31	1,29(1,13 - 1,48)·
≥80	107,53	2,09(1,80 - 2,43)·
	P<0,001	P<0,001
2020		
60 – 69	49,11	1,00
70 – 79	68,16	1,38 (1,24 - 1,55)·
≥80	116,63	2,37(2,11 - 2,66)·
	P<0,001	P<0,001

Source: Mortality Information System – SIM / Ministry of Health.

Note: *Mortality rate per 100,000 inhabitants/year; **χ^2 for trends; # Significant rate ratio ($p < 0.05$).

Data in Table 04 present the results of trend analyses in temporal series of mortality coefficients, performed with the Joinpoint program, considering crude and age-adjusted mortality rates per 100,000 inhabitants/year for breast cancer in the South region for the 60–69, 70–79, and 80+ age groups over 1997–2020. These are expressed as APC (Annual Percent Change) values: for women aged 60–69, 1997–2012 (APC = 0.8) and 2012–2020 (APC = −0.8). For women aged 70–79: 1997–2002 (APC = −1.3), 2002–2005 (APC = 5.1), 2005–2008 (APC = −7.4), 2008–2018 (APC = 1.6), and 2018–2020 (APC = −5.3). Finally, for women aged 80 and older, 1997–2020 (APC = 0.1). The Average Annual Percent Change (AAPC) for 1997–2020 was 0.2 for women 60–69; −0.5 for women 70–79; and 0.1 for women 80+.

Table 04 – Joinpoint analysis of crude and age-adjusted mortality rates per 100,000 inhabitants/year for breast cancer in the South region by age group, 1997–2020.

Faixa etária (anos)	Tendência 01		Tendência 02		Tendência 03		Tendência 04		Tendência 05		AAPC#
	Período	APC§	Período	APC§	Período	APC§	Período	APC§	Período	APC§	1997-2020
60 - 69	1997-2012	0,8*	2012-2020	-0,8*							0,2 (-0,1;0,5)
70 - 79	1997-2002	-1,3	2002-2005	5,1	2005 - 2008	-7,4	2008 - 2018	1,6*	2018 - 2020	-5,3	-0,5 (-2,7; 1,8)
≥80	1997-2020	0,1									0,1 (-0,3; 0,6)
Total	1997-2020	0,1									0,1 (-0,1; 0,4)

Source: Mortality Information System – SIM / Ministry of Health.

Note: § Average Annual Percent Change; & Annual Percent Change; † APC significantly different from 0 ($p < 0.05$); # AAPC significantly different from 0 ($p < 0.05$).

DISCUSSION OF RESULTS

According to the Brazilian Society of Oncology and the Brazilian Society of Mastology, breast cancer is the malignant neoplasm that most commonly affects women worldwide.

Knowledge about the incidence and mortality of neoplasms supports public policy structures aimed at early diagnosis and appropriate treatment of these diseases, as well as their associated comorbidities (DUTRA; PARREIRA; GUIMARÃES, 2018).

In recent decades, Brazil has experienced demographic and epidemiological changes that have consequently been reflected in the profile of diseases and conditions, with increased life expectancy. In this context of epidemiological and demographic transition, the Brazilian population shows a high prevalence of cardiovascular and chronic-degenerative diseases, including cancer (AMARO et al., 2013).

One of the most important aspects to be evaluated in Brazil is the distribution of health services across different regions of the country. Deficiencies are related to screening performance, diagnosis, the stage of disease at diagnosis, the treatment methods available, and, as a consequence, survival outcomes (RENCK et al., 2014).

Lifestyle changes over the years have accompanied the rise in cancer incidence and mortality. However, disparities between nations related to socioeconomic and cultural characteristics affect prevention policies, control strategies, and quality of life after diagnosis. While developed countries have reduced cancer incidence and mortality rates, poorer and developing countries—such as Brazil—concentrate 80% of the world's noncommunicable diseases, and cancer will be the leading cause of morbidity and mortality in the coming decades in these regions (BRAY et al., 2012).

CONCLUSION

Southern Brazil accounts for 6,76% of Brazilian territory. It is the country's smallest region, displays high levels of industrialization, and its population has the best quality-of-life indicators in the country.

Nevertheless, the present study demonstrated that increasing age favors a rising trend in breast-cancer mortality in Southern Brazil.

The analysis of breast-cancer mortality among elderly women in Southern Brazil from 1996 to 2020 reveals a worrisome and persistent scenario. Despite advances in medicine, awareness campaigns, and expanded access to early diagnosis, death rates remain high,

especially among women over 70. This picture reveals not only gaps in the effectiveness of public policies targeting elderly women's health, but also the urgent need for more targeted strategies that consider the specificities of this age group.

It is essential that health managers intensify prevention, screening, and treatment actions with a focus on regional equity and strengthening primary care. In addition, investment in continuing education for health professionals and encouragement of research on breast cancer in aging populations may contribute significantly to reversing this situation.

Therefore, this study reinforces the importance of a multidisciplinary and integrated approach that values aging with dignity and promotes the reduction of inequalities in cancer care in Brazil.

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SOCIAL MOVEMENTS AND THEIR CONTRIBUTION TO THE EMANCIPATION OF THE SOCIAL ACTORS INVOLVED

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ABSTRACT

This article aims to analyze discussions about social movements in education and their change in approach over the course of the 20th century, with an emphasis on the more active participation of the social actors involved, valuing orality and local and regional experiences for decision-making. It addresses the struggle for recognition and autonomy of Indigenous peoples, Black people and Afro-descendants, women, and the rural population, thereby contributing to social visibility provided by liberating knowledge. It presents criticism aimed at overcoming historical processes inherited from coloniality, supported by access to education with more participatory actions for decision-making that meets local and regional aspirations. It discusses the overcoming of historical processes of coloniality in Latin America and Brazil promoted by a change of focus toward participatory action research. The study was developed through bibliographic analysis of contemporary authors who discuss social movements and education.

Keywords: Social Movements. Education. Coloniality. Political Emancipation. Rural Education.

INTRODUCTION

The objective of this study is to analyze the contribution of social movements to processes of political and social emancipation through education, supported by the pedagogy of active listening that mediates the aspirations of the communities served, in pursuit of greater participation and belonging in contemporary society.

The discussion promoted by social movements underwent paradigm shifts throughout the 20th century, when governments were dictatorial and the relationship was tense, requiring greater attention to the causes of citizenship and political participation. With the shift to democratic governments and economic neoliberalism, the agenda came to demand the correction of regional socioeconomic inequalities. The alternative put forward by social movements was closer engagement with governments to establish partnerships that would support education and subsequent entry into the labor market. The criticism of this approach lies in the fact that it does not provide the clarification necessary for an appropriate critical reading of the reality of those involved, serving only to reproduce the historical process of coloniality. Another approach within social movements is one that contemplates the active participation of those involved, strengthened by active listening and an understanding of their true local and regional situation. This approach is considered quite appropriate because it mediates the community's aspirations by creating joint alternatives to foster education that transforms and liberates.

DEVELOPMENT

Emancipation from Coloniality

According to Streck and Adams (2012), Latin America has experienced a process of coloniality despite the independence processes of Spanish-speaking countries and Brazil. How are social movements acting to overcome the dichotomy between "developed" and "developing"? European countries' hegemony has long dominated the autonomy to develop social proposals for education, maintaining educational policies that do not meet the aspirations of emancipation among the economically disadvantaged population.

"In this perspective, we propose to set forth an epistemology of the South that grounds research capable of empowering emancipatory movements so that they can better fulfill their historical role. Increasingly, knowledge and technology are decisive components in the direction societies take. Therefore, as education agents, it is essential that we seek clarity regarding the foundations upon which we anchor our strategies to overcome the coloniality of knowledge, of power, and of being." (Streck & Adams, 2012, p. 245).

According to Streck and Adams (2012), during the 20th century there was a significant shift in the understanding of social movements. Attention turned to the importance of collective participation in drafting comprehensive proposals for education, steering them toward more participatory and independent endeavors. The authors mention social research efforts led by the sociologist Orlando Fals Borda in Colombia and Paulo Freire in Brazil—both focused on action that leads participants to becoming aware of their reality. "All share, with distinct roles, the protagonism in unveiling and pronouncing the world." (Streck & Adams, 2012, p. 246).

The collective began to take on greater prominence in South America, with an emphasis on orality. Memory came to be sought out and valued in its multiple differences and in the ways communities experience it. "[...] systematization emphasizes the role of collective memory, recognizes the complexity of social phenomena, and values the diversity of languages used to name and interpret reality." (Streck & Adams, 2012, p. 247).

This differentiated approach in social research meets Latin America's desire for independence from the vestiges of coloniality that still exist on the continent. The nuances of social actors committed to achieving

independence in educational knowledge include Indigenous peoples, Black people, and women. The authors cite the important contribution of Nísia Floresta (1810–1885), a pioneer of feminism in Brazil, and the inclusion of women in the scientific sphere.

"It is within these spaces of struggle within social movements that we perceive a nexus between participatory research methodologies, the construction of paths to overcome coloniality through the development of transformative actions, and the practices of popular education. How can research be enhanced in the current context of collective actions with an emancipatory character?" (Streck & Adams, 2012, p. 250).

During the dictatorial governments that afflicted Latin America in the 20th century, social movements had an autonomous political character that sought to confront their respective governments in pursuit of social justice. In the 21st century, we see a rapprochement with democratic governments.

"The centralized, bureaucratic, and explicitly authoritarian State was replaced by the neoliberal model (blended with elements of the welfare state), which decided to share with society the responsibility of caring for the social wounds left by the exclusionary dynamics of the capitalist market." (Streck & Adams, 2012, p. 251).

There is a strong change in how social movements operate, driven by neoliberalism, which differs from the pioneering activities of earlier social movements.

"In our understanding, participatory research brings together the favorable conditions to remain a practice that contributes to strengthening the perspective of decoloniality of power, knowledge, and being, and to building emancipatory processes. For that, it is necessary to recover and rewrite—that is, systematize and analyze—the vast range of experiences in order to expand the horizon of concrete possibilities, taking into account the potential present in these practices and identifying within them the tendencies of an emancipated future." (Streck & Adams, 2012, p. 253).

Are We Copying or Recreating?

Eggert (2016, p. 19) begins by challenging Streck and Adams's (2012) analysis when they assert that social actions aimed at the autonomy of the subjects involved—through pedagogy—are merely copies of the colonial legacy existing in Latin America. Eggert counters by arguing for the importance of copying as a compass for the development and improvement of local particularities.

"I advocate this understanding of copying for pedagogy and observe that, for some people, the idea and the word copy provoke astonishment and rejection. Even so, I identify the argument for the reality and possibility of copying. Copying is nothing more than one of the techniques in the learning process. And technique is the work of bringing hand and thought together to solve a problem, a need that generates work and that, in the artisan's hand, leads to refinement." (Eggert, 2016, p. 19).

We can define two ways of transmitting accumulated knowledge—formally or informally—and we can assert that transmission is a copy of what has been discovered and is being taught, whether through school, in social movements, or by collective memory. In this way, that knowledge will be re-signified to meet local aspirations.

"Is the transmission of knowledge a kind of teaching of what already exists and, therefore, a copy? We need to ask ourselves about this and consider to what extent we copy to remain subservient or whether, ambiguously, we copy to survive and then, a little further on, free ourselves from the copy and recreate other paths?" (Eggert, 2016, p. 19).

The feminist movement's analysis of women's living conditions and access to education—framed by submission to masculinity inside and outside the home, unequal wages, and a subordinate and condescending social treatment; and Black women, who are neglected for being both

women and Black—raises uncomfortable questions and opened space for women's visibility and their recognition as autonomous, participating social subjects, whether through learning in social movements or at school. Schools have felt the impact of the demands of social movements, altering their curricula to include the history of Indigenous peoples, Africans and Afro-descendants, thereby promoting the sense of belonging among the popular classes in the teaching–learning process.

"Today, after so many years of struggle for quality public schooling, we are still hopeful and see many things happening. In no way do we have the sense of a mission accomplished. We know that we live in a different time, unlike that in which only white men could vote—those who owned land and those who could read." (Eggert, 2016, p. 21).

Undergraduate Degree in Rural Education (LEdoC)

The right to education is one of the basic conditions of society—everyone should be served from basic education through higher education. Are basic and higher education equally available in urban and rural areas? Rural populations have faced the closure of classrooms, forcing them to travel far from their homes to urban areas to continue their studies. The operation of multi-grade classrooms contributes to widening students' learning gaps; school curricula are not designed to serve rural populations with the pedagogy of alternation in all regions where it is necessary to meet this local specificity. Education does not always serve rural education in the countryside.

Social movements have contributed to the protagonism of rural social actors in achieving their political and educational autonomy.

"In this context, the establishment of Undergraduate Degrees in Rural Education at public universities represents an epistemological and political effort by peasants, organized in social movements, to build a rural education policy across Brazil's entire rural territory. Progressively, it restores the centrality of the right to education in the context of the rural basic school and in the struggle for access to higher education." (Batista & Silva, 2024, p. 3).

The aim of Batista and Silva (2024) was to analyze the professionalization of rural teachers and understand how much this education aligns with and meets the aspirations of daily rural life.

"Thus, inspired by the philosophical and educational principles that guide rural education, we feel compelled—based on experiences shared with students in the Undergraduate Degree in Rural Education (LEdoC) at the Professora Cinobelina Elvas Campus (CPCE), Federal University of Piauí (UFPI), and with peasants from rural communities located in the south of Piauí—to think about and problematize the professional and training context of teachers for work in rural basic schools and in non-school settings." (Batista & Silva, 2024, p. 3).

Rural education should address the realities that peasants face and promote the effectiveness of their political and social autonomy. Thus,

"Rural education, offered in rural schools from the perspective of the paradigm of/within the countryside, seeks to value peasant culture as well as the education of children, youth, and adults in accordance with the reality of the rural environment, based on contextualized teaching. Re-signifying the meaning of rural basic schooling—now underway—requires the political and pedagogical rejection of multi-grade schools." (Batista & Silva, 2024, p. 6).

It is by sharing knowledge and the aspirations of rural populations—regarding their needs for continuing into higher education—that degree programs were conceived and defended through the action of social movements.

FINAL CONSIDERATIONS

Social movements, in their multiple roles within civil society, have contributed—and continue to contribute—to the resumption of

political and social emancipation of the actors involved in both urban and rural areas. These movements are not static; on the contrary, they follow all the historical dynamics of the societies in which they are embedded. We observe a change in how proposals are put forward to better meet the aspirations of the communities involved.

The concern with overcoming processes of coloniality—bequeathed by Eurocentric hegemony present in Latin America and Brazil—has led social movements to look at and value local and regional cultures and experiences, thereby valuing orality, the knowledge of Indigenous peoples and original peoples, Africans and Afro-descendants, women, and rural populations; and to establish partnerships with democratic governments in order to promote voice, visibility, and belonging for these social actors in society.

We can identify two important paradigm shifts in education through Laws 10.639/03—which mandates the teaching of Afro-Brazilian and African history and culture in basic education—and 11.645/08—which mandates the inclusion of Indigenous themes in basic education. These are actions that move us toward otherness.

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PLAYFUL TRAINING IN PEDAGOGY: A TRANSFORMATIVE PILLAR FOR THIRD MILLENNIUM EDUCATION

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ABSTRACT

This article discusses playful training in pedagogy programs as a fundamental element for establishing a new educational paradigm aligned with the demands of the third millennium. Based on a qualitative study conducted with graduating students from the Frassinetti College of Recife (FAFIRE), the aim is to understand how playfulness, experienced during initial training, influences the development of a more sensitive, critical, and creative teaching practice. The text delves deeper into the theoretical framework of playfulness, engaging with neuroscientific, philosophical, and pedagogical concepts. It also presents a thorough analysis of empirical data, revealing the potential and limitations of playful training in the context of private higher education. It concludes that playfulness, when treated as a formative and epistemological axis, transforms not only pedagogical practices but also the educator's way of being, promoting a more humanizing and emancipatory education.

Keywords: Teacher training. Playfulness. Pedagogy. Pedagogical practice. Education in the third millennium.

INTRODUCTION

Twenty-first-century education demands new understandings of teaching and learning. In a world marked by technological advances, cultural shifts, and socio-environmental challenges, teacher training needs to be rethought from a perspective that transcends the limits of instrumental rationality and technocratic pedagogy. In this context, playfulness emerges as a fundamental formative principle, capable of articulating reason and emotion, body and mind, content and sensitivity.

Playfulness cannot be confused with mere recreation. It is an existential and methodological approach that allows students to experience learning with pleasure, creativity, and engagement. It is in this sense that it becomes urgent to reflect on the place of playful training in pedagogy programs, especially in private higher education, where a commercialized logic of education often prevails.

This article is the result of research carried out with students completing the pedagogy course at FAFIRE, in Pernambuco , with the aim of analyzing the need and importance of play in teacher training in the expectation of changes in pedagogical practice. The study, of a qualitative nature and hermeneutic-dialectical approach, aimed to analyze how playfulness was understood, experienced and projected by the participants in their future teaching activities.

Throughout the history of education, playfulness was long relegated to the recreational realm, associated with childhood or informal learning. However, in recent decades, the concept has been redefined, assuming a central position in debates on integral human development.

Brazilian legislation enacted the Law of Guidelines and Bases of Education, Law 9.394/96, which expanded the scope of action for education professionals and the social dynamics themselves, mobilized by the socio-cultural transformations that have characterized education globally, and place as a requirement a solid and contextual training that meets the educational needs of contemporary times.

Within this framework, the proposal for pedagogy courses seeks to consolidate the playful educational proposal of the third pillar of 21st-century education, in order to guarantee the insertion of professionals in the job market in order to provide them with training that provides cognitive, affective and emotional skills that ensure the mastery of knowledge coherent with the demands of professional profiles that meet the challenges, in the face of social transformations, which requires constant professional qualification.

In the context of teacher training, playfulness represents a break with rigid pedagogical models centered on the mechanical transmission of content. It proposes a pedagogy of the sensitive, the symbolic, listening, and interaction, in which knowledge is constructed through meaningful, pleasurable, and collaborative experiences.

Playfulness is any activity that provides pleasure when performed. Through it, children learn to coexist, to win and lose, to wait their turn, to deal with frustration, and to understand and explore the world. It is a practical tool for stimulation, and can be used at any stage of development . It is a global form of expression that encompasses all domains of nature. It offers significant physical, intellectual, social, and educational benefits for children. However, playfulness is integral to the overall educational process, and the objective of education lies not only in the meaning of the word "educate," but also in how it is done, in the expressions, in how thoughts are developed, in the types of distinctions that emerge, and in the moral and ethical criteria that underlie the path to be followed.

The basis of playfulness is supported by various fields of knowledge. In the field of neuroscience, studies indicate that the right hemisphere of the brain, associated with emotion, imagination, intuition, and sensitivity, plays an essential role in the processes of learning and development. The activation of

this hemisphere, often neglected by traditional pedagogical models, is directly linked to playful experiences. For Santos (2010, p. 13), "Being playful, therefore, means using the right hemisphere more and, thereby, giving a new dimension to human existence." This hemisphere is responsible for creativity and pleasure, in addition to exploring fundamental factors that make playfulness possible. flows naturally. Therefore, it needs to be encouraged by everyone involved in the training process.

Thus, playful training is not limited to acquiring techniques for using games or play in the classroom, but involves a paradigm shift. It involves training educators capable of developing a playful approach to life, knowledge, and relationships with others—an approach that combines ethical commitment, creativity, and critical thinking.

In pedagogy, scholars such as Kishimoto, Negrine, Luckesi, and Brougère advocate playfulness as an emancipatory pedagogical practice. Kishimoto understands play as a cultural language, while Brougère proposes a sociological approach to play. Luckesi, in turn, emphasizes the aesthetic dimension of playfulness, conceiving it as a way of living with intensity and authenticity. These contributions reinforce the need for teacher training that goes beyond the instrumental, recognizing the educator as a creator of playful experiences. He proposes that playfulness is not synonymous with fun or play, but rather an experience of wholeness and mindfulness, experienced by the individual in their entirety—body, mind, and emotion. Inspired by authors such as Ken Wilber and David Boadella, the author advocates a comprehensive view of the human being, which articulates four dimensions of existence: individual interior (I), collective interior (We), individual exterior (He), and collective exterior (They). In this framework, playfulness is situated in the sphere of the "I" — the aesthetic and spiritual dimension of consciousness.

In short, we highlight one of the main merits of playfulness as a fully subjective experience, which can only be authentically experienced when the subject surrenders to the action with involvement and presence. The same activity can be playful for one person and not playful for another, depending on each person's life history, emotional state, and existential openness. Thus, playfulness is more of a "state of being" than a "type of action."

METHODOLOGY

The research underlying this study was developed using a qualitative, exploratory, and descriptive approach. Its goal was to understand the importance of playful learning in pedagogy programs, based on the perceptions of graduating students at a private higher education institution in Pernambuco. This approach was chosen because it allows for the appreciation of the participants' subjective experience, interpretations, feelings, and representations of the educational process.

The epistemological framework supporting the research is hermeneutic-dialectical in nature, allowing the interpretation of participants' discourse from a sensitive, critical perspective, open to a plurality of meanings. The analysis aims to go beyond description, seeking to understand the meanings attributed to play and their implications for teacher training and future practice.

The data collection tool used was a focus group, conducted with students graduating from the pedagogy program at Frassinetti College in Recife (FAFIRE). The focus group was chosen because it facilitated collective listening, interaction among participants, and the emergence of spontaneous and contextualized discourse. The session was recorded, transcribed, and analyzed based on content analysis and thematic interpretation.

Data analysis was organized into thematic blocks, constructed from the recurring ideas, feelings, and reflections expressed by the students. Each block highlighted central aspects of playful training, such as the conceptual understanding of play, experiences during the course, perceived training gaps, and projections for professional practice. This methodology

fostered the emergence of a critical and proactive perspective on the importance of playfulness in teacher training for the third millennium.

ANALYSIS OF RESULTS

Data collected through a focus group with students graduating from the FAFIRE Pedagogy program were analyzed using content analysis, based on a hermeneutic-dialectical perspective. The analysis allowed the discourse to be organized into thematic blocks that reveal perceptions, experiences, and projections related to playful training during undergraduate studies and its implications for future teaching practice. The main findings are presented below.

Students' perceptions of playfulness

The participants demonstrated an understanding of playfulness as an experience that goes beyond mere play. For them, playfulness is related to the pleasure of learning, creativity, and a lighthearted approach to the educational process. Some reported that, during the course, playfulness was addressed sporadically, in specific disciplines, without systematic articulation with teaching practices. Even so, they affirmed their recognition of its importance as a driving force for meaningful learning.

Training experiences and playful practices

The students reported that their most memorable experiences involving play occurred during supervised internships, extension projects, or extracurricular activities. They highlighted the lack of playful experiences in the regular curriculum, which created uncertainty about the practical application of playful activities in the school environment. At the same time, they expressed enthusiasm when recalling situations in which they were able to role-play, create games, or tell stories, noticing the positive impact of these strategies on children's learning.

Educational play activities include a variety of pedagogical experiences that integrate games, play, art, and body expression into the teaching process. They must be intentional, planned, and integrated into an educational project that respects the educational objectives and the student's comprehensive development.

Professional projections: playfulness as an emancipatory practice

Despite the gaps in their training, the students expressed a desire to incorporate play into their future teaching practices, recognizing its formative and humanizing value. For them, being a playful educator means being sensitive, creative, welcoming, and open to dialogue. They emphasized that play is not just a teaching tool, but an ethical and existential stance toward the act of educating. They also advocated for the need to expand the presence of play in pedagogy courses, with specific disciplines, active methodologies, and integrative projects.

When incorporated as a cross-cutting axis of the pedagogy curriculum, playfulness enables more meaningful training that respects the rhythms and uniqueness of the students. It allows future teachers to experience the joy of learning and recognize the value of listening, play, art, and dialogue as legitimate forms of knowledge construction.

Analysis of the results reveals that, although the students recognize the value of play and have experienced some meaningful practices, there is still a gap between institutional discourse and actual educational practice. There is consensus among the participants regarding the urgent need for training more aligned with the challenges of the third millennium, preparing educators capable of integrating reason and emotion, knowledge and sensitivity. Playfulness, in this sense, emerges as a possible and necessary path toward building a more humanized, critical, and transformative pedagogical practice.

CONCLUSION

The data reveal that, although playful learning was not treated as a central focus of the curriculum, the students perceived it as essential to their teaching practice. This perception aligns with the contributions of Negrine (1994), who highlights playfulness as a constituent element of the learning process, necessary for the development of sensitivity and pedagogical creativity.

The participants' statements also confirm Marli Pires dos Santos's (2000) analysis, which states that playfulness cannot be treated merely as a technique, but as a philosophy of education and a life stance toward teaching. For them, being a playful educator implies developing empathy, listening, and presence—elements that were often not effectively addressed during training.

Luckesi (1994) reinforces this view by considering playfulness as an aesthetic experience that mobilizes the individual as a whole. This idea is evident in the students' statements, when they state that the playful moments of the course were the most memorable and meaningful, as they allowed them to feel welcomed and motivated. Thus, the empirical results align with the theoretical foundations discussed in the theoretical framework, consolidating the case for playfulness as a structuring axis of teacher education.

The analysis developed in this article highlights the importance of playful training in pedagogy courses as a structuring element of a more sensitive, creative, and humanizing teaching practice. Throughout the theoretical and empirical journey, it was possible to understand that playfulness, when treated as a formative pillar, enhances the educator's integral development and expands the students' learning possibilities. More than a methodology, playfulness represents an ethical and existential stance toward the act of education, connecting emotion, reason, body, and culture in a meaningful educational experience.

The results obtained from students graduating from the FAFIRE Pedagogy program reveal a desire for a more experiential education, consistent with the principles of playfulness. Although they experienced specific moments of playful practices, the participants highlighted curricular and methodological gaps that limit the consolidation of a playful approach in professional practice. These data reinforce the need to reconfigure teacher training curricula, with greater emphasis on art, play, corporeality, and sensitivity as essential dimensions of education.

In the third millennium, characterized by complexity, instability, and uncertainty, educators must be prepared to deal with multiple languages, realities, and subjectivities. Teacher training must, therefore, promote the development of emotional, social, and creative skills—skills that are at the heart of playfulness.

When incorporated as a cross-cutting axis of the pedagogy curriculum, playfulness enables more meaningful training that respects the rhythms and uniqueness of students. It allows future teachers to experience the joy of learning and recognize the value of listening, play, art, and dialogue as legitimate forms of knowledge construction.

Therefore, to respond to the educational challenges of the third millennium, it is urgent to invest in the training of educators capable of integrating academic knowledge with the aesthetic, symbolic, and affective experience of learning. Playfulness, as a science and pedagogical practice, offers fertile paths to an emancipatory, democratic, and comprehensive education. Educational institutions must be ethically committed to making play a permanent and structuring pillar of their education.

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NEUROEDUCATION: NEUROSCIENCE TO ADD VALUE TO EDUCATIONAL RESEARCH THROUGH TECHNOLOGY

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ABSTRACT

This article is about neuroeducation, within the context of neuroscience to add value to educational research through technology. In an article published in the Dana Foundation's prestigious virtual space, Hardiman and Denckla (2009) refer to the relevance of what they call the science of education, bringing to light an approach that has been consolidating in recent years, mainly in the United States, through a new multidisciplinary field of knowledge and professional practice in the areas of teaching and educational research, Neuroeducation. The aim of this article is to summarize points that have already been consolidated in relation to Neuroeducation, as well as to reflect on the urgency of disseminating its potential to support educational research based on scientific methodology, involving not only teaching-learning practices and methods from different areas of knowledge, ages and professional profiles, but also to reflect on the possible impacts of contemporary educational technologies on these practices and methods. It was also noted that such educational products need to take into account the integrity of the content; the pedagogical intentions for which they are intended; the cognitive support to fulfill these intentions; and the specific language of the media or technological solution chosen for the function.

Keywords: Neuroeducation. Neuroscience. Educational research. Technology.

INTRODUCTION

In an article published in the prestigious virtual space of the Dana[1] Foundation, Hardiman and Denckla (2009) refer to the relevance of what they called the science of education, bringing to light an approach that has been consolidating in recent years, mainly in the United States, through a new multidisciplinary field of knowledge and professional activity in the areas of teaching and educational research, Neuroeducation. According to these authors, the next generation of educators will necessarily need to take into account the knowledge generated by Neuroscience research when planning and developing their teaching and learning projects.

These topics have been addressed in a structured manner in the general training of designers (especially in interface design and virtual design) and, more recently, through the creation of a new professional area, instructional design (Filatro, 2008). However, they may be included in the training of teachers and all other professionals integrated into multidisciplinary teams producing educational materials, precisely because they imply mastery of knowledge from multiple areas of cognition, integrated with the content in question.

The objective of this article is to summarize already consolidated points regarding Neuroeducation, as well as to reflect on the urgency of disseminating its potential, to support educational research based on scientific methodology, involving not only teaching-learning practices and methods, from different areas of knowledge, ages and professional profiles, but also to reflect on the possible impacts of contemporary educational technologies on these practices and methods.

About neuroeducation: emergence and relevance

Defended in 2008 at Capella University/ USA, Tracey Noel Tokuhama-Espinosa's doctoral thesis (2008), under the supervision of Elena Kays, will be considered in this article as a kind of founding document, since it brings together not only the foundations of Neuroeducation, since its emergence, but also exhaustively describes the set of bibliography already existing on the subject, in addition to the main problems, foundations and principles of the new area of knowledge.

In an attempt to avoid an equally exhaustive repetition of the researcher's work, some of her information is summarized, highlighting, like Tokuhama-Espinosa and authors cited by her, the importance of approaching the subject in a cautious and realistic manner, without intending to establish definitive relationships and conclusions about research results and didactic-pedagogical solutions.

Topics, foundations and principles of neuroeducation

Among the topics cited by Tokuhama-Espinosa (2008), based on his research in the existing bibliography, which delimit possible approaches for research in Neuroeducation, are the various techniques for capturing neuronal information, through electrical signals or brain imaging as an instrument for observing learning4, neurogenesis and plasticity; theories of consciousness and intelligence, neuroethics; differences in learning; and body-mind relationships (sleep and physical exercise, among other items in this Regard).

The topics cited by Tokuhama-Espinosa (2008), based on her research in the existing bibliography, which delimit possible approaches for research in Neuroeducation, are the various techniques for capturing neuronal information, through electrical signals or brain imaging as an instrument for observing learning4, neurogenesis and plasticity; theories of consciousness and intelligence, neuroethics; differences in learning; and body-mind relationships (sleep and physical exercise, among other items in this regard).

She also lists what would be 14 basic principles, to be used as a guiding thread for Neuroeducation, around which premises of the three structuring areas (neuroscience,

psychology and education, according to the author) would be articulated, not necessarily in hierarchical order of relevance:

Students learn better when they are highly motivated than when they are unmotivated:

a. Each brain is unique and uniquely organized;

b. Brains are specialized and are not equally good at everything;

c. The brain is a complex, dynamic system that changes daily through experience;

d. Brains are considered 'plastic' and continue to develop throughout life;

e. Learning is based in part on the brain's ability to self-correct and learn from experience, through data analysis and self-reflection;

f. The search for meaning is innate in human nature;

g. The search for meaning occurs through 'patterning';

h. Learning is based in part on the brain's ability to detect patterns and make approximations to learn;

i. Emotions are critical to detecting patterns;

j. Learning is based in part on the brain's ability to create;

k. Learning is enhanced by challenge and inhibited by threat;

l. The brain processes parts and wholes simultaneously (it is a parallel processor);

m. Brains are designed for fluctuations rather than constant attention;Aprendizado envolve tanto atenção focada quanto percepção periférica;

n. The brain is social and grows through interaction (as well as personal reflection);

o. Learning always involves conscious and unconscious processes;

p. Learning is developmental;

q. Learning recruits the entire physiology (the body impacts the brain and the brain controls the body);

r. Different memory systems (short-term, working, long-term, emotional, spatial, habit) learn in different ways;

s. New information is stored in various areas of the brain and can be recalled through different access routes;

t. The brain remembers best when facts and skills are integrated into natural contexts; and

u. Memory + Attention = Learning6 (Tokuhama-Espinosa, 2008: 79,80.

Among the final findings of Tokuhama-Espinosa's research are some that justify the relevance and urgency of consolidating the new research area, pointing to the need for dialogue between science and its application, in a justified manner and based on observable evidence:

> (...) while thousands of studies have been devoted to explaining various aspects of neuroscience (how animals, including humans, learn), only a few neuroscientific studies have attempted to explain how humans should be taught in order to maximize learning. (...) of the hundreds of dissertations devoted to 'brain-based teaching', or 'neuroscientific methods of learning', in the last five years, most have documented the application of these techniques, rather than justifying them. (Tokuhama-Espinosa, 2008: 117).

The challenge posed by Hardiman and Denckla (2009) of building bridges for dialogue that can align research methodologies and epistemologies that are diverse and sometimes so antagonistic that they make publications by authors from one area in another unfeasible still remains open.

Produce educational technology with neuroeducational foundations

Moving from the general context of Neuroeducation to the practical needs of contemporary researchers, especially those involved in teaching and learning in scientific and technological areas, such as Engineering, health sciences and other areas of higher education, a universe of questions arises throughout the decision-making processes regarding the best pedagogical practices, as well

as the foundations for producing the best educational technology resources.

One can also think of scientific foundations for pragmatic decision-making, in the production of a simple set of slides or an educational video, regarding the use of one or two colors, a font or its size, a background, a texture, a movement, or other items that can alter students' perception or attention. Do such micro-decisions, taken throughout the process of producing educational technologies, have a positive or negative impact on attention, content apprehension, short/long-term memory, consolidation, recall, motivation, reasoning or any of the other items that make up that student's interaction with the content?

Understanding a framework of multiple needs that structure the reality of contemporary educational ecology, it is suggested, then, that the research area of Neuroeducation, if implemented in Brazil, should not be limited to integrating the knowledge of pedagogues, neuroscientists and psychologists, but of all other areas that constitute the so-called Cognitive Sciences6, as well as with the areas of knowledge of Communication and Information Sciences, all of them intertwined in the technological-cognitive-informational-communicational ecology of the Internet, classroom, entertainment and interaction, learning and application, production and reception, among many other characteristics, both opposite and complementary, that characterize education in the 21st Century.

Just as there is no possible return of humans to the world of wireless telegraphy, it is also not plausible to assume that teaching-learning processes will once again depend solely on a good theory or a good blackboard, even if they are integrated with a good neuroscientific foundation. In an attempt to substantiate research on educational technologies applied to scientific and technological teaching, questions have been raised based solely on the determination of a desirable pedagogical model, constructivism, and on the criticism of other models (Schnaid et al., 2003, 2006; Bonini-Rocha et al., 2008b).

It was then realized the relevance of identifying the cognitive and motivational needs of each audience, each area for which the materials and pedagogical projects are intended (Timm, 2005, Timm et al., 2009). It was also realized that such educational products need to account for the integrity of the content; the pedagogical intentions for which they are intended; the cognitive support to fulfill said intentions; and the specific language of the media or technological solution chosen for the function.

Some of these issues were partially synthesized in the form of questions (Timm et al., 2007), some of which are listed below, with the aim of ratifying the relevance of establishing an area such as Neuroeducation, as a promising multidisciplinary territory to qualify contemporary educational research:

The art of these issues was partially synthesized in the form of questions (Timm et al., 2007), some of which are listed below, with the aim of ratifying the relevance of establishing an area such as Neuroeducation, as a promising multidisciplinary territory to qualify contemporary educational research:

- Does hypermedia-based educational technology, which contains representations (verbal/non-verbal), (...) have an equal impact on students in the humanities, biological sciences and exact sciences? Yes/no/how and why? (...)

- How – and to what extent, and under what specific conditions – can the presence of less or more intelligent ingredients in the computer-based educational ecosystem contribute to overcoming resistance to learning, related to: a) dyslexia or aphasia; b) writing difficulties; c) difficulties in calculating operations?

- (...) - How – and to what extent – does learning new representation languages affect the teacher's ability to communicate with heterogeneous groups of students?

- How – and to what extent – can the teacher's increased (or not) capacity interfere in overcoming students' resistance to learning to think according to the reasoning characteristic

of each discipline/profession/area of knowledge?

- Among the variables involved in human cognition, which (and how and to what extent) are most affected by the computing environment (and its different possibilities), in each discipline/profession/area of knowledge?

- What are the ethical limits within which cognitive technology can be considered a cognitive support (educational software, chip-based prosthetics for special needs, etc.) or just a enhancer (intellectual doping) with a view to increasing competitiveness in normal individuals? (Timm et al., 2007).

In addition to these questions, there are others that are beginning to form part of the daily teaching routine, of discussions at events and even of the anxieties of those who need to know whether a video, for example, has the same educational potential as a face-to-face class. Answering these questions – and many others that are beginning to form part of the daily teaching routine – may be part of the delimitation of the territory of Neuroeducation, but it is certainly far from covering it in its entirety.

METHODOLOGY

This paper presents bibliographical information about a new paradigm for educational research, which foresees the integration of research findings from Neuroscience with the need to identify the best ways to teach, in order to enhance learning outcomes. The foundation of this new interdisciplinary area of study is to provide a scientific character to educational research, establishing a theoretical and methodological framework so that the best pedagogical practices can be tested.

Neuro-educational research would encompass a vast field of investigation – of quantitative, qualitative, empirical and even ethnographic natures – including topics such as, for example, learning differences between children, young people, adults, the elderly, as well as between students from different areas of knowledge5, and the impact of different audiovisual technologies on each of them (Ribeiro et al., 2005). Or, even, the differences in teaching-learning involved in the observation that there are different types of theoretical, practical, technical, applicable, memorizable5 knowledge, etc., each of them adapting, perhaps, to one type or another of technological solution (when and why should one choose a video, a game, a dynamic research collection or a simulation, for example?).

Furthermore, it contextualizes ideas and productions with this focus, carried out in recent years by a group of researchers linked to the Federal University of Rio Grande do Sul and other institutions in the region and suggests that this new area can also guide the development and research on the use of educational products, especially those that use computerized technologies, such as multimedia, videos and integrated projects with multiple resources and functions. © Cien. Cogn. 2010; Vol. 15 (1): 199-210.

RESULTS AND DISCUSSIONS

From a philosophical point of view, what has been conventionally called modern thought, in the area of the theory of knowledge, or epistemology, begins with Kant (1724-1804), who recovers Descartes (1596-1650) idea of the epistemic subject (the subject that knows), but frees it from metaphysics, by treating the human mind as an instrument for synthesizing and organizing data obtained through the senses, based on schemes, forms and logical categories that are part of this very mind. A conception so innovative, in its time, that to this day it is considered the "Copernican revolution of philosophy" (Martini, 2006).

The logical evolution of this innovative thought by Kant, which directly relates the understanding of the functioning of the mind with the production of knowledge, could not fail to be due to its intersection with scientific methodology: the observation of the biology of the genesis of knowledge in the brain-mind of

humans, in this case, children, as done by the Swiss researcher Jean Piaget (1896-1980).

Possibly, Piaget (1973, 1987) was the great pioneer of this qualitative transformation in the approach to human learning (from speculation to empirical research), when describing, through what he called genetic epistemology, the formation of human thought and knowledge, through mental structures, of increasing nature and complexity, throughout the entire learning process and, therefore, throughout human life.

Observing his own children initially and then expanding to a larger number of children, Piaget was courageous and visionary, in identifying stages of evolution of a learning process that begins with the operation of the world through concrete approach strategies and moves, throughout the maturation of the child and young person, towards abstract logical-formal mental constructions that are more capable of processing the demands of complex knowledge.

Piaget was certainly a genius of synthesis, when he described a basic module through which this permanent learning process occurs in the human mind: assimilation (of new information), accommodation (of new information in relation to the cognitive base previously structured in the individual) and equilibration (a rearrangement of cognitive structures, absorbing the transformations caused by new information in contact with previous information). His observation can certainly be considered a correct model - although quite simplified and certainly incomplete - of what would be a basic process of acquisition, consolidation and recall of memories, in general, seen through the eyes of a neurophysiologist, which could not be different, since Piaget was a biologist, with an eye and reasoning trained by scientific methodology.

Piaget's observation spread throughout the world and supported complex pedagogical interpretations[2], which ended up structuring an important paradigm of thought disseminated today regarding teaching-learning processes, constructivism (Martini, 2006, Bonini-Rocha et al., 2008b). Inspired by Piaget and many of his followers, constructivism preaches, with undeniable reason, the relevance of the learner's action in the process of constructing his own learning.

Based on the understanding of these new demands, intensified by the massive use of new educational technologies, as well as by the evidence of different cognitive, affective, motor and cultural needs of each society and each area of knowledge, the authors intend throughout this text, simultaneously:

- Point out the opportunity to sow academic foundations in Brazil for Neuroeducation, as a territory for multidisciplinary and dynamic research on the challenges that are part of the formal and informal teaching-learning processes;

- Expand the possibilities opened by the multidisciplinarity of this new area of research, towards the set of Cognitive Sciences and the areas of Communication and Information Sciences, to structure a theoretical framework capable of supporting research and the production of efficient and effective educational technologies, which can make the teacher's pedagogical intentions viable, in an organic and ergonomic way to the cognitive processes of each student.

This will be done below, based on a quick bibliographic review about Neuroeducation, commented within the scope of the article's objectives and followed by a reflection on possible contributions of this scientific and multidisciplinary perspective to meet a new and equally intense need: to train good planners, producers and users of educational technologies.

CONCLUSION

Perhaps as a consequence of the literal interpretation and generalization of Piaget's findings to all types of audiences and areas of knowledge; and probably also as a consequence of the lack of dialogue between these generalizations and scientific thought (in this

case, with Cognitive Neuroscience, which has evolved significantly in recent decades), it is suggested that constructivism alone does not cover all the needs of contemporary educational research, especially those in higher education in scientific and technological areas, which are currently struggling with the demands of countless variables and the complexity already glimpsed regarding the human information processing system. These limitations may also be related to the fact that most higher education students have already left adolescence, the age range up to which Piaget's research focused with greater emphasis.

It is suggested, however, that the emergence of new educational technologies, their inexorability and their enormous potential to impose updates on new needs and ways of teaching and learning is the opportune moment for educators of all backgrounds to understand the metaphor of the human brain itself, to support the production of knowledge about learning, by processing diverse information, in diverse areas, integrating them through third and fourth areas, in which it will be able to produce meaning and complexity compatible with the knowledge necessary for the student and educator of the 21st century.

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NOTES

1. The Dana Foundation (http://www.dana.org) is a private American philanthropic organization with headquarters in New York and Washington, DC, whose interests focus on brain science, immunology, and arts education. Charles A. Dana, an industrialist, philanthropist, and legislator, served as president of the institution from 1950 to 1966, defining its main programs, which include publications, events, research support, and the dissemination of information about these fields. areas.
2. It is important to remember, in this section, that Jean Piaget did not produce pedagogical theories interpreting his scientific findings for classroom practices. These interpretations were made based on his work. This caveat is relevant, since pedagogical interpretations were not always produced with the same methodological concern as Piaget's initial research. Piaget.
3. In the original, the author refers to the expression "nature or nurture," which, in English, focuses on arguments related to the biological or cultural causes of learning, which, in Brazil, have been expressed around questions that oppose innateness versus learning. The authors of this article consider that both factors are relevant to understanding learning, and the balance between them is absolutely unique, for each individual, in any given situation. culture.
4. It is worth highlighting, in the item related to theories on intelligence, an important reference in the thesis on the themes of multiple intelligences (nine types of intelligence, a flexible number according to the author himself: interpersonal, intrapersonal, mathematical, corporal, linguistic, spatial, musical, naturalist, humanist (Gardner, 2005) and the constructs of neurodevelopment by Levine (2002, apud Tokuhama-Espinosa, 2008), describing eight of these constructs in the human brain (memory, attention, temporal sequential order, spatial order, language, neuromotor function, social cognition and order cognition). higher).
5. While not desirable as a general rule of learning, it is undeniable that some content requires memorization, and this varies across fields. For example, biologists work with an extremely designative type of knowledge, due to the evolution of the profession, which Howard Gardner (2005) described when highlighting naturalistic intelligence. Throughout the evolution of the species, they needed to categorize edible plants, for example, through visual identification and corresponding designation. Another area that necessarily involves memorization is language learning. or the training of actors. In that sense, and necessary recover the training from the memory, in instructional projects where this is necessary, without representing a paradigmatic heresy in relation to the construction of the knowledge.
6. Cognitive Sciences: “(...) new area that repositions the biology of perception and information processing (Cognitive Neuroscience) in dialogue with the

knowledge models that allow automatons and software to infer decisions and trigger virtual or mechanical behaviors (AI and Logic); with the cultural variables that influence the fundamental beliefs and values of learning (Anthropology); with the cognitive-emotional variables that influence the structuring of each individual's endogenous knowledge (Psychology); with the general representational characteristics of the species and specific to each professional or educational environment (Linguistics); and with the reflective and interpretative capacity of the human mind, to seek an integrative meaning of the process of production and categorization of knowledge (Philosophy)", (Timm et al., 2007).

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6. Italics for titles of works, words or expressions in other languages cited in the text.

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