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AURUM EDITORA LTDA - 2025

Curitiba – Paraná - Brasil

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COVER IMAGES

Canva Pro, Freepik

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Maria Alice Ferreira

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Education Science

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International Cataloguing in Publication (CIP) Data (Brazilian Book Chamber, São Paulo, Brazil)

School, culture, and society [e-book] :
1st edition / organization Aurum Editora ;
[translation Daniel Rodrigues da Silva]. --
1. ed. -- Curitiba, PR : Aurum Editora, 2026.
PDF

Original title: Escola, cultura e sociedade
Various authors.
Bibliography
ISBN 978-65-83849-48-9

Culture 2. Education 3. School - Administration and
organization 4. Multidisciplinarity 5. Educational
policies 6. Teaching practice 7. Society

26-332655.0

CDD-370.1934

Indexes for systematic catalog:

1. Educational sociology: Education 370.1934

Maria Alice Ferreira – Librarian - CRB-8/7964

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  <https://doi.org/10.63330/aurumpub.032-008>

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  <https://doi.org/10.63330/aurumpub.032-011>

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  <https://doi.org/10.63330/aurumpub.032-012>

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  <https://doi.org/10.63330/aurumpub.032-013>

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  <https://doi.org/10.63330/aurumpub.032-014>

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  <https://doi.org/10.63330/aurumpub.032-015>

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 <https://doi.org/10.63330/aurumpub.032-001>

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Abstract

Behavioral mediation in the classroom has emerged as a relevant pedagogical strategy in addressing the challenges posed by Oppositional Defiant Disorder in the educational context. This disorder, characterized by persistent patterns of defiant, negativistic, and oppositional behavior, significantly interferes with the teaching–learning process, interpersonal relationships, and the school climate. The present study aimed to analyze behavioral mediation practices in the classroom in relation to Oppositional Defiant Disorder, considering their theoretical, legal, and pedagogical foundations, as well as their contributions to inclusive education. This is an integrative literature review conducted through the analysis of scientific articles, academic works, and normative documents published between 2018 and 2025, selected from national and international databases. The results showed that behavioral mediation, when grounded in dialogue, routine predictability, positive reinforcement, and the strengthening of the teacher–student bond, contributes to conflict reduction, improved social interaction, and the socioemotional development of children with Oppositional Defiant Disorder. It was also found that the effectiveness of these practices is directly related to teacher training, institutional support, and articulation with inclusive education public policies. It is concluded that behavioral mediation constitutes an essential pedagogical resource for promoting more welcoming, equitable, and inclusive school environments, reaffirming the role of the school in guaranteeing the right to education and the integral development of students.

Keywords: Behavioral mediation, Classroom, Inclusive education, Oppositional defiant disorder, Pedagogical practice.

INTRODUCTION

Behavioral mediation in the classroom has consolidated itself as a fundamental pedagogical strategy in the face of the challenges posed by Oppositional Defiant Disorder (ODD), especially in the context of inclusive education. ODD is characterized by a persistent pattern of negativistic, defiant, disobedient, and hostile behavior toward authority figures, occurring most frequently in childhood and

potentially generating significant impacts on the child's emotional, social, and academic development (Côrtes, 2021; Ribeiro et al., 2024). In the school environment, such manifestations directly affect interpersonal relationships, classroom dynamics, and the teaching–learning process, demanding from education professionals pedagogical practices that are sensitive, structured, and grounded in theoretical and legal frameworks.

The school, as a privileged space for socialization and knowledge construction, plays a central role in the early identification of behavioral difficulties and in the implementation of strategies that foster the student's integral development. In this sense, behavioral mediation emerges as a pedagogical resource aimed at guiding, regulating, and reframing behaviors, promoting respectful coexistence, autonomy, and the strengthening of socioemotional skills. Studies indicate that mediated interventions, based on dialogue, predictable routines, and the establishment of clear limits, contribute to the reduction of conflicts and to the improvement of the school performance of children with ODD (Bezerra et al., 2024; Utzig et al., 2022).

In the Brazilian context, the discussion of educational practices concerning ODD must be understood in light of the legal frameworks that ensure the right to education and inclusion. The 1988 Constitution of the Federative Republic of Brazil establishes, in Articles 205 and 208, that education is a right of all and a duty of the State, guaranteeing specialized educational services to learners who require them (Brasil, 1988). This principle is reinforced by the Law of Guidelines and Bases of National Education, which guides the organization of education systems to meet student diversity, respecting their specificities and educational needs (Brasil, 1996). Moreover, the Brazilian Law for the Inclusion of Persons with Disabilities broadens the debate by reaffirming inclusive education as a fundamental right, emphasizing the elimination of attitudinal and pedagogical barriers in the school context (Brasil, 2015).

Complementarily, the National Policy on Special Education from the Perspective of Inclusive Education guides the construction of pedagogical practices that foster the participation and learning of all students, regardless of their cognitive or behavioral conditions (Brasil, 2008). The National Common

Curricular Base, in turn, highlights the importance of developing socioemotional competencies, empathy, and conflict resolution—elements directly related to the proposals of behavioral mediation in the classroom (Brasil, 2018). Thus, addressing ODD in the educational context is not limited to isolated interventions but requires coordinated actions among the school, family, and health services.

In the health field, documents such as the Psychosocial Care Notebooks and the Care Pathway for Comprehensive Health Care of Children and Adolescents underscore the need for interdisciplinary approaches to the care of children with behavioral disorders, including ODD (Brasil, 2014a; Brasil, 2014b). This intersectoral coordination reinforces the importance of educational practices aligned with strategies for comprehensive care, in which behavioral mediation assumes a relevant role by fostering communication, social adaptation, and the bond between student and school.

Despite normative and theoretical advances, many teachers still face difficulties in dealing with oppositional behaviors in the classroom, especially due to the lack of specific training and ongoing institutional support. Research shows that lack of preparation can lead to the adoption of punitive or exclusionary practices, which tend to intensify challenging behaviors and compromise the educational process (Mendes, 2022; Menezes et al., 2022). In this context, behavioral mediation presents itself as an ethical and effective pedagogical alternative, prioritizing welcoming approaches, understanding the causes of behavior, and jointly constructing coexistence strategies.

Given this panorama, the research problem is defined as follows: in what ways can behavioral mediation in the classroom contribute to more inclusive and effective educational practices in the face of Oppositional Defiant Disorder? This problematization stems from the recognition that ODD should not be understood solely from a pathologizing perspective, but also as a phenomenon involving power relations, social norms, and institutional contexts, as discussed by authors who analyze the disorder from critical and interdisciplinary approaches (Martins et al., 2021; Gomes et al., 2025).

The general objective of this work is to analyze behavioral mediation practices in the classroom in the face of Oppositional Defiant Disorder, considering their theoretical, legal, and pedagogical

foundations, as well as their contributions to the process of school inclusion. The aim is to understand how such practices can foster the socioemotional development, learning, and social interaction of children with ODD, in addition to supporting teaching practice in the face of the daily challenges imposed by this disorder.

The justification for this study is based on the social, educational, and scientific relevance of the topic. From a social standpoint, understanding and disseminating behavioral mediation strategies contributes to the promotion of more just, welcoming, and inclusive school environments, reducing processes of stigmatization and exclusion. In the educational sphere, the study offers theoretical and practical support to teachers and school administrators, assisting in the construction of pedagogical practices aligned with public policies and the real needs of students. In the scientific field, the research dialogues with recent productions that approach ODD from different perspectives, expanding the debate on behavioral mediation as a pedagogical tool and reinforcing the importance of interdisciplinary approaches in facing contemporary educational challenges (Bandeira & Martins, 2021; Corrêa et al., 2023; Sousa, 2023).

Thus, by addressing behavioral mediation in the classroom in the face of Oppositional Defiant Disorder, this work aims to contribute to critical reflection and the improvement of educational practices, reaffirming the school's commitment to inclusive education and the integral development of all students.

METHODOLOGY

The present study is characterized as an integrative literature review, a method that enables the systematic and critical synthesis of scientific productions on a given phenomenon, allowing for an expanded understanding of the state of knowledge and the identification of theoretical and practical gaps. This approach proved appropriate for analyzing behavioral mediation practices in the classroom in the face of Oppositional Defiant Disorder, as it encompasses studies with different methodological designs and interdisciplinary perspectives, especially in the areas of education, health, and public policy.

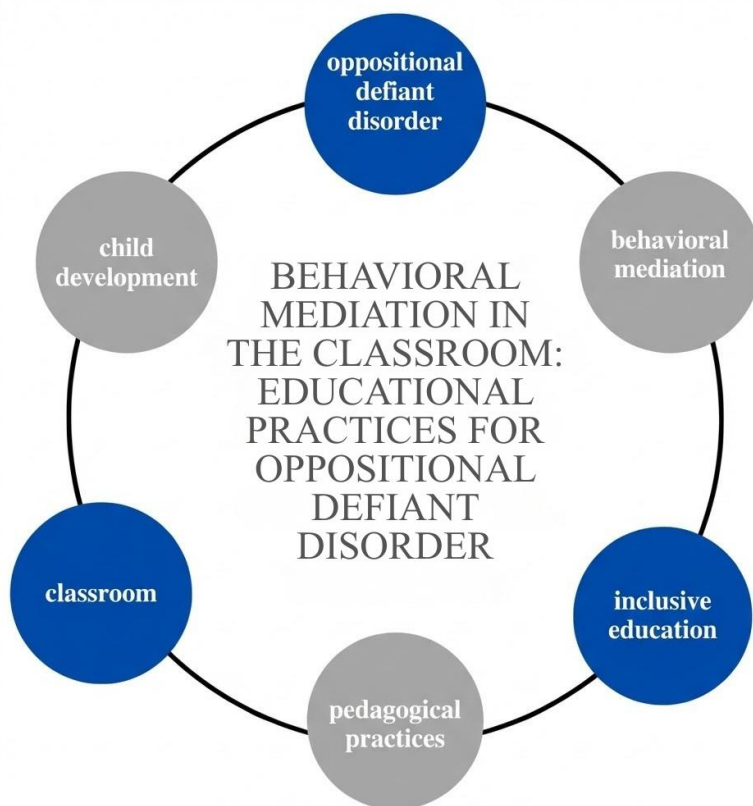
The integrative review was conducted through the following steps: identification of the theme and formulation of the guiding question; definition of inclusion and exclusion criteria; database searches; selection of studies; critical analysis of the material; and synthesis of results. The guiding question was defined as: which behavioral mediation practices in the classroom are described in the scientific literature as educational strategies in the face of Oppositional Defiant Disorder?

The search for studies was carried out in national and international databases relevant to the fields of education and health, including SciELO, the Virtual Health Library, Google Scholar, and specialized scientific journals, in addition to consulting Brazilian normative documents and legislation pertinent to inclusive education. Controlled and uncontrolled descriptors were used, combined through Boolean operators, in order to increase search sensitivity and ensure the retrieval of studies aligned with the research objective.

The descriptors used included terms related to the disorder, the school context, and pedagogical practices, such as: oppositional defiant disorder, behavioral mediation, inclusive education, pedagogical practices, classroom, and child development. These terms were used in Portuguese, considering the predominance of national productions on the topic, as well as the relevance of the Brazilian legal and educational framework.

Figure 1

Flowchart or scheme of the descriptors and search strategies used in the integrative review



Source: Authors (2026)

The inclusion criteria were defined as: scientific articles, literature reviews, case studies, academic works, and official documents published between 2018 and 2025, available in full, in Portuguese, and addressing Oppositional Defiant Disorder in the school context, with an emphasis on pedagogical practices, behavioral mediation, or educational inclusion. As exclusion criteria, duplicate studies, productions that did not address the educational context, or that treated the disorder exclusively from a clinical perspective without relation to school practice were disregarded.

Study selection initially occurred through reading titles and abstracts, followed by full reading of the productions that met the established criteria. Subsequently, critical content analysis was conducted, considering aspects such as objectives, methodology, main results, and contributions to understanding behavioral mediation in the classroom in the face of Oppositional Defiant Disorder.

Data synthesis was performed in a descriptive and analytical manner, organizing the findings into thematic categories such as: characterization of Oppositional Defiant Disorder in the school context; challenges faced by teachers; behavioral mediation strategies; and coordination between pedagogical practices and public policies for inclusive education. This organization allowed for the integration of results and the construction of a critical perspective on the educational practices described in the literature.

As this is bibliographic and documentary research, the study did not involve the direct participation of human beings, thus waiving ethics committee review, in accordance with current regulations. Even so, the ethical principles of scientific research were respected, with appropriate citation of sources used and rigor in data analysis and interpretation.

This methodology enabled the construction of a consistent overview of behavioral mediation in the classroom in the face of Oppositional Defiant Disorder, offering theoretical and practical support for reflection and the improvement of inclusive educational practices.

RESULTS AND DISCUSSION

Analysis of the selected studies showed that behavioral mediation in the classroom constitutes an essential pedagogical strategy for addressing the challenges imposed by Oppositional Defiant Disorder in the school context. The results indicate that ODD has significant impacts on child development, especially regarding learning, socialization, and student retention in school, demanding educational practices that go beyond punitive and exclusionary approaches (Côrtes, 2021; Ribeiro et al., 2024).

Recurrently, the analyzed studies highlight that oppositional and defiant behavior directly interferes with classroom dynamics, generating frequent conflicts with teachers and peers, in addition to compromising academic performance. Bezerra et al. (2024) indicate that, when not adequately mediated, such manifestations tend to be interpreted merely as indiscipline, disregarding the emotional, social, and

institutional factors involved. In this sense, behavioral mediation emerges as a pedagogical resource that enables a broader understanding of behavior, fostering more humanized and effective interventions.

The results also reveal that behavioral mediation contributes to the construction of a more organized, predictable, and welcoming school environment—fundamental aspects for students with ODD. Predictable routines, clear rules, and the use of dialogue as a central strategy were identified as factors that reduce episodes of confrontation and favor emotional self-regulation. These findings corroborate the literature by indicating that the organization of the pedagogical environment is a key element in promoting more adaptive behaviors (Utzig et al., 2022; Mendes, 2022).

Oppositional defiant disorder is characterized by a persistent pattern of negativistic, defiant, and hostile behavior, which recurs in interactions with authority figures, especially in the school environment, requiring interventions that consider the multiple factors involved in its manifestation (Côrtes, 2021).

This definition reinforces the understanding that ODD should not be analyzed in isolation but contextualized within the social and institutional relationships in which the child is embedded. Thus, behavioral mediation assumes a relevant role by enabling the reorganization of these relationships, fostering more inclusive pedagogical practices.

CHARACTERIZATION OF OPPOSITIONAL DEFIANT DISORDER IN THE SCHOOL CONTEXT

The analyzed studies indicate that children with ODD show persistent difficulties in complying with rules, resistance to teacher guidance, frequent irritability, and provocative behaviors, which negatively affect the teaching–learning process. Ribeiro et al. (2024) emphasize that such manifestations, when not appropriately mediated, can generate cumulative harms to child development, exacerbating academic and social difficulties over time.

Oliveira and Costa (2021) stress that the school environment, when adopting rigid and inflexible practices, tends to intensify oppositional behaviors, reinforcing cycles of conflict and exclusion. From this

perspective, behavioral mediation presents itself as an alternative to punitive logic by prioritizing understanding behavior and constructing pedagogical strategies that promote inclusion.

When the school fails to recognize the specificities of oppositional defiant disorder, it ultimately reinforces processes of symbolic exclusion, in which the child becomes labeled as indisciplined, hindering effective participation in the educational process (Oliveira & Costa, 2021).

Table 1

Characteristics of Oppositional Defiant Disorder in the school context

Dimension	Characteristics observed in the school context
Behavioral	Defiant behaviors, refusal to obey rules, frequent confrontation with teacher authority
Emotional	Constant irritability, low frustration tolerance, emotional outbursts
Social	Difficulties interacting with peers, recurring interpersonal conflicts
Academic	Impaired school performance, difficulty concentrating and engaging in activities
Institutional	Higher risk of stigmatization, application of punitive practices, and exclusion processes

Source: Authors (2026)

Table 1 presents a synthesis of the main characteristics of ODD in the school environment, as described in the literature, including challenging behaviors, difficulties in social interaction, and impact on academic performance. This systematization highlights the need for pedagogical practices that consider such specificities, avoiding homogeneous and exclusionary approaches.

BEHAVIORAL MEDIATION AS AN INCLUSIVE PEDAGOGICAL STRATEGY

In the studies, behavioral mediation is described as a pedagogical practice seeking to guide student behavior through dialogue, active listening, and the construction of agreements, promoting autonomy and socioemotional development. Utzig et al. (2022) point out that mediated strategies foster social interaction

and reduce conflicts, especially when associated with collaborative practices and the strengthening of the teacher–student bond.

Bandeira and Martins (2021) emphasize the role of psychopedagogy in behavioral mediation, highlighting the importance of systematic observation of behavior and the development of individualized intervention plans. According to the authors, mediation makes it possible to identify triggers of oppositional behavior and to build pedagogical alternatives more appropriate to the student’s needs.

Behavioral mediation in the school context is not limited to containing behavior but involves a continuous process of understanding, intervention, and follow-up, in which the teacher assumes the role of mediator of the child’s emotional and social development (Bandeira & Martins, 2021).

Table 2
Behavioral mediation strategies used in the school context

Strategy	Description	Contributions to the student with ODD
Positive reinforcement	Valuing appropriate behaviors through praise and incentives	Strengthens adaptive behaviors and self-esteem
Establishing routines	Predictable organization of daily activities	Reduces anxiety and oppositional behaviors
Conflict mediation	Dialogic intervention in conflict situations	Fosters peaceful resolution and socioemotional development
Behavioral contracts	Clear agreements between teacher and student	Promotes responsibility and co-responsibility
Active listening	Attentiveness to the student’s needs and feelings	Strengthens the teacher–student bond

Source: Authors (2026)

Table 2 brings together the main behavioral mediation strategies identified in the literature, such as positive reinforcement, conflict mediation, adaptation of pedagogical routines, and the establishment of clear limits. Studies indicate that such strategies are more effective when applied consistently and aligned with the guidelines of inclusive education.

TEACHER TRAINING AND CHALLENGES OF PEDAGOGICAL PRACTICE

The results show that teacher training is a determining factor in the effectiveness of behavioral mediation. Mendes (2022) and Menezes et al. (2022) highlight that many teachers feel unprepared to deal with challenging behaviors, which contributes to adopting punitive and ineffective practices. The lack of specific training on behavioral disorders and inclusive education was identified as one of the main obstacles to implementing mediation.

Sousa (2023) adds that workload, large class sizes, and lack of institutional support hinder the application of mediating strategies in daily school life. These factors reinforce the need for public policies that invest in continuing education and multiprofessional support for teachers.

The challenges faced by teachers in managing oppositional defiant disorder in the classroom highlight the need for continuous training and institutional support so as to avoid exclusionary practices and promote school inclusion (Mendes, 2022).

Table 3

Challenges and possibilities in behavioral mediation in the classroom

Identified challenges	Possibilities for addressing them
Lack of specific teacher training	Investment in continuing professional development
Large class sizes	Collaborative pedagogical planning
Absence of multi professional support	Coordination with health teams and educational guidance
Prevalence of punitive practices	Adoption of mediating and inclusive strategies
Teacher workload overload	Institutional support and participatory management

Source: Authors (2026)

Table 3 presents the main challenges faced by teachers, as well as the possibilities for overcoming them highlighted in the literature, including continuing education, interdisciplinary work, and support from school management.

BEHAVIORAL MEDIATION AND PUBLIC POLICIES FOR INCLUSIVE EDUCATION

The analyzed studies reinforce that behavioral mediation must be aligned with legal frameworks and public policies for inclusive education. The Federal Constitution, the Law of Guidelines and Bases of National Education, and the Brazilian Law for the Inclusion of Persons with Disabilities ensure the right to education for all students, guiding the adoption of pedagogical practices that respect diversity (Brasil, 1988; Brasil, 1996; Brasil, 2015).

Gomes et al. (2025) discuss the gap between the legal recognition of ODD and its effective consideration in school practices, emphasizing that the existence of a diagnostic report does not, in itself, guarantee educational inclusion. According to the authors, it is essential that the school appropriate the legislation and translate it into concrete pedagogical actions.

Between the report and the law, there is a significant hiatus in which the educational rights of children with oppositional defiant disorder do not always materialize into inclusive pedagogical practices in everyday school life (Gomes et al., 2025).

Table 4

Legal frameworks and guidelines related to inclusive education and ODD

Legal/normative document	Contributions to educational practice
1988 Federal Constitution	Guarantees the right to education and specialized educational services
Law No. 9,394/1996 (LDB)	Guides the organization of education systems to address diversity
Law No. 13,146/2015	Reaffirms inclusive education as a fundamental right
National Special Education Policy (2008)	Directs inclusive pedagogical practices
National Common Curricular Base (2018)	Values socioemotional competencies and conflict resolution

Source: Authors 2026)

Table 4 systematizes the main legal instruments and normative documents that underpin the school’s role in the face of ODD, reinforcing the obligation to adopt mediating and inclusive practices.

SYNTHESIS AND IMPLICATIONS OF THE RESULTS

In an integrated manner, the results demonstrate that behavioral mediation constitutes a fundamental pedagogical strategy for addressing Oppositional Defiant Disorder in the classroom. When grounded in inclusive, legal, and interdisciplinary principles, mediation contributes to improving the school climate, strengthening interpersonal relationships, and promoting the child's integral development. The findings reinforce the need to invest in teacher training, institutional support, and coordination between education and health, reaffirming the school's role as a space for promoting equity and educational inclusion.

CONCLUSION

This study had the general objective of analyzing behavioral mediation practices in the classroom in the face of Oppositional Defiant Disorder, considering their theoretical, legal, and pedagogical foundations, as well as their contributions to promoting inclusive education. Throughout the research, we sought to understand how behavioral mediation can foster the socioemotional development, learning, and social interaction of children with ODD, in addition to supporting teaching practice in the face of challenges imposed by this disorder in the school context.

The results showed that Oppositional Defiant Disorder significantly impacts classroom dynamics, interfering with the teaching-learning process, interpersonal relationships, and the school climate. It was found that challenging behaviors, when understood solely from the perspective of indiscipline, tend to be aggravated by punitive and exclusionary practices. In contrast, the analyzed literature indicates that behavioral mediation strategies—grounded in dialogue, predictable routines, and the strengthening of the teacher-student bond—contribute to reducing conflicts and improving academic and social performance.

It was also observed that behavioral mediation is configured as a pedagogical practice aligned with the principles of inclusive education, as advocated by Brazilian legal and normative frameworks. The Federal Constitution, the Law of Guidelines and Bases of National Education, the Brazilian Law for

the Inclusion of Persons with Disabilities, the National Policy on Special Education from the Perspective of Inclusive Education, and the National Common Curricular Base provide normative support for adopting mediating practices that respect diversity and guarantee the right to education for all students, including those with Oppositional Defiant Disorder.

Regarding the study's contributions, we highlight the systematization of scientific evidence reinforcing the relevance of behavioral mediation as an effective and ethical pedagogical strategy in the school context. The study contributes to critical reflection on teaching practice by demonstrating the need to move beyond punishment-centered approaches and to advance in the construction of more humanized, inclusive, and interdisciplinary educational practices. It also offers theoretical support that can assist teachers, school administrators, and other education professionals in developing intervention strategies better suited to the needs of students with ODD.

Nevertheless, the research also revealed limitations related to the scarcity of empirical studies that systematically assess the effects of behavioral mediation practices in everyday school life. In this sense, future research is suggested to investigate the application of these strategies in different educational contexts, as well as qualitative and quantitative studies that explore the perceptions of teachers, students, and families regarding behavioral mediation in the face of Oppositional Defiant Disorder.

Finally, it is concluded that behavioral mediation in the classroom is a fundamental pedagogical resource for addressing the challenges imposed by Oppositional Defiant Disorder, provided it is coordinated with public policies, teacher training, and institutional support. By promoting inclusive and mediating educational practices, the school reaffirms its commitment to students' integral development and to building an education based on equity, respect for diversity, and the guarantee of rights.

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PLAY AS LANGUAGE AND EXPERIENCE IN EARLY CHILDHOOD EDUCATION

 <https://doi.org/10.63330/aurumpub.032-002>

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Abstract

This chapter discusses play as a constitutive language and experience in Early Childhood Education, articulating pedagogical practices, active methodologies, project-based learning and the organization of time, space and materials. Grounded in theoretical contributions from childhood studies and experiential pedagogy, the text understands the child as an active subject, a producer of culture and a participant in intentionally mediated educational processes. The theoretical analysis highlights that play should not be understood as a secondary or recreational activity, but as a structuring axis of learning and child development, in line with the guidelines of the Brazilian National Common Core Curriculum. Active methodologies are addressed as pedagogical stances that value experience, investigation and attentive listening to children, avoiding premature schooling processes. Project-based learning is presented as a powerful strategy for integrating multiple languages and promoting meaningful experiences, while respecting the rhythms of childhood. Finally, the organization of time, space and materials is discussed as a central pedagogical dimension capable of enhancing play as language and experience. It is concluded that pedagogical practices grounded in play contribute to a more meaningful, holistic and child-centered Early Childhood Education.

Keywords: Early Childhood Education, Play, Pedagogical practices, Active methodologies, Project-based learning.

INTRODUCTION

Early Childhood Education constitutes the first stage of basic education and plays a fundamental role in the holistic development of children, encompassing cognitive, affective, social, bodily, and linguistic dimensions. At this stage, play assumes centrality as a privileged form of expression, communication, and meaning-making. For Kramer (2007), recognizing play as language means understanding the child as a historical and cultural subject, capable of producing meanings and actively participating in educational experiences.

In recent decades, studies on childhood and education have indicated the need to overcome pedagogical practices based on the anticipation of school contents or on the fragmentation of activities. Kishimoto (2011) highlights that proposals focused exclusively on outcomes or products tend to empty play of its meaning, reducing it to a didactic resource. In contrast, approaches that value experience, listening to the child, and pedagogical intentionality strengthen practices consistent with the specificity of childhood.

This understanding finds support in the National Common Curricular Base, which establishes interactions and play as structuring axes of Early Childhood Education and organizes the curriculum around fields of experience (BRASIL, 2018). By adopting this perspective, the BNCC recognizes that learning occurs in relationships, explorations, and meaningful experiences, respecting the unique tempos and modes of young children.

Within the scope of contemporary pedagogical practices, active methodologies gain relevance by fostering learning processes centered on participation, investigation, and experimentation. Dewey (1959) had already affirmed that learning entails living meaningful experiences, in which the subject acts upon the world and reflects on their actions. Moran (2018) revisits this conception by advocating pedagogical practices that place the student at the center of the educational process, including in Early Childhood Education, provided that the characteristics of child development are respected.

When designed for young children, project-based learning emerges as a powerful strategy to articulate play, children's curiosity, and the construction of knowledge in meaningful contexts. Hernández (1998) understands projects as forms of curricular organization that begin with questions relevant to the subjects involved. In Early Childhood Education, this approach makes it possible to integrate different languages, promote collaboration, and establish relationships between school and the lived world, as Barbosa (2009) also points out.

Furthermore, the organization of time, spaces, and materials plays a central role in the constitution of pedagogical practices in Early Childhood Education. Malaguzzi (1999) conceives space as the "third

teacher,” capable of provoking interactions, inquiries, and learning. From this perspective, intentionally planned environments enhance play as experience and language, transforming the school space into an active pedagogical element (HORN, 2014).

In light of these considerations, this chapter aims to analyze play as a constitutive language and experience of Early Childhood Education, understanding it as the structuring axis of pedagogical practices and the curriculum at this stage of basic education. We start from the conception that play, by articulating symbolic, bodily, social, and cognitive dimensions, is configured as a privileged form of learning and development in childhood, as indicated by Vygotsky (2007) and Kishimoto (2011). From this perspective, we discuss pedagogical practices grounded in active methodologies, project-based learning, and the intentional organization of time, spaces, and materials, understood as pedagogical dimensions inseparable from play. It is thus assumed that teacher mediation is a central element for play to become a meaningful formative experience, in line with contemporary curricular guidelines and with the principles established by the National Common Curricular Base (BRASIL, 2018).

With the aim of synthesizing the main theoretical axes discussed in this chapter and making explicit the articulation among play, pedagogical practices, and the organization of everyday life in Early Childhood Education, a conceptual framework is presented below. Table 1 systematizes the pedagogical dimensions addressed, highlighting their contributions to Early Childhood Education and the theoretical references that underpin them. This synthesis seeks to offer the reader an integrated view of the assumptions that guide the analysis developed in the subsequent sections, reinforcing play as the structuring axis of educational experiences in childhood.

Table 1 – Play as a structuring axis of pedagogical practices in Early Childhood Education

Pedagogical dimension	Contribution to Early Childhood Education	Theoretical basis
Play as a language	Form of expression, communication and construction of meaning by the child	Vygotsky (2007); Benjamin (2012); Kishimoto (2011)
Active methodologies	Valuing experience, investigation and protagonism children	Dewey (1959); Moran (2018); Freire (1996)
Project-based learning	Language integration and knowledge building significant	Hernández (1998); Barbosa (2009); Zabala (1998)
Time management	Respect for the rhythms of childhood and continuation of experiences	Horn (2014); Barbosa (2009)
Organization of spaces and materials	Space as a pedagogical element that provokes interactions and learnings	Malaguzzi (1999); Montessori (1965)
Teacher mediation	Planning, listening and pedagogical intent	Tardif (2002); Freire (1996)

Source: Prepared by the authors (2026)

PLAY AS LANGUAGE AND EXPERIENCE IN EARLY CHILDHOOD EDUCATION

Play occupies a central place in Early Childhood Education because it constitutes a privileged form of expression, communication, and symbolic elaboration by the child. Kishimoto (2011) states that, in playing, the child interprets the world, constructs meanings, and establishes relationships with others and with culture. Thus, understanding play as language implies recognizing that the child expresses, communicates, and learns through playful, bodily, and symbolic actions.

From a historical-cultural perspective, Vygotsky (2007) understands play as a fundamental activity for the development of higher psychological functions. By assuming roles and rules in play, the child operates with meanings that go beyond the immediate situation, creating zones of proximal development. In these spaces, learning occurs mediated by social interaction, language, and imagination.

The notion of play as experience is deepened in Benjamin's reflections (2012), for whom childhood is constructed in a sensitive relationship with the world and cultural objects. According to the

author, play allows the child to elaborate experiences through repetition, invention, and narrative. Play, in this sense, is not reduced to action itself, but involves memory, imagination, and meaning-making.

By treating play as cultural language, Huizinga (2014) contributes by affirming that the game is a constitutive element of human culture. In *Homo ludens*, the author emphasizes that play precedes and permeates different forms of social organization, being an expression of freedom, creation, and meaning. In Early Childhood Education, this understanding broadens the pedagogical value of play, recognizing it as cultural practice rather than a mere preparation for future learning.

This approach is deepened in pedagogical proposals that value the multiple languages of childhood. Malaguzzi (1999) maintains that the child expresses themselves through “a hundred languages,” among which play occupies a central position. Through play, the child investigates the world, constructs hypotheses, and communicates their thoughts, shifting the focus from a pedagogy of instruction to a pedagogy of listening and experience.

In the Brazilian context, Kishimoto (2011) emphasizes that play, when intentionally mediated by the teacher, constitutes the structuring axis of pedagogical practices in Early Childhood Education. The author stresses that pedagogical intentionality does not eliminate the playful character of play, but rather enhances it as a meaningful learning experience.

This conception is supported by the guidelines of the National Common Curricular Base, which recognizes interactions and play as structuring axes of Early Childhood Education and organizes the curriculum around fields of experience (BRASIL, 2018). By valuing play as language and experience, the BNCC reaffirms the child as a subject of rights, active in the construction of knowledge and a participant in intentionally organized educational practices.

In this direction, understanding play as language and experience supports pedagogical practices consistent with the specificity of childhood. By recognizing play as the structuring axis of the curriculum, Early Childhood Education reaffirms its commitment to a meaningful, dialogical, and holistic formation, in which learning is living experiences in the body, in language, and in social relations.

ACTIVE METHODOLOGIES IN EARLY CHILDHOOD EDUCATION

When discussed within the scope of Early Childhood Education, active methodologies require careful conceptual understanding in order to avoid reductionist interpretations that associate them with anticipating school contents or with the uncritical adoption of didactic procedures characteristic of other stages of basic education. In childhood, the notion of an active methodology should be understood as the intentional organization of experiences in which children participate as protagonists, exploring, investigating, playing, and assigning meaning to lived situations (DEWEY, 1959).

Since the beginning of the 20th century, Dewey (1959) had already advocated that learning occurs through experience, understood as continuous interaction between subject and environment. For the author, learning does not mean receiving ready-made information, but engaging in problematizing situations that demand action, reflection, and the reconstruction of meanings. In Early Childhood Education, this conception materializes in pedagogical proposals that value play, curiosity, and investigation as legitimate forms of learning.

From this perspective, active methodologies are not configured as a set of isolated techniques or strategies, but as a pedagogical stance that recognizes the child as an active subject in the educational process. Moran (2018) emphasizes that active practices presuppose teacher intentionality, sensitive listening, and constant mediation, so that the experiences lived by children are transformed into opportunities for meaningful learning. Thus, the centrality of the child in active methodologies does not eliminate the teacher's role; on the contrary, it requires an even more qualified teaching performance.

When discussing Early Childhood Education, it is essential to highlight that the activity of the young child is essentially playful, bodily, and relational. In this sense, active methodologies are realized through play situations, exploration of materials, investigation of the environment, and interaction with peers. Vygotsky (2007) contributes by affirming that development occurs in social interactions mediated by language and culture, which reinforces the importance of pedagogical proposals that favor joint action, dialogue, and cooperation among children.

The National Common Curricular Base also aligns with this understanding by recognizing interactions and play as structuring axes of Early Childhood Education. By organizing the curriculum around fields of experience, the BNCC proposes pedagogical practices that respect the ways in which children learn, valuing experimentation, curiosity, and the construction of meanings from everyday experiences (BRASIL, 2018). In this context, active methodologies are expressed as practices that enhance these axes, rather than as external models imposed on the curriculum of childhood.

It is important to stress that, in Early Childhood Education, active methodologies should not be confused with overly directed activities or with the imposition of predefined results. Kishimoto (2011) warns that excessively structured pedagogical proposals can compromise the playful character of experiences, emptying play of its meaning. Thus, pedagogical intentionality must coexist with flexibility, respect for children's interests, and openness to the unexpected.

In this sense, listening to the child assumes a central role in active pedagogical practices. Freire (1996) emphasizes that teaching implies dialogue, openness to the other, and recognition of the subject as a producer of knowledge. In Early Childhood Education, this listening materializes in attentive observation of children's actions, speech, and play, allowing the teacher to reorganize time, spaces, and proposals based on the experiences lived in the group.

Therefore, active methodologies in Early Childhood Education are configured as pedagogical practices that value children's protagonism without disregarding teacher mediation. By articulating play, experience, and pedagogical intentionality, these methodologies contribute to the construction of meaningful learning, respecting the tempos of childhood and promoting the holistic development of children.

PROJECT-BASED LEARNING FOR YOUNG CHILDREN

When situated in the context of Early Childhood Education, project-based learning should be understood as a form of pedagogical organization that values curiosity, investigation, and the active

involvement of children in meaningful experiences. Unlike traditional school models, projects in childhood are not guided by the linearity of contents or by previously defined products, but arise from interests, questions, and situations experienced by the children themselves (HERNÁNDEZ, 1998).

Since its origins, the proposal of working with projects has been associated with the idea of meaningful and integrated learning. Kilpatrick (1935), when discussing the project method, had already argued that learning implies engaging in activities that are meaningful to the subject, in which action and reflection are articulated. In Early Childhood Education, this conception takes on specific contours, as projects are built from play, exploration of the environment, and social interactions, respecting the ways young children learn.

Hernández (1998) reinforces that projects make it possible to break with curricular fragmentation, fostering the integration of different languages and areas of knowledge. In the context of Early Childhood Education, this integration manifests naturally, since children's experiences simultaneously involve bodily, affective, cognitive, and symbolic aspects. Thus, pedagogical projects enable the articulation of drawing, movement, orality, symbolic play, and exploration of materials around themes that are meaningful to the group.

This perspective is consonant with the studies of Barbosa (2009), who highlights that projects in Early Childhood Education should be understood as open, processual, and collective experiences. For the author, the pedagogical value of the project does not lie in the final product, but in the learning pathways experienced by the children, in the hypotheses formulated, in the mistakes made, and in the negotiations carried out collectively. Such an understanding shifts the focus of assessment to processes, fostering deeper and more contextualized learning.

Project-based learning also dialogues with the perspective of competencies, understood as the integrated mobilization of knowledge, skills, and attitudes in the face of complex situations. Zabala (1998) states that pedagogical practices oriented by projects favor the construction of knowledge articulated with action, reflection, and decision-making. In Early Childhood Education, this mobilization

is expressed in situations in which children observe, question, experiment, and construct provisional explanations about the world.

The National Common Curricular Base reinforces this approach by organizing the Early Childhood Education curriculum around fields of experience, encouraging pedagogical proposals that value investigation, curiosity, and children's protagonism (BRASIL, 2018). In this sense, project-based learning proves consistent with contemporary curricular guidelines, provided it respects the tempos of childhood and is intentionally mediated by the teacher.

Thus, working with projects in Early Childhood Education means creating conditions for children to experience integrated, meaningful, and contextualized learning experiences. When articulated with play and interactions, project-based learning helps to strengthen children's protagonism, promote authorship, and expand possibilities for meaning-making in daily school life.

ORGANIZATION OF TIME, SPACES, AND MATERIALS AS A PEDAGOGICAL DIMENSION

The organization of time, spaces, and materials constitutes a central dimension of pedagogical practices in Early Childhood Education, exerting direct influence on the learning experiences lived by children. Far from being a merely administrative or logistical aspect, this organization expresses conceptions of childhood, learning, and education that guide everyday school life (BARBOSA, 2009).

Malaguzzi (1999) contributes decisively by asserting that space can be understood as the "third teacher," alongside the teacher and the children. From this perspective, educational environments should be conceived as provocative spaces that invite exploration, interaction, and investigation. In Early Childhood Education, the arrangement of materials, the organization of learning corners, and the flexibility of spaces enhance play as language and formative experience.

The temporal dimension also plays a relevant role in the daily life of Early Childhood Education. Horn (2014) highlights that the tempos of childhood are not organized according to the logic of productivity or the fragmentation of activities, but demand continuity, repetition, and the possibility of

deepening experiences. Respecting the child's time implies allowing play to be prolonged, projects to develop over days or weeks, and learning to occur without haste or constant interruptions.

In this context, the organization of materials takes on a fundamental pedagogical character. Montessori (1965) had already emphasized the importance of prepared environments, in which materials are accessible, diverse, and appropriate to children's possibilities. In contemporary Early Childhood Education, this conception is broadened to include unstructured materials, everyday objects, and natural resources, which favor imagination, creation, and symbolic play.

The articulation among time, spaces, and materials contributes to the construction of more democratic and inclusive learning environments. Barbosa (2009) emphasizes that flexible environments allow children to choose, negotiate, and reorganize their experiences, strengthening autonomy and childhood protagonism. Thus, space ceases to be a passive backdrop and becomes an active part of the educational process.

The National Common Curricular Base also recognizes the importance of this organization by highlighting that children's experiences are constructed in interactions, in play, and in the contexts offered by the educational environment (BRASIL, 2018). Therefore, the organization of time, spaces, and materials must be aligned with the fields of experience, ensuring coherence among curriculum, pedagogical practice, and children's lived experiences.

Therefore, understanding the organization of time, spaces, and materials as a pedagogical dimension implies recognizing that learning in Early Childhood Education is constructed in everyday life, in relationships, and in lived experiences. Environments planned in an intentional, flexible manner, sensitive to children's needs, enhance play as language, strengthen meaningful pedagogical practices, and contribute to an education that respects childhood in its entirety.

FINAL CONSIDERATIONS

Throughout this chapter, we have sought to understand play as a constitutive language and experience of Early Childhood Education, articulating pedagogical practices, active methodologies, project-based learning, and the organization of time, spaces, and materials. We started from the assumption that childhood has its own ways of learning and expressing itself, which cannot be reduced to schooling practices or to the anticipation of formal contents, as Kramer (2007) and Kishimoto (2011) warn. In this sense, play was assumed as the structuring axis of educational experiences, in line with contemporary curricular guidelines.

The theoretical analysis developed showed that play, understood as symbolic, cultural, and relational language, constitutes a privileged space for learning and development. Vygotsky (2007) demonstrates that, in playing, the child creates zones of proximal development, expanding their cognitive and social possibilities through interaction. This understanding is deepened by Benjamin (2012), who highlights play as a sensitive and narrative experience through which the child elaborates the world and assigns meaning to everyday experiences. Thus, play is not restricted to playful action, but involves complex processes of signification and cultural construction.

Regarding pedagogical practices, we discussed that active methodologies, when situated in Early Childhood Education, should be understood as pedagogical stances that value children's experience, investigation, and participation, rather than as closed techniques or models. Dewey (1959) had already pointed out that learning entails living meaningful experiences, and Moran (2018) reinforces that the centrality of the student in educational practices demands teacher intentionality and qualified mediation. In Early Childhood Education, such principles materialize in proposals that articulate play, sensitive listening, and the pedagogical organization of everyday life.

Project-based learning proved to be especially pertinent for young children, insofar as it favors the integration of different languages, curiosity, and children's protagonism. Hernández (1998) and Barbosa (2009) highlight that projects make it possible to overcome curricular fragmentation, valuing learning

processes over final products. When articulated with play and interactions, pedagogical projects become powerful experiences of meaning-making, respecting the tempos of childhood and promoting contextualized learning.

Another central aspect discussed in this chapter concerns the organization of time, spaces, and materials as a pedagogical dimension. Malaguzzi (1999) conceives space as the “third teacher,” capable of provoking interactions, inquiries, and learning. Horn (2014) and Montessori (1965) reinforce that environments planned in an intentional, flexible, and accessible way enhance autonomy, exploration, and symbolic play. Thus, the organization of everyday life in Early Childhood Education expresses conceptions of child, learning, and education, directly influencing the quality of experiences lived.

The reflections presented throughout the chapter directly dialogue with the National Common Curricular Base, which recognizes interactions and play as structuring axes of Early Childhood Education and organizes the curriculum around fields of experience (BRASIL, 2018). By valuing play as language and experience, the child is reaffirmed as a subject of rights, active in the construction of knowledge and a participant in intentionally organized educational practices.

It is concluded, therefore, that understanding play as language and experience in Early Childhood Education implies rethinking pedagogical practices, curricula, and forms of organizing everyday school life. Active methodologies, project-based learning, and intentionally planned educational environments are configured as powerful pathways toward an education that respects childhood in its entirety. By recognizing play as the structuring axis of the educational process, Early Childhood Education reaffirms its commitment to a holistic, dialogical, and meaningful formation, in which learning is living experiences in the body, in language, and in social relationships.

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INCLUSIVE EDUCATION AND SOCIAL EQUITY: CHALLENGES IN THE IMPLEMENTATION OF EDUCATIONAL POLICIES IN BRAZIL

 <https://doi.org/10.63330/aurumpub.032-003>

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Abstract

Inclusive education and social equity have become central principles of contemporary Brazilian educational policies, guided by the Federal Constitution of 1988, the National Education Guidelines and Framework Law, and specific regulations related to special education and diversity. This chapter aims to analyze the main challenges in the implementation of these policies within the Brazilian educational context, considering historical, socioeconomic, and institutional inequalities. Methodologically, a qualitative, exploratory, and descriptive study was conducted, based on a narrative literature review and

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analysis of legal and normative documents, drawing on authors such as Freire, Mantoan, and Arroyo. The results show that, despite normative advances, significant obstacles remain, including insufficient teacher training, lack of pedagogical and accessibility resources, and a gap between policy formulation and school-level implementation. It is concluded that strengthening inclusive education and social equity requires democratic school management, continuous investment in teacher education, and intersectoral public policies capable of addressing structural inequalities, ensuring the right to quality education for all.

Keywords: Educational policies, Inclusive education, School inclusion, Social equity, Diversity.

INTRODUCTION

Inclusive education, associated with the principle of social equity, constitutes one of the fundamental pillars of contemporary educational policies in Brazil, guiding actions aimed at ensuring the right to education for all, regardless of physical, sensory, intellectual, social, ethno-racial, or economic conditions. Supported by legal provisions such as the Federal Constitution of 1988, the National Education Guidelines and Framework Law (Law No. 9,394/1996), and the National Policy on Special Education from the Perspective of Inclusive Education, the topic gains relevance in light of the persistent inequalities that mark the Brazilian educational system.

In this context, the following research problem is delineated: what are the main challenges faced in implementing inclusive education and social equity policies in the Brazilian educational system, especially with regard to making these policies effective in the daily life of educational institutions? This problem highlights the distance between normative advances and the practical reality experienced by schools, administrators, and teachers.

The general objective of this study is to analyze the challenges of implementing educational policies aimed at inclusive education and social equity in Brazil. As specific objectives, it seeks to: understand the conceptual foundations of inclusive education and social equity; identify the main legal and political landmarks related to the topic; analyze the institutional, pedagogical, and training-related

barriers that hinder the implementation of these policies; and discuss possibilities for overcoming these challenges in the school context.

The justification for this work is grounded in the social and academic relevance of the topic, since the realization of inclusive education represents an essential step toward building a more just and democratic society. Moreover, the study contributes to the scientific debate by systematizing theoretical reflections that may support the formulation and improvement of public policies and inclusive pedagogical practices.

From a theoretical standpoint, the study engages with contributions from authors such as Paulo Freire, in defending an emancipatory education committed to social justice; Mantoan, who problematizes the paradigms of school inclusion; and Miguel Arroyo, who analyzes the relationships among education, inequality, and social rights. These approaches make it possible to understand inclusive education not only as an educational policy, but as an ethical and political commitment to social equity.

METHODOLOGY

This chapter presents the methodological procedures adopted for the development of the study, describing the type of research, the methodological approach, the techniques and instruments for data collection, as well as the analysis criteria used. The organization into sections and subsections aims to ensure clarity, scientific rigor, and coherence in the investigative process, in line with the proposed objectives.

TYPE AND APPROACH OF THE RESEARCH

The research is characterized as qualitative in nature, with an exploratory and descriptive character. The qualitative approach allows an in-depth understanding of social and educational phenomena, considering their meanings, contexts, and multiple dimensions, especially with regard to the implementation of inclusive education and social equity policies in Brazil. The exploratory character is

justified by the need to broaden understanding of the challenges faced, while the descriptive character enables the systematization and critical interpretation of the information gathered.

RESEARCH PROCEDURES AND TECHNIQUES

As a methodological procedure, a narrative literature review was adopted, as it enables an integrated analysis of scientific productions, legal documents, and normative documents relevant to the theme. Scientific articles, books, dissertations, theses, and official documents published by governmental bodies—such as the Ministry of Education—were consulted, in addition to national legislation related to inclusive education. The bibliographic search was carried out in databases such as SciELO, Google Scholar, and specialized education journals.

Data collection instruments

The instruments used consisted of reading notes, synthesis tables, and analytical records of the selected works, allowing the systematic organization of information and the identification of thematic categories related to the challenges of inclusive educational policies. These instruments supported comparison among different theoretical and normative approaches, contributing to a critical and well-founded analysis.

SAMPLE AND SELECTION CRITERIA

The study sample consisted of scientific productions and legal documents published, primarily, in recent years, without prejudice to the inclusion of classical works and reference authors in the field, such as Freire, Mantoan, and Arroyo. The selection criteria involved thematic relevance, academic significance, source credibility, and contribution to understanding inclusive education and social equity in the Brazilian context.

DATA ANALYSIS PROCEDURES

Data analysis was conducted through content analysis, enabling the categorization, interpretation, and discussion of the findings in light of the adopted theoretical framework. The analytical categories emerged from a critical reading of the selected material, encompassing aspects such as legal landmarks, teacher education, school management, pedagogical resources, and structural inequalities. This grounded discussion made it possible to relate the analyzed data to the objectives of the study, contributing to a consistent understanding of the challenges and the possibilities for making inclusive educational policies effective.

RESULTS AND DISCUSSION

The analysis of the literature and normative documents made it possible to identify significant advances in the field of inclusive educational policies in Brazil, especially with regard to the expansion of the legal framework that recognizes education as a right of all and a duty of the State. The Federal Constitution of 1988, the National Education Guidelines and Framework Law, and the National Policy on Special Education from the Perspective of Inclusive Education represent important landmarks by consolidating principles of access, permanence, and learning for students historically excluded from the educational system.

However, the study's results reveal a discrepancy between what is provided for in public policies and their effective implementation in the daily life of schools. The literature points out that one of the main challenges is related to teachers' initial and continuing education, which, in many cases, does not sufficiently include content and practices focused on inclusive education. Authors such as Mantoan and Freire emphasize that the absence of critical and reflective education compromises the development of pedagogical practices capable of responding to the diversity present in classrooms.

Another relevant finding concerns the insufficiency of material, human, and accessibility resources, especially in public schools located in contexts of greater social vulnerability. The lack of

specialized professionals, adapted teaching materials, and adequate infrastructure limits the implementation of inclusive educational policies, reinforcing already existing inequalities. Arroyo emphasizes that such limitations reflect structural inequalities that go beyond the school sphere, requiring intersectoral policies to confront them.

The results also indicate that school management plays a central role in the realization of inclusive policies. The analyzed studies point out that democratic management practices, with the participation of the school community and articulation among different actors, contribute to the construction of more inclusive and equitable environments. On the other hand, the absence of institutional planning and systematic monitoring of policies compromises their effectiveness.

Overall, the discussion of the results, in light of the literature, reveals that inclusive educational policies in Brazil have advanced at the normative level, but still face significant challenges for their practical consolidation. These findings reinforce the need for continuous investments in teacher education, school infrastructure, and democratic management, as well as articulated actions that promote social equity and guarantee the right to quality education for all.

CONCLUSION

This study had the general objective of analyzing the challenges of implementing inclusive educational policies and social equity in the Brazilian context, seeking to understand the extent to which normative advances have been translated into effective practices in the daily life of educational institutions. To this end, the specific objectives were defined as understanding the theoretical foundations of inclusive education, identifying the main legal landmarks, and analyzing the obstacles that hinder the realization of these policies.

The main results showed that, although Brazil has a consistent legal framework aimed at inclusive education, a significant distance still persists between the formulation of public policies and their practical implementation. Recurring challenges highlighted include insufficiency in teachers' initial and

continuing education, scarcity of pedagogical and accessibility resources, weaknesses in school management, and socioeconomic inequalities that directly impact the educational process. Such factors compromise the guarantee of access, permanence, and learning for students in situations of vulnerability.

As a contribution, this research offers a theoretical and critical systematization of inclusive educational policies in Brazil, collaborating toward deepening the academic debate and fostering reflection among administrators, teachers, and public policy makers. By articulating scientific literature and normative documents, the study reinforces the understanding of inclusive education as an ethical, political, and social commitment.

For future research, it is suggested to conduct empirical studies in specific school contexts, making it possible to analyze the implementation of inclusive policies from the standpoint of pedagogical practice and educational management, as well as investigations that consider intersectoral articulation as a strategy for confronting inequalities and promoting social equity in the Brazilian educational system

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USE OF CANVA IN THE LITERARY ANALYSIS OF STUDENTS WITH HIGH ABILITIES FROM THE PERSPECTIVE OF INCLUSIVE EDUCATION

 <https://doi.org/10.63330/aurumpub.032-004>

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Abstract

This study analyzes the use of infographics produced with the Canva application as a pedagogical strategy for the analysis of literary works by high school students identified with high abilities/giftedness (HA/G) in the area of languages. Grounded in theoretical foundations on giftedness (Renzulli; Gardner; Virgolim), inclusive education, multiliteracies, and Digital Information and Communication Technologies (DICT), the research seeks to understand how the production of multimodal artifacts can enhance these students' creativity, authorship, and critical analysis, while also fostering collaborative writing with peers who have different learning profiles. This is a qualitative, descriptive study, configured as a multiple case study, developed with high school classes in which students produced infographics in Canva to systematize and interpret four Brazilian literary works: *A hora da estrela*, by Clarice Lispector; *Memórias póstumas de Brás Cubas*, by Machado de Assis; *Torto arado*, by Itamar Vieira Júnior; and *Vidas secas*, by Graciliano Ramos. The results indicate that using Canva to produce literary infographics contributes to curricular enrichment, to the development of

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linguistic and multimodal competencies, and to the construction of a more inclusive and motivating learning environment (Utami; Djamdjuri, 2021), provided that there is intentional planning and teacher mediation that recognizes and values the potential of students with high abilities.

Keywords: High abilities/giftedness, Infographics, Canva, Literary analysis, Digital technologies.

INTRODUCTION

The teaching of literature in high school, in many contexts, is still marked by practices centered on the teacher's oral exposition and on the completion of exercises that prioritize memorization of information about literary movements, authors, and works. In general, this model relegates to the background the construction of critical, authorial, and socially situated readings. In this scenario, students with high abilities/giftedness (HA/G) in the area of languages may simultaneously experience a strong interest in reading and a sense of frustration or boredom in the face of the scarcity of challenging proposals that provide space for inquiry, in-depth interpretation, and creation.

In parallel, the use of Digital Information and Communication Technologies (DICT) in educational contexts has expanded, calling on schools and teachers to rethink the articulation between digital resources, curriculum, and pedagogical practices (Brazil, 2018). Tools such as Canva, a digital platform that enables the creation of infographics, posters, presentations, and other multimodal artifacts, make it possible to integrate texts, images, icons, charts, and colors in a relatively simple, intuitive, and collaborative way (Ferreira; Silva, 2020).

The production of literary infographics through Canva may thus be configured as a strategy for curricular enrichment and for the personalization of instruction for students with high abilities in languages, while simultaneously aligning with the perspective of inclusive education. According to the principle of curricular enrichment (Virgolin, 2007), these students can assume roles of intellectual and creative leadership in collaborative projects, contributing more complex interpretations of works, while peers with different learning rhythms and styles participate with other competencies, especially in the

field of visual organization and the selection of multimodal resources. This dynamic reflects a multidimensional conception of learning and a focus on identifying and developing different talents.

In light of the above, this study analyzes a pedagogical experience developed with high school classes in which students produced infographics in Canva to analyze four Brazilian literary works: *A hora da estrela* (Lispector, 1998), *Memórias póstumas de Brás Cubas* (Assis, 2017), *Torto arado* (Vieira Júnior, 2019), and *Vidas secas* (Ramos, 2019). The study seeks to articulate theoretical foundations such as the models of Renzulli (1978), Gardner (1983), and Virgolim (2007), innovative practices, and the use of DICT, focusing on the potentialities and challenges of this approach for working with students with high abilities in the area of languages, in a context of inclusive education.

Research on the use of Canva in the analysis of literary works with students with high abilities/giftedness (HA/G) in inclusive contexts is justified, initially, by the need to re-signify the place of literature in school. In many settings, work with literary texts remains limited to exam preparation and excessively instrumentalized reading practices, which ultimately relegate to the background the aesthetic dimension, authorial interpretation, and the construction of meaning linked to students' experiences. Such a model proves insufficiently responsive to the demands of students who present high potential in the area of languages, because it does not systematically offer them more complex intellectual challenges, conditions to exercise authorship, and opportunities to develop their creative expression.

Moreover, the contemporary scenario of text circulation is marked by the constant presence of visual, hypermedia, and interactive resources. The Brazilian National Common Core Curriculum (BNCC) itself highlights the importance of developing competencies related to digital culture, the production of arguments in multiple languages, and active participation in multiliteracies practices (Brazil, 2018). Disregarding these modes of meaning-making is to maintain a distance between what the school proposes and the ways of reading, producing, and sharing information that students experience daily. By integrating Canva into work with literature, the teacher brings the study of canonical works closer to contemporary communicative practices, without relinquishing the analytical rigor that characterizes literary education.

In the specific case of students with HA/G, the justification becomes even more evident. These students generally reveal ease in identifying patterns, establishing connections between texts and contexts, formulating theses, and proposing their own interpretations. However, they do not always find, in everyday school life, opportunities to fully mobilize this potential in activities that value depth of reading and the exploration of multiple languages. Producing literary infographics in Canva entails decisions of selection, organization, and hierarchization of information, as well as aesthetic choices that “translate” interpretations into visual formats. It is, therefore, an intellectually challenging task that demands synthesis, analysis, and creativity—attributes consistent with the profile of students with high abilities/giftedness.

At the same time, the proposal is not restricted to serving a specific audience. By promoting work in heterogeneous groups, in which students with high abilities interact with peers who present different learning rhythms and styles, the activity fosters an inclusive practice that recognizes and values the diversity of competencies present in the class. While some stand out in the formulation of interpretations and argumentation, others contribute with visual elaboration, mastery of digital resources, or the practical organization of the work. Under these circumstances, the task becomes a space in which differences cease to be perceived as obstacles and instead operate as pedagogical resources, promoting cooperation, the exchange of knowledge, and a sense of belonging among all.

Another aspect that makes this study pertinent is the scarcity of investigations that concretely document experiences in which digital technology does not act merely as a presentation support, but as a structuring element of the process of reading and literary analysis. Frequently, the use of digital platforms in school is limited to transposing traditional practices to an online environment, without modifying the underlying pedagogical logic. By focusing on the production of infographics in Canva as a constitutive part of the interpretive process, this work seeks to highlight possibilities for critical and creative uses of DICT, capable of re-signifying ways of reading, discussing, and socializing literature in Basic Education.

Thus, by analyzing an experience developed in a public school with high school classes, the study offers practical support for teachers who wish to integrate literature, high abilities, and digital technologies in their lessons. The systematization of results can support the planning of future proposals, guide teacher education processes, and reinforce the conception that the teaching of literature can be, at the same time, academically rigorous, digitally up to date, and truly inclusive.

Given this set of elements—the need to re-signify the teaching of literature, the potential of students with HA/G, the relevance of DICT in the context of multiliteracies, and evidence that collaborative practices can strengthen inclusive education—it becomes essential to investigate systematically how the production of infographics in Canva can act as a pedagogical strategy in high school. In this sense, this study is organized around a general objective and specific objectives that guide the analysis of the developed experience.

The general objective of the study is to analyze the use of infographics produced in Canva as a pedagogical strategy for the analysis of literary works by high school students with high abilities/giftedness, from the perspective of inclusive education.

More specifically, it seeks to:

- describe pedagogical experiences in which high school students produced literary infographics in Canva, articulating reading, interpretation, and multimodality;
- investigate how students identified with high abilities in languages engage in the production of these infographics and what types of contributions they present in terms of depth of literary analysis;
- examine how this practice fosters the participation and learning of peers with different performance profiles, contributing to an inclusive education environment;
- elaborate recommendations for the pedagogical use of Canva in the production of literary infographics in classes with students with high abilities in high school.

To understand how these actions materialize in the school context and sustain the proposed objectives, the next item presents the theoretical frameworks that support understanding of the proposal investigated here.

LITERATURE REVIEW

Brazilian legislation and public policies recognize students with high abilities/giftedness as part of the target population of special education within the perspective of inclusive education (Brazil, 2008). These students present differentiated cognitive, creative, and socioemotional characteristics, as well as high potential in isolated or combined areas, such as intellectual, academic, artistic, or psychomotor. From an inclusive perspective, the goal is not to separate or isolate these students, but to ensure their access, participation, and learning in common contexts, with opportunities for enrichment and curricular deepening (Brazil, 2018). This implies proposing cognitive challenges, authorship experiences, and projects that allow the exploration of creativity and critical thinking, avoiding both demotivation due to boredom and the reduction of their identity to academic performance (Neihart et al., 2016). Failure to observe these needs constitutes one of the recurrent challenges in teaching practice.

The understanding of giftedness is widely grounded in theorists such as Renzulli (1978) and Gardner (1983). Joseph Renzulli defines HA/G as the intersection of three components: above-average ability, high levels of task commitment, and high levels of creativity. The author emphasizes that giftedness is not a fixed or static trait, but a behavior that emerges in contexts that motivate and offer opportunities for these abilities to be applied meaningfully. Complementarily, Howard Gardner (1983), with the Theory of Multiple Intelligences, challenges the conception of a single and homogeneous intelligence by proposing the existence of multiple talents—linguistic, spatial, musical, among others. This perspective is fundamental to inclusion, as it supports that teaching should contemplate the unique combinations of different intelligences that each student presents. The Brazilian researcher Ângela Virgolim (2014), in dialogue with Renzulli, highlights the need for early identification and appropriate

pedagogical intervention, emphasizing the role of Digital Information and Communication Technologies (DICT) as relevant tools in this process.

DICT have been recognized as central elements in the constitution of new reading and writing practices that involve multiple languages, media, and modes of meaning-making (Rojo; Moura, 2012). The notion of multiliteracies highlights that, in contemporary times, reading and writing are not restricted to printed verbal text, but involve the ability to interpret and produce multimodal texts that combine verbal, visual, sound, graphic, and other forms of representation (Kress, 2010; Dion sio, 2012).

In literature teaching, the production of infographics in Canva responds directly to this need. Infographics are multimodal genres that require synthesis, selection, and hierarchical organization of information, challenging the student to identify the essential elements of the work and make them visually comprehensible. Such practices foster active participation, collaboration, and the development of critical competencies. As a pedagogical resource, infographics have been used to support the understanding of complex content, develop skills of selecting and hierarchizing information, and promote clear communication of ideas (Santaella, 2012).

In the specific context of literature teaching, infographics can represent narrative structures, relationships between characters, timelines, historical contexts, recurring themes, symbols, and possible interpretations of a work. The requirement for synthesis and visual choices involves interpretive decisions, strengthening understanding and expanding the student's capacity for argumentation.

Canva, in turn, is a free digital platform (with an educational version) that enables the creation of diverse graphic materials, with an intuitive interface and the possibility of collaborative work in real time. The application makes it possible to develop, organize, and share ideas visually, illustrating concepts based on the reading of texts (Ferreira; Silva, 2020). In educational environments, the use of Canva has been reported as a resource capable of increasing students' motivation and engagement in writing. Studies by Utami and Djamdjuri (2021) indicate that students feel motivated to produce when they can experiment with layouts, combine visual elements, and express themselves creatively.

In the specific case of students with HA/G, the use of Canva and other digital technologies can intensify engagement and individual creativity. However, the literature also points to significant challenges: gaps in teacher education for the pedagogical use of DICT, infrastructure limitations, as well as the risk of prioritizing aesthetic aspects to the detriment of conceptual depth. Thus, although the potential of Canva is significant in terms of motivation and multimodality, its effectiveness depends on public policies that ensure adequate conditions of use and on continuing education processes that support teachers in building innovative and inclusive practices.

METHODOLOGY

The research is characterized as qualitative, exploratory, and descriptive, configured as a multiple case study (Yin, 2015), since it involves analyzing a pedagogical experience developed with different literary works and groups of students.

The study was conducted in a public high school in the Federal District that develops actions for identifying and serving students with high abilities/giftedness, in accordance with the guidelines of the National Policy on Special Education from the Perspective of Inclusive Education (Brazil, 2008). Two 12th-grade classes participated in the experience, totaling approximately sixty students, among whom five were identified by the school as presenting high abilities in the area of languages.

Identification was based on pedagogical assessment, teachers' recommendations, and participation in curricular enrichment activities, in line with guidance from specialized literature (Freitas; Pérez, 2010). The Portuguese Language teacher, with experience in using DICT, acted as mediator of the proposal and was responsible for both participating classes, which facilitated continuous monitoring of the activity's development.

The experience was developed over six 50-minute sessions, organized in the following stages:

- a) Reading and discussion of the works:

The classes carried out the full reading of *A hora da estrela* (Lispector, 1998), *Memórias póstumas de Brás Cubas* (Assis, 2017), *Torto arado* (Vieira Júnior, 2019), and *Vidas secas* (Ramos, 2019). Next, guided discussions were conducted on plot, characters, narrator, time, space, themes, linguistic resources, and historical and social contexts.

Reading occurred throughout the academic term: sometimes students read chapters at home; at other times, selected excerpts were read and debated in class. In the work with *Memórias póstumas de Brás Cubas*, for example, issues related to the aesthetic effect of the “dead-author” and specific uses of irony were discussed, preparing students for possible analytical focuses in the infographics.

b) Presentation of the infographic genre and of Canva:

Subsequently, the teacher presented examples of educational and journalistic infographics, discussing characteristics such as synthesis, information hierarchization, use of colors and icons, and integration between text and image (Kress, 2010). Then, a brief tutorial on basic use of Canva was provided.

The examples were projected in the classroom, and students analyzed how information was distributed into blocks and what types of visual resources (arrows, frames, icons) contributed to comprehension. In the tutorial, the teacher produced, in real time, a model infographic about a short story previously studied, demonstrating how to select templates, insert texts, adjust fonts, add images, and organize elements.

c) Formation of groups and definition of analytical focuses:

Students were organized into heterogeneous groups, seeking to include, whenever possible, at least one student with high abilities in each group. Each group chose an analytical focus for its infographic, such as: the construction of the narrator in *Memórias póstumas de Brás Cubas*; Macabéa’s psychology in *A hora da estrela*; power relations and the land question in *Torto arado*; or the social conditions and concise language in *Vidas secas*. The groups produced drafts on paper or directly in Canva.

d) Production of the infographics:

In the production stage, students used Canva to synthesize and visually represent their literary analyses. Students with high abilities frequently took on the selection of quotations, the formulation of interpretations, and the logical organization of content; other peers contributed by searching for images, choosing layouts, organizing the visual design, and revising the text.

This stage took place over two sessions, combining the use of the school's laptops and students' personal mobile phones. In several groups, students with HA/G also assisted peers who were less familiar with Canva, explaining features such as element alignment, color palettes, and creating new text boxes.

e) Sharing and reflection:

The groups presented their infographics to the classes, explaining their choices of content and form. Next, a discussion circle was conducted about the experience, emphasizing learning about the literary works, contributions of using Canva, and perceptions about group work.

Students responded to questions such as: what was easiest and most difficult in the activity; whether the process of transforming reading into an infographic contributed to understanding the works; and how they perceived interaction among group members, including peers with HA/G.

Data were produced from three main sources:

- Participant observation, with records in a field diary, focusing on interactions, roles assumed by students with high abilities, and teacher interventions. For example, situations were recorded in which students with HA/G assumed leadership in defining analytical focuses or explained literary concepts to peers.
- Infographics produced in Canva, digitally analyzed regarding depth of literary analysis, use of quotations, thematic organization, and use of visual resources;
- Accounts from students and the teacher, collected through open-ended questionnaires and brief interviews.

Data analysis followed procedures of thematic content analysis (Bardin, 2016), seeking to identify categories such as: depth of literary analysis; roles performed by students with HA/G; forms of participation by other peers; perceptions about using Canva; and challenges of the proposal. Ethical principles of educational research were respected, including informed consent, guarantee of anonymity, and institutional authorization.

The methodological path adopted here made it possible to follow the development of the pedagogical proposal, recording both the processes of elaborating the infographics and the interactions and perceptions of students throughout the activity. The combination of participant observation, analysis of digital products, and reports from those involved enabled a multifaceted understanding of the experience, articulating cognitive, creative, and collaborative dimensions. These procedures ground the discussion of results, presented in the next section.

RESULTS AND DISCUSSION

Analysis of the produced infographics indicated that groups that included students with high abilities in languages tended to elaborate more complex analytical cutouts, going beyond plot summary. In *Mem rias p stumas de Br s Cubas*, for example, infographics were created that highlighted the construction of the “dead-author” narrator, the break with temporal linearity, and the use of irony and metalanguage, linking excerpts of the work to interpretations about the critique of nineteenth-century society. In *A hora da estrela*, infographics were produced that explored the relationship between narrator and character, Macab a’s social invisibility, and the metalanguage characteristic of Clarice Lispector. Such elements were identified both in the reading of the Canva digital files and in the field diary records produced during group presentations.

In *Torto arado*, some groups emphasized power relations and the struggle for land, as well as the mythical dimension of the narrative, combining quotations and symbolic images. In *Vidas secas*, the infographics frequently established relationships between Graciliano Ramos’s sparse language, the aridity

of the backlands, and the dehumanization of the characters, building consistent parallels between linguistic form and social context. In these analyses, careful articulation was observed between visual choices—such as color palettes, icons, and photographs—and the thematic and stylistic aspects highlighted in the explanatory texts of the infographics.

These results suggest that producing infographics in Canva, when guided by analytical questions, favors deeper literary reading, in line with multiliteracies perspectives that advocate practices of critical analysis, synthesis, and authorship. The need to transform interpretations into visual languages led students to negotiate meanings, select relevant aspects, and justify their choices, both in group discussions recorded in the field diary and in oral presentations during sharing.

Classroom observations recorded in the field diary showed that students with high abilities frequently assumed roles of intellectual leadership within groups, proposing interpretations, selecting significant excerpts from the works, and organizing the argumentative structure of the infographics. These students were recognized by peers as references in terms of literary knowledge and capacity for synthesis, which contributed to their protagonism in the process. On the other hand, the multimodal nature of the task created space for other students to contribute complementary skills, such as choosing layouts, selecting representative images, defining colors, and visually organizing information. In this way, contributions were not limited to verbal mastery, allowing different learning profiles to be valued. This dynamic resonates with the conception of inclusive education that understands diversity—including the presence of students with high abilities—as a pedagogical resource rather than a problem (Brazil, 2008). Instead of isolating students in adapted activities, the proposal engaged them in collaborative work, in which they could exercise intellectual and creative leadership while also learning from peers.

Students' reports, collected through open-ended questionnaires and brief interviews, indicated broadly positive evaluations of Canva use. Students with high abilities highlighted that the activity challenged them to “think about the work in a different way,” suggesting that the digital resource fostered a reading that articulates text, image, and visual organization. In line with Utami and Djamdjuri (2021),

several students reported feeling “more confident” and perceived that the production process in Canva can “improve the success” of their writing skills.

The teacher, in his open-ended questionnaire, also highlighted greater engagement during the activity, with intense discussions about interpretations of the works and interest in sharing the infographics with other classes. At the same time, he pointed to challenges, such as some students’ tendency to emphasize aesthetic aspects to the detriment of content, the time required to become familiar with the tool, and inequalities in access to devices and connectivity, especially outside school.

These challenges reinforce that the use of DICT such as Canva does not, in itself, guarantee pedagogical innovation or inclusion (Brazil, 2018). Teacher mediation is central to maintaining focus on learning objectives—in this case, literary analysis—and to supporting students with different levels of technological familiarity. Strategies such as defining clear assessment criteria for both content and form, organizing moments of technical support, and promoting metacognitive reflections on the process can enhance this practice.

FINAL CONSIDERATIONS

The results obtained suggest that the proposal contributed significantly to curricular enrichment, expanding opportunities for deepening the reading and interpretation of works such as *A hora da estrela*, *Memórias póstumas de Brás Cubas*, *Torto arado*, and *Vidas Secas*, as well as to the development of multimodal competencies. By shifting the focus from practices centered on memorizing information about authors and literary movements to the production of infographics that require synthesis, selection of significant excerpts, and explicit articulation of interpretations, the experience brought literature teaching closer to a more investigative and authorial perspective, in line with the defense of multiliteracies practices and with BNCC guidelines regarding the critical and creative use of DICT.

The activity enabled students with high abilities to assume roles of intellectual leadership, meeting recommendations for their educational support without removing them from interaction and collaboration

with peers. It was observed that these students frequently took charge of formulating interpretive hypotheses, selecting relevant quotations from the works, and logically organizing the arguments presented in the infographics, mobilizing characteristics such as rapid reasoning, analytical thinking, and capacity for synthesis. At the same time, the collaborative nature of infographic production favored qualified participation by students with different learning profiles, who contributed complementary skills related to choosing layouts, selecting images and icons, and constructing visual strategies to make interpretations clearer. This pedagogical arrangement reinforces the conception of inclusive education present in Brazilian educational policies, according to which classroom diversity should be understood as formative potential.

On the other hand, the study highlights the need for careful planning and attentive teacher mediation, so that the use of Canva does not become reduced to producing aesthetically appealing but conceptually superficial materials, nor accentuate inequalities in access to DICT. The teacher's observations and students' reports highlighted challenges related to the time needed to become familiar with the platform, the tendency of some groups to prioritize visual aspects over literary analysis, and asymmetries in access to devices and the internet, especially outside school. These elements point to the importance of making explicit assessment criteria that simultaneously consider the quality of literary analysis and the appropriateness of visual resources, organizing moments of technical support for Canva use, and linking this practice to broader digital inclusion policies.

Among the study's limitations are its implementation in a specific context, with a restricted number of classes, and its reliance on the institutional identification of students with high abilities, which may not include all existing cases within the school.

In addition, the research focused on a relatively short time frame and on a single type of multimodal product (infographics), which prevents broader generalizations about the use of Canva and other DICT in literature teaching. Even so, the detailed description of the experience and the analysis of

the produced materials offer relevant indications of the possibilities and limits of this strategy in real classroom contexts.

As follow-ups, investigations are suggested at other levels of education and in different school contexts, in order to verify to what extent similar proposals can be adapted to elementary education and to youth and adult education; comparative studies between classes that use or do not use digital infographics in analyzing works; and explorations of other digital genres—such as podcasts, videos, webcomics, and blogs—as enrichment resources for students with high abilities in the area of languages. These directions can contribute to consolidating pedagogical practices that recognize the potential of students with HA/G, value classroom diversity, foster authorship and critical analysis, and integrate DICT into literature teaching in a careful, creative, and ethical manner.

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SCHOOL GARDENS AS A STRATEGIC IN ENVIRONMENTAL EDUCATION AND CULTURAL IDENTIFY IN A RURAL SCHOOL THE MUNICIPALITY OF PORTEL, MARAJÓ MESOREGION

 <https://doi.org/10.63330/aurumpub.032-005>

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Abstract

This study corresponds to an Environmental Education practice at the Adelson Fernandes Municipal Elementary School, located in the Bom Remédio Community in the municipality of Portel-Pará, in the Marajó Mesoregion. Its objective was to raise awareness and develop critical thinking and citizenship skills in children aged 6 to 11 regarding socio-environmental issues such as sustainability, agroecological food, and improving quality of life. The methodological practice was characterized as an innovative and meaningful learning method by highlighting the importance of healthy, sustainable, and responsible

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consumption through the use of a school garden. This non-formal educational tool allowed these elementary school students to take the lead through experiences and the construction of systematized and interdisciplinary knowledge to foster socio-environmental awareness. Prior to this, lectures were held on topics related to the environment and agroecological management. Finally, a questionnaire was administered to the students, and the results demonstrated the importance of family farming for sustainability. It was concluded that the school garden represented a strategic element for the preservation of the exuberant and valuable marajoara culture, nutritional balance, and environmental conservation, guaranteeing the future of future generations.

Keywords: Environmental Education, Interdisciplinarity, Sustainability, School Garden, Marajó Mesoregion.

INTRODUCTION

Actions within the school context should provide a sense of constructing an educational vision that offers access to socio-environmentally relevant knowledge, enabling children's integral development according to conditions of social vulnerability (Bertazzo and Wiezzel, 2025). Therefore, Early Childhood Education is considered the best stage for educational interventions, since tastes, personality, and decisions are influenced by lived experience with the environment (Santana et al., 2022).

Recognizing the school as one of the pillars sustaining cultural, social, ethical, and autonomous development, the construction of pedagogical practices capable of sensitizing students from the earliest school years becomes relevant. This should encourage them to observe environmental reality through critical and questioning lenses. Sustainability must be the foundational principle for the formation of transformative agents and participatory citizens (Silva, Sherer and Galle, 2025).

The modern world, marked by unrestrained consumerism, has been one of the main drivers of environmental degradation and the depletion of natural resources. In response to this global challenge, Environmental Education (EE) emerges as a powerful tool capable of mitigating the negative impacts of

this trend (Gomes, Magalhães Júnior and Triani, 2025). In this context, it is necessary for Environmental Education (EE) to be addressed from Early Childhood Education onward, so as to enhance children's imagination in order to re-signify the human–nature relationship and enable improvements in the quality of life of future generations through everyday attitudes, such as adopting sustainable eating habits (Oliveira et al., 2024).

In view of this, it is necessary to promote activities that bring children closer to environmental components (abiotic and/or biotic), and the school garden can be cited as an example of such activities (Souza et al., 2021). The development of a school garden, as a practical activity for students, makes it possible for them to analyze ways of achieving more promising outcomes regarding environmental issues. Moreover, Environmental Education becomes a challenging activity in the practical dimension of students' knowledge, as it fosters competencies focused on environmental conservation and student engagement through interdisciplinary environmental practices (Moura et al., 2025). Therefore, implementing school gardens is an agroecological practical activity that reinforces feelings of belonging and identity and reaffirms the school's role as a formative space capable of transforming realities (Pantoja, Pantoja and Brito, 2025).

Teaching activities in a school garden help students understand the dangers of using agrochemicals for human health and the environment. Thus, they stimulate awareness of the need for environmental preservation and the development of the capacity to work in teams and cooperate. This provides greater contact with natural resources and reflections on their uses (Queiroz et al., 2020). Furthermore, the garden in the school environment enables inquiry-based teaching, since it allows students and teachers to leave the monotony of the classroom to experience moments of collaborative and reflective interaction in a natural environment, and to be concerned with social well-being, as well as socio-environmental balance and the guarantee of natural resources for future generations (Brasil and Scareli-Santos, 2023).

SCHOOL GARDENS AS A STRATEGIC IN ENVIRONMENTAL EDUCATION AND CULTURAL IDENTIFY IN A RURAL SCHOOL THE MUNICIPALITY OF PORTEL, MARAJÓ MESOREGION

Gardens in the school environment are agroecological spaces that seek to value cognitive construction. They are sustained by critical reflection, aimed at the emancipation of subjects and collective conditions grounded in healthier eating habits and the adoption of responsible environmental conduct (Sousa et al., 2018). Thus, the present work aimed to promote environmental education through the construction of a garden at the Adelson Fernandes Municipal Elementary School (EMEF), located in the rural area of the municipality of Portel, in the Marajó Archipelago; as well as to stimulate interest in healthy eating and the production of organic foods and, at the same time, contribute to the use of spaces and sustainable, collaborative, and co-participatory principles among children, as well as strengthening cultural identification and a sense of belonging to the Marajoara territory.

METHODOLOGY

The municipality of Portel (latitude 01°56'08" South and longitude 50°49'16" West) is the second largest in the Marajó Mesoregion and is located 324 km from Belém, the capital of the state of Pará, with access occurring by river. The population of Portel engages in activities related to agriculture, plant extractivism, fishing, and tourism (Brasil, 2022).

Figure 1

Map of the location of the municipality of Portel in the Marajó Mesoregion



Source: MOVIMENTO MARAJÓ FORTE, 2024.

The climatic classification of the municipality of Portel, according to the Köppen classification, is Af, characterized as humid tropical, which presents high temperatures and abundant rainfall throughout the year, with the period of highest rainfall index occurring between October and April, with annual climatic averages of temperature of 29°C, relative humidity of 80%, and average annual rainfall of 2200 mm (Portel, 2025).

The municipality of Portel possesses immeasurable environmental heritage, with a vast forested area. It encompasses the Anapu, Camairapi, Pacajá, and Acutyperera rivers and, along their banks, there are freshwater beaches and bathing areas that constitute a real picture of spontaneous beauty, which qualifies it to be part of the Marajó Tourism Pole. This Marajoara municipality attracts tourists through a cuisine shaped by local fish, and the richness of the people of Portel is another legacy left by Indigenous peoples (Castilho and Mello, 2024). According to IBGE (2022) data, Portel has a population of 62,503 people, with 52.5% residing in rural areas.

The work was carried out at the Adelson Fernandes Municipal Elementary School (EMEF) (Figure 2), located in the Bom Remédio Community, Marajó Mesoregion. The activity was developed by students from the Full Teaching Degree in Rural Education and from the Environmental Management Technology program, who assisted the teachers of the aforementioned educational institution in developing the school garden, assessing socio-environmental impacts and emphasizing the importance of awareness regarding environmental disasters and agroecological management, since this practice aligns with the graduate profiles of the two higher education programs of the Federal Institute of Pará – Breves Campus. The community is located on the right bank of the Camaraipi River, in the Bay of Portel, and is characterized as a rural area of the municipality of Portel, Pará (PA).

Figure 2

Adelson Fernandes Municipal Elementary School (EMEF), rural area of the municipality of Portel



Source: Authors, 2023.

The activities were conducted between January and August 2023 and targeted elementary school students at a rural school in the municipality of Portel, in the Marajó Archipelago. The present study is grounded in a qualitative approach and supported by participatory research methodology. It is characterized by the researcher being in loco and involved in the real experiences of the participants, by the use of multiple and interactive methods, by descriptive results, and by holistic analysis of social phenomena, according to Rodrigues, Oliveira; Santos, 2021.

The students who participated in the activities of implementing and maintaining the garden were aged 6 to 11 years and were enrolled from the 1st to the 5th school year. On average, the classes comprised 40 students, totaling 200 students participating in this research. Activities with the students took place once a week.

For the implementation and maintenance of the garden, materials and vegetable species were used (Table 1). It is worth noting that some species, such as jambu, ora-pro-nóbis, cipó-kubá, and chicória, belong to the group of plants known as PANC (Unconventional Food Plants), because they are plants of regional importance and typical dishes in the Brazilian diet can become more nutritious, according to researchers (Subtil, 2022). Therefore, introducing these species aims to maintain food culture in the

Marajó Mesoregion, given that dishes such as saltadinho marajoara (Almeida, 2018). Indeed, the Marajó Regional Public Hospital maintains a garden of 180 square meters that produces 80% of the vegetables consumed by patients at this hospital; according to the head of the Nutrition and Dietetics Service of the hospital unit, contact with a pesticide-free garden enables children's biopsychosocial development and raises awareness about the importance of preservation and interaction with the environment (Vilanova, 2023).

Table 1

Materials used and vegetables cultivated in the school garden at Adelson Fernandes Municipal Elementary School (EMEF)

Materials	vegetables	
	Common name	Scientific name
Rake	Abiu cutite	<i>Pouteria macrophylla</i>
Wheelbarrow	Lettuce	<i>Lactuca saliva L.</i>
Transplanting trowel	Leek	<i>Allum ampelosarum var. porum</i>
Hoe	Cheiro-verde	<i>Petroselinum crispum</i>
Sickle	Chicória	<i>Eryngium foetidum L.</i>
PET bottles	Cipó-kubá	<i>Cissus gonglyodes Burch</i>
Nylon line	Kale	<i>Brassica oleraceae L.</i>
Hose	Hortelãzinho	<i>Mentha pulegium L.</i>
Measuring tape	Limão galego	<i>Citrus medica L.</i>
Saw	Ora-pro-nós	<i>Pereksia aculeata</i>
Pine boards	Black pepper	<i>Piper nigrum L.</i>
Wood hooks 13 × 30		
Headed nails 16 × 24		
NPK fertilizer		
Disposable cups		

Source: Authors, 2023.

Before implementing the garden at Adelson Fernandes Municipal Elementary School (EMEF) and the maintenance activities, educational lectures were delivered in a formal setting (the classroom). Thus, the lectures aimed to highlight the importance of the school garden as a space for environmental awareness and the production of agroecological foods. In addition, waste management was addressed (use of organic compost and PET bottles – polyethylene terephthalate) and the general characteristics of the vegetable species that would be implemented (Figure 3). At the end of the lectures, students answered a questionnaire whose questions sought to investigate whether they had already cultivated or intended to

invest in vegetable cultivation in the future and, primarily, the relevance of the garden for the environment.

Figure 3

Presentation of the importance of the school garden through educational lectures



Source: Authors, 2023.

After the period of educational lectures, the second step was the construction of the school garden and the execution of activities in this open space, carried out by the members of this article together with students and teachers of Adelson Fernandes Municipal Elementary School (EMEF). The activities followed these stages: soil preparation; sowing—during which sowing methods were presented; planting; and general plant care up to harvest. In this way, throughout all processes, students were able to become familiar with different plants, as well as strengthen their contact with nature. In addition, introducing vegetables into the preparation of school meals was encouraged. At the end, a questionnaire was administered to learn about the importance of agriculture for the environment.

Each “bed,” with dimensions of 1.2 m in width and 0.25 m in height, of the suspended school garden (Figure 4) was filled with moinha or açaí fertilizer, using the foliar fertilization technique (using NPK, at a dosage of 7 ml per liter of water) every 15–20 days, totaling a period of 120 days. The vegetables were selected in this study due to a prior assessment of the diet of residents of the Bom Remédio Community, and the spacing for each crop was 30 cm. For irrigation, a hose was used, and the vegetables were irrigated twice a day, in the morning (around 9 a.m.) and in the afternoon (around 5 p.m.).

Figure 4
Stages of the cultivation process in the school garden at Adelson Fernandes Municipal Elementary School (EMEF)

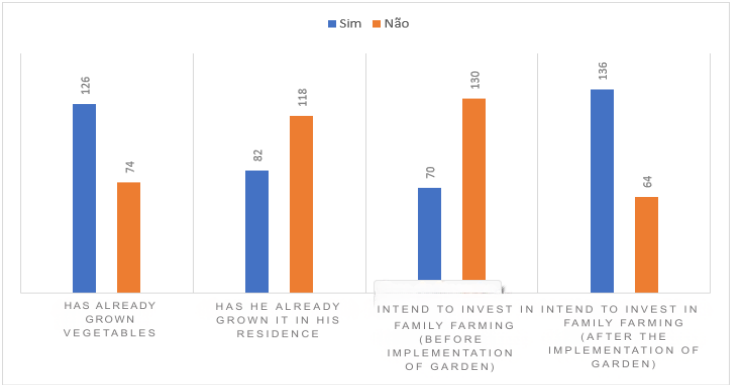


Source: Authors, 2023.

RESULTS AND DISCUSSION

Administering the questionnaire to understand students’ opinions was the first step toward implementing the garden. This made it possible to assess their interest in the research. At the beginning of the implementation of the school garden project at Adelson Fernandes Municipal Elementary School (EMEF), the 200 students were asked about their consumption of vegetables (Figure 5) and whether they recognized the importance of regular vegetable intake.

Figure 5
Responses of the interviewed students regarding the importance of the garden



Source: Authors, 2023.

As shown in Figure 5, 63% of respondents (a total of 126 students) already had the habit of cultivating vegetables and, notably, 41% of respondents (a total of 82 students) reported helping their parents in farming. It is important to highlight that the percentage regarding the importance of family farming rose from 35% (a total of 70 students) to 68% (a total of 136 students) among students after the agroecological practices in the school garden were conducted. Thus, the school garden is a tool for integrating students through teaching and nutrition in a practical and educational experience. It serves as a strategy for environmental education, contributing to sustainable development, the formation of students' critical thinking, and the promotion of healthy eating (Freire, Batista and Silva, 2024).

According to Oliveira et al. (2025), sustainability must be integrated into school curricula as an essential theme for constructing a society that is more responsible for its attitudes, where there is concern about the consequences of human actions on the environment and how these consequences can directly affect human beings' quality of life, not only in the present but also for future generations. Therefore, in the school environment, children construct meanings, learn to regulate their emotions and resolve conflicts, create responsibility for social and collective well-being, and develop skills based on ethical, democratic, sustainable, and inclusive principles (Sá and Hermógenes, 2021). In this sense, didactic-educational activities in the school garden contribute to improvements in the teaching-learning process due to greater interdisciplinarity, raising students' awareness of environmental problems and modifying eating habits (Cancelier et al., 2023), given that teachers at Adelson Fernandes Municipal Elementary School (EMEF) related the theoretical components of their subjects to practices in the garden, as can be seen in Figure 6.

Figure 6

Active participation of teachers at Adelson Fernandes Municipal Elementary School (EMEF) in the school garden



Source: Authors, 2023.

Regarding the implementation and maintenance stage of the garden, students' interest in carrying out the activities was verified. This occurred due to their active participation in the development of agroecological techniques such as soil preparation, sowing, and planting, as well as daily management (care) of the cultivation (Figure 7). Furthermore, it is emphasized that one of the factors that made implementation and care of the garden feasible was the participation of teachers and technical staff at Adelson Fernandes Municipal Elementary School (EMEF), because although children were actively participating in the activities, the absence of more in-depth technical knowledge and practices would have hindered the execution of certain activities, such as fertilization, a fact that could compromise production.

Figure 7

Early Childhood Education students' protagonism in the Environmental Education process



Source: Authors, 2023.

Additionally, regarding aspects of vegetable production, it is emphasized that crops were produced following principles of organic food production. On this occasion, the importance of producing this type of food for environmental preservation and health promotion was highlighted. For example, jambu and leek are ingredients in the delicacy saltadinho marajoara (Almeida, 2018). Taturubá, popularly known as abiu-cutite, is native to the Amazon region. It has high nutritional and commercial value (Castro et al., 2014). It has been the subject of research for the pharmaceutical industry (Carvalho, 2023). It can be found in the Caxiuanã Forest (Silva, Carvalho and Yared, 2001), which is a federal conservation area in Brazil located in the northeast of the state of Pará, in the municipalities of Portel and Melgaço (Brasil, 2023).

CONCLUSION

After analyzing this research, it was possible to identify several benefits that an organic school garden can bring to the school's pedagogical, productive, and recreational context, such as:

- Natural foods free of agrochemicals (food health);
- Reduces spending on food and complements school meals;
- Awakens and stimulates socio-environmental awareness (Environmental Education);
- Values collective work, the social responsibility of the agents involved (socialization), and the formation of citizenship allied to sustainability;
- Enables theoretical and practical pedagogical activities with Meaningful Learning.

Carrying out environmental education activities, having the school garden as a consolidating focal point for forming citizens who are more sensitive and responsible in promoting environmental conservation, as well as being multiplying agents of such conservation, proved to be a feasible space capable of achieving these purposes.

Through the development of valuable activities for the teaching–learning process in the sustainable garden at Adelson Fernandes Municipal School (EMEIF), which is located in the municipality

of Portel, children's feelings of belonging and humanization were strengthened. In addition, traditional knowledge related to food production and valuing rural life was developed. Moreover, children were introduced to a new relationship with food, the environment, and society in a holistic manner, through creative activities that constitute support points for their growth because they make sense throughout the surrounding school community, when they recognize themselves in local culture and understand that they are agents capable of modifying socio-environmental reality. Finally, this non-formal space contributed to valuing and preserving the exceptionally rich and exotic Marajoara cuisine, which is a cultural landmark for the promotion of tourism in the Marajó Mesoregion.

Therefore, developing this theme in school environments is fundamental to assuming a commitment to everyone, promoting integral education, transdisciplinary and sustainable knowledge, in pursuit of quality environmental and nutritional education. For this, it is necessary that school management, teachers, students, and the community be engaged in actions that seek balance between environmental preservation and economic activities, meeting the demands of the twenty-first century.

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THE ROLE OF THE EDUCATIONAL MANAGER AND THE E-LEARNING ENVIRONMENT

 <https://doi.org/10.63330/aurumpub.032-006>

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Abstract

Information and Communication Technologies (ICT) have transformed education, promoting collaborative learning spaces, interaction between students and teachers, and enhancing communication within schools. Their strategic use expands the continuing education of teachers and school managers, encouraging innovative pedagogical practices and digital inclusion. The advancement of digitalization, especially following the remote teaching adopted during the COVID-19 pandemic, highlighted the need for school managers with digital competencies to implement technologies critically, ethically, and contextually. Despite challenges such as teacher resistance and infrastructure limitations, e-learning enables personalized learning, student protagonism, and equitable access to education. Effective integration of ICT requires strategic planning, ongoing professional development, and a collaborative school culture, consolidating innovative, inclusive educational environments focused on the holistic development of students.

Keywords: ICT, E-learning, Digital inclusion, School management.

INTRODUCTION

The presence of Information and Communication Technologies (ICT) in the school environment has brought about profound changes in educational practices, moving beyond the limited conception of use restricted to access to data and content. When incorporated in a planned and conscious manner, these technologies contribute to the constitution of collaborative learning spaces in which knowledge is

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collectively constructed, grounded in reflection, dialogue, and the active participation of the subjects involved. This movement fosters interaction and dynamism in the school environment, with a focus on the student, enhancing communication among managers, teachers, students, and families.

The use of Information and Communication Technologies also expands possibilities for the ongoing development of professionals in the educational field by broadening access to continuing education, up-to-date materials, and collaborative networks for exchanging experiences. This connectivity stimulates the circulation of innovative pedagogical practices and strengthens the process of teacher professional updating—an indispensable aspect in light of contemporary educational demands. In addition, the adoption of technologies contributes to a systemic integration among the administrative, pedagogical, and informational spheres of the school, favoring integrated and efficient management connected to the demands of the school community.

The advance of digitalization in the educational field intensified significantly as of the remote teaching experiences imposed by the COVID-19 pandemic at the beginning of 2020. This scenario highlighted the need for school managers prepared to act in contexts of technology-mediated education, such as e-learning. In this new panorama, the manager's role goes beyond administrative routines, requiring competencies to articulate pedagogical innovation, adequate structural conditions, and a digital culture coherent with the school institution's political-pedagogical project.

In view of these demands, it becomes essential for the school manager to develop digital competencies that support critical analysis, careful selection, and the strategic, responsible, and ethical implementation of technologies. These competencies include not only technical mastery of digital tools and platforms, but also analytical competence to critically assess their relevance and applicability in pedagogical practices. For administration to achieve a truly transformative effect in this scenario, it is essential that the manager adopts a reflective and proactive stance, evaluating how technologies influence learning, promote digital inclusion, and strengthen an inclusive, fair, and high-quality education.

Achieving these objectives depends, indispensably, on the continuous engagement of school managers in their own professional development. Training actions must adopt a comprehensive perspective that includes both technical knowledge and the pedagogical, administrative, and ethical dimensions related to the use of ICT.

In this way, managers will be better equipped to foster innovative school environments in which teacher autonomy, student protagonism, and the application of active methodologies supported by digital technologies are integrated in a contextualized and efficient manner.

With regard to methodological procedures, the study adopted bibliographic research as its main approach, considering it appropriate for the critical analysis of existing theoretical productions, enabling the articulation of concepts and reflections relevant to the theme. This approach made it possible to systematize and establish dialogue among different authors who investigate school management in the context of digital technologies, favoring a broad and consolidated understanding of the object of study.

The present study aims to analyze the performance of the school manager in the process of implementing educational technologies, examining the challenges and opportunities that emerge in this context. Considering the manager's role as a strategic agent allows for the formulation of institutional actions and policies that consolidate the integration of technology into school culture, promoting innovative, inclusive, and contextualized pedagogical practices capable of effectively articulating teachers' knowledge, student protagonism, and the transformation of the educational process.

In summary, it is emphasized that the strategic performance of the educational manager is fundamental to consolidating digital culture in the school environment, promoting the integration of technologies, pedagogical innovation, and digital inclusion in an effective and sustainable manner. The stance adopted by the manager regarding educational technologies impacts the receptivity and engagement of the teaching staff. Therefore, the strategic performance of the manager as a central agent in consolidating digital culture constitutes an essential element so that ICT cease to be mere auxiliary

instruments, becoming transformatively integrated into pedagogical and administrative processes, promoting innovation, digital inclusion, and the strengthening of school learning.

THE SCHOOL MANAGER'S PERFORMANCE IN RELATION TO ICT AND E-LEARNING

According to Moran et al. (2020), in the context of the twenty-first century, ICT have become central elements in shaping contemporary society. This occurs due to the convergence among advances in computing, communication, and telecommunications, present in computers, mobile phones, and other technological devices. These resources enable multiple functionalities, including exchanging messages, accessing audiovisual content, producing images, and communicating in real time among people located in different regions of the world.

Although important advances have been recorded in recent years—especially with regard to the improvement of educational indicators and the expansion of access to elementary education—there are still significant challenges to be overcome. As Silva (2021) points out, it is necessary to qualify this access and confront the historical social exclusion that marks the Brazilian educational system.

In society in general, the incorporation of new technologies occurs at an accelerated pace; however, in the school environment, resistance, slowness, and, in many cases, the ineffective use of these resources are still observed. A recurring practice in public schools is maintaining technological equipment unused, often stored away for fear of damage or due to the absence of adequate infrastructure conditions. Although these limitations are real, Moran et al. (2020) emphasize that, in addition to teacher training, it is essential that school managers also participate in training processes in order to encourage the use of technologies in both administrative and pedagogical activities, promoting digital inclusion and technological literacy within the school context.

In this scenario, it is the school manager's responsibility to exercise functions related to planning, leadership, and the creation of spaces conducive to reflection and experimentation. Within the scope of school management, the collective mobilization of competencies and the active participation of the

community contribute significantly to achieving educational objectives. According to Vieira (2023), transformations in the school environment tend to occur more intensely when principals, teachers, staff, students, families, and the community become directly involved in the actions implemented by the institution.

Franco (2019) highlights that the manager's involvement in integrating the various segments of the school community, in implementing ICT both in administrative management and in teaching, and in promoting the continuing education of professionals can play a crucial role in transforming the school into an environment oriented toward the production and sharing of knowledge.

For this to materialize, the school manager's commitment to continuing education directed toward the use of educational technologies and media is essential. It is the responsibility of this professional to ensure that technological resources are incorporated into the school's daily life in a meaningful way. The introduction of technologies must enable innovative pedagogical practices, making learning experiences possible that would not be feasible by other means. As Silva (2021) underscores, the appropriate use of ICT favors integration among different areas of knowledge, makes the school more attractive, and contributes to the formation of independent students who are capable of exploring multiple sources of information and different means of digital communication.

In the context of e-learning, educational management faces numerous challenges to ensure the effectiveness of digital programs. A major obstacle is the insufficiency of technological infrastructure. Kenski (2020) points out that many institutions encounter difficulties related to the lack of adequate equipment and the low quality of connectivity—a situation that is even more serious in economically vulnerable or geographically remote regions. Overcoming these limitations requires continuous investments and public policies aimed at expanding digital inclusion.

Another relevant challenge concerns the resistance of part of the teaching staff to the changes imposed by the use of digital technologies. Almeida and Rubim (2021) observe that many teachers feel insecure or insufficiently prepared to use technologies as part of pedagogical strategies. According to

Vieira (2023), a shift in mindset constitutes a determining element for the success of e-learning initiatives. The educational manager, in this context, must act as a transformative leader, offering support, encouragement, ongoing training, and technical assistance to teachers during the process of integrating digital teaching into the school context.

Nevertheless, e-learning presents numerous possibilities for educational innovation. According to Kenski (2020), digital environments constitute participatory and collaborative learning communities in which students can interact, share knowledge, and construct learning collectively. Digital tools serve as enhancers of these interactions, expanding communication possibilities and promoting a more dynamic and collaborative educational process.

Pretto (2020) emphasizes that e-learning favors the personalization of the educational process, allowing content and learning rhythms to be adapted to each student's particularities. The strategic management of these digital environments contributes significantly to expanding access to education, promoting inclusion and equity, by enabling audiences frequently excluded from face-to-face education to actively participate in the educational opportunities offered by institutions.

Almeida and Rubim (2021) stress that this modality is particularly relevant for continuing and professional education, as it enables students to conduct their learning autonomously, flexibly, and in a personalized manner, fostering the use of opportunities provided by digital technologies.

In this context, Pretto (2020) highlights that digital inclusion becomes a fundamental requirement to ensure that all individuals can benefit from the opportunities offered by e-learning, promoting educational equity and enabling student protagonism through innovative pedagogical practices mediated by digital technologies, regardless of geographical location or socioeconomic condition.

FINAL CONSIDERATIONS

Technologies, in and of themselves, do not generate significant changes in education. When used critically, contextually, and reflectively, ICT function as tools capable of significantly expanding

pedagogical possibilities and learning processes. However, the mere presence of ICT in the school environment does not promote effective changes in pedagogical practice. For these changes to be consolidated, it becomes essential to consolidate a critical and reflective stance among professionals, so that they can adequately evaluate the limits and potential of technologies in the school context.

The effective implementation of technologies in school processes requires training processes that consider sociocultural and institutional specificities. Teachers, managers, and other professionals need to be prepared to recognize the demands of the school community, as well as the obstacles and resistance that permeate the adoption of digital resources. This recognition presupposes practices of listening, analysis, and collective reflection, fostering commitment and shared responsibility among the different members of the educational process.

Based on this contextual diagnosis, it becomes possible to outline strategies that contribute to the re-signification of pedagogical practices. Such strategies must be aligned with innovative and participatory methodologies, supported by educational conceptions that value student protagonism and the teacher's mediating role. In this process, resources such as virtual learning environments, interactive digital platforms, educational games, diverse media, and collaborative tools can enhance more meaningful formative experiences.

In view of this context, it is incumbent upon the educational manager to promote and organize guidelines related to ongoing professional development. It is the educational manager's responsibility to promote the strategic articulation of institutional cooperation with universities, educational technology centers, and digital learning platforms, with the aim of making courses, workshops, mentoring programs, and other formative actions feasible. These initiatives are fundamental to strengthening the qualification of education professionals and to the innovative and pedagogical integration of technologies into teaching and learning processes.

Ultimately, the consistent integration of technologies into the teaching process depends on consolidating an institutional culture grounded in valuing collaborative work, ongoing professional

development, and educator autonomy. This path requires not only investments in technological resources, but also the formulation of public policies aimed at promoting digital equity and valuing education professionals. Only through this approach will it be feasible to establish dynamic, accessible, and innovative learning environments in which technology functions as an essential ally in the humanization of teaching, in promoting fair access to digital tools, and in strengthening student protagonism—stimulating innovative, relevant pedagogical practices focused on students’ integral development.

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FULL-TIME EDUCATION: CHALLENGES AND POSSIBILITIES IN THE TEACHING AND LEARNING PROCESS

 <https://doi.org/10.63330/aurumpub.032-007>

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Abstract

Full-time education has been consolidated as an important strategy for promoting the comprehensive development of students by extending learning time and educational opportunities within the school environment. This chapter aims to analyze the main challenges and possibilities of full-time education in the teaching and learning process, considering pedagogical, social, and institutional aspects.

Methodologically, this is a qualitative study based on a narrative literature review, supported by national and international scientific publications addressing educational policies, pedagogical practices, and outcomes related to the extension of the school day. The results indicate that full-time education can significantly contribute to improving academic performance, strengthening socioemotional skills, and reducing educational inequalities, provided it is supported by integrative pedagogical proposals, continuous teacher training, and adequate infrastructure conditions. However, challenges such as curriculum fragmentation, teacher workload, limited resources, and difficulties in articulating pedagogical and complementary activities are also identified. It is concluded that the effectiveness of full-time education depends on a pedagogical approach that goes beyond merely increasing school hours, fostering contextualized, interdisciplinary, and student-centered educational practices that enhance teaching and learning in a meaningful way.

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Keywords: Educational policies, Full-time education, Learning process, School day extension.

INTRODUCTION

Full-time education has gained prominence in contemporary educational discussions, especially in the context of public policies aimed at improving the quality of basic education. This modality proposes extending the school day in conjunction with an educational conception that seeks the student's integral development, encompassing not only cognitive aspects but also social, cultural, emotional, and ethical dimensions. In this sense, the school comes to be understood as an expanded learning space, capable of promoting more diverse and meaningful educational experiences.

Despite its formative potential, the implementation of full-time education still presents challenges that directly impact the teaching and learning process. Difficulties are observed related to curricular organization, teacher education and professional recognition, school infrastructure, and the integration between pedagogical and complementary activities. In light of this scenario, the research problem is delineated by the following question: in what ways does full-time education contribute to the teaching and learning process, and what are the main challenges that limit its effectiveness in the school context?

The general objective of this chapter is to analyze the challenges and possibilities of full-time education in the teaching and learning process. The specific objectives are: (a) to discuss the conceptual foundations of integral education and full-time education; (b) to identify the main obstacles faced by schools in implementing this modality; and (c) to reflect on the contributions of extending the school day to students' learning and development.

The relevance of this study is justified by the need to deepen the debate on full-time education beyond the mere expansion of school time, highlighting the importance of intentional and integrative pedagogical practices. In addition, the theme is pertinent in view of Brazilian educational challenges, especially in confronting social and educational inequalities.

From a theoretical standpoint, integral education is grounded in conceptions that advocate human formation in its totality, as addressed by authors such as Anísio Teixeira, Darcy Ribeiro, and contemporary scholars who discuss policies for extending the school day. Recent studies indicate that full-time education can promote better educational outcomes when articulated with a consistent pedagogical project capable of integrating knowledge, times, and educational spaces in a contextualized manner.

METHODOLOGY

This chapter was developed based on a methodological approach that enables a critical and reflective understanding of the challenges and possibilities of full-time education in the teaching and learning process. The type of research, the procedures adopted for data collection and analysis, as well as the criteria for selecting the analyzed sources are presented below.

TYPE OF RESEARCH

The research is characterized as qualitative, exploratory, and descriptive in nature. The qualitative approach was chosen because it allows an in-depth analysis of complex educational phenomena, considering the meanings, contexts, and interpretations present in scientific productions on full-time education. Regarding technical procedures, a narrative literature review was adopted, a method widely used in theoretical studies in the field of education, as it allows the integration of different theoretical perspectives and findings from empirical research.

DATA COLLECTION PROCEDURES

Data collection occurred through a bibliographic survey in scientific databases and academic repositories, including books, book chapters, scientific articles, and official documents related to integral education policies and the extension of the school day. National and international publications addressing the topic from pedagogical, social, and political perspectives were prioritized, ensuring theoretical diversity and scientific consistency in the analysis.

CRITERIA FOR SELECTING SOURCES

The inclusion criteria for the analyzed works considered: (a) thematic relevance to full-time education; (b) the authors' academic recognition; (c) a time frame encompassing both classical productions and contemporary studies; and (d) suitability to the educational context of basic education. Works that did not present a direct relationship with the teaching and learning process or that treated the extension of school time in a merely administrative manner were excluded.

ANALYSIS TECHNIQUES AND INSTRUMENTS

Data analysis was grounded in a critical and interpretive reading of the selected works, using the thematic content analysis technique. This technique enabled the identification of analytical categories related to structural, pedagogical, and formative challenges, as well as to the potentialities of full-time education for promoting meaningful learning. As an instrument for organizing the data, analytical notes (reading fiches) were used, allowing the systematization of concepts, arguments, and results presented by the authors.

METHODOLOGICAL DISCUSSION

The choice of a narrative review proved appropriate to the objective of this chapter, as it made it possible to articulate different theoretical approaches and empirical evidence, fostering a broader understanding of full-time education. Although this type of research does not aim at statistical generalization of results, its contribution lies in its capacity to deepen theoretical debate and support critical reflections on educational practices and policies. Thus, the adopted methodology supports a consistent and well-grounded analysis, aligned with the complexity of the educational phenomenon under investigation.

RESULTS AND DISCUSSION

The analysis of the selected scientific productions made it possible to identify a set of results that reveal both the potentialities and the challenges of full-time education in the teaching and learning process. The findings were organized into thematic axes that enable a discussion articulated with contemporary educational literature.

CONTRIBUTIONS OF FULL-TIME EDUCATION TO THE TEACHING AND LEARNING PROCESS

The analyzed studies indicate that extending the school day, when associated with a consistent pedagogical project, favors the diversification of educational practices and expands learning opportunities. It is observed that full-time education contributes to students' cognitive development, as well as to strengthening socioemotional competencies such as autonomy, cooperation, and critical thinking. These results corroborate theoretical conceptions that defend integral education as a promoter of human formation across multiple dimensions.

Furthermore, the literature indicates that a longer time spent at school enables integration between curricular contents and complementary activities—such as cultural, sports, and artistic workshops—supporting more meaningful and contextualized learning. When well planned, such actions strengthen students' bonds with the school and contribute to reducing dropout rates and school failure.

CHALLENGES IN IMPLEMENTING FULL-TIME EDUCATION

Despite the advances identified, the results highlight recurrent challenges in implementing full-time education. Among the main obstacles are curricular fragmentation, insufficient adequate infrastructure, and teacher workload overload. Many studies point out that extending school time is not always accompanied by qualitative changes in pedagogical practices, which compromises the objectives of integral education.

Another relevant aspect concerns teachers' continuing education, considered essential for implementing integrative pedagogical proposals. The absence of training policies aligned with full-time

education hinders the articulation among different educational times and spaces, limiting the transformative potential of this teaching modality.

LINKING THE RESULTS TO THE LITERATURE

The interpretation of the results confirms that full-time education should not be understood merely as extending school time, but as a reorganization of the curriculum and educational practices. Classical and contemporary authors emphasize that the effectiveness of this proposal depends on a critical and emancipatory pedagogical conception capable of integrating school knowledge with students' sociocultural experiences.

The findings of this study reinforce the need for investments in public policies that consider full-time education as a broad educational project, articulated with social demands and the specificities of school contexts. In this sense, the results dialogue with the literature by showing that the identified challenges do not invalidate the proposal, but rather point to pathways for its improvement.

POSSIBILITY OF PRESENTING SYNTHETIC DATA

Depending on the standards of the event or publication, the discussed results may be synthesized through tables or figures, such as comparative charts of the main challenges and possibilities of full-time education or illustrative schemes of the dimensions of integral formation. These visual resources can contribute to clarity and organization of information, without prejudice to the qualitative analysis developed.

CONCLUSION

This chapter aimed to analyze the challenges and possibilities of full-time education in the teaching and learning process, based on a narrative literature review. It sought to understand how extending the school day can contribute to students' integral development, as well as to identify the main obstacles that limit the effectiveness of this proposal in the educational context.

The results showed that full-time education has significant potential to improve the quality of teaching, especially when grounded in an integrative and contextualized pedagogical project. Among the main contributions are the expansion of learning opportunities, strengthening of cognitive and socioemotional competencies, diversification of pedagogical practices, and the promotion of greater educational equity. However, the analysis also revealed important challenges, such as curricular fragmentation, insufficient infrastructure, teacher overload, and the need for continuing education aligned with the specificities of this teaching modality.

From a scientific and educational standpoint, this study contributes to deepening the theoretical debate on full-time education by reinforcing the understanding that its effectiveness is not limited to extending school time, but lies in the quality of the educational experiences offered. In addition, the chapter provides support for administrators, teachers, and public policy makers interested in implementing or improving integral education proposals.

As a suggestion for future research, it is recommended to conduct empirical studies that investigate the implementation of full-time education in different school contexts, considering the perceptions of students, teachers, and administrators. Quantitative research approaches or case studies may also contribute to assessing the impacts of this teaching modality on learning indicators and students' integral development.

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**TEACHER TRAINING FOR TECHNOLOGICAL EDUCATION: COMPETENCIES,
CHALLENGES, AND INNOVATION**

 <https://doi.org/10.63330/aurumpub.032-008>

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Abstract

This study aimed to analyze competencies, challenges, and innovation strategies in teacher training for technological education. It consists of an integrative literature review with a qualitative approach conducted between December 2025 and January 2026. The methodological process included defining the

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research problem, establishing inclusion and exclusion criteria, conducting a systematic search in the SciELO, ERIC, ScienceDirect, and SpringerLink databases, selecting and fully reviewing the studies, extracting data using a structured instrument, and performing thematic data analysis. Articles published between 2020 and 2025, available in full text and related to teacher training and digital competence, were included. The search identified 245 publications, of which 13 comprised the final sample. The results were organized into three axes: teachers' digital competencies, structural and institutional challenges, and innovative training strategies. Findings indicate that digital competence involves the integration of technological mastery, pedagogical knowledge, instructional contextualization, and ethical responsibility. Identified challenges included curricular fragmentation, weaknesses in continuing professional development, infrastructure limitations, and the absence of articulated institutional policies. The study also highlights training strategies grounded in the articulation between theory and practice, supervised experimentation, and continuous mentoring. In summary, the consolidation of technological education depends on the implementation of integrated and systematic training models supported by active methodologies, institutional support, and an organizational culture oriented toward innovation. Teacher education should be understood as a continuous process aligned with the demands of contemporary digital society, fostering critical, creative, and socially responsible pedagogical practices.

Keywords: Active Methodologies, Curricular Integration, Digital Competence, Institutional Culture, Professional Development.

INTRODUCTION

Technological education may be understood as a formative field that integrates scientific, technical, and pedagogical knowledge aimed at the critical understanding, reflective use, and production of technologies in educational contexts. Unlike a merely instrumental approach, it involves processes of pedagogical mediation, curricular innovation, and the development of digital competencies that enable individuals to act ethically, creatively, and transformatively in contemporary society. In this regard, Zhang

et al. (2025) argue that technological education is associated with the sustainable development of teacher education, linking digital competence, critical thinking, and social responsibility.

The expansion of digital technologies in educational environments has intensified the need to redefine teacher education processes. Kaminskienė, Järvelä, and Lehtinen (2022) argue that technological integration challenges traditional training structures by requiring articulation among pedagogical knowledge, content mastery, and technological competence, thereby overcoming the curricular fragmentation historically present in teacher education programs. Thus, technological education is not limited to the use of digital tools; rather, it implies methodological and epistemological reorganization.

The problem guiding this study stems from the following question: which competencies are essential for teacher training oriented toward technological education, and which challenges compromise its effective implementation?

Vanegas, Cifuentes, and Morrás (2025) show that effective training programs encompass technical, pedagogical, and collaborative competencies, supported by structured models and active methodologies. This finding reinforces the need for integrated approaches in initial and continuing teacher education.

In higher education, pedagogical innovation associated with digital technologies depends directly on the quality of teacher training. Riedner and Pischetola (2021) demonstrate that innovative practices emerge when there is consistent articulation between theory, practice, and technological experimentation, fostering the meaningful construction of knowledge. This perspective underscores that technological education requires pedagogical intentionality and institutional follow-up.

Nevertheless, challenges persist in the formative context. Bento (2024) highlights that gaps in continuing education, the absence of structuring policies, and insecurity regarding the pedagogical use of technologies limit the development of teachers' digital competencies. These factors indicate that the consolidation of technological education requires investment in ongoing professional development and an institutional culture favorable to innovation.

In addition, specific training strategies enhance the development of digital competence.

Momdjian, Manegre, and Gutiérrez-Colón (2025) point out that the combination of direct instruction, integrated practice, and pedagogical modeling supports the consolidation of technological knowledge applied to teaching, demonstrating that the training process must be experiential and reflective.

The relevance of this study lies in the need to strengthen theoretical and practical frameworks that guide teacher education policies and programs aligned with the demands of digital culture. By deepening the understanding of technological education, this work seeks to contribute to the construction of training models that promote innovation, criticality, and educational quality.

Therefore, the objective of this study is to analyze competencies, challenges, and possibilities for innovation in teacher training for technological education. The specific objectives are: (a) to identify essential digital competencies for teaching practice; (b) to discuss structural and pedagogical challenges in initial and continuing education; and (c) to examine innovative strategies that enhance educational practices mediated by technologies.

METHODOLOGY

This is an integrative literature review with a qualitative approach, exploratory and descriptive in nature, conducted between December 2025 and January 2026. The methodological pathway was structured according to the stages proposed by Whittemore and Knafl (2005), encompassing the definition of the research problem, the establishment of inclusion and exclusion criteria, the search and selection of studies, the critical appraisal of the material, the extraction and organization of information, and the interpretive synthesis of findings.

DEFINITION OF THE PROBLEM AND GUIDING QUESTION

The initial stage consisted of delimiting the research problem, considering the growing demand for teachers' digital competencies in light of the transformations imposed by digital culture and by the

integration of emerging technologies into educational systems. It is observed that, despite advances in incorporating technologies into educational contexts, challenges remain related to the consolidation of training practices that promote the effective development of competencies for technological education.

In this sense, the following guiding question was formulated: How are competencies, challenges, and innovation strategies articulated in teacher training for technological education?

DATABASES AND SEARCH STRATEGY

The search for studies was conducted in national and international databases recognized for their relevance in the educational and technological fields. The following databases were consulted: Scientific Electronic Library Online (SciELO), Education Resources Information Center (ERIC), ScienceDirect, and SpringerLink. The search strategy was developed using controlled descriptors drawn from the Health Sciences Descriptors (DeCS) and Medical Subject Headings (MeSH), combined using the Boolean operator AND. The following descriptors were used in Portuguese: formação docente, educação tecnológica, competência digital docente; and in English: teacher training, educational technology, and digital competence.

INCLUSION AND EXCLUSION CRITERIA

Articles published between 2020 and 2025 were included if they were available in full text, in any language that could be translated, and if they directly addressed teacher education, digital competence, pedagogical innovation, or technological integration in educational contexts. This time frame was chosen because discussions about digital transformation intensified in the post-pandemic period, when the topic gained greater centrality in scientific production. Duplicated articles, narrative reviews, theses, and dissertations were excluded, as were studies that addressed the descriptors only in isolation.

STUDY SELECTION PROCESS

The initial search yielded 245 studies identified in the consulted databases. After excluding 58 duplicate articles, 187 studies remained for title and abstract screening. At this stage, 142 articles were excluded for not meeting the established criteria, mainly because they did not directly address teacher education or because they dealt only with the instrumental use of technologies. Next, 45 studies were selected for full-text reading. After detailed analysis, 32 articles were excluded because they did not adequately respond to the research objective or because they presented a narrow focus on describing digital tools, without a consistent discussion of training. At the end of the selection process, 13 articles comprised the final sample of this review.

DATA EXTRACTION AND ANALYSIS

Information was extracted using a structured instrument containing author identification, year of publication, country of origin, study objectives, methodological design, main results, and contributions to technological teacher education. Data analysis was conducted through thematic content analysis, as proposed by Bardin (2011), involving the stages of pre-analysis, material exploration, categorization, treatment of results, and interpretation. From this process, analytical categories emerged related to teachers' digital competencies, structural and institutional challenges, and innovative training strategies. The discussion was developed interpretively, articulating empirical findings with contemporary theoretical frameworks on technological education and teacher professional development.

RESULTS AND DISCUSSION

The articles analyzed were organized in Table 1, containing information about the authors, titles, and main contributions of their studies.

Table 1

Summary of selected studies on teacher training and digital technologies

Author(s)/Year	Study title	Main contributions
Bento (2024)	Formação continuada de professores e tecnologias digitais: reflexões e desafios na prática de ensino [Continuing teacher education and digital technologies: reflections and challenges in teaching practice]	Analyzes the limits of continuing education for the pedagogical use of digital technologies, highlighting structural gaps and the need for systematic follow-up.
Kaminskienė; Järvelä; Lehtinen (2022)	Como a tecnologia desafia a formação de professores? [How does technology challenge teacher education?]	Highlights the need for curricular reorganization and integration between theory, practice, and technological competence in teacher education.
Medeiros; Wunsch (2023)	TPAC3K: conhecimento tecnológico-pedagógico dos conteúdos criativos, culturais e colaborativos do docente [TPAC3K: technological-pedagogical content knowledge of teachers' creative, cultural, and collaborative contents]	Proposes an expansion of the TPACK model by incorporating creative, cultural, and collaborative dimensions into teacher competence.
Momdjian; Manegre; Gutiérrez-Colón (2025)	Um estudo sobre o desenvolvimento da competência digital de professores em formação inicial [A study on the development of digital competence among pre-service teachers]	Shows that direct instruction, integrated practice, and pedagogical modeling foster consistent development of digital competence.
Oliveira; Mélo; Franco (2020)	Práticas de ensino com o uso de tecnologias digitais: o papel da formação docente [Teaching practices using digital technologies: the role of teacher education]	Emphasizes the importance of pedagogical planning and institutional support for the effective use of technologies.
Riedner; Pischetola (2021)	A inovação das práticas pedagógicas com uso de tecnologias digitais no ensino superior [Innovation in pedagogical practices using digital technologies in higher education]	Emphasizes the importance of pedagogical planning and institutional support for the effective use of technologies.
Santos <i>et al.</i> (2025)	Processos de ensino e aprendizagem nos anos iniciais e as tecnologias digitais [Teaching and learning processes in the early years and digital technologies]	Highlights didactic intentionality in technological mediation in the early years.
Silva; Matta (2024)	Percepções docentes sobre o conhecimento tecnológico-pedagógico em formação continuada [Teachers' perceptions of technological-pedagogical knowledge in continuing education]	Identifies teachers' insecurities and the need for contextualized training practices.

Theodorio; Wambua (2024)	Integração tecnológica na formação de professores: desafios e perspectivas na transformação digital [Technology integration in teacher education: challenges and perspectives in digital transformation]	Discusses institutional and cultural challenges in the digital transformation of teacher education.
Trujillo-Juárez <i>et al.</i> (2025)	Fortalecimento da competência digital docente no ensino superior: uma revisão sistemática [Strengthening teacher digital competence in higher education: a systematic review]	Systematizes effective models for strengthening digital competence in higher education.
Vanegas; Cifuentes; Morrás (2025)	Tecnologia educacional na formação de professores: revisão sistemática de competências, habilidades e modelos [Educational technology in teacher training: a systematic review of competencies, skills, and models]	Organizes competencies, skills, and integrated training models for technological education.
Wagner <i>et al.</i> (2024)	Desafios dos formadores de professores no contexto da transformação digital [Challenges faced by teacher educators in the context of digital transformation]	Analyzes challenges faced by teacher educators and their impacts on training quality.
Zhang; Yang; Zheng (2025)	Competência digital para a educação sustentável de professores em formação inicial [Digital competence for sustainable education of pre-service teachers]	Relates digital competence to sustainable education, emphasizing ethical responsibility and digital citizenship.

Source: Authors (2026).

From the thematic analysis of the thirteen selected articles, three structuring axes emerged: (1) teachers' digital competencies; (2) structural and institutional challenges; and (3) innovative strategies in teacher training for technological education. Below, an in-depth discussion of each category is presented.

TEACHERS' DIGITAL COMPETENCIES IN TECHNOLOGICAL EDUCATION

The analyzed studies indicate that teachers' digital competence cannot be reduced to the operational mastery of technological tools. Rather, it is a formative construction that involves articulation among pedagogical knowledge, content mastery, critical capacity, and ethical responsibility in the use of technologies. Zhang, Yang, and Zheng (2025), when examining teacher education oriented toward sustainable education, argue that digital competence is linked to digital citizenship and social responsibility. For the authors, the pedagogical use of technologies should be guided by ethical principles and by a critical understanding of their social impact. From this perspective, teacher education needs to

overcome instrumental approaches and promote continuous professional development aligned with broader educational purposes.

Convergently, Vanegas, Cifuentes, and Morrás (2025) show that effective training programs are those that integrate technical, pedagogical, and collaborative dimensions in an articulated manner. The systematic review conducted by the authors demonstrates that fragmented proposals—where technology appears dissociated from pedagogical practice—tend to produce limited effects on professional development. Digital competence becomes consolidated when technological learning is embedded in real teaching contexts, accompanied by collective reflection and curricular integration.

This understanding is deepened by Medeiros and Wunsch (2023), who, in proposing the TPAC3K model, broaden the scope of technological-pedagogical knowledge by incorporating creative, cultural, and collaborative dimensions. In this framework, technology ceases to be an accessory resource and becomes a structuring element of pedagogical practice, requiring from the teacher the capacity for creation, adaptation, and contextualization to students' sociocultural specificities.

However, the study by Silva and Matta (2024) reveals that the consolidation of this competence does not occur automatically. Although the investigated teachers recognize the relevance of technological integration, they report insecurity regarding practical application in everyday school life. This finding evidences a gap between conceptual understanding and effective pedagogical practice, indicating the need for more contextualized and closely supported training experiences.

In initial teacher education, Momdjian, Manegre, and Gutiérrez-Colón (2025) demonstrate that the consistent development of digital competence is associated with the combination of structured instruction, integrated practice, and pedagogical modeling. Guided observation of didactic strategies, followed by supervised experimentation and systematic feedback, fosters greater autonomy and professional confidence.

Complementarily, Santos et al. (2025) emphasize that, especially in the early years, technological integration requires didactic intentionality. Tool selection must be aligned with learning objectives,

avoiding superficial or decontextualized uses. Trujillo-Juárez et al. (2025) indicate that training programs with continuous follow-up and process-based assessment yield more consistent results, reinforcing the progressive and cumulative character of digital competence.

STRUCTURAL AND INSTITUTIONAL CHALLENGES IN TEACHER EDUCATION

Despite conceptual advances, significant challenges persist in the effective implementation of technological education. Kaminskienė, Järvelä, and Lehtinen (2022) highlighted that technology challenges teacher education by requiring curricular reorganization and the overcoming of fragmentation between theory and practice. The authors observed that many programs still maintain isolated pedagogy and technology courses, which hinders articulation between theory and practical application and compromises comprehensive teacher preparation. According to them, technological integration demands structural revision of training programs and institutional changes that promote alignment among pedagogical objectives, technological competence, and supervised practice.

Complementing these observations, Oliveira, Mélo, and Franco (2020) analyzed teaching practices using digital technologies across different educational institutions and found that the lack of institutional preparedness and technical support prevents teachers from consistently implementing digital strategies. The study showed that even when teachers have technical knowledge, barriers such as the absence of ongoing training, lack of structured pedagogical planning, and inadequate technological resources limit the effectiveness of technological education. It becomes evident that structural challenges are not restricted to curricular reorganization; they also include infrastructure, teacher development, and clear institutional policies.

In higher education, Riedner and Pischetola (2021) demonstrate that innovative practices emerge when there is articulation among theory, practice, and technological experimentation, but their implementation depends on consistent institutional support, such as laboratories, digital resources, and incentives for pedagogical experimentation.

Wagner et al. (2024) identify that teacher educators face challenges in their own digital upskilling, directly impacting the quality of the training they provide. Complementarily, Theodorio and Wambua (2024) emphasize that digital transformation in educational institutions requires cultural and organizational changes and is not limited to the acquisition of technological resources.

Thus, the studies reveal that the consolidation of technological education depends on articulated institutional policies, an organizational culture favorable to innovation, and structured continuing education programs, as well as adequate infrastructure and consistent teacher development—evidencing that the effective implementation of technological education requires an integrated approach among resources, competencies, and institutional strategies.

INNOVATIVE STRATEGIES AND TRAINING MODELS

With regard to training strategies, the studies point to the need for active methodologies and contextualized practical experiences. Momdjian, Manegre, and Gutiérrez-Colón (2025), based on observation of teacher education programs, found that pedagogical modeling—when the trainer demonstrates strategies and participants practice under guidance—strengthens the internalization of digital competencies. In other words, learning becomes more concrete because teachers experience real digital teaching situations, reflecting on their decisions and adjustments. Santos et al. (2025) analyzed teaching practices in the early years and observed that when teachers plan the use of technologies with clear objectives and contextualized activities, students show greater engagement and achieve meaningful learning. The study shows that pedagogical mediation is decisive for technology to enhance learning rather than merely being an available resource in the classroom.

Vanegas, Cifuentes, and Morrás (2025) found that continuous follow-up, feedback, and process-based assessment yield more consistent results in acquiring digital competencies. Their study indicates that continuity and methodological support are essential to consolidate teachers' technological learning. Zhang, Yang, and Zheng (2025) argue that teacher education should include principles of sustainability

and digital citizenship. This indicates that technological education is not limited to technical mastery of tools but involves ethical and socially responsible application of technology in educational contexts.

Medeiros and Wunsch (2023) show that creative and collaborative approaches expand the transformative potential of technological education. Silva and Matta (2024) emphasize that continuing education courses that provide opportunities for reflection, discussion of practices, and simulated experimentation enable teachers to consolidate technological knowledge. Bento (2024) highlights that isolated training sessions are not sufficient to internalize digital competencies. The research shows that training cycles, follow-up, and continuous support are fundamental for lasting results.

Riedner and Pischetola (2021) argue that pedagogical innovation requires articulation between technological experimentation and theoretical grounding. Without understanding the pedagogical principles that underpin technology, digital use becomes superficial and minimally transformative. Kaminskienė, Järvelä, and Lehtinen (2022) state that, for innovative strategies to be effective, curricular reorganization, integration among disciplines, and institutional support are required. The study shows that organizational barriers can prevent teachers from applying active methodologies even when they possess digital competence. Overall, the studies indicate that effective innovative strategies are those that articulate practice, reflection, and institutional support.

CONCLUSION

This study sought to analyze competencies, challenges, and possibilities for innovation in teacher training for technological education, aiming to understand how these elements are articulated in the contemporary context shaped by digital culture. It was possible to identify that training for technological education requires a multidimensional approach that goes beyond technical mastery of tools and involves integration among pedagogical knowledge, content mastery, critical thinking, and ethical responsibility.

The results show that teachers' digital competence constitutes a complex construct, supported by articulation among technical, pedagogical, collaborative, and sociocultural dimensions. The analyzed

literature converges in indicating that fragmented training proposals have limited impact, whereas structured models that combine theoretical grounding, supervised practice, pedagogical modeling, continuous follow-up, and process-based assessment tend to produce more consistent results. In addition, it was found that the consolidation of technological education depends not only on individual initiatives but also on favorable institutional conditions, including curricular reorganization, adequate infrastructure, permanent training policies, and an organizational culture oriented toward innovation.

As a contribution, this study systematizes recent evidence on teacher training for technological education, offering theoretical and analytical support for planning more integrated and sustainable training programs. By organizing the findings into structuring axes, the work broadens understanding of the factors that enhance or limit the development of teachers' digital competence, and it may guide institutional policies and pedagogical practices more closely aligned with contemporary educational demands.

Finally, empirical investigations are suggested in specific contexts of initial and continuing teacher education, especially regarding longitudinal evaluation of the impact of innovative training models. Comparative studies across different institutional realities may also help identify contextual variables that influence the effectiveness of technological education. In this way, it will be possible to advance the construction of more consistent frameworks for teacher education in a society increasingly mediated by digital technologies.

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THE CONSTRUCTION OF PEDAGOGIES ON FEMININITIES: SCENES IN PREHISTORIC ROCK ART IN SERRA DA CAPIVARA NATIONAL PARK IN SÃO RAIMUNDO NONATO, PIAUÍ, BRAZIL

 <https://doi.org/10.63330/aurumpub.032-009>

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Abstract

This study focused on rock art in Brazilian prehistory in the Serra da Capivara Park in the city of São Raimundo Nonato, in the northeast of the state of Piauí. The objective of the article was to investigate representations of femininity in the region in a bibliographic review using a cultural history approach. We investigated two images: the figure from the Northeast Tradition of the sex scene at Toca do Paraguai and another from the Northeast Tradition, Serra da Capivara style, at Sítio Toca do Baixão. Feminist and gender research can influence the interpretations of these representations. In the paintings captured in PARNA, the phallus and vulva are represented and suggest a scene of monogamous sex in Figure 1. Researchers disagree on the interpretation of Figure 2 as childbirth or a scene of polyandry.

Keywords: Pedagogies, Identity, Heritage, Femininities.

INTRODUCTION

When investigating Prehistory in History and Art History textbooks, authors offer only brief remarks on rock art. Even more succinctly, we find only a few notes on these cultural manifestations in

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Brazilian territory. In this sense, did individuals from diverse and different places in Prehistory live and represent their existence in the same way? The testimonies of art suggest that they did not.

Behaviors, ideas, and ways of life are mutable, and when we select a cultural practice to analyze, we uncover complex relationships among artistic, social, economic, political, and historical factors (Chauí, 2002). Thus, like any other human production—far from a single, homogeneous style—paintings produced on rocky slopes or in caves deserve recognition of their particularities, which may diverge from the information conveyed by patriarchal, sexist, misogynistic, racist, and ethnocentric discourses.

To discuss Prehistory, given that it spans a very long period, historians divide it into the Lower Paleolithic (500,000 BC), Upper Paleolithic (30,000 BC), and Neolithic (10,000 BC). However, as is evident, for example, in the books most commonly used in Art History courses, emphasis falls above all on the bison paintings at Altamira in Spain, and at Niaux, Font de Gaume, and Lascaux in France (Gombrich, 2001; Janson, 2001; Proença, 1997; Prous, 2007; Strickland; Boswell, 2014). It is important to note that, right on the opening pages of these books, the emphasis presents Europe as the center of cultural production from Prehistory to the contemporary era.

In some works—even by Brazilian authors—disregard for, or the belittling of, “our” art also prevails, especially before 1970, when feminist theories had not yet influenced (or claimed space within) historical discourses. In the 1970s, as Niède Guidon’s research was beginning, her proposals received only small spaces in textbooks. Nevertheless, in publications addressing national Prehistory, such as those by Funari and Noelli (2002), the authors argue that unknown meanings still remain regarding rituals, festivities, and activities such as fishing, hunting, among others, in that distant period.

By contrast, in more recent editions of textbooks by various authors, artistic manifestations in Brazilian territory are timidly listed. Some include notes on rock art in Piauí, the production of Indigenous ceramics, and sambaquis in the coastal region of São Paulo and Rio de Janeiro. Alongside these presentations, one also finds the female fossil that received the name Luzia. The mortal remains of

this woman constitute, up to the present moment, the oldest evidence of human presence found in South America, in Minas Gerais (Proença, 2014).

It should also be highlighted that, although some researchers have referred to Prehistoric art as “primitivism,” this term is regarded as surrounded by mistaken judgments regarding human expressiveness. Certain studies, such as those by Mauduit (1964), express prejudice toward the art of the period termed Prehistory by comparing it to children’s art, in which images and reality are confused. Moreover, they also disparage the technique by considering it to be poorly developed. From another angle, this study emphasizes that rock art requires care in the search for materials, the development of techniques, and a refined symbolic universe.

Today it is considered certain that, beyond the capacity for logical reasoning that has always characterized intelligence, it is also revealed through other intelligent abilities, such as sensitivity to colors, sounds, and images, and the capacity to express ourselves through these languages. Developing this capacity is, therefore, becoming more intelligent (Costa, 2013, p. 13).

In light of this, we begin to question: even though the paintings at Altamira in Spain are the oldest found to date, what about the gaps concerning other forms of creative expression and their possible symbolic systems, so vital to intelligent acts? More specifically, we turn to those found—perhaps not as well known or widely disseminated—namely, the rock art in Serra da Capivara National Park, in the city of São Raimundo Nonato, in the Brazilian Northeast, State of Piauí, and the interpretations of these works beyond those presented above.

METHODOLOGY

For the purposes of this article, we delimit our investigation to representations of femininities within the research that has, to date, been presented in academic settings in this region. In which scenes do these women appear? What symbolisms are involved? What do these scenes narrate? Are discussions

of gender diversity and sexuality included? Does the construction of these interpretations differ between male and female researchers?

In this context, the present study takes as its theme the examination of prehistoric rock art in Serra da Capivara National Park as a means of constructing pedagogies of femininities, through the approach of Cultural History and the discussion of gender. From this perspective, we acknowledge that “[...] the behaviors, beliefs, and representations of feminist researchers interfere with the results of their research—in the same way that those of any researcher do” (Louro, 2016, p. 158).

Even in this region, researchers—especially archaeologists and historians—have distinguished the styles or traditions encountered by seeking elements that group them according to similar characteristics. Nevertheless, the researcher’s activity is not neutral. The works do not come to meet the researchers. On the contrary, researchers, with their intentions and concerns—or, put differently, with the ways in which we distinguish and recognize ourselves academically—seek, within their lines of inquiry and approaches, answers or directions that often lead, not to say always, to interpretations of the past and to the construction of the memory one wishes to reinforce or to forget.

In view of these aspects, we examine rock painting in its symbolic, social, and cultural dimensions. As Pessis (1992, p. 37) advises us, “[...] knowing the society in which the work was produced makes it possible [...] to establish relationships between the graphic characteristics of the work and the possible meanings such a work could have had in the society in which it was produced.”

Given historical considerations regarding the importance of the site, this park was selected due to the breadth of research on rock art and its initial considerations of gender and sexuality; however, up to the present, few studies have provided illustrations enabling other interpretations. On the basis of these considerations, the study will focus on investigating prehistoric rock art in Serra da Capivara National Park through two visual documents: the figure from the Northeast Tradition depicting of the sex scene at Toca do Paraguai, and another from the Northeast Tradition, Serra da Capivara style, from the Toca do Baixão site. After this introduction, we will discuss Prehistory and the divergences among interpretations

of art in that period. Next, we will indicate the presence of gender in art. Finally, we will provide a brief presentation of the park's rock art and the two visual sources proposed for this study, in order to consider certain narratives that interpret representations of women and their social insertion in that context.

PREHISTORY AND SOCIAL RELATIONS OF POWER

At the end of the nineteenth century, researchers regarded prehistoric humanity as primitive, or, in other words, as lacking artistic abilities. At Altamira, for example, when it was discovered in 1878, historians believed the rock paintings were forgeries, since a painter lived in the vicinity of the region (Prous, 2007).

In this regard, the term “primitivism” is linked to a Eurocentric view of the world: in the nineteenth century, social scientists posited a supposed evolution of societies in which those holding beliefs in gods or in God would progress to a stage of reason. Some of these societies might then evolve to the apex of human development, according to the uses of reason and science, with urban and industrial Europeans serving as the model to be followed. On the basis of this theoretical support, we may consider certain ethnocentric interpretations of rock art, briefly listed below.

In such approaches, rock arts “[...] suggest that they were conceived as a visual aid, a hunting manual composed to recreate the problems of hunting and reinvigorate the hunter's knowledge, as well as to instruct those who were still inexperienced [...]” (Dondis, 1999, p. 170). In the same vein, images that we interpret as arrows indicated and instructed other individuals about the most suitable place to strike animals during hunting. Other researchers emphasize that these images, more than teaching new generations their practices, were also associated as an “instrument of magic” (Guerra; Martins; Picosque, 1998, p. 35). Regarding this magic, Proença argues that:

[...] the most accepted explanation is that this art was produced by hunters, and that it formed part of a magical process through which one sought to influence the capture of animals. That is, the painter-hunter of the Paleolithic assumed he had power over the animal as long as he possessed its image. He believed he could kill the real animal provided he represented it mortally wounded in a drawing. Thus, for him, the drawings were not representations of beings, but the beings themselves (Proença, 1997, p. 11).

These are ethnocentric views, as if the various rock arts did not involve particular symbolic appropriations, or as if there existed a superior artistic manifestation of white Europeans and another, inferior one of other cultures which, within their beliefs, would associate art with mystical aspects. On the other hand, even today:

[...] prehistoric images often reflect the concepts prevailing in their time and, for this reason, interpretations of prehistoric art have varied considerably since modern Westerners first noticed its manifestations. [...] In the absence of explanatory texts, the meaning of art in prehistory should be found in the vestiges themselves and not in the projection of our beliefs and our prejudices onto what our distant predecessors might have been (Prous, 2007, p. 12–13).

Nevertheless, in light of the authors' discussions, we may consider that the image could have functioned as a pedagogical instrument for other members, a way of recording their history, given that writing had not yet been created.

Another important point that may be taken into account when choosing to use the term Rock Art is the fact that this term is already traditionally consolidated in international Archaeology. In English, for example, the term "Rock Art" seems to be preferred when referring to paintings made on rocks in prehistoric times, not only because it is consolidated, but because there is no better way to refer to them (Santos, 2010, p. 30).

Therefore, in accordance with cultural relativism, we adopt the term rock art. These cultural productions, although they are the oldest in humanity, involve numerous controversies regarding their "true" meaning even among specialists in the field. For this reason, we will use the term rock art in this study. Next, we will present some studies on issues of gender in art.

THE CONSTRUCTION OF GENDER IN ART

Discussions about art and gender in Brazil have long been overlooked, given that Brazilian history is told from a male perspective following the great European voyages of discovery. In this regard, historians often render women's participation in society invisible, or only present the version narrated by the “victors.” Given this, “[...] the reproduction of inequality (whatever it may be) will continue to occur as long as there are dominant parties with vested interests and subjugated parties who are complacent and/or ignorant” (Pinsky, 1994, p.41).

In this vein, in 1963 the researcher Elizabeth Baity went so far as to propose, in her description of what Americans would have been like during the Ice Age, that labor would be divided. Women would be responsible for caring for animal hides or for what would become the family's future protections, while men would prepare the utensils for the hunt. In the author's words, “[...] women wore aprons made of tanned bison leather and the man a leather loincloth. Everyone looked alike, with their brown skin, their slanted black eyes, and their straight, black, loose hair” (Baity, 1963, p. 14).

It is precisely such expressions that lead us to believe that this appearance does not point to equality; on the contrary, it is associated with differences proposed through clothing, as well as with social relations of power among individuals through the gendered division of activities. Moreover, this narrative helps construct the social imaginary of what those ancient societies would have been like within dichotomous frameworks that separate “proper” achievements of women and men. By proposing this scene in which the woman wears an apron, the author symbolically perpetuates, from the very beginning, domestic and private work as something considered “natural” to women, while men would occupy public spaces and activities such as hunting.

Another construction in her book that links childcare to women's responsibilities appears when Elizabeth Baity (1963) narrates that, in order to reach the Americas, men went ahead and carried their hunting belongings as they forged into new territory. This occurred at the same time that women carried small children on their backs, while the older children walked behind along with the other animals. As she

continues her description, the author's assertion becomes contradictory when she states that these traces of humanity disappeared and that only a few indications remained for us.

In this regard, we observe that many suppositions were formulated in accordance with social inequality, based solely on biological factors, and that they neglected cultural factors in representations of what social relations would be—relations that are constructed rather than given to the individual at birth and tied to biological sex. On issues of gender, the researcher Guacira Lopes Louro emphasizes:

It is intended, in this way, to reposition the debate in the social field, because it is there that (unequal) relations among subjects are constructed and reproduced. The justifications for inequalities would need to be sought not in biological differences (if even these can be understood outside their social constitution), but rather in social arrangements, in history, in conditions of access to the resources of society, and in forms of representation. The concept then comes to be used as a strong relational appeal—since it is within the scope of social relations that genders are constructed (Louro, 2001, p. 26).

Based on these analyses, early research led by women associates women's invisibility throughout history with patriarchal discourse. In such discourses as those of Elizabeth Baity, a narrative was supposedly reinforced that diminished the role of women throughout human formation, which contributed to ethnocentric theories and disregarded the cultural relativism of Prehistory.

On the other hand, as Simone de Beauvoir (1949) highlights, and as the interview with Alison Wylie on gender archaeology indicates (Koide; Ferreira; Marin, 2014), it is difficult to think about women in the period before agriculture—whether their musculature was more developed, as in the era of hunter-gatherer peoples that demanded greater physical effort, or what their social role may have been. Other interpretations, such as those found in ethnographic research, report distant matriarchal societies, with the appreciation of and effective participation by women in their respective societies. “One might even suppose that, at certain stages of food abundance, the protective and nurturing role of the male subordinated him to the mother-woman” (Beauvoir, 1949, p. 91).

From this perspective, cultural factors begin to be emphasized in order to study social relations and the constructive process of what would count as a woman or a man. In other words, the research

record often reflects the sexist interpretations within which the researcher is situated. At the other extreme, when considering discussions of gender, we seek to examine social relations and disputes, in order to dialogue about diverse activities, aspirations, and occupations that individuals may perform, regardless of gender, but as human beings.

Once again, we turn to Guacira Louro for explanations concerning the importance of studying cultural aspects and showing the construction of pedagogies of femininities in each place and in each period:

Initially related to biological distinctions, the difference between genders served to explain and justify the most varied distinctions between women and men. Theories were constructed and used to “prove” physical, psychological, and behavioral distinctions; to indicate different social skills, talents, or aptitudes; to justify social places, possibilities, and the “proper” destinies of each gender. The feminist movement then becomes centrally occupied with this difference—and its consequences (Louro, 2014, p. 49).

For example, research conducted by Loredana Ribeiro investigates the particularities of material culture in Serra do Ramalho, in the southwest of Bahia on the left bank of the São Francisco River, and concludes that “[...] the production of this same rock art has, for more than one hundred years, been attributed by many archaeologists to male individuals, principally to shamans and hunters” (Ribeiro, 2009, p. 162). However, by the end of the twentieth century, new horizons—such as feminist and gender theories—made it possible to question women’s involvement in various other practices, including those associated with shamanism, which had previously been linked only to forms of masculinity. In light of these considerations regarding gender studies, we will next present the construction of pedagogies of femininities in the rock-art images of Serra da Capivara National Park.

ROCK ART IN SERRA DA CAPIVARA NATIONAL PARK

The general population of Brazil’s Northeast prior to European colonization—the so-called hunter-gatherers—did not master fishing, did not develop skills for building houses, and did not know the

wheel or the domestication of animals. In addition, communities were not divided into social classes and walked around naked or half-naked (Martin, 2008). In this context, we will briefly present the research on the site that is now Serra da Capivara National Park (PARNA), selected as the focus of this study.

The first photographs of the region were taken in 1963. As soon as Niède Guidon came into contact with these photographs, she did not recognize them from anywhere else. In other words, they were images of a new tradition in rock art that was, until then, unknown. Only seven years later did the researcher visit São Raimundo Nonato and thus become acquainted with Serra da Capivara. Later, in 1973, Niède took part in the first Franco-Brazilian mission to the site to search for archaeological sites. From 1980 onward, Niède benefited from the contributions of Anne-Marie Pessis, currently a professor at UFPE. In Nelson Piletti's *History of Brazil*, we find some traces of that moment:

Until the end of the 1960s, the state of Minas Gerais was the region where the greatest quantity of rock art was found. In 1969, the then mayor of São Raimundo Nonato, in southern Piauí, took 69 photographs of rock shelters and paintings from the area to the Museu Paulista. From that point on, several expeditions were carried out at the site, including international collaboration—especially from France—and more than 220 shelters and approximately 9,000 figures were discovered. These numbers are highly significant, given that Europe has little more than forty catalogued shelters (Piletti, 1991, p. 9–10).

After years of struggle and political disputes, Niède and her team succeeded in formally establishing Serra da Capivara National Park, encompassing 129,140 hectares (Prous, 2007, p. 123). According to De Almeida (2013), archaeological studies have identified more than 1,000 registered sites in Brazil alone, 657 of which contain rock paintings, while others constitute villages and cemeteries.

Another contribution of researcher Niède Guidon to History is the proposal that humans arrived in the Americas much earlier than is commonly assumed—more precisely, in South America. This claim is supported by charcoal remains found at Toca do Boqueirão, located within the same Park, which, through carbon-14 analysis, date to 31,500 years (Pinsky, 1994). In light of this information, we question the invisibility of Brazilian rock art in international art history books, since, according to Gabriele Martin

(2008), Serra da Capivara Park has been recognized as a UNESCO Natural and Cultural World Heritage site since 1991.

Within the Park, rock art displays notable differences, given that various groups inhabited the region and, over time, new elements were incorporated. Accordingly, we will address the traditions present in Serra da Capivara National Park. These artistic productions in the area now occupied by PARNA are probably associated—by locality—with what is termed the “Macro-Jê subculture” (Melatti, 1993 apud Justamand, 2007, p. 23), which still warrants further study. It should be emphasized that human relationships with each other and with the environment were different. These archaeological sites show that humanity adapted to a space that is currently semi-arid but that, in the past, included the presence of rivers (at least prior to the seventeenth century) and, consequently, other fauna and flora, some of which are now extinct.

These traditions consist of graphic works produced by the same cultural group and which can be grouped independently of the chronology of their analysis. The graphic motifs found can be classified into the Northeast Tradition, Agreste, Geometric, and Itacoatiara. The *Tradição Nordeste* [Northeast Tradition] is characterized by human figures, animals, and objects arranged in everyday scenes or in ceremonies. In turn, the *Tradição Agreste* [Agreste Tradition] is composed of static paintings that represent humans, inert animals, or hunting scenes. The *Tradição Geométrica* [Geometric Tradition] involves simpler motifs, such as human hands or reptiles. There are also additional motifs that remain unrecognizable and are produced in isolation, belonging to the *Tradição Itacoatiara* [Itacoatiara Tradition] (Pessis, 1992).

However, the Northeast Tradition is the most open to interpretations that may yield further information depending on their temporalities, and it encompasses works dating from at least 12,000 to 6,000 years ago—that is, 6,000 years of rock paintings. Anne-Marie Pessis assists us insofar as she developed three characteristics taken into account in subsequent research on rock art: the material dimension (the technique used in its production), the thematic dimension (choices of scenes and themes),

and the graphic presentation (the figures themselves—how they are presented, size, frontal view or profile, spatial arrangement, movement, and which elements are employed for the recognition of beings) (Pessis, 1992).

To study the Northeast Tradition, we have two subdivisions, or subtraditions, called *Várzea Grande*, located in the city of São Raimundo Nonato, and *Seridó*, located in the city of the same name in Rio Grande do Norte. In the *Várzea Grande* subtradition, the presence of human figures can be identified through the temporal ensemble. Moreover, *Várzea Grande* is further subdivided into styles in terms of technique or presentation, such as the *Serra da Capivara* style or the *Serra Branca* style (Pessis, 1992).

Furthermore, studies on representations within the *Serra da Capivara* style in *Serra da Capivara* Park generally interpret human figures in scenes of sex in various positions, masturbation, hunting, fighting, and dancing (De Almeida, 2013; Oliveira, 2013; Justamand, 2007; Justamand, 2012; Santos, 2010), and some depict rituals in front of a tree:

Some of these scenes are being interpreted by certain researchers in light of the rituals of the present-day Fulnió Indians: the tree could be the *Jurema*, which provides a hallucinogenic substance; the scenes of masturbation would actually be ritual flagellation of the penis with a stinging plant [...] (Prous, 2007, p. 33).

In these paintings captured in PARNA, women are depicted in scenes of pregnancy, childbirth, breastfeeding, and sexual intercourse. Depictions of childbirth, for example, may be associated with fertility or religious rituals (Justamand, 2007). We understand that women during this period participated fully in their society, both in art and in political matters (Justamand, 2012). However, in other ritual scenes, hunts do not show the genitals of the anthropomorphic figures involved (Justamand, 2012; Santos, 2010).

This leads us to the following reflection: was sex an important distinction in ancestral societies? Did these individuals have greater freedom to express themselves, and was it not significant to indicate gender in ritualistic activities only in sexual ones? At this point, we highlight that the following two

images were selected due to the greater number of publications regarding their interpretations of sex scenes supposedly involving women.

Figure 1

Northeastern tradition: sex scene. Toca do Paraguai. Serra da Capivara National Park in Piauí. Cave painting approximately 12,000 years old.



Source: FUNDHAM Collection apud Borges (2007)

The possible interpretations (**Figure 1**) are based on studies by Anne Marie Pessis (1992), Síría Borges (2007), and Michel Justamand (2007), who briefly analyzed the scene. These researchers follow the line initially presented by researcher Anne Marie, who considers a circle or semicircle at the end of the figure on the right to be one of the clues that would represent the vulva, while the phallus would be represented as an erect protrusion between the legs of the other figure. According to their interpretations, this figure would be a representation of sexual intercourse between a man and a woman.

Figure 2

Northeastern tradition, Serra da Capivara style: representation of an anthropomorphic figure with sexual distinction in a sexual scene. Toca do Baixão da Vaca site. Serra da Capivara National Park in Piauí. Cave painting approximately 12,000 years old.



Source: FUNDHAM Collection apud Borges (2013)

The other image we present (**Figure 2**) appears to have been created at the same time as the artist. The scene on the left could be a representation of a man and a woman having sex (Oliveira, 2013). However, researchers disagree on the thematic dimension of the scene on the right. While Michel Justamand's (2014) study interprets the image as a representation of a woman giving birth, another study by Sara Oliveira (2013) on the same scene describes it as a possible representation of sexual intercourse between a group of three men and a woman in the center.

It is worth noting that in both scenes in **Figure 2**, the woman, considering studies that indicate the vulva as a distinctive marker in some scenes, is represented larger than the other anthropomorphic figures. Does this difference in the proportion of the figures have any meaning? Could the woman be considered, as in other studies, a deity or at least deserving of more respect in her social relationships? Could she have produced these scenes in a pedagogical way for the other inhabitants?

Given these considerations, we add that in other scenes, sexual acts are seen between two or three individuals, in groups, or with animals in a society with different moral values (Justamand, 2007). Given

this, we can indicate that “[...] concerns about sexuality and reproduction seem strong in certain styles of this tradition” (Prous, 2007, p. 34).

Based on the premises of Michelle Perrot (2012) when commenting on images of women over time, we also ask ourselves whether women really lived their representations, whether they liked or disliked them, and what uses they made of these image sources. It is important to note that, in this relational game of the scene, as presented by Guacira Louro (2014), we have the possibility of deconstructing the dichotomy between man and woman, feminine and masculine, the opposite and distinct poles.

Upon encountering these interpretations of Figure 1 and Figure 2, we question whether the researcher's tendency to interpret the scene on the left as a birth is influenced by his current context or even by moral values that value monogamous relationships or patriarchal sex between a man and a woman. Furthermore, we wondered whether the researcher, upon encountering studies on the multiple ways in which educators construct femininity, had adopted an approach that would shock the most puritanical and conservative observers today by interpreting the scene as perhaps a pleasurable or imagined act among the group.

FINAL CONSIDERATIONS

Over the course of the study, it was found that textbooks address rock art in other countries while concealing many of Brazil's cultural productions. For example, only national textbooks present the discoveries of the archaeologist Niède Guidon, who since the 1970s has studied the prehistoric rock art of São Raimundo Nonato in the state of Piauí. However, it is only in publications specifically devoted to art in Brazilian national Prehistory that the narrative proposed by the author differentiates art in Brazil from other artistic productions worldwide by emphasizing its distinctive and challenging character.

Following these initial considerations, research on the history of rock art in Brazil, in the region of Serra da Capivara National Park—recognized as a Natural and Cultural World Heritage site—involves a

complex web of diverse and mutually divergent discourses, with emphasis on certain social actors and female actors. Yes, female actors and researchers in the sense that many women contest academic spaces, seek recognition for their research, and contribute to other possible interpretations of hunter-gatherer societies prior to the adoption of agriculture and the establishment of patriarchy.

The Serra da Capivara subdivision of the Northeast Tradition includes diverse cultural practices that narrate sex in greater detail, while at the same time these scenes remain open to other interpretations. Feminist and gender research may influence the interpretations of these representations. In the paintings recorded in PARNA, the phallus and the vulva are represented and suggest a monogamous sex scene in Figure 1. Researchers diverge in their interpretation of Figure 2 as childbirth or a scene of polyandry..

When combined with future research that connects information about the region's lithic remains, or with studies that examine additional scenes within the Northeast Tradition in the Serra da Capivara style, it may become possible to develop clearer directions regarding cultural practices—including artistic productions—through gender-related questions that move beyond the opposing and antagonistic poles of masculine and feminine, both in representations and in in their sexualities.

Finally, these reflections lead us to consider that “it has not always been this way,” or at least that there are other possible approaches to relations among diverse and different social groups. Moreover, we can think about the construction of pedagogies of gender in the construction of what it means to be a woman in relation to a man—that is, between femininities and masculinities in the case addressed here—and about the relations among social groups disputing spaces of visibility from Prehistory to the present, in culture, society, and in possible artistic manifestations and representations of their sexualities and lived experiences. Therefore, it falls to future research to seek the particularities of each society and to (re)think historiographical production.

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PEDAGOGICAL INNOVATION THROUGH ACTIVE METHODOLOGIES AND NANOTECHNOLOGY: INTERDISCIPLINARY STRATEGIES FOR THE TRANSFORMATION OF THE TEACHING-LEARNING PROCESS

 <https://doi.org/10.63330/aurumpub.032-010>

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Abstract

The increasing complexity of scientific, technological, and social demands in the 21st century has required the reconfiguration of educational practices and the adoption of innovative pedagogical strategies capable of promoting meaningful learning and comprehensive education. In this context, the present study aimed to analyze how the articulation between active methodologies and nanotechnology, from an interdisciplinary perspective, can contribute to the transformation of the teaching-learning process. This is a systematic literature review with a qualitative and descriptive-analytical approach, based on publications indexed between 2021 and 2026 in national and international databases. Descriptors related to pedagogical innovation, active methodologies, interdisciplinarity, and nanotechnology were used, with previously defined inclusion and exclusion criteria. The results showed that active methodologies, such as project-based learning, Team Based Learning, maker culture, and structured instructional design, promote greater student protagonism, development of critical skills, and integration between theory and practice. Interdisciplinarity proved to be a central element in consolidating these strategies, fostering connections among different fields of knowledge around real and socially relevant problems. Regarding nanotechnology, the analyzed studies indicate that its curricular integration, when associated with active approaches, enhances scientific training, innovation, and ethical reflection on emerging technologies. It is concluded that pedagogical innovation supported by active methodologies and the integration of nanotechnology contributes to a more dynamic, critical, and 21st-century-aligned education, strengthening interdisciplinary education and the development of techno-scientific competencies.

Keywords: Active methodologies, Interdisciplinarity, Nanotechnology, Pedagogical innovation, Teaching-learning process.

INTRODUCTION

Contemporary education is marked by profound transformations resulting from scientific and technological advances and from shifts in social, economic, and cultural demands. In this scenario, pedagogical innovation emerges as a central element for re-signifying the teaching–learning process, requiring educational institutions to adopt strategies that foster autonomy, critical thinking, and the integration of different forms of knowledge. Projections about the future of higher education indicate that the incorporation of emerging technologies and innovative methodologies will be decisive for educating professionals capable of acting in complex and dynamic contexts (Aithal; Prabhu; Aithal, 2024). Thus, pedagogical innovation is not limited to the insertion of technological resources; rather, it involves a structural transformation of didactic practices, curricula, and conceptions of learning.

In this context, active methodologies have become consolidated as fundamental strategies for promoting meaningful learning, centered on the student as the protagonist of their own formative process. Unlike the traditional model, grounded in the passive transmission of content, active methodologies encourage problematization, collaboration, investigation, and the collective construction of knowledge (Santos; Pereira, 2023). Studies show that such approaches foster the development of socioemotional and cognitive competencies, in addition to strengthening the integration among teaching, research, and extension/outreach (Costa et al., 2026). Faculty perceptions regarding these methodologies also reveal their potential in terms of student engagement and improved academic performance, although structural and training-related challenges persist (Valente et al., 2025).

Among active strategies, models such as Team Based Learning (TBL) stand out, as they promote collaborative learning and individual and collective accountability (Costa; Cani; Sandrini, 2021), as well as the application of instructional design through the ADDIE model, which organizes pedagogical planning in a systematic way aligned with educational objectives (Convento, 2025). The complementarity between methodologies—such as the arc method and transdisciplinary itineraries—also highlights the importance of articulating theory and practice in the construction of scientific knowledge (Martins;

Carneiro, 2025). Moreover, experiences with 3D modeling and prototyping demonstrate that the integration between technology and active methodologies enhances learning at different educational levels (Soares; Ferreira, 2025).

Interdisciplinarity constitutes the structuring axis of this pedagogical innovation, as it breaks with the fragmentation of knowledge and promotes connections among different areas. Didactic strategies aimed at implementing interdisciplinarity from early childhood education through the initial years of schooling contribute to students' integral development (Boesing; Gubiani; De Santana, 2025). The integration among projects, the identification of students' interests, and technological mediation reinforces the construction of contextualized and socially relevant learning (Santos; Schimiguel, 2025). Furthermore, the articulation among environmental education, sustainability, and technology highlights the transformative potential of pedagogical innovation in forming critical citizens committed to sustainable development (Nunes et al., 2024).

The incorporation of digital technologies into educational environments intensified especially during the COVID-19 pandemic, when new strategies had to be implemented to ensure continuity of teaching (Dionízio; De Paiva, 2021). Hybrid teaching (B-learning) became consolidated as a viable alternative, combining in-person and virtual activities and expanding the possibilities for personalized learning (Leal, 2025). In this scenario, technologies also play a fundamental role in educational inclusion, although they still face challenges related to access, teacher training, and infrastructure (Almeida et al., 2025; Santos et al., 2025). Maker culture and the use of digital tools, in turn, strengthen scientific literacy and combat misinformation, encouraging experimentation and student authorship (Vieira-Neto et al., 2025).

Parallel to methodological transformations, nanotechnology has emerged as a strategic area for contemporary scientific and technological development. Characterized by the manipulation of matter at the nanometric scale, this field has applications in sectors such as health, energy, the environment, and industry (Khan; Asmatulu; Asmatulu, 2025). Discussions about its development and implementation

highlight both its innovative potential and the associated social, economic, and ethical implications (Verma et al., 2024). In the educational sphere, introducing content related to nanotechnology fosters rapprochement between cutting-edge science and academic training, stimulating a culture of innovation and technological safety (Deng-Guang et al., 2023).

The articulation between active methodologies and nanotechnology therefore constitutes an interdisciplinary strategy capable of promoting the transformation of the teaching–learning process. By integrating knowledge from the exact sciences, biological sciences, social sciences, and technological fields, this approach makes it possible to develop investigative projects, solve real problems, and build innovative solutions. Such integration supports not only the acquisition of content but also the development of essential competencies for the twenty-first century, such as critical thinking, creativity, collaboration, and socio-environmental responsibility.

In this way, pedagogical innovation through active methodologies and nanotechnology presents itself as a promising path toward building a more dynamic, inclusive education aligned with contemporary demands. By promoting interdisciplinarity, technological integration, and student protagonism, these strategies contribute to re-signifying educational practices and to forming critical and innovative subjects. Thus, the present study aims to analyze how the articulation between active methodologies and nanotechnology, from an interdisciplinary perspective, can transform the teaching–learning process, enhancing academic and scientific training at different educational levels.

METHODOLOGY

This study is a systematic literature review with a qualitative approach and a descriptive-analytical character, conducted with the objective of identifying, analyzing, and synthesizing scientific evidence about pedagogical innovation through active methodologies and nanotechnology, with an emphasis on interdisciplinary strategies aimed at transforming the teaching–learning process. The systematic review

was chosen because it allows greater methodological rigor in the search, selection, evaluation, and synthesis of studies, ensuring transparency and reproducibility of the investigative pathway.

The research covered the period from 2021 to 2026, considering indexed publications within this time interval in order to include recent scientific production related to educational transformations intensified in the post-pandemic context and to the advance of emerging technologies. The selected databases were: Scopus, Web of Science, ERIC (Education Resources Information Center), SciELO, and Google Scholar, as they encompass relevant national and international production in the areas of Education, Science, and Technology.

To construct the search strategy, controlled and uncontrolled descriptors were used, combined through the Boolean operators AND and OR, in Portuguese and English. The main descriptors used were: “Pedagogical innovation,” “Active methodologies,” “Project-based learning,” “Interdisciplinarity,” “Higher education,” “Basic education,” “Nanotechnology,” “Nanotechnology education,” “Active learning,” and “Interdisciplinary strategies.”

The inclusion criteria adopted were: (1) original articles, systematic or integrative reviews, experience reports, and theoretical studies published between 2021 and 2026; (2) studies addressing active methodologies associated with pedagogical innovation; (3) research relating nanotechnology to the educational context or to scientific training; (4) publications in Portuguese, English, or Spanish; and (5) texts available in full electronically.

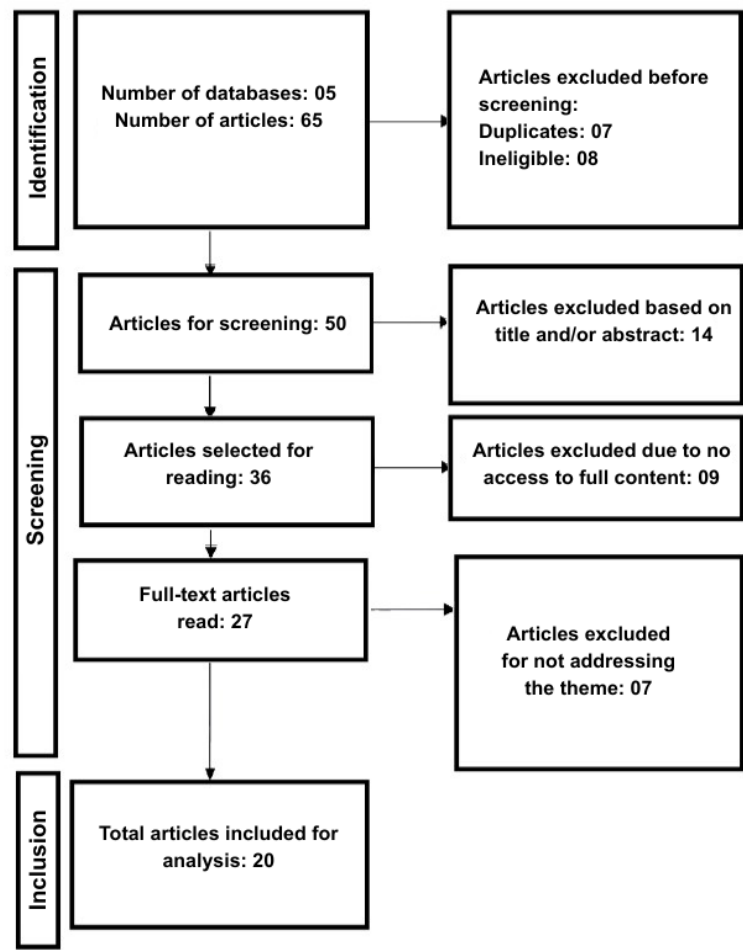
The exclusion criteria were: (1) studies published before 2021; (2) duplicate works across databases; (3) productions addressing exclusively technical aspects of nanotechnology without relation to the educational context; (4) articles dealing with traditional methodologies without an interface with active approaches; and (5) simple abstracts, editorials, letters to the editor, and works without peer review.

The study selection process occurred in four stages: (1) identification of records in the databases; (2) screening by reading titles and abstracts; (3) eligibility assessment by reading the full text; and (4) final inclusion of studies that met the established criteria. Reference organization and management were

carried out with the aid of bibliographic management software, enabling the removal of duplicates and the systematization of data.

The methodological quality of the included studies was assessed based on criteria adapted from international protocols for systematic reviews, considering clarity of objectives, methodological design, coherence between methods and results, and consistency of conclusions. This procedure aimed to ensure greater reliability of the synthesized evidence. The systematization of the search and selection process will be presented in a flowchart, as illustrated below:

Figure 1
Flowchart of the process of identification, screening, eligibility, and inclusion of studies.



Source: Authors (2026)

In this manner, the adopted methodology ensures scientific rigor and transparency in conducting the systematic review, enabling a consistent analysis of evidence regarding the articulation between active methodologies and nanotechnology as interdisciplinary strategies for transforming the teaching–learning process.

RESULTS AND DISCUSSION

Analysis of the selected studies showed that pedagogical innovation, articulated with active methodologies and nanotechnology, has promoted significant transformations in the teaching–learning process across different educational levels. The results were organized into three analytical axes: (1) consolidation of active methodologies as a strategy for student protagonism; (2) interdisciplinary and technological integration in the curriculum; and (3) insertion of nanotechnology as a strategic field for scientific and innovative training.

In the first axis, it was observed that active methodologies have been widely recognized as catalysts of meaningful learning. Santos and Pereira (2023) emphasize that such methodologies foster the development of critical and reflective competencies by shifting the focus from content transmission to the collaborative construction of knowledge.

From this perspective, Costa et al. (2026) stress that integration among teaching, research, and extension/outreach strengthens academic formation, expanding the articulation between theory and practice.

Emphasizing the authors' perspective, Aithal, Prabhu, and Aithal (2024) argue that innovation in higher education depends on incorporating emerging technologies associated with new pedagogical approaches, stating that:

The transformation of higher education requires convergence between technological forecasting, curricular innovation, and student-centered methodologies capable of anticipating emerging social and professional demands.

This statement reinforces the need to align pedagogical practices with contemporary scientific and technological trends. Team Based Learning (TBL), for example, demonstrated a positive impact on student engagement and collaborative learning (Costa; Cani; Sandrini, 2021), while the ADDIE model contributed to the structured planning of innovative formative experiences (Convento, 2025).

In addition, Trindade and Santos (2025) emphasize that applying active methodologies in Portuguese language teaching promotes greater student participation and contextualization of content. Similarly, Santos and Schimiguel (2025) show that technology-mediated projects based on students’ interests enhance engagement and autonomy.

The second analytical axis revealed that interdisciplinarity is an essential element for consolidating pedagogical innovation. Boesing, Gubiani, and De Santana (2025) demonstrate that interdisciplinary strategies from early childhood education favor the construction of integrated and contextualized knowledge. Martins and Carneiro (2025) defend the complementarity between the arc method and transdisciplinary itineraries, strengthening articulation among different fields of knowledge.

Table 1
Interdisciplinary strategies and active methodologies identified in the analyzed studies.

Author(s)/Year	Methodology or Pedagogical Strategy	Main Contributions to Innovating the Teaching–Learning Process
Costa et al. (2026)	Integration of teaching–research–extension/outreach	Strengthening critical and reflective training; articulation between theory and practice; expansion of student protagonism in real learning contexts.
Convento (2025)	Instructional design (ADDIE model) associated with active methodologies	Systematized pedagogical planning; alignment among objectives, strategies, and assessment; promotion of meaningful and structured learning.

Costa; Cani; Sandrini (2021)	Team Based Learning (TBL)	Stimulus to collaborative learning; development of individual and collective accountability; improvement of logical and argumentative reasoning.
Martins; Carneiro (2025)	Arc method and transdisciplinary itineraries	Integration between theory and practice; contextualization of scientific knowledge; promotion of interdisciplinarity and the problematization of reality.
Soares; Ferreira (2025)	3D modeling and prototyping with an active approach	Development of technological and creative competencies; encouragement of maker culture; strengthening of experiential and investigative learning.
Vieira-Neto et al. (2025)	Maker culture and digital tools	Expansion of scientific literacy; combating misinformation; encouragement of authorship, experimentation, and innovation.

Source: Authors (2026)

Maker culture and the use of digital tools also stood out as relevant interdisciplinary strategies. Vieira-Neto et al. (2025) show that such approaches strengthen scientific literacy and combat misinformation, promoting active and contextualized learning. Nunes et al. (2024) reinforce that environmental education in the digital era expands socio-environmental awareness by integrating technology and innovation.

In the context of educational inclusion, Almeida et al. (2025) highlight that the use of technologies can reduce pedagogical barriers, although challenges related to infrastructure and teacher training still persist. Santos et al. (2025) corroborate this analysis by stating that integrating digital technologies in the early years requires consistent pedagogical planning and continuing education.

Emphasizing the author's perspective, Leal (2025) observes that hybrid teaching (B-learning) represents one of the main strategies for contemporary educational transformation, as it articulately combines in-person and virtual environments. According to the author:

Hybrid teaching expands possibilities for personalized learning and strengthens student autonomy by integrating digital technologies with innovative pedagogical practices.

This perspective aligns with the findings of Dionízio and De Paiva (2021), who identified, during the COVID-19 pandemic, the need to reconfigure didactic practices to ensure continuity of the formative process.

The third axis highlighted the relevance of nanotechnology as a strategic field for educational innovation. Khan, Asmatulu, and Asmatulu (2025) emphasize that nanotechnology presents emerging trends with significant impact across various productive sectors, requiring academic training aligned with global techno-scientific demands. Verma et al. (2024) stress that the development and implementation of nanotechnology involve not only technical aspects but also social and ethical implications.

Emphasizing the authors' perspective, Deng-Guang et al. (2023) advocate integrating education for innovation and education for safety in higher education, stating that:

Contemporary scientific training must combine technological innovation with ethical awareness and safety, especially in strategic areas such as nanotechnology.

This approach indicates that inserting nanotechnology into the curriculum should occur in an interdisciplinary and responsible manner, promoting both technical competencies and critical reflection.

Table 2

Contributions of nanotechnology to interdisciplinary pedagogical innovation.

Author(s)/Year	Analytical Focus	Scientific Contributions	Implications for Academic Training and Educational Innovation
Khan; Asmatulu; Asmatulu (2025)	Emerging trends, markets, and safety in nanotechnology	Analysis of industrial, biomedical, and environmental applications; identification of regulatory and ethical challenges.	Need for curricular updating; insertion of interdisciplinary content; training aligned with global techno-scientific demands.
Verma et al. (2024)	Development and social implementation of nanotechnology	Discussion of the social, economic, and technological impacts of nanotechnology on sustainable development.	Integration among science, ethics, and society; promotion of critical awareness and social responsibility in scientific training.
Deng-Guang et al. (2023)	Education for innovation and safety in higher education	Proposal of an integrated model that articulates technological innovation and education for scientific safety.	Critical and responsible scientific training; strengthening a culture of innovation associated with ethics and technological safety.

Source: Authors (2026)

The results show that articulating active methodologies and nanotechnology enhances problem-based learning grounded in concrete issues, favoring investigative, experimental, and innovative processes. As systematized in Table 1, different pedagogical strategies—such as Team Based Learning, the ADDIE model, maker culture, and 3D prototyping—converge in promoting student protagonism, collaboration, and contextualization of knowledge. In this regard, Soares and Ferreira (2025) highlight that practices involving modeling and prototyping increase students’ interest in scientific and technological areas by integrating theory and practice into actively experienced activities. Complementarily, Valente et al. (2025) point out that faculty perceptions regarding active methodologies are predominantly positive, especially with respect to student engagement and improved academic

performance, even as they emphasize the need for greater institutional investment, continuing education, and adequate infrastructure.

It is also observed that interdisciplinarity constitutes a structuring element of this innovative process. As shown in Table 1, the analyzed strategies surpass disciplinary fragmentation and promote articulations among different areas of knowledge, allowing scientific content to be addressed in an integrated and contextualized manner. This integration is deepened when associated with nanotechnology, whose curricular insertion, as presented in Table 2, expands possibilities for an interdisciplinary approach by connecting scientific, technological, ethical, and social dimensions. The analyzed literature converges in indicating that nanotechnology should not be understood solely as specialized technical content, but as a strategic field for developing investigative and innovative competencies.

Moreover, Table 2 shows that training in nanotechnology requires curricular updating and a critical approach, considering both emerging trends and the social and ethical impacts associated with its application. When incorporated through active methodologies, nanotechnology becomes an articulating axis for interdisciplinary projects, favoring the resolution of real problems and the development of innovative solutions. Such articulation strengthens meaningful learning by bringing students closer to contemporary scientific contexts and concrete technological demands.

Overall, the findings indicate convergence among the studies regarding the transformative potential of active methodologies when associated with emerging technologies. The integrated analysis of Tables 1 and 2 demonstrates that pedagogical innovation occurs more consistently when there is alignment among structured didactic planning, collaborative strategies, and the insertion of advanced scientific content such as nanotechnology. In this way, the results reinforce that pedagogical innovation sustained by active methodologies and by the strategic insertion of nanotechnology into the curriculum contributes significantly to transforming the teaching–learning process, aligning it with twenty-first-century demands and strengthening interdisciplinary, critical, and socially responsible scientific education.

CONCLUSION

This systematic review showed that pedagogical innovation, when articulated with active methodologies and nanotechnology, constitutes a powerful strategy for transforming the teaching–learning process. The analyzed studies converge on the need to overcome traditional models centered on content transmission, indicating that pedagogical practices grounded in student protagonism, problematization, and collaborative learning favor the development of cognitive, socioemotional, and techno-scientific competencies. In this context, innovation is not limited to inserting technological resources, but implies curricular restructuring, intentional didactic planning, and a change in educational paradigms.

The results also revealed that active methodologies—such as project-based learning, Team Based Learning, maker culture, and structured instructional design—promote greater student engagement and strengthen the articulation between theory and practice. Interdisciplinarity proved to be a structuring element of this process, as it enables the integration of different areas of knowledge around complex and socially relevant problems. Such integration favors the construction of contextualized, critical learning aligned with contemporary demands, expanding the social meaning of education.

Regarding nanotechnology, it was found that its insertion in the educational context goes beyond the technical dimension, assuming a strategic role in scientific and innovative training. When addressed through active methodologies, nanotechnology becomes an articulating axis for interdisciplinary experiences that stimulate investigation, experimentation, and ethical reflection. This approach helps bring students closer to the frontiers of scientific knowledge, while also promoting critical awareness of the social, environmental, and economic impacts of emerging technologies.

Furthermore, analysis of the studies reinforces that consolidating these practices depends on institutional investment, continuing teacher education, and educational policies that encourage curricular innovation. Although evidence points to significant benefits, challenges persist related to infrastructure, resistance to change, and the need for greater integration among teaching, research, and

extension/outreach. Thus, implementing pedagogical innovation requires institutional commitment and strategic planning to ensure the sustainability of the proposed transformations.

The articulation between active methodologies and nanotechnology shows potential to align education with twenty-first-century demands, promoting critical, creative, and socially responsible formation. By integrating advanced scientific knowledge, collaborative strategies, and the problematization of reality, this approach strengthens the development of essential competencies for acting in complex and technologically dynamic contexts. Therefore, the pedagogical innovation analyzed in this review constitutes a promising path for improving basic and higher education.

As a suggestion for future research, it is recommended to conduct empirical studies of a quasi-experimental or longitudinal nature to investigate the impacts of inserting nanotechnology associated with active methodologies on academic performance, the development of scientific competencies, and students' ethical formation. In addition, studies that assess student and teacher perceptions at different educational levels may contribute to improving interdisciplinary strategies and consolidating sustainable, contextualized innovative pedagogical practices.

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PUBLIC POLICIES, AEE, AND FULL-TIME EDUCATION: INTERFACES WITH THE TEACHING OF MATHEMATICS AND CHEMISTRY IN BRAZIL

 <https://doi.org/10.63330/aurumpub.032-011>

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Abstract

This chapter analyzes the interfaces between public educational policies, Specialized Educational Assistance (AEE), and Full-Time Education in Brazil, focusing on their implications for Mathematics and Chemistry teaching. The objective is to understand how these policies contribute to equity, inclusion, and meaningful learning in the fields of Mathematics and Natural Sciences. The methodology is based on a bibliographic review and documentary analysis of regulatory frameworks, including the National Policy

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on Special Education from the Perspective of Inclusive Education and the National Common Curricular Base, as well as academic studies on inclusive pedagogical practices. The results indicate that the articulation between AEE and Full-Time Education enhances differentiated teaching strategies, the use of assistive technologies, and interdisciplinary practices, fostering the participation of students with special educational needs. However, challenges remain regarding teacher training, school infrastructure, and curriculum integration. It is concluded that strengthening these policies requires continuous investment, collaborative planning, and the consolidation of an inclusive culture, particularly in Mathematics and Chemistry, areas historically associated with high levels of exclusion and learning difficulties.

Keywords: Full-Time Education, Mathematics Teaching, Public educational policies, Specialized Educational Assistance, Chemistry Teaching.

INTRODUCTION

The consolidation of educational public policies aimed at inclusion and equity has assumed a central role in the Brazilian educational landscape in recent decades. The 1988 Federal Constitution established education as a fundamental social right, subsequently regulated by the National Education Guidelines and Framework Law—LDB No. 9,394/1996—which sets forth equal conditions for access to and permanence in school (Brazil, 1996). In this context, Specialized Educational Assistance (AEE) and Full-Time Education are configured as essential strategies for making an inclusive school effective. The National Policy on Special Education from the Perspective of Inclusive Education defines AEE as a complementary and supplementary service to schooling, ensuring pedagogical and accessibility resources for students who are the target audience of special education (Brazil, 2008). In an articulated manner, the National Common Core Curriculum—BNCC guides integral formation, emphasizing the development of cognitive, scientific, and socioemotional competencies (Brazil, 2018).

Despite these normative advances, the materialization of these guidelines in school practices still faces challenges, especially in the teaching of Mathematics and Chemistry—areas historically associated

with high rates of failure and conceptual difficulties. In view of this, the research problem is delimited by the following question: in what ways have public policies aimed at AEE and Full-Time Education contributed to inclusive pedagogical practices in the teaching of Mathematics and Chemistry in Brazil? The premise adopted is that the effectiveness of these policies requires not only legal support but also structural changes in school culture.

The general objective of this chapter is to analyze the interfaces among public policies, AEE, and Full-Time Education, highlighting their implications for the teaching of Mathematics and Chemistry. As specific objectives, it is intended to: (a) examine the main legal frameworks that underpin AEE and Full-Time Education; (b) discuss theoretical contributions on inclusive education and the teaching of Science and Mathematics; and (c) identify challenges and possibilities for consolidating inclusive pedagogical practices in these areas.

The justification for this study is grounded in the need to deepen the debate on inclusion in scientific disciplines, which have traditionally been marked by transmissive and selective pedagogical practices. School inclusion requires a structural transformation of educational organization, overcoming homogeneous models of teaching (Mantoan, 2015). In the field of Mathematics, the importance of recognizing different forms of knowledge production stands out, valuing diverse sociocultural contexts (D'Ambrosio, 1996). Regarding the teaching of Chemistry, the construction of scientific meanings depends on discursive interactions mediated by the teacher (Mortimer; Scott, 2002).

Furthermore, the concept of Full-Time Education goes beyond the extension of school time, encompassing the multidimensional formation of the subject in their cognitive, cultural, and social dimensions (Cavaliere, 2007). From this perspective, the articulation between AEE and Full-Time Education can enhance differentiated didactic strategies, the use of assistive technologies, and interdisciplinary approaches. However, its effectiveness demands continuous teacher education, collaborative planning, and the strengthening of democratic management—elements indispensable for consolidating inclusive scientific education in the Brazilian context.

METHODOLOGY

This chapter is characterized as a qualitative study of an exploratory and descriptive nature, grounded in a literature review and documentary analysis. The choice of this approach is justified by the need to understand, in depth, the interfaces among public policies, Specialized Educational Assistance (AEE), and Full-Time Education, especially with regard to their implications for the teaching of Mathematics and Chemistry in the Brazilian context. Qualitative research makes it possible to interpret educational phenomena in their historical, social, and normative complexity, considering multiple dimensions of analysis (Minayo, 2014).

TYPE OF RESEARCH

This is a theoretical-analytical study, supported by a narrative review of the literature and the analysis of official documents. The bibliographic review enabled the survey and systematization of academic productions related to inclusive education, AEE, Full-Time Education, and the teaching of Science and Mathematics. According to Gil (2019), bibliographic research is developed on the basis of previously produced material, constituting an essential stage for constructing the theoretical framework and delimiting the investigated problem.

The documentary analysis included legislation, guidelines, and educational public policies, such as the National Education Guidelines and Framework Law (Brazil, 1996), the National Policy on Special Education from the Perspective of Inclusive Education (Brazil, 2008), and the National Common Core Curriculum (Brazil, 2018). The analysis of these documents made it possible to understand the legal and pedagogical foundations that guide the organization of AEE and Full-Time Education in the country.

TECHNIQUES AND INSTRUMENTS FOR COLLECTION AND ANALYSIS

The techniques used involved a bibliographic survey in academic databases, selection of scientific articles, books, and official documents, as well as analytical note-taking (*fichamento*) of the selected

material. Data analysis was carried out through the content analysis technique, which makes it possible to identify thematic categories and interpret meanings present in the examined texts (Bardin, 2011).

The following were established as analytical categories: (a) legal foundations of public policies; (b) conceptions of inclusion and Full-Time Education; (c) pedagogical practices in the teaching of Mathematics and Chemistry; and (d) challenges for implementing AEE. These categories guided the organization and interpretation of the analyzed corpus, enabling the construction of a discussion articulated between theory and educational norms.

DELIMITATION OF THE CORPUS AND DOCUMENTARY SAMPLE

The research corpus consisted of national normative documents and academic productions published predominantly from the 2000s onward—a period marked by significant advances in policies of educational inclusion in Brazil. The documentary sample was defined by criteria of thematic relevance, timeliness, and academic recognition of the selected authors, prioritizing works that discuss inclusive education, integral formation, and the teaching of Science and Mathematics.

METHODOLOGICAL DISCUSSION AND GROUNDING

The choice for a qualitative and documentary approach is grounded in the understanding that educational public policies constitute historical and social constructions, whose analysis requires contextualized interpretation. According to Minayo (2014), qualitative research allows one to apprehend meanings, values, and intentions present in social practices. Likewise, documentary analysis makes it possible to examine institutional discourses and official guidelines, identifying convergences and gaps between what is prescribed in regulations and its effectiveness in everyday school life.

Thus, the adopted methodology favors a critical understanding of the interfaces among public policies, AEE, and Full-Time Education, especially with regard to the teaching of Mathematics and

Chemistry, contributing to theoretical deepening and reflection on inclusive pedagogical practices in the Brazilian educational context

RESULTS AND DISCUSSION

The analysis of normative documents and the literature evidenced significant advances in consolidating Specialized Educational Assistance (AEE) and Full-Time Education as instruments for promoting educational equity. However, the results indicate that the implementation of these policies in the teaching of Mathematics and Chemistry still presents asymmetries related to teacher education, infrastructure, and curricular organization (Brazil, 2008; Brazil, 2018).

The findings were organized into analytical categories, as presented in Table 1.

Table 1
Summary of the main research findings

Category of Analysis	Main Results	Identified Challenges
Legal Foundations	Consistent normative framework for inclusion and AEE	Gap between legislation and school practice
Practices in Mathematics	Use of contextualized methodologies and adapted resources	Difficulties in curricular flexibility
Practices in Chemistry	Dialogic mediation and guided experimentation	Lack of laboratories and accessible materials
Full-Time Education	Expansion of interdisciplinary opportunities	Reduction of the proposal to merely extending school time

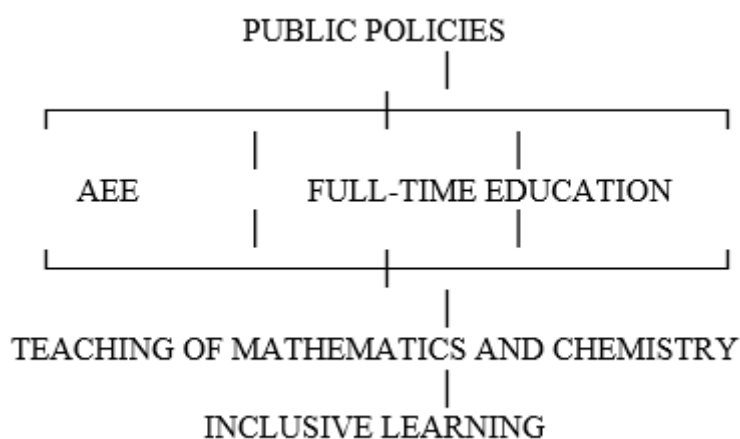
Source: Authors (2026).

In the teaching of Mathematics, it was found that contextualized and culturally situated approaches contribute to greater engagement and conceptual understanding, in line with the perspective of valuing diverse forms of knowledge (D'Ambrosio, 1996). Nevertheless, traditional practices centered on mechanical repetition of exercises still predominate, which hinders the effective inclusion of students with specific needs.

In Chemistry, it was observed that mediated experimentation and scientific dialogue favor the construction of meanings, especially when associated with inclusive strategies (Mortimer; Scott, 2002). However, the limitation of physical and technological resources compromises the expansion of these practices.

Figure 1

Interface between Public Policies, AEE, and Science Teaching



Source: Authors (2026).

Figure 1 illustrates the interrelationship among the structuring axes analyzed. It is observed that AEE and Full-Time Education function as mediators of public policies, directly impacting pedagogical practices in scientific areas.

In addition, the qualitative analysis made it possible to organize the identified impacts, as presented in Table 2.

Table 2*Impacts of public policies on the teaching of Mathematics and Chemistry*

Dimension	Positive Impacts	Limitations
Pedagogical	Methodological differentiation	Insufficient teacher education
Structural	Extension of school time	Inadequate infrastructure
Curricular	Possibility of interdisciplinarity	Rigidity in content organization
Inclusive	Greater student participation	Persistent attitudinal barriers

Source: Authors (2026).

The discussion of the results shows that, although there is normative coherence with the principles of inclusive education (Mantoan, 2015), the effectiveness of policies depends on continuous investment, collaborative planning, and strengthening an inclusive school culture. Full-Time Education, when understood as multidimensional formation (Cavaliere, 2007), expands possibilities for curricular integration and fosters more meaningful learning.

Thus, the results indicate that consolidating the interfaces among public policies, AEE, and the teaching of Mathematics and Chemistry requires overcoming structural and pedagogical challenges, reaffirming the need for articulated and sustainable policies in the Brazilian educational context.

CONCLUSION

This chapter aimed to analyze the interfaces among educational public policies, Specialized Educational Assistance (AEE), and Full-Time Education, highlighting their implications for the teaching of Mathematics and Chemistry in Brazil. The investigation sought to understand how normative frameworks and inclusive pedagogical conceptions have guided educational practices aimed at promoting equity, participation, and meaningful learning in scientific areas.

The results demonstrate that the Brazilian legal framework provides consistent bases for consolidating an inclusive and integral education. It was observed that the articulation between AEE and Full-Time Education can foster methodological diversification, the use of accessible pedagogical resources, the extension of time and opportunities for learning, as well as the strengthening of interdisciplinary practices in the teaching of Mathematics and Chemistry. However, challenges persist related to initial and continuing teacher education, school infrastructure, curricular organization, and overcoming traditional pedagogical practices that hinder the full inclusion of students.

As a contribution, this study reinforces the importance of integrating public policies, school management, and teaching practices in a collaborative perspective, emphasizing that making inclusion effective in the areas of Natural Sciences and Mathematics requires systematic planning, continuous investment, and institutional commitment. The proposed reflection broadens the debate on the need for contextualized practices, qualified pedagogical mediation, and curricular reorganization that take into account the diversity of subjects.

For future research, it is suggested to develop empirical studies in specific school contexts in order to analyze concrete experiences of implementing AEE in Mathematics and Chemistry classes. Further, investigations on teacher education, inclusive assessment, and the use of assistive technologies are recommended, contributing to the improvement of educational policies and to the consolidation of a more equitable and socially committed scientific education.

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**COMPARATIVE ANALYSIS OF LEARNING GAINS IN EDUCATIONAL ENVIRONMENTS
MEDIATED BY GAMIFICATION VERSUS ARTIFICIAL INTELLIGENCE**

 <https://doi.org/10.63330/aurumpub.032-012>

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Abstract

Pedagogical innovation mediated by emerging technologies has assumed a central role in the contemporary transformation of the teaching–learning process, particularly in response to the demands of an increasingly digital, interconnected, and data-driven society. In this context, gamification and artificial intelligence stand out as promising strategies for reshaping educational practices by fostering greater engagement, personalization, and dynamism in learning experiences. This study presents a systematic literature review that critically analyzes the contributions of these two approaches to educational improvement, encompassing indexed publications from 2021 to 2026. The investigation was guided by a reformulated research question, with clearly defined descriptors, explicit inclusion and exclusion criteria, and a structured process of identification, screening, and selection of studies, organized through a methodological flowchart. The findings indicate that gamification, when grounded in consistent theoretical frameworks and aligned with well-defined pedagogical objectives, enhances student engagement, intrinsic motivation, and active participation. Simultaneously, artificial intelligence demonstrates significant potential in personalizing learning pathways, continuously monitoring performance, and providing adaptive real-time feedback, thereby supporting more precise and data-informed pedagogical interventions. The comparative synthesis suggests that integrating gamification with intelligent systems may further strengthen educational outcomes by combining motivational and analytical dimensions within hybrid instructional models. It is concluded that the effective implementation of these technologies requires structured pedagogical planning, ongoing teacher training, and robust ethical regulation to ensure effectiveness, equity, and sustainability in contemporary educational settings.

Keywords: Artificial intelligence, Educational technology, Gamification, Pedagogical innovation, Systematic review.

INTRODUCTION

The incorporation of digital technologies in higher education has promoted significant transformations in teaching and learning processes, especially through the adoption of active methodologies and advanced technological resources. In this context, gamification and artificial intelligence (AI) stand out as innovative strategies that seek to enhance student engagement, autonomy, and academic performance. Recent literature indicates that AI has been progressively integrated into educational environments, expanding possibilities for personalization, data analysis, and support for pedagogical decision-making (Akinwalere; Ivanov, 2022; Younas; El-Dakhs; Noor, 2025). In parallel, gamification has consolidated itself as a didactic approach capable of mobilizing intrinsic motivation and active participation, fostering meaningful knowledge construction (Buenadicha-Mateos et al., 2025; Vairavan, 2024).

Gamification, understood as the application of game elements and dynamics in non-playful contexts, has been explored from different theoretical and methodological perspectives. Studies indicate that its implementation goes beyond the mere assignment of points and rewards, involving creative, collaborative, and emancipatory processes (Carolei, 2022a; Carolei, 2022b). The notion of “gamicity,” for example, broadens the traditional concept by integrating responsible and transformative practices within the educational context (Carolei, 2022c). Moreover, empirical investigations indicate that gamification can positively impact academic performance by promoting greater engagement and persistence in proposed activities (Buenadicha-Mateos et al., 2025; Souza; Ribeiro; Versuti, 2025). In Science and Biology teaching, this strategy has demonstrated potential for systematizing complex content and fostering active learning in the final years of elementary education (Queiroga; Pacheco, 2024; Moura; Henriques, 2024).

In turn, artificial intelligence has been consolidating as one of the main drivers of educational innovation. Tools based on language models, chatbots, and adaptive systems make it possible to provide immediate feedback, personalized learning pathways, and support for self-regulation (Hwang; Chang,

2021; Ge et al., 2025). The integration of AI with educational processes also favors the development of socioemotional skills and transversal competencies, especially when articulated with virtual learning environments (Marengo et al., 2025). However, the adoption of these technologies involves ethical, pedagogical, and structural challenges, requiring institutional preparedness and adequate teacher training (Akinwalere; Ivanov, 2022; Kassengkhan; Moldagulova; Serbin, 2025).

A comparative analysis between environments mediated by gamification and those structured with support from artificial intelligence becomes relevant in view of the need to understand not only levels of engagement, but also the effective learning gains provided by each approach. While gamification tends to strengthen motivational and collaborative aspects, AI stands out for its capacity for personalization and continuous monitoring of student progress (Kassengkhan; Moldagulova; Serbin, 2025; Marengo et al., 2025). Furthermore, recent studies suggest that combining both strategies can enhance self-regulation and critical thinking, expanding educational outcomes (Ge et al., 2025). Even so, a gap is observed in the literature regarding a systematic comparison of the impacts of these approaches on objective indicators of learning.

Within the scope of active methodologies, the integration between teaching, research, and outreach also reinforces the importance of strategies that place the student at the center of the educational process (Costa et al., 2026; Meroto et al., 2024). The systematic literature review constitutes an essential tool for mapping evidence, identifying trends, and grounding robust comparative analyses (Campos; Caetano; Laus-Gomes, 2023). Thus, the discussion of gamification and artificial intelligence must be supported by consistent empirical evidence, capable of guiding grounded pedagogical practices that are contextualized to contemporary demands.

In light of this scenario, it becomes imperative to investigate, critically and systematically, the effects of these two approaches on academic performance and the quality of the educational process. Although both are associated with pedagogical innovation, their mechanisms of action, levels of personalization, motivational impacts, and cognitive outcomes may differ significantly. Understanding

these differences is fundamental to support institutional decision-making and to improve teaching strategies in the context of digital education.

Accordingly, the present study aims to comparatively analyze learning gains in educational environments mediated by gamification versus artificial intelligence, in light of recent scientific evidence, identifying the potentialities, limitations, and pedagogical implications of each approach for promoting more effective, innovative, and student-centered teaching.

METHODOLOGY

This is a systematic literature review with a qualitative approach and a descriptive-analytical character, conducted with the objective of identifying, analyzing, and synthesizing scientific evidence regarding learning gains in educational environments mediated by gamification versus artificial intelligence, from 2021 to 2026. The systematic review was chosen because it enables methodological rigor in the search, selection, critical appraisal, and synthesis of studies, reducing biases and ensuring greater reliability of the results (Campos; Caetano; Laus-Gomes, 2023).

The methodological protocol was developed following previously defined steps: (1) formulation of the research question; (2) definition of the databases; (3) establishment of descriptors and Boolean operators; (4) application of inclusion and exclusion criteria; (5) selection and critical analysis of studies; and (6) synthesis of findings. The guiding question was structured based on the following problematization: To what extent do gamification and artificial intelligence influence students' academic performance?

Searches were carried out in the following electronic databases: Scopus, Web of Science, ERIC, PubMed, IEEE Xplore, and Google Scholar, as they include relevant productions in the areas of Education, Educational Technology, and Computer Science. Descriptors in Portuguese and English were used, combined through the Boolean operators AND and OR, namely: “Gamificação” OR “Gamification”; “Inteligência Artificial” OR “Artificial Intelligence”; “Aprendizagem” OR “Learning

Gain” OR “Academic Achievement”; “Educação Superior” OR “Higher Education”; “Ambientes Virtuais de Aprendizagem” OR “E-learning”.

The search strategy was structured with combinations such as: (“Gamification” AND “Learning Gain”) AND (“Artificial Intelligence” OR “AI in Education”); (“Gamificação” AND “Desempenho Acadêmico”) AND (“Inteligência Artificial” AND “Educação”). Filters were applied related to publication period (2021 to 2026), language (Portuguese, English, and Spanish), and document type (scientific articles, experimental studies, quasi-experimental studies, systematic reviews, and meta-analyses).

Inclusion criteria comprised: (a) studies published between January 2021 and December 2026; (b) research that explicitly addressed the use of gamification or artificial intelligence in formal educational contexts; (c) investigations presenting indicators of learning gains, academic performance, content retention, or development of cognitive skills; (d) full-text availability; and (e) peer-reviewed studies.

Excluded were: (a) duplicate works; (b) studies addressing exclusively technical aspects of software development without pedagogical analysis; (c) publications dealing only with student perception or satisfaction without measurement of learning outcomes; (d) simple abstracts, editorials, letters to the editor, and chapters without empirical evaluation; and (e) research outside the established time scope.

The selection process occurred in three stages: reading of titles, reading of abstracts, and full-text reading of eligible texts. Screening was carried out independently by two reviewers, with subsequent consensus in cases of disagreement. After the final selection, data were extracted into a structured instrument containing: authors, year, country, methodological design, level of education, type of intervention (gamification or AI), learning indicators used, and main results.

Data analysis was conducted through thematic qualitative synthesis, allowing the identification of emergent categories related to motivational impact, personalization of learning, development of self-regulation, and academic performance. When available, quantitative data related to standardized tests,

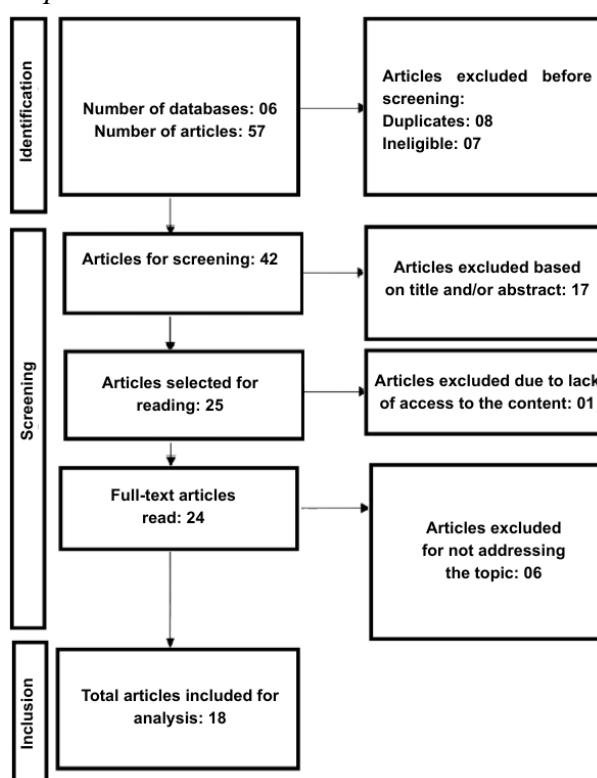
comparative means, and effect measures were considered in order to support the comparative discussion between approaches.

The methodological quality assessment of included studies was performed based on criteria of clarity of objectives, adequacy of design, description of the sample, validity of assessment instruments, and consistency of the reported results. This procedure contributed to strengthening the interpretive robustness of the review.

The flow of identification, screening, eligibility, and inclusion of studies will be presented, including the total number of records identified, excluded, and analyzed in the final sample.

Figure 1

Flowchart of the study selection process



Source: Authors (2026)

In this way, the adopted methodology ensures transparency, systematicity, and scientific rigor in the investigative process, enabling a consistent comparative analysis of learning gains in educational environments mediated by gamification versus artificial intelligence.

RESULTS AND DISCUSSION

The analysis of the studies included in this systematic review revealed a robust and multifaceted panorama of learning gains in educational environments mediated by gamification and by artificial intelligence from 2021 to 2026. In line with the methodological guidance of Campos, Caetano, and Laus-Gomes (2023), the results are presented in an integrated manner with critical discussion, enabling examination not only of identified effects but also of their pedagogical, methodological, and institutional implications. Overall, the findings indicate that both approaches promote positive impacts on academic performance, although they are grounded in distinct theoretical assumptions and operate through different mechanisms of learning mediation.

Within the set of studies focused on gamification, there was a predominance of empirical research with experimental and quasi-experimental designs, concentrated mainly in higher education. Buenadicha-Mateos, Sánchez-Hernández, González-López, and Tato-Jiménez (2025) demonstrate that the structured implementation of game elements—such as levels, progressive challenges, symbolic rewards, and continuous feedback—resulted in a significant increase in academic performance, measured by standardized assessments and pass rates. According to Buenadicha-Mateos et al. (2025), student engagement constitutes an essential mediating variable between the playful experience and cognitive gain, evidencing that intrinsic motivation plays a central role in knowledge consolidation.

Corroborating this perspective, Vairavan (2024) identified, in an experimental study in language teaching, that students exposed to gamified applications showed greater content retention and persistence in proposed activities. According to Vairavan (2024), the combination of clear goals, symbolic rewards, and structured progression favored not only immediate performance but also the maintenance of learning

over time. These results reinforce the understanding that gamification acts significantly on affective-motivational dimensions, with measurable cognitive repercussions.

In basic education contexts, Queiroga and Pacheco (2024) observed that the systematic application of gamification in Biology Science teaching contributed to greater conceptual organization and active student participation. According to Queiroga and Pacheco (2024), the use of collaborative challenges and structured narratives increased student involvement and favored the internalization of complex scientific concepts. Moura and Henriques (2024) add that, in Natural Sciences classes, the integration of gamification and artificial intelligence enhanced learning by associating playfulness and personalization, promoting greater autonomy and critical reflection.

From a theoretical standpoint, Carolei (2022a) proposes the concept of gamicity as a critical expansion of traditional gamification, advocating transformative and socially responsible practices. According to Carolei (2022a), play should be understood as a pedagogical device capable of articulating aesthetic experience, ethical reflection, and collective construction of knowledge. In another work, Carolei (2022b) argues that creative gamification requires intentional planning and consistent theoretical grounding, avoiding reductions based exclusively on extrinsic rewards. Amaral and Carolei (2022) reinforce this perspective by relating playful practices to the construction of territorial and cultural meanings, expanding the notion of learning gains to identity and social dimensions.

Table 1

Synthesis of studies on gamification and their impacts on learning gains

Author/Year	Gamified Foundations and Strategies	Learning Gain Indicators	Main Evidenced Contributions
Buenadicha-Mateos et al. (2025)	Structuring by levels, progressive challenges, symbolic reward system, and continuous formative feedback	Highlighted the cultural and experiential dimension as a component of formative gain	Demonstrated a statistically significant relationship between gamified engagement and improvement in academic performance
Vairavan (2024)	Gamified application with gradual goals, positive reinforcement, and performance-based progression	Content retention, persistence, and intrinsic motivation	Evidenced increased retention and greater persistence in learning activities
Queiroga; Pacheco (2024)	Collaborative challenges, contextualized narrative, and problem solving	Conceptual organization, active participation, and performance in formative assessments	Contributed to the systematization of scientific content and increased student involvement
Moura; Henriques (2024)	Integration between gamified dynamics and interactive digital resources	Autonomy, problem solving, and meaningful learning	Fostered student protagonism and the development of cognitive competencies
Souza; Ribeiro; Versuti (2025)	Analysis of gamified instructional design and its motivational mechanics	Academic performance and engagement levels	Indicated that the quality of gamified design directly influences educational outcomes
Carolei (2022a)	Concept of gamicity as a transformative, ethical, and socially situated practice	Critical, reflective, and emancipatory dimensions of learning	Expanded the concept of learning gains beyond quantitative metrics

Carolei (2022b)	Creative gamification grounded in pedagogical intentionality and emancipation	Reflective engagement and active participation	Evidenced the need for consistent theoretical grounding for pedagogical effectiveness
Amaral; Carolei (2022)	Territorial playful practices and sensory experiences	Identity construction and contextualized learning	Highlighted the cultural and experiential dimension as a component of formative gain

Source: Authors (2026)

Table 1 shows, in a synthetic manner, that studies on gamification converge regarding the positive impact on engagement, motivation, and academic performance levels, although they present variations in methodological designs and in the assessment instruments used. It is observed that research of an experimental nature tends to demonstrate quantitative gains in performance tests and retention rates, as indicated by Buenadicha-Mateos et al. (2025) and Vairavan (2024), while investigations of a qualitative and theoretical character, such as those by Carolei (2022a; 2022b), emphasize broader formative dimensions, including emancipation, criticality, and collective construction of knowledge. In addition, studies applied to basic education, such as Queiroga and Pacheco (2024), highlight contributions to conceptual organization and active participation, reinforcing that learning gains are not restricted to higher education. Thus, the table makes it possible to understand that the effectiveness of gamification is directly related to pedagogical planning, didactic intentionality, and the coherent integration of playful elements with educational objectives.

With regard to artificial intelligence, the analyzed studies highlight as the main differential the ability to personalize and adapt to students’ individual needs. Akinwalere and Ivanov (2022) state that AI-based systems enable continuous monitoring of academic progress, identification of learning gaps, and provision of adaptive real-time interventions. According to Akinwalere and Ivanov (2022), such resources

expand opportunities for individualized learning in higher education, although they require institutional investments and specialized teacher training.

Hwang and Chang (2021) analyze the use of educational chatbots and emphasize that these tools provide immediate feedback, clarification of doubts, and metacognitive support. According to Hwang and Chang (2021), continuous interaction with intelligent systems contributes to the development of self-regulation, an element considered essential for sustainable learning gains. This metacognitive dimension is also emphasized by Ge et al. (2025), who demonstrate that the use of large language models, integrated with gamified elements, strengthens skills of planning, monitoring, and evaluating one's own learning.

The review conducted by Younas, El-Dakhs, and Noor (2025) shows that AI-based tools, including advanced conversational models, have driven academic innovation by providing more interactive and responsive experiences. According to Younas, El-Dakhs, and Noor (2025), AI fosters the development of higher-order cognitive competencies when aligned with clear pedagogical objectives and coherent assessment practices. This perspective is expanded by Marengo, Pagano, Lund, and Santamato (2025), who advocate the integration of artificial intelligence and gamification as a promising strategy for optimizing e-learning environments and assessing socioemotional competencies.

When systematically comparing the two approaches, Kassengkhan, Moldagulova, and Serbin (2025) argue that gamification and artificial intelligence share the goal of promoting critical thinking and problem solving, but differ in terms of mediation mechanisms. According to Kassengkhan, Moldagulova, and Serbin (2025), gamification acts predominantly on motivation and collaboration, while AI prioritizes personalization and predictive analysis of educational data. This distinction was corroborated in the present review, in which it was observed that studies on gamification emphasize indicators of engagement and satisfaction, whereas research on AI prioritizes metrics of individual progression and content adaptation.

Table 2

Comparison between environments mediated by gamification and by artificial intelligence

Analytical Dimension	Gamification-Mediated Environments	Artificial Intelligence-Mediated Environments
Pedagogical Foundation	Based on active methodologies, experiential learning, and the theory of intrinsic motivation	Grounded in adaptive learning, educational data analysis, and self-regulation theory
Central Mediation Mechanism	Playful engagement through challenges, symbolic rewards, and social interaction	Personalization of instruction through adaptive algorithms, automated feedback, and continuous monitoring
Predominant Focus	Motivation, collaboration, and active participation	Individualization of learning and metacognitive development
Assessment Indicators	Scores, test performance, content retention, participation levels	Individual progression, predictive performance analysis, self-regulation metrics
Cognitive Contributions	Content consolidation through immersive experiences and collaborative problem solving	Development of metacognitive competencies, individualized support, and adaptive interventions
Identified Limitations	Risk of superficiality when lacking structured pedagogical intentionality	Ethical challenges, technological dependence, need for infrastructure and specialized teacher training
Convergence Potential	Can be integrated with intelligent systems to broaden personalization	Increases effectiveness when associated with playful and motivational dynamics

Source: Authors (2025)

Table 2 enables a comparative visualization of the main distinctions and convergences between environments mediated by gamification and by artificial intelligence, showing that both approaches contribute to learning gains, but through distinct pedagogical mechanisms. It is observed that gamification places greater emphasis on engagement, intrinsic motivation, and collaboration, as discussed by Buenadicha-Mateos et al. (2025), while artificial intelligence stands out for personalized instruction, continuous monitoring, and development of self-regulation, as pointed out by Akinwalere and Ivanov

(2022) and Ge et al. (2025). The table also demonstrates that the indicators used to measure outcomes vary significantly, reinforcing the need for methodological standardization to enable more precise comparisons. Moreover, the comparative synthesis suggests that integrating the two strategies may represent a promising path to enhance both motivational and cognitive aspects of learning, in line with the analyses of Marengo et al. (2025) and Kassengkhan, Moldagulova, and Serbin (2025).

The methodological analysis of the studies revealed heterogeneity in the instruments used to measure learning gains. Buenadicha-Mateos et al. (2025) and Souza, Ribeiro, and Versuti (2025) employed comparative performance assessments before and after the gamified intervention, whereas Akinwalere and Ivanov (2022) analyzed adaptive learning data generated by intelligent systems. This methodological diversity, although it enriches the field, hinders direct comparisons and highlights the need for standardization of indicators.

At the institutional level, Costa et al. (2026) emphasize that the effectiveness of active methodologies and digital technologies depends on curricular integration and strategic alignment among teaching, research, and outreach. According to Costa et al. (2026), the adoption of technological resources must be associated with pedagogical intentionality and continuous teacher education. This analysis converges with Akinwalere and Ivanov's (2022) warning regarding ethical and structural challenges related to implementing artificial intelligence in higher education.

The discussion of results allows the inference that gamification presents more consolidated evidence with respect to increasing motivation, engagement, and persistence, especially in collaborative environments. On the other hand, artificial intelligence demonstrates greater potential for personalizing instruction and developing self-regulation, contributing to continuous monitoring and adaptive interventions. As highlighted by Kassengkhan, Moldagulova, and Serbin (2025), the choice between approaches should not be exclusive, but rather guided by specific pedagogical objectives and the educational context.

There is also a growing trend of research investigating the convergence between gamification and artificial intelligence. Marengo et al. (2025) argue that hybrid environments enhance learning gains by combining playful engagement with adaptive data analysis. Ge et al. (2025) corroborate this perspective by evidencing significant improvements in self-regulation when intelligent systems are associated with gamified dynamics. Nevertheless, the literature still lacks longitudinal studies that assess long-term impacts and examine potential side effects, such as technological dependence or conceptual superficiality.

In summary, the results of this systematic review indicate that both gamification and artificial intelligence contribute significantly to learning gains, albeit through distinct and complementary pathways. The consolidation of more standardized comparative evidence, together with in-depth ethical and pedagogical analyses, is essential to guide evidence-based educational decisions. As emphasized by Campos, Caetano, and Laus-Gomes (2023), the production of rigorous and systematized knowledge is an indispensable condition for the advancement of pedagogical innovation in technology-mediated educational contexts.

CONCLUSION

The present systematic review enabled an in-depth analysis of the contributions of gamification and artificial intelligence in the contemporary educational scenario, evidencing that these strategies constitute significant vectors of pedagogical innovation. The synthesis of studies published between 2021 and 2026 demonstrates that incorporating these technologies transcends the instrumental dimension, assuming a structuring role in the reorganization of teaching practices. A progressive transition is observed from models centered on the unidirectional transmission of knowledge to interactive, adaptive, and evidence-oriented approaches, in which the student occupies a leading position in the educational process.

In the domain of gamification, the findings indicate that the systematized use of game mechanics and dynamics—such as level-based progression, immediate feedback, gradual goals, and symbolic reward

systems—fosters students’ cognitive and emotional engagement. When articulated with clearly defined pedagogical objectives, gamification enhances intrinsic motivation, stimulates active participation, and strengthens persistence in the face of academic challenges. However, the literature also warns of the need for consistent theoretical grounding in order to avoid a merely aesthetic or superficial application of playful elements, which could compromise pedagogical intentionality and the effectiveness of the intervention.

With regard to artificial intelligence, the analyzed studies show substantial advances in learning personalization, early identification of difficulties, and the provision of adaptive real-time feedback. Intelligent tutoring systems, predictive analytics algorithms, and platforms based on learning analytics demonstrate potential to support data-informed pedagogical decisions, increasing diagnostic precision and instructional individualization. Nevertheless, relevant ethical challenges emerge, especially concerning data protection, algorithmic transparency, and teacher training for the critical use of these technologies—indispensable aspects to ensure equity and responsibility in the educational context.

The comparative analysis of results reveals that the convergence between gamification and artificial intelligence represents a promising perspective for the development of hybrid educational ecosystems. While gamification strengthens motivational and experiential dimensions, artificial intelligence expands the analytical and adaptive capacity of the educational process. Integrating these approaches may foster more responsive, dynamic, and student-centered pedagogical practices, reconciling engagement, personalization, and continuous performance monitoring. Such articulation points to a paradigmatic reconfiguration of teaching, aligned with the demands of the digital society and 21st-century competencies.

Despite the identified advances, the review revealed important methodological limitations in the analyzed studies, such as heterogeneity of designs, the predominance of short-duration investigations, and the diversity of assessment instruments used. These variables hinder direct comparisons and the consolidation of robust evidence. Moreover, a scarcity of research conducted in public educational

contexts and in regions with restricted technological infrastructure was observed, highlighting inequalities in access to and implementation of technology-mediated pedagogical innovations.

In view of this panorama, the conduction of longitudinal research with mixed methodological approaches is recommended, investigating in an integrated manner the cognitive, motivational, and socioemotional impacts of pedagogical models that articulate gamification and artificial intelligence. It is also suggested that ethical protocols and institutional guidelines be developed to ensure the responsible use of educational data, promoting transparency, security, and algorithmic fairness. Future investigations encompassing different educational levels and distinct sociocultural contexts may contribute to strengthening scientific evidence and supporting data-informed educational policies, consolidating theoretical and practical foundations for sustainable and socially inclusive pedagogical innovation.

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THE ACADEMIC DEVELOPMENT OF EDUCATORS IN HIGHER EDUCATION

 <https://doi.org/10.63330/aurumpub.032-013>

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Abstract

This academic article aims to examine the professional growth of professors in higher education through an understanding of practical experiences, essential for the educator's training. Thus, it seeks to reflect on the perspectives of authors who address these experiences in the university context and in daily life, both inside and outside the classroom, in higher education, in the construction of knowledge by teachers and students. The focus is on identifying the main competencies acquired in teacher training; analyzing the remaining characteristics of each, their contributions to the development of skills and competencies, and exploring the theoretical and methodological foundations that guide the relationship between theory and practice in addressing teaching topics. The research will be primarily bibliographic, focusing on theoretical studies related to the topic. Through these sources, the roles of practical knowledge in teacher training will be analyzed. To support the analysis, authors such as Monteiro (2007), Pimenta (2002), Tardif (2012), among others, will be referenced. Furthermore, this study seeks to define the key knowledge offered, enabling a meaningful connection with the social context, communities, their cultures

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and values, while also exercising our political responsibility in decision-making and effectively influencing our actions as professionals capable of shaping opinions and mindsets.

Keywords: Practical knowledge, Teaching performance, Higher education.

INTRODUCTION

It is well known that teachers from various fields are in constant pursuit of a pedagogical practice that makes their knowledge viable throughout their education—knowledge that is continually renewed by the desire to confront the problems present in daily life, especially in the workplace.

The development of this study will initially be based on theoretical contributions that address the aforementioned theme, such as Monteiro (2007), Pimenta (2002), Tardif (2012), among others.

As to its purpose, we emphasize the importance of lived experience—inside and outside the classroom—as a reference for teaching. On that basis, this study intends to point out, in light of acquired knowledge, significant advantages for our teaching practice in this field, observing in which contexts greater difficulties were encountered, which theoretical-methodological assumptions were most operationalized, and how to understand the importance attributed to the knowledge acquired in this relationship. This is essential for an appropriate discursive posture toward the themes offered by teaching, in its integration with the world and with the people who are situated within it.

This article will also undertake studies within a new paradigm that demonstrates the advantages gained through an experiential trajectory, reintegrating the contributions offered by our education in the face of changes evidenced across time and space. Beyond perceiving and seeking to understand these changes, we examine the relationship established between theory and practice, thus projecting significant instruments in our formation, with the aim that they may be applied in our daily and professional lives.

In this research, conceptions offered by authors who refer to the importance that experiential knowledge exerts in our personal and professional lives will be analyzed. Such knowledge is indicated here as an important instrument for reintegrating lived experience within the socio-educational milieu,

through which we may contribute to improved reflection on teacher education—especially with regard to teaching—yet also concerning the responsibilities attributed to it.

Regarding the organization of this scientific article, it will include a contextualization composed of: knowledge constructed during the formation process; the principal theoretical-methodological assumptions applied in the interaction between theory and practice directed to the themes discussed in teaching; the importance of experiential knowledge for teacher education; and the support offered by such knowledge for the construction of teachers' skills and competencies.

PROFESSIONAL EDUCATION IN TEACHING

In fact, it is known that there are no ready-made recipes and that, many times, professional education is carried out at a distance from the reality of the field in which we are situated. Solutions often emerge through different experiences shaped by urgent needs, when, dialectically, under reflection and evaluative analysis of pedagogical action, we are able to reach the expected results.

In this context, the author describes a general framework of educational regulations from 1930 onward, adopting that date as a watershed in Brazilian education and, at times, highlighting the relationships between historical conjunctions and the characteristics assumed by regulatory frameworks.

Education, as a pedagogical practice, faces the challenge of responding to the demands that contexts place upon it. In this sense, society expects education to be able to develop a form of education that is compatible with and committed to the organization and development of the purposes of the social design (Pimenta, 2002, p. 47).

Indeed, this is an extensive theme and therefore must be studied in its theoretical-methodological assumptions, in light of its real needs, thus addressing the prevailing reality in which it is situated within the scope of higher education.

In this interim, one may infer that educational research contributes to the process of questioning and reflection already established, in which theory is related to practice in the challenge of understanding the knowledge offered.

Nevertheless, through this theme one seeks to define the knowledge offered, through which we may become capable of constructing our relationship with the social milieu, with the people who live within it, and with the cultures that exist there—regarding our political act of decision-making and, more precisely, its concrete enactment in our professional work as shapers of opinions and mindsets. At the same time, we must be capable of transforming—whether in a problem-posing and/or discursive manner—the articulation with these urgent needs in the classroom, taking into account the different environments and/or realities that permeate it.

The personal and socio-educational formation of a professional are fundamental processes within higher education. In this respect, the acquisition of knowledge provided by this construction enables a better understanding and transformation of the reality in which one is situated.

Teacher education and the exercise of the teaching profession are situated, however, within a logic that—seeking to measure the “quality” of schools and/or their students through national evaluation processes—has created a ranking exploited by the media and a source of controversy among teachers, education technicians, students, and their families. By instituting educational establishments as the starting point of dynamics of competition and parental choice, the Law of Guidelines and Bases (1996) established the darker side of the autonomy that Brazilian schools today enjoy with regard to their pedagogical proposal (Monteiro; Gasparello; Magalhães, 2004, p. 47).

In this way, the curriculum defines teaching content with the aim of optimizing teachers’ skills and competencies. However, there is complexity in this process, requiring greater proximity to experiential practice in the classroom so that teachers can discern the construction of curricular and disciplinary knowledge allied to experiential knowledge—thereby enabling effective performance in carrying out the role of educator and ensuring conditions to continue their formative process.

Experiential knowledge is rooted in the following broader fact: teaching develops in a context of multiple interactions that represent diverse constraints on the teacher's work. These constraints are not abstract problems like those encountered by the scientist, nor technical problems like those faced by technicians and technologists. The scientist and the technician work from models, and their constraints result from the application or development of those models (Tardif, 2012, p. 49).

Our forms of knowledge are present throughout our lives, but they become systematized and observably so from the moment we begin attending school, because in that environment they become institutionalized. The school context contributes to the significance of our culture based on the knowledge we already possess, adding new knowledge so that it may shape our conception of reality.

Access to this environment contributes to our intellectual development. Any information added will be analyzed, confronted, and modified by our previously constructed ideas and knowledge. The appropriation of experience has significant importance for any professional, including the teacher, because it contributes to confidence in interpretations of reality situated in time and space.

When we relate the selection and appropriation of knowledge as science properly so called, we can reflect, in the educational context, on the significant role that learning plays in higher education—starting from one's own individual action within the social milieu, in groups of coexistence, through conscious participation in society, understanding oneself, others, and one's insertion in society, and participating precisely in its construction.

If, around school failure, discourses and satisfactory procedures remain silent, this seems to push us, strategically, toward the successive displacement of attention from the observable to the sayable and to ways of saying, from deconstruction to the construction of existing representations (Monteiro; Gasparello; Magalhães, 2004, p. 52).

However, this process needs the teacher's contribution as mediator of knowledge, for the teacher is an important subject of integration in the exchange of stimuli between what is studied and what is lived, in consonance with other areas of knowledge, in the confrontation of opinions, and in the transformation of conceptions.

In view of the method still most widely used today—the conventional transmissive method, based on the sequence exposition–study–exercise–test or examination—different pedagogical currents sought alternatives by offering solutions that, in one way or another, also represented stereotyped models (Zabala; Arnau, 2010, p. 143).

Nevertheless, even in the face of difficulties in choosing an appropriate teaching method, there is awareness of the need to broaden teaching—not abandoning the conventional method entirely, but diversifying its procedural context in light of choices and criteria selected by learners—in order to make them active subjects capable of identifying their social relations with the group, questioning their reality, and mastering research practices.

In truth, when working with knowledge through a process of investigation and analysis, one of the teacher's functions at the higher-education level is to analyze knowledge itself, having the power to classify it, thereby highlighting subjectivity and partiality.

THE IMPORTANCE OF EXPERIENTIAL KNOWLEDGE FOR TEACHER EDUCATION

With the emergence of new technologies, the gradual growth of existing problems, and the various thematic discussions within the educational field—and particularly in teaching—our contemporary world requires a deeper and highly careful study of what measures can be taken to understand such issues. Hence the need to invest, during our professional formation within the educational process, in order to find our own identity—through which we may make viable, by means of the knowledge constructed, instruments capable of meeting our real needs in the contexts in which we find ourselves.

To be in formation implies a personal, free, and creative investment in pathways and projects, with a view to constructing a personal identity that is also a professional identity. [...] Formation is constructed through work of critical reflexivity on practices and through the permanent reconstruction of a personal identity (Nóvoa, 1991, p. 70).

With regard to these forms of knowledge, they must stem from one's lived experience during teaching practice inside and outside the classroom, alongside initial formation, within a partnership between the instructor and the learner, and also in partnership with one's students.

When the teacher has these characteristics, the teacher is recognized as a subject capable of promoting change, because, in addition to speaking out against economic, political, and social injustices inside and outside the school, the teacher also works to create conditions that give students the opportunity to become citizens who are likewise critical and transformative (Giroux, 1997, p. 111).

Thus, a direction is shaped by existing needs, establishing an articulation with the forms of knowledge one intends to formalize, thereby creating essential conditions for the viability of a pedagogical practice that promotes greater dynamism in the teaching–learning process. Brito (2006) states that the teacher's thinking is constructed based on individual experiences and on exchanges and interactions with others. However, this professional often complains that initial formation leaves much to be desired, because many of these courses remain strongly attached to theory, forgetting to associate it with practice; they depart from the prevailing reality and from real conflicts, failing to demonstrate, in concrete terms, how such theory is realized so that it may be analyzed and its viability observed.

Initial training is considered by teachers to be excessively theoretical or insufficiently practical, too far removed from classroom reality and tied to pre-established models. Teachers complain that training courses do not make explicit enough the difficulties that would be encountered in everyday school life [...] and that they did not provide sufficient information about strategies for dealing with students and techniques to be applied when real problems arise (Perrenoud, 1996, p. 86).

With the formation of theoretical knowledge, and with permission to integrate it with practice, the educator will dialectically enable reflection on the concrete functionality of that knowledge acquired during formation, with greater proximity to the dynamic forms of knowledge constructed therein. Through such discernment, the educator can identify which important skills and competencies may be embedded in the know-how constructed within everyday professional experience.

The teacher is defined as an actor—that is, a subject who assumes his or her practice according to the meaning that he or she attributes to it, possessing knowledge and a know-how that originate from his or her own teaching activity, from which the teacher structures and orients practice (Zibertti; Sousa, 2007, p. 250).

Thus, with respect to competence and teacher know-how, the teacher can play a fundamental role in coordinating a teaching–learning process directed to the work environment itself and to the characteristics pertinent to the different bodies of knowledge that persist within formation, in consonance with the reality expressed by students. Giving meaning to these considerations, Veiga (2007, p. 36) offers reflections on these affirmations, contextualizing:

The teacher structures, throughout the process of constructing his or her professional pathway, the pedagogical space that expresses the knowledge of the craft, created in the context of his or her trajectory and resulting from a plurality of knowledges: knowledge related to the sciences of education and pedagogical ideas; curricular knowledge, related to the selection of academic knowledge linked to teaching; and experiential knowledge, originating from professional practice, constructed individually or through the socialization of one's work.

However, the teacher needs to be endowed with different competencies that can contribute to better performance of the function—not in a mechanical manner and without instilling objectivity, but through studied theoretical-methodological assumptions that facilitate better organization of actions around higher education in which students are promoted toward gradual growth with regard to understanding and constructing arguments that ensure participation in society. For this, the teacher must learn to have clarity about the competence acquired during lived teaching experience, which defines the mobilization of main educational intentions within skills, concepts, and attitudes constructed in partnership with the external environment and in relationship with students. In accordance with these considerations, we anchor ourselves in the following quotation:

Learning a competence is very far from mechanical learning and implies the highest possible degree of relevance and functionality, because in order to be used both the competence itself and its procedural, attitudinal, and conceptual components must make sense (Zabala, 2010, p. 93).

In fact, an educator must have the competence to establish a relationship with the role of making the student reflect, assuming responsibility in sensible attitudes, and enabling the transformation of the socio-cultural and political context. Thus, over the course of this process, the educator will evaluate the intended objectivity, perceiving the relationship between lived experience in the workplace and educational formation, analyzing the results evidenced therein.

This dimensioning of teaching work, with respect for the moral concern for students' well-being and for ethics, with commitment to the community, in partnership regarding problems, as well as professional competence in the mastery of skills and techniques, requires that a challenge be made viable: changing ways of thinking at three levels through which one passes, namely, mentalities, practices, and commitments. According to Machado (1996), the first refers to the way of thinking, judging, and acting. The second is associated with how to transform lived experiences into objects of analysis and reflection. The third moves discourse into action, articulating the real possible and the ideal, dismantling the fantasies surrounding it—the world of programs—thus managing proposals capable of dialoguing with emergent practices and realities, restoring the meaning of planning for action and the discussion of the instruments offered.

In this formation process, autonomy, responsibility, and training are characteristics traditionally associated with professional values that should be discussed in the teaching profession. Beyond these values, other spheres and/or realities involved in this experiential trajectory are also propagated, reflected in the teaching practice of teachers who faced numerous difficulties during a transitional period between the military dictatorship and democratic expansion.

According to Gimeno Sacristán as cited by Papi (2005), education involves other spheres—political, economic, and cultural determinations—and this means that teachers do not have total control over practice, since such sectors interfere in professional life. In this involvement between the construction of practice and this professional's lived experience, identity within formation is influenced, becoming linked to emergent changes and needs.

In studies referenced by Pimenta (2002), identity cannot be considered an immutable given, nor an ultimate end that can be acquired; rather, it is a process of constructing the subject as a situated transmitter of knowledge. The teaching profession, like others, emerges at a given moment and in a determined context, as a response to needs posed by society, acquiring its own status and legal imposition. Pimenta and Lima (2004) also state that it is in the formation process that the profession's options and intentions are consolidated. Thus, professional identity is built through experiences and through higher-education-level teacher formation.

From this concern, it is appropriate to analyze the contributions brought by practice lived inside and outside the classroom, acting as a teacher, in light of conceptual, procedural, and attitudinal development made effective by initial and/or continuing formation.

In the classroom, it is known that the teacher faces countless situations and/or individualities. Thus interventions emerge that the teacher makes available to undertake, and through this the teacher acquires extensive experience, which then interacts with the various forms of professional knowledge acquired. According to Tardif (2000, p. 45): "Professional knowledge is learned in practice, through experience, in contact with the reality of work and with other social actors, within a broader process that is professional socialization."

In fact, there is awareness that a highly contradictory reality persists regarding our education, including one influenced by the need for better professional qualification, as a consequence of greater incentives for initial and continuing education and of subsidized contributions that are not monitored.

Teachers, educational authorities, and the training policies themselves, however, end up assuming the premise that formation is something one receives. But it is more than that. It is a complex process of interaction that has been shaken by the growth of everyday work in schools; by instruments of control and evaluation; and by the presence of new tasks demanded by educational reforms (Monteiro; Gasparello; Magalhães, 2004, p. 51).

Formation, in this sense, constitutes a process that contributes substantially to articulating theory and practice in classroom teaching. However, constructing quality education is associated with a series of

experiences lived by the teacher inside and outside the classroom, which are linked systematically and unsystematically to students' reality.

Yet, despite all the afflictions in this sphere, one experiences gradual advancement, driven by the educator's concern to build a career in consonance with better preparation for divergent situations, thus managing—through pedagogical practice—to navigate existing problems.

The complexity of this proposed theme leads us to an exercise of analyzing different **theoretical-methodological** procedures, both more usual and more innovative. Accordingly, we were led to a bibliographic review of specialized literature in the field, investigations, and reflective sessions, thereby making it possible to classify the construction of thinking during the teaching–learning process as operationalized through the moment of formation.

With more intensive theoretical deepening, it is possible to indicate suggestions that may improve school practice in teaching. Although there still frequently exists a traditional discourse in which most teachers, in their teaching practice, do not use critical reflection as a basis, there are many limitations with regard to classroom practice.

THEORETICAL-METHODOLOGICAL ASSUMPTIONS

It is known that for a long time—and even today—teaching has been characterized by the traditional practice of positivism, leading students to restrict themselves in their knowledge. This type of teaching implies concern with not creating questions and not debating the content studied in the classroom, thus avoiding a critical stance and the formulation of a science with a problem.

Science plays a significant role in society's life, because in order to understand the changes that occur constantly and how scientists interact, we must study and understand knowledge itself. Hence the discussions about the teaching of science, the role played by the teacher in learning, and better preparation of this professional in teaching activities.

In opposition to these ideas, new conceptions emerged with proposals considered inverse to those preached by positivism. As an example, we highlight the Annales school, which in its three generations—represented by Henri Berr, Lucien Febvre, Marc Bloch, and Le Goff—began to value more significant participation in theoretical debates, eliminating a single specialty and promoting the practice of multidisciplinary, with more concrete discussions, in which one would not present merely corollaries, but a continuous and participatory science that takes into account the process of knowledge, situated within defined lines of research.

As we have seen, time brings about changes, and alongside them arise new concerns, research, themes, and new tendencies to which teaching adapts. Through these transformations—imposed by globalization and technology—teaching converges and allows innovations to exert influence on its themes, on the emergence of plural identities, on the strengthening of cultural democratization, on the full exercise of citizenship, and on the genders evidenced by this new way of thinking about the importance of experience for formation in teaching.

In the face of these changes—whether in socio-cultural, political, or economic aspects—the need is considerably strengthened to seek, within higher education and within the teacher–student and teaching–learning relationship, new knowledge and new methods capable of accompanying them, so that no realities, or few realities, remain deprived of information that supports their arguments for decision-making as true protagonists of this new way of doing teaching. Thus, it aims to recognize the influence and importance of the learner by enabling the learner to assign new meaning.

School and curriculum represent one of the most central social inventions of modernity. As such, they constitute particularly distinctive ways of organizing the experiences and activities of children and young people for the formation and construction of subjectivities and social identities (Goodson, 1995, p. 109).

The quotation focuses on contributing to the discussion of the character of curriculum and the importance of teaching action **to** renew and rethink culture in higher education.

However, these testimonies may be necessary for us to observe how teachers' thinking and teaching experience were taken into account in the mobilization of a formal, informal, and hidden process within emancipations, in the manifestation of knowledge that could significantly benefit the learner. This occurs through the insertion of theoretical-methodological assumptions that make viable a critical, reflective, and transformative formation in light of the academic curriculum and existing laws—projecting competencies capable of discerning and downplaying certain problem situations in the field of the sciences.

FINAL CONSIDERATIONS

Teaching constitutes a broad field of research in an ongoing process of construction, which legitimizes and affirms itself both in institutional spaces of knowledge production in the field of Education. In Brazil, this field of knowledge is situated in an interdisciplinary space built in the interrelation of science and its knowledge, in the search for understanding the teaching–learning processes in higher education.

It is necessary for the teacher to make students aware that one cannot survive without science. It is necessary to show students that science is in full evolution and does not exist by itself, but rather as a result of ideas that add up, values that multiply, and systematic knowledge that intertwines.

In this sense, teaching practice must be grounded in higher education that is carried out through meaningful activities, in a productive dialogue between thought and action—awakening, provoking, and making possible the autonomy of being and doing.

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EDUCATION AND RELIGIOUS EDUCATION: FOUNDATIONS, CHALLENGES, AND PERSPECTIVES IN CONTEMPORARY TIMES

 <https://doi.org/10.63330/aurumpub.032-014>

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Abstract

This article explores the theoretical and legal foundations of Religious Education in Brazil, considering its contemporary configuration based on the principles of secularity, plurality, and inclusion. The study is justified by persistent challenges related to teacher education, curriculum definition, and the overcoming of confessional practices in public schools. The objective is to critically reflect on the role of Religious Education in fostering ethical, civic, and critical student development. A qualitative approach is adopted, grounded in the methodology proposed by Lakatos and Marconi (2017), through a bibliographic review and analysis of normative documents such as the LDB, BNCC, and PCNER. The results indicate that despite legal advances, significant gaps remain in the implementation of the subject, particularly

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regarding curricular coherence and professional qualification. It is concluded that strengthening Religious Education requires effective public policies, continuous teacher training, and a pedagogical approach committed to human rights and religious diversity.

Keywords: Religious Education, Education, Secularity, Religious diversity, Teacher education.

INTRODUCTION

The National Common Core Curriculum (2017) constitutes a fundamental normative document of Brazilian educational policy, as it defines the essential learning outcomes of Basic Education and guides the construction of an education grounded in equity and respect for sociocultural diversity. In this context, Religious Education is recognized as a curricular component that must be offered in a secular, plural, and inclusive manner, promoting knowledge of different religious and non-religious traditions, as well as interreligious dialogue. As established by the BNCC, this field of knowledge contributes to the ethical, civic, and critical formation of students, strengthening democratic values and respectful coexistence in the school environment.

Moreover, the contemporary conception of Religious Education departs from confessional practices and assumes the religious phenomenon as an object of historical, cultural, and social study. Such a perspective requires specific teacher training in the field of Religious Studies and the development of pedagogical practices that foster listening, respect for differences, and the appreciation of students' spiritual diversity. By treating religious knowledge as a cultural production of humanity, the subject contributes to the consolidation of human rights, the secularity of the State, and the plurality of ideas in the educational space.

In this regard, secularity constitutes a structuring principle of Religious Education in public schools, as discussed by Knoblauch and Valente (2022), who highlight the challenges of ensuring informative and critical instruction without favoring specific beliefs. In contexts marked by cultural diversity and ideological disputes, Religious Education presents itself as a sensitive field that requires

constant theoretical and pedagogical reflection, especially with regard to promoting dialogue, mutual respect, and democratic coexistence.

Furthermore, when properly structured and conducted by qualified professionals, Religious Education can become a privileged space for the development of alterity and civic awareness. By addressing themes such as identity, belonging, values, and spirituality, it stimulates students' critical reflection on themselves and on others, fostering relationships based on respect and solidarity. Thus, the classroom is transformed into a learning environment in which the religious phenomenon is understood as a constitutive dimension of human experience, without a doctrinal character, in accordance with the principles of a democratic state governed by the rule of law.

For Knoblauch and Valente (2022), the principle of secularity, which separates State and religion in many educational systems, raises questions about how religious education can be neutral and informative without favoring any specific religion. This is a complex, sensitive issue and remains in a constant process of construction and evolution, especially in contexts marked by cultural diversity, ideological conflicts, and the need to promote an education focused on mutual respect, dialogue, and democratic coexistence in schools.

According to Silva and Rosseto (2022), Religious Education in public schools goes beyond established content; it opens up dialogical possibilities and forms of knowledge by addressing the diverse religiosities present in students' daily lives. In this way, empathy, mutual respect, appreciation of cultural diversity, and the development of critical civic awareness are promoted. It also contributes to the construction of a more just, inclusive, and democratic society by fostering understanding among different beliefs and worldviews.

Finally, the objective of this article is to explore the theoretical and legal foundations of Religious Education in Brazil, highlighting its historical evolution, current challenges, and future perspectives. It also seeks to understand how this curricular component can contribute to the ethical, civic, and critical

formation of students, promoting respect for religious and cultural diversity within the school environment.

METHODOLOGY

The research adopts the methodology proposed by Lakatos and Marconi (2017), characterized by a qualitative and exploratory approach. A comprehensive bibliographic review was conducted, including official documents and recent academic articles, with the aim of understanding the multiple facets of Religious Education in Brazil.

Furthermore, the investigation sought to identify theoretical and practical contributions that may support the implementation of Religious Education aligned with the principles of secularity, inclusion, and respect for diversity. To this end, curricular guidelines and research developed in recent years were analyzed, with emphasis on contemporary debates concerning the role of religious education in promoting interreligious dialogue. The choice of this approach allowed for a deeper understanding of the challenges faced by educators and the possibilities for constructing a critical, ethical, and plural pedagogical practice.

THE HISTORICAL EVOLUTION AND LEGAL MILESTONES OF RELIGIOUS EDUCATION IN BRAZIL

The presence of Religious Education in Brazil dates back to the colonial period, marked by the activity of the Society of Jesus beginning in 1549, with the arrival of missionaries led by Manuel da Nóbrega. The Jesuits assumed a central role in the organization of formal education, founding schools that became a reference in the public and free education of the period. Although initially directed toward Indigenous catechesis, these institutions progressively came to serve the interests of the colonial elite, consolidating an educational model strongly linked to Catholic doctrine and to the cultural domination projects of the Portuguese Crown.

This educational model remained in force until the mid-eighteenth century, when, in 1759, the expulsion of the Jesuits from Portuguese territories, ordered by the Marquis of Pombal, brought about a restructuring of public education. As a result, education came to be administered by other sectors of the Catholic Church, while nevertheless maintaining its confessional character and the centrality of religion in school formation. This period reveals the close relationship among State, Church, and education, a characteristic that would influence later configurations of Religious Education in the country.

With the promulgation of the 1824 Constitution, the first Brazilian constitutional charter, Catholicism was officially consolidated as the religion of the Empire, reinforcing its presence in institutional spaces, including education. Religious Education, in this context, assumed a mandatory and confessional character, reflecting the conception of unity between State and religion. Only with the Proclamation of the Republic in 1889 and the issuance of Decree No. 119-A of 1890 did the process of separation between Church and State begin, ensuring freedom of worship and establishing the foundations for the secularity of public education.

Moreover, the 1891 Constitution deepened this movement by declaring public education secular and guaranteeing the free exercise of religion, marking a significant turning point in the history of Religious Education in Brazil. However, throughout the twentieth century, the subject returned to the school curriculum under different legal formats, such as the decrees of the Vargas Era and subsequent Constitutions, always under tension between the secularity of the State and social demands for its permanence in the educational system. These historical milestones demonstrate that Religious Education in Brazil constitutes a field marked by political, cultural, and pedagogical disputes, whose understanding is fundamental for the analysis of its contemporary challenges.

In 1931, during the government of Getúlio Vargas, religious education was officially reintroduced into Brazilian public schools by decree, assuming an optional character and becoming part of the school timetable. This measure represented an important milestone in the debate on the relationship between State and religion in the educational field, rekindling discussions about the secularity of public education.

Thus, this period marked an intensification of reflections on the limits and possibilities of Religious Education in a constitutionally secular State.

Consequently, the Constitution of 16 July 1934 reintroduced religious education in public schools as an optional subject, evidencing a partial retreat from the previous secular model. This provision was maintained in the Constitution of 10 November 1937, during the *Estado Novo*, reinforcing the symbolic presence of religion in the school space. Although optional, religious education became part of the regular timetable of public institutions. These provisions demonstrate the historical oscillation of the Brazilian State between formal secularity and confessional accommodations. In addition, the period reveals the instrumentalization of education as a mechanism of social and cultural control.

At the outset, the Constitution of 18 September 1946 reaffirmed optional religious education in public schools, preserving freedom of conscience and belief. On 20 December 1961, the first Law of Guidelines and Bases of National Education (Law No. 4.024/1961) was promulgated, maintaining this provision and assigning educational systems the organization of its offering. Religious education came to be understood as an optional component, without cost to the State, since this period consolidated educational regulation in dialogue with democratic principles and individual rights, given that the legislation reflects an unstable balance between religious plurality and historical tradition.

Later, on 11 August 1971, Law No. 5.692 reformed primary and secondary education, reaffirming religious education as an optional subject in official establishments. The legislation inserted this provision in an authoritarian context in which education assumed a central role in moral and civic formation. The legal provision reinforced the normative presence of religion in the curriculum, albeit under the aegis of optionality. One observes the coexistence of State control and religious references in educational policy. This milestone highlights continuities and ruptures in the relationship between education and religion.

Furthermore, the Federal Constitution of 5 October 1988 reaffirmed the secular State and ensured religious freedom, maintaining optional religious education in elementary education. On 20 December 1996, Law No. 9.394 (LDB) regulated this offering, assigning educational systems the definition of

content and prohibiting proselytism. Subsequently, Law No. 13.796 of 3 January 2019 amended the LDB to guarantee the right to absence for reasons of religious observance, with the possibility of making up activities. This normative advance strengthens the protection of religious diversity in the school environment. The historical trajectory reveals a construction marked by disputes, advances, and reinterpretations of the principle of secularity.

The implementation of Religious Education in Brazilian public schools presents obstacles involving both theoretical and practical aspects. One of the main challenges is the clear definition of the subject's object of study, since, unlike confessional instruction, the Religious Education provided for by Brazilian legislation must adopt a secular and plural approach aimed at knowledge of the various religious traditions, without the intention of converting students or privileging any belief. According to Machado (2025), religious education must adopt a non-confessional approach, since the State, from the outset, has not managed to implement a National Common Curricular Guideline for this subject.

CHALLENGES AND PERSPECTIVES OF RELIGIOUS EDUCATION IN CONTEMPORARY TIMES

Religious Education in contemporary times faces structural challenges that express historical tensions among the principle of State secularity, the cultural and religious diversity of Brazilian society, and educational practices still strongly marked by confessional legacies. Although the legal frameworks ensure its optional and non-confessional offering, the implementation of this curricular component occurs unevenly across school systems, varying according to regional contexts, political conceptions, and normative interpretations. This heterogeneity compromises the formative potential of the subject and highlights the need for critical reflection on its epistemological, pedagogical, and ethical foundations. Moreover, the absence of guidelines that are widely understood and operationalized contributes to mistaken interpretations regarding the educational objectives of Religious Education.

Historically, Religious Education was associated with confessional and catechetical models, especially during the colonial and imperial periods, which still reverberate in contemporary pedagogical practices. Even after the consolidation of the secular State, traces of approaches centered on hegemonic religious traditions remain, often legitimized by local customs or by sociocultural pressures. These practices strain the principle of religious neutrality in public schools and challenge the construction of a truly plural and inclusive education. In this sense, it becomes essential to understand Religious Education as a field of knowledge, guided by the critical analysis of the religious phenomenon, rather than as a space for indoctrination or proselytism.

One of the most relevant challenges concerns the training of teachers who work in Religious Education within public school systems. In many contexts, the teachers responsible for the subject do not possess specific training in the field of Religious Studies, which makes it difficult to approach the various religious traditions and philosophies of life in a systematic, critical, and contextualized manner. This reality favors pedagogical practices based on personal experiences, individual beliefs, or confessional references, compromising the secular and educational character of the subject. As a consequence, Religious Education runs the risk of distancing itself from its formative and social objectives.

The late regulation of the licentiate degree in Religious Education, instituted only in the 1990s through Law No. 9.475/1997, reveals a historical delay in the professionalization of the area. To fill this gap, extension and specialization courses began to be offered as emergency alternatives to initial training. Such initiatives contributed to minimizing the deficiency in training, although they still prove insufficient in light of the existing demand in school systems. Since the absence of consistent continuing education programs aggravates this scenario, it limits teachers' professional development and weakens the pedagogical quality of Religious Education.

Another significant challenge concerns the production, selection, and use of teaching materials. When guided by confessional perspectives, these materials tend to reinforce symbolic exclusions, stigmatization, and practices of religious intolerance, contrary to the constitutional principles of secularity

and respect for cultural diversity. Furthermore, materials that privilege only one religious worldview end up rendering other beliefs, spiritualities, and philosophical conceptions invisible, negatively affecting students belonging to religious minorities or those who profess no religion.

In line with this, Silveira (2010) states that intolerance of any kind toward the Other, different from us, generates discrimination, prejudice, conflict, violence, and even war. Thus, constant updating in Religious Education makes it possible to keep pace with social and cultural transformations, maintaining its relevance and coherence with the challenges of the twenty-first century.

The strengthening of interreligious dialogue in schools also stands as one of the main perspectives for the future of Religious Education. Such dialogue does not mean relativizing differences, but rather recognizing and respecting them, promoting listening, empathy, and mutual understanding. The school can become a privileged space for this exercise in democratic coexistence, contributing to the formation of conscious, critical citizens committed to the values of social justice, peace, and equity. In this context, Silva (2024) states:

Religious Education, by addressing issues related to spirituality and ethical values, has a unique potential to foster inclusion and respect for differences. However, its effectiveness depends directly on teacher training, which must prepare teachers to deal with the specificities of students and promote inclusive pedagogical practices (Silva, 2024, p. 3).

Moreover, the development of teaching materials requires the participation of qualified specialists in the fields of Education and Religious Studies, capable of ensuring informative, critical, and pedagogically accessible content. In this context, the work of these professionals helps prevent proselytizing practices and strengthens a plural school environment grounded in dialogue, respect, and the appreciation of diversity. Thus, Religious Education can fulfill its social and educational function, aligned with human rights and the promotion of a culture of peace.

Another critical point in the implementation of Religious Education concerns the absence of a clearly defined national coordination for this subject. This gap results in heterogeneous pedagogical

practices among states and municipalities, generating significant disparities in the quality of the education offered. Consequently, without a National Common Curricular Guideline that is widely disseminated and effectively monitored, many schools end up reproducing confessional models, sometimes sustained by the personal convictions of administrators or teachers, in disagreement with the current legal principles.

In addition, the reconciliation between the constitutional principle of secularity and the offering of Religious Education in public schools remains a sensitive issue in the educational field. Although the Federal Constitution of 1988 ensures freedom of belief and the separation between State and religion, Article 33 of the LDB authorizes the optional offering of the subject in Elementary Education. This duality gives rise to recurring debates about the best way to implement Religious Education without violating students' rights, especially in contexts marked by the predominance of a single religious tradition.

Despite the legal advances observed in recent decades, the persistence of confessional practices in public schools reveals that religious intolerance still constitutes a concrete challenge. The resistance of certain social groups to the proposal of a secular Religious Education compromises fundamental democratic principles and directly affects students' right to freedom of belief. Consequently, such resistance perpetuates symbolic inequalities and reinforces processes of exclusion within the school space.

Overcoming this scenario requires the implementation of firm educational policies committed to compliance with the law, as well as the incorporation of interreligious dialogue as a central pedagogical strategy. Interdisciplinary projects that integrate Religious Education with areas such as History, Geography, and Portuguese Language broaden the understanding of religions as historical, cultural, and social phenomena. These initiatives favor the development of socioemotional competencies, such as empathy, respect, and active listening, which are fundamental for democratic coexistence.

The participation of families and the school community proves essential for the consolidation of a plural and inclusive Religious Education. Much of the resistance stems from a lack of knowledge

regarding the pedagogical objectives of the subject, which can be overcome through training actions, pedagogical meetings, and spaces for collective dialogue. It is fundamental to understand that Religious Education does not replace family or community religious experience, but rather offers analytical tools for understanding the multiple religious and philosophical manifestations present in society.

The future perspectives of Religious Education point to the need to consolidate pedagogical practices aligned with the principles of secularity, inclusion, and cultural diversity. This requires continuous investment in both initial and continuing teacher training, ensuring theoretical, methodological, and ethical mastery of the religious phenomenon. The use of digital technologies also emerges as a promising perspective for contemporary Religious Education. Digital platforms, audiovisual resources, hybrid methodologies, and virtual learning environments broaden students' cultural repertoire and encourage more dynamic and contextualized approaches. These tools make it possible to present different religious traditions in a critical and interactive manner, strengthening interreligious dialogue in the school environment.

Furthermore, the strengthening of academic research in the area constitutes another fundamental axis for the advancement of Religious Education. Interdisciplinary investigations contribute to the maturation of the field as an area of scientific knowledge, supporting the formulation of more effective public policies and the qualification of pedagogical practices. The dialogue among research, teacher training, and school practice proves indispensable for the consolidation of the subject.

Finally, overcoming the challenges involving Religious Education depends on the ethical and political commitment of the various actors involved in education, including teachers, administrators, universities, public policy makers, families, and students. The consolidation of a plural, secular, and inclusive Religious Education requires valuing difference as a pedagogical principle and maintaining a permanent openness to dialogue. In this process, the school reaffirms its role as a space of comprehensive, democratic, and humanizing formation, contributing to the construction of a society that recognizes religious diversity as the cultural and spiritual heritage of humanity, as noted by Nascimento et al. (2021).

FINAL CONSIDERATIONS

The analysis of the challenges and perspectives of Religious Education in Brazil highlights the complexity of this curricular component in the contemporary educational scenario. When guided by the principles of secularity, plurality, and human rights, Religious Education reveals a significant formative potential. It contributes to the construction of an ethical, democratic, and inclusive education. Its relevance goes beyond religious content and reaches civic formation.

The challenges identified, such as insufficient teacher training, the lack of inclusive teaching materials, and resistance to non-confessional models, demand concrete actions from public authorities. Clear educational policies, continuing education, and oversight of pedagogical practices are essential measures. Institutional commitment is indispensable to ensure the effectiveness of the legislation.

It is concluded that Religious Education must be understood as a space for critical reflection, dialogue, and the promotion of human rights. When conducted responsibly, it fosters respect for diversity and strengthens democratic coexistence. In this way, it contributes to the formation of conscious, ethical subjects prepared to act in a plural society.

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THE LENS OF INTERSECTIONALITY IN PROMOTING SCHOOL INCLUSION: AN ANALYSIS OF MULTIPLE IDENTITIES AND OPPRESSION STRUCTURES IN DAILY TEACHING PRACTICE

 <https://doi.org/10.63330/aurumpub.032-015>

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Abstract

This article analyzes intersectionality as an analytical and pedagogical tool applied to the Brazilian school context, aiming to understand how multiple social markers — race, class, gender, sexuality, disability, and regionality — combine to produce singular experiences of exclusion that traditional educational models are unable to capture. Drawing on Kimberlé Crenshaw's seminal work and its development in the Brazilian context, particularly by Carla Akotirene, the article problematizes the insufficiency of pedagogical policies based on single identity axes, which tend to erase the specificities of doubly or multiply marginalized groups. Through qualitative bibliographic review and analysis of school trajectories documented in specialized national literature — highlighting the experiences of trans students and students with disabilities at the intersection of class and race markers — the article proposes concrete strategies for intersectional inclusion, articulating teaching practices, use of cultural media, and intersectoral policies. It concludes that incorporating intersectional sensitivity into teacher training and practice is a fundamental condition for Brazilian schools to fulfill their social function of fully welcoming all subjects.

Keywords: Intersectionality, Inclusive education, Racial literacy, Social markers, Teacher training.

INTRODUCTION

The Brazilian public school is, par excellence, a space of multiplicity. Within it converge subjects traversed by histories, bodies, affections, and belongings that exceed any simplifying framework. Each student who enters a classroom is not merely a student: they are simultaneously a racialized being, gendered, situated in a social class, with or without a disability, originating from a specific region of the country, and constituted by a sexuality that the surrounding world frequently judges, hierarchizes, and punishes. Ignoring this complexity is not a neutral posture — it is a political choice that perpetuates inequalities, as Akotirene (2019) reminds us when denouncing the effects of invisibilization upon bodies crossed by multiple oppressions.

Despite legal advances, inclusive education, as advocated by Brazilian legislation and international organizations, still coexists with a structural problem that is difficult to resolve: educational policies and hegemonic pedagogical practices tend to operate with isolated identity categories, treating issues of race, gender, disability, or social class separately. This analytical fragmentation, already criticized by Crenshaw (1989) in the field of U.S. anti-discrimination law, finds its pedagogical equivalent in educational policies that treat each axis of oppression as if it were self-contained. The result is policies that become blind to the experiences of students who inhabit multiple margins at the same time.

A poor Black girl living in a peripheral community does not experience racism in the same way as a middle-class Black man, nor does she experience sexism in the same way as a wealthy white woman. The overlap of these categories does not constitute a mere sum of disadvantages, but rather generates specific and qualitatively distinct forms of exclusion. If the problem has no name, it cannot be confronted — and what cannot be confronted tends to be reproduced. It is precisely this conceptual and political gap that Lélia Gonzalez (1984) had already denounced by showing how the silence surrounding the place of the Black woman in Brazilian society perpetuated structures of domination — and that intersectionality, as an analytical tool, comes to fill.

The present article aims to analyze how intersectionality, understood as an analytical sensitivity and political tool, can equip teachers and school administrators to promote truly transformative inclusion, capable of combating the fragmentation of pedagogical policies and recognizing the singularity of students' trajectories. To this end, the theoretical grounding of the concept is articulated with its practical application in everyday school life, culminating in the proposal of concrete pedagogical strategies. Methodologically, the study is based on a systematic qualitative literature review, combined with the analysis of school trajectories documented in specialized national literature.

The justification for this research rests on the social urgency of overcoming the “universal gaze” that erases the specificities of doubly disadvantaged groups. It is this urgency that leads us to examine, further on, the particular experiences of trans students and students with disabilities — groups in which

the collision of multiple oppressions becomes more evident. When the school is unaware of or ignores these experiences, it not only fails to include them: it actively contributes to their exclusion, reproducing what Patto (1999) called the institutional production of school failure. Intersectionality therefore offers the theoretical tools necessary to make these trajectories visible and susceptible to transformative pedagogical intervention.

THEORETICAL FRAMEWORK

ORIGINS AND DEVELOPMENT OF THE CONCEPT OF INTERSECTIONALITY

The concept of intersectionality was systematized by the North American jurist and activist Kimberlé Crenshaw in her seminal text “Demarginalizing the Intersection of Race and Sex,” published in the University of Chicago Legal Forum in 1989. Crenshaw started from a concrete problem: U.S. anti-discrimination law, by treating race and gender as separate and mutually exclusive categories, became incapable of protecting Black women, whose experiences of discrimination did not fit the model of racism experienced by Black men or the sexism experienced by white women.

The author used the metaphor of a **traffic intersection** to illustrate her thesis: a Black woman who suffers discrimination is positioned at a crossroads where traffic flows simultaneously from multiple directions. If she is struck, the harm cannot be attributed to only one vehicle; it results from the confluence of forces operating at the same time. In the same way, the oppression she suffers cannot be adequately understood if analyzed exclusively through the prism of racism or sexism, but only through their simultaneous articulation. This critique of the “single-axis model,” so powerful in the U.S. legal context, finds fertile ground in Brazil — where, as Lélia Gonzalez (1984) and Carla Akotirene (2019) will show, social hierarchies are equally complex and deeply marked by the colonial legacy.

This epistemological rupture proposed by Crenshaw revealed how the traditional model operated on the basis of standard subjects: the subject of racism was the Black man; the subject of sexism was the white woman. Black women, because they did not fit either of these archetypes, were systematically

rendered invisible both in legal frameworks and in liberation movements. Intersectionality quickly migrated from the legal field to the social sciences and education, consolidating itself as an essential lens for reading reality in a multidimensional way. It does not propose a simple list of overlapping oppressions, but rather the understanding that social categories are constitutive of one another: race does not exist independently of class, gender does not operate outside a context of racialization — a perspective that Akotirene (2019) synthesizes by pointing out that colonialism is the structure organizing all these relations in contemporary Brazil.

SOCIAL MARKERS OF DIFFERENCE: CATEGORIES IN INTERSECTION

In the context of Brazilian education, the social markers of difference that most frequently intersect to produce processes of exclusion and school marginalization are: race/ethnicity, social class, gender and sexuality, disability, and territoriality. Munanga (1999) and Gonzalez (1984) analyze the racial dimension; Patto (1999) investigates the institutional production of class-based exclusion; Louro (1997) articulates gender, sexuality, and pedagogy; Mantoan (2003) problematizes the limits of including people with disabilities in regular schools; and Arroyo (2011) highlights the territorial dimensions of educational inequalities. However, the intersectional perspective allows us to understand that their combination is not merely cumulative, but constitutive of new political and subjective realities. These markers are not “things” or fixed attributes, but social relations that are produced and reproduced in the everyday life of educational institutions.

Race, in Brazil, operates in a particularly complex way because of a historical process of forced miscegenation and an ideology of racial democracy that, for decades, denied the existence of structural racism. As Lélia Gonzalez (1984) argues, this ideology acted as a powerful mechanism of silencing, making it difficult to name racism and, consequently, to confront it, by creating an illusory harmony that conceals the subordinate place reserved for Black bodies. Kabengele Munanga (1999) deepens this analysis by showing how the myth of racial democracy instrumentalized the idea of *mestiçagem* to

disguise the racial hierarchies constitutive of Brazilian society. Akotirene (2019), in turn, articulates these readings with the intersectional perspective, denouncing how the colonial legacy simultaneously structures oppressions of race, class, and gender — which makes this articulation indispensable in the analysis of everyday school life. In this scenario, Black and Indigenous students face objective barriers — less access to quality schools, underrepresentation in curricula, and symbolic violence in everyday interactions — which intensify dramatically when combined with poverty, belonging to peripheral territories, or dissident gender identities.

Gender and sexuality constitute another critical knot of school intersections. Joan W. Scott (1995) offers the essential theoretical foundation by arguing that gender is a category of analysis that articulates power relations and cannot be understood outside the social and historical contexts that produce it. It is upon this foundation that Guacira Lopes Louro (1997) builds her analysis of the school environment as one of the principal spaces for constructing and monitoring gender and sexuality norms, operating as a device that seeks to frame bodies within a heterosexual and binary matrix. This pedagogical structure often pathologizes, invisibilizes, or punishes identities that deviate from the norm. Consequently, LGBTQIA+ students — and, even more drastically, trans students — experience forms of violence that intensify when combined with markers of race and class. The contrast is pedagogically revealing: a white middle-class gay young man, although facing prejudice, possesses protection networks and symbolic capital that are denied to a Black travesty youth from the periphery, whose very presence in school is often read as an affront to institutional order.

Disability, in turn, is often treated in educational studies in isolation, as if the student's experience were homogeneous and independent of their racial, class, or gender position. Although the Brazilian Inclusion Law (LBI, 2015) establishes the right to inclusive education at all levels, Mantoan (2003) had already warned, even before this legislation, that inclusion is not achieved merely through the student's physical presence in regular school: it requires deep transformations in pedagogical conceptions, curricular structures, and teaching practices. This critique is deepened in the intersectional perspective:

the approach that is “blind” to intersections disregards the fact that disability is experienced in radically different ways by a young Black woman using a wheelchair in an under-equipped public school in the countryside of the Northeast and by a white young man with the same diagnosis in an elite private school in São Paulo. The intersection of these categories is therefore decisive for the real possibilities of access, permanence, and success in learning, revealing that inclusion without social equity is an incomplete project.

Territory and regionality emerge as particularly relevant markers in the Brazilian context, given the magnitude of interregional inequalities and the diversity of living conditions between countryside and city, between the urban center and the periphery. As Arroyo (2011) demonstrates, the curriculum and school organization are territories in dispute, permeated by tensions that reflect broader social hierarchies. Students from quilombola communities, Indigenous territories, rural settlements, or metropolitan peripheries carry territorial marks that, combined with other markers, configure specific educational experiences that are frequently rendered invisible by universalizing educational policies.

INTERSECTIONALITY IN THE BRAZILIAN CONTEXT: CONTRIBUTIONS AND SPECIFICITIES

Although the concept originated in the United States, its reception and re-elaboration in Brazil produced original theoretical contributions that are indispensable to understanding the phenomenon. Carla Akotirene (2019), in her work *Intersectionality*, recovers and updates the intellectual legacy of Lélia Gonzalez (1984), who as early as the 1980s was already articulating race, gender, and class in her forceful analysis of the “place of the Black person” and of the Black woman in Brazilian society. Akotirene highlights how Gonzalez, by proposing the concept of *Amefricanity*, offered an essential key for reading the experiences of the diaspora, anticipating the intersectional debate by denouncing how colonial structures operate simultaneously. Thus, intersectionality in Brazil, through the lens of these authors, is understood not only as an academic tool, but as a political instrument of resistance and of naming the violences that structure the everyday life of marginalized populations.

Akotirene (2019) argues that, to understand intersectionality in Brazil, it is essential to consider the slaveholding legacy as the founding structure of contemporary inequalities. Slavery is not merely a closed historical fact; it produced a social architecture that persists in class relations, racial hierarchies, the territorial organization of cities, and institutional dynamics — including school dynamics. To ignore this historical dimension is to treat the symptoms without recognizing the disease. In this perspective, Boaventura de Sousa Santos (2006) contributes by proposing that understanding inequalities in the Global South requires a rupture with Eurocentric epistemologies — a task that intersectionality of the Afro-diasporic matrix, as proposed by Akotirene (2019) and Gonzalez (1984), effectively performs by placing historically silenced experiences at the center of analysis.

Brazilian regional inequalities constitute another specificity that any intersectional analysis of the national educational system must incorporate. Brazil is a country of brutal geographic contrasts: indicators of schooling, school infrastructure, access to qualified teachers, and school violence vary dramatically between the states of the Southeast and the North and Northeast regions, between capitals and inland municipalities, between urban and rural areas. This territorial dimension, deepened by Arroyo (2011) in his analysis of the curriculum as territory in dispute, needs to be integrated into intersectional analysis so that it can produce faithful diagnoses of Brazilian educational reality.

Alê Lopes's (2019) contribution on the distinctions and connections between intersectionality, intersectorality, and transversality deepens the discussion initiated by Akotirene (2019): it is not enough for the school to recognize intersections at the theoretical level; it is imperative that health, housing, transport, social assistance, and education policies operate in an articulated manner to respond to the full range of subjects' needs. Real inclusion is therefore necessarily intersectoral. This perspective will be taken up later, when we discuss pedagogical and management strategies that connect the school with other facilities in the territory, ensuring that support for the student is not fragmented, but systemic.

THE SCHOOL AS A FIELD OF INTERSECTIONS AND VIOLENCES

THE “COLLISION” OF STRUCTURES IN THE SCHOOL ENVIRONMENT

The school environment is not an island isolated from broader social structures. It reproduces them, refracts them, and, in many cases, intensifies them. If, as we saw with Crenshaw (1989), oppressions collide upon the bodies of Black women at a crossroads, in everyday school life this “collision” manifests continuously, shaping trajectories unequally. Institutional racism, structural machismo, LGBTphobia, and ableism do not remain outside when students and teachers pass through the gates; they penetrate the institution, infiltrated into curricular practices, hallway interactions, disciplinary norms, and, more insidiously, into the differentiated expectations that teachers construct regarding the potential of each group of students — what Tomaz Tadeu da Silva (1999) would call pedagogies of identity, that is, the ways in which the curriculum produces and hierarchizes subjects.

Brazilian educational research has exhaustively documented how these structures operate in an articulated way in everyday school life. As Maria Helena Souza Patto (1999) demonstrated in her analysis of the production of school failure, exclusion mechanisms are subtle and operate through differentiated expectations that reproduce class and race hierarchies: Black and poor students are disproportionately labeled or referred to disciplinary processes for behaviors that, in white students, would be tolerated. With regard to gender, the contributions of Guacira Lopes Louro (1997), grounded in Scott’s (1995) theoretical perspective on gender as a relation of power, reveal how the school acts in the fabrication of bodies and sexualities: girls are systematically discouraged from pursuing careers in the exact sciences, while boys are pressured to suppress expressions of fragility. This scenario of exclusion is completed by the situation of students with disabilities who — as Mantoan (2003) already warned — often occupy the school’s physical space without there being any real insertion into pedagogical practices, evidencing a purely formal inclusion.

The problem becomes more complex when these structures collide upon the same body. A Black student with visual impairment does not face only racism added to ableism: she faces a specific form of

exclusion that emerges from the intersection of these two systems, and which would not be adequately addressed by policies focused exclusively on race or exclusively on disability. Inclusion policies that do not operate with this level of analytical complexity are structurally destined to produce partial and exclusionary forms of inclusion.

INVISIBLE CASE STUDIES: TRAJECTORIES AT THE MARGIN OF MARGINS

Trans students and transvestites: The school as a hostile space

The school experience of trans students and transvestites represents one of the most acute cases of intersectional exclusion in contemporary Brazil. These students face barriers that operate on multiple levels simultaneously: the non-recognition of their social name by teachers and by school bureaucracy, the prohibition of or embarrassment in using bathrooms corresponding to their gender identity, harassment and violence by classmates often tolerated or rendered invisible by school management, and the almost total absence of representation of their existences in curricular content.

These obstacles, already enormous for any trans student, take on even more severe dimensions when combined with other markers of vulnerability. A poor Black transvestite in a public school on the periphery faces conditions radically different from those of a white middle-class trans woman in a private school. The intersection between dissident gender identity, Blackness, and poverty produces a field of hostilities that frequently makes staying in school impossible — and school dropout, an almost inevitable consequence.

National data corroborate this analysis. The National Survey on the Educational Environment in Brazil, conducted by ABGLT (2016), indicates that school dropout among LGBT+ students is significantly higher than the national average, with even more serious rates among trans students — a figure strongly correlated with experiences of violence in the school environment. This dropout is not an individual choice: it is the result of a school structure that, by failing to guarantee basic conditions of dignity, symbolically expels these subjects even before formalizing their departure.

Felipe Daniel Ezebio (2020), in his work on intersectionality in classrooms, draws attention to the need for teachers to understand that the violence suffered by trans students is not an isolated or individual phenomenon, but an expression of broader social structures that the school has the power — and the obligation — to contest. This argument echoes and deepens Louro's (1997) analysis, according to which the school is not a neutral space, but a device for the fabrication of gender norms — and, therefore, a space that can either reproduce or contest transphobic violence. Teacher silence in the face of these violences is not neutral: it is a form of structural complicity with exclusion.

The intersection between disability and other markers: The invisibility of data

One of the most persistent problems in the agenda of intersectional inclusion is the scarcity of disaggregated data that would allow us to understand how disability articulates with other social markers in producing specific educational trajectories. Brazilian educational censuses, although progressively advancing in the collection of data on race and disability, rarely cross-reference this information systematically, making it difficult to measure the magnitude of the exclusions operating at the intersections.

What the available literature allows us to affirm is that disability is not a homogeneous experience. The sexuality of people with disabilities is often infantilized or denied — a phenomenon that the specialized literature calls “desexualization” and that operates with varying intensity according to the type of disability, gender, and race of the subject. Black women with physical or intellectual disabilities are among the people most vulnerable to sexual violence in Brazil, and this vulnerability is, to a great extent, the product of an intersection of invisibilities: the ableism that denies sexuality, the racism that leaves Black bodies unprotected, and the machismo that objectifies them.

Within the school sphere, students with intellectual or psychosocial disabilities frequently experience forms of exclusion that go far beyond the inadequacy of physical structures. Teachers' low academic expectations regarding these students, when combined with markers of race and class, can

produce trajectories of under-schooling that become self-fulfilling: by expecting little from a Black student with an intellectual disability, the school system frequently obtains exactly what it expected — a dynamic that Patto (1999) identified as constitutive of the very mechanism producing school failure in Brazil.

THE TEACHER AS AN ACTIVE WITNESS: THE TEACHING ROLE IN RECOGNIZING INVISIBLE VIOLENCES

In everyday school life, the teacher occupies a unique position: they are the adult who spends the most time with students, who observes their interactions, who notices changes in their behavior, and who has privileged access to their difficulties. This position confers upon teachers a responsibility that transcends the teaching of curricular content: the responsibility to be an active witness to the violences that do not make headlines, the exclusions that happen in silence, the sufferings that remain unnamed because the school does not possess the conceptual categories necessary to name them. As Crenshaw (1989) and Akotirene (2019) remind us, naming oppressions is the first step toward making them visible and, therefore, contestable.

Being an active witness does not mean merely observing passively, but intervening. It means recognizing, when a student begins systematically missing classes, that this behavior may be the symptom of violence suffered in the school environment — something Patto (1999) already identified as an expression of the subtle ways in which the school institution produces and naturalizes exclusion. It means perceiving, when a poor Black female student begins to isolate herself, that this isolation may be a response to forms of discrimination operating simultaneously along multiple axes. Above all, it means having the conceptual tools to name these experiences and the pedagogical tools to confront them.

Intersectionality offers the teacher exactly this conceptual repertoire. By understanding that their students are subjects traversed by multiple social markers — as Crenshaw (1989), Akotirene (2019), and Louro (1997) demonstrate from complementary perspectives — teachers acquire the capacity to

formulate more precise diagnoses of the exclusion situations they observe and to propose more effective interventions. It is not a matter of teachers becoming specialists in sociology or law, but of developing an analytical sensitivity that allows them to see what single and isolated categories render invisible.

PEDAGOGICAL STRATEGIES FOR INTERSECTIONAL INCLUSION

ACTIVE METHODOLOGIES AND THE USE OF CULTURAL MEDIA

One of the most effective strategies for introducing the debate on intersectionality into the classroom without resorting to academic jargon is the use of cultural productions that materialize, in an accessible and emotionally resonant way, the experiences of subjects who inhabit multiple margins. Music, cinema, literature, and social media constitute privileged channels for bringing theoretical debate closer to the reality lived by students.

In the field of contemporary Brazilian music, artists such as Liniker, a Black trans woman who sings about love, the body, and resistance, and Emicida, a Black rapper whose work articulates race, class, and hope, offer rich material for discussions that simultaneously address multiple identity markers. The use of these productions in the classroom is not a mere motivational resource: it is an epistemological choice that — as Tomaz Tadeu da Silva (1999) argues when discussing identity policies in the curriculum — recognizes that knowledge is always produced from a specific social position, and that silencing this position is also a way of exercising power. Recognizing students as cultural subjects capable of producing knowledge from their own experiences is, therefore, a pedagogical and political act.

Social media, often treated as threats to the educational process, can be re-signified as spaces for the production and circulation of intersectional narratives. Profiles of Black activists with disabilities, collectives of trans mothers, and quilombola communities documenting their struggles for quality education are sources of living knowledge that the school can integrate into the curriculum in a critical and systematic way. This integration, in addition to broadening students' analytical repertoire, communicates that the school recognizes the legitimacy of their existences and of their struggles.

Active methodologies — such as problem-based learning, structured discussion groups, and collaborative projects — are especially suitable for working with intersectionality because they allow students themselves to bring their experiences to the center of the pedagogical process. When a teacher proposes that the class discuss how different students experience access to public transportation in order to get to school, they are creating the conditions for markers of race, class, disability, and territory to emerge organically and on the basis of lived experience.

EVERYDAY WELCOMING PRACTICES: SMALL GESTURES, MAJOR IMPACTS

Intersectional inclusion is not achieved only through major curricular reforms or elaborate pedagogical projects. It is built day by day in everyday practices of welcoming that communicate to students that their full presence is recognized and valued. Among these practices, some deserve special emphasis because of their capacity to positively impact students who inhabit multiple vulnerabilities.

The use of the preferred name and pronoun — regardless of any bureaucratic formality or state regulation — is one of these practices. For a trans student or transvestite, being called by the name with which they identify is not a gesture of concession or tolerance; it is the elementary recognition of their humanity. This simple gesture, which requires neither financial resources nor higher authorization, has the potential to transform that student's relationship with the school and significantly reduce the risk of dropout, as the data from ABGLT (2016) indicate.

The review of teaching materials and of the examples used in the classroom constitutes another high-impact practice. When mathematics exercises always portray white, heterosexual, middle-class families, when literature texts rarely include Black characters in leading roles, or when history examples disregard the contributions of women and Indigenous peoples, the school is communicating, in a subliminal but powerful way, which bodies and histories have value and which do not — reproducing what Silva (1999) calls the curricular politics of identity.

The organization of physical spaces is also a relevant dimension of intersectional pedagogical practice. Schools that ensure accessible bathrooms for people with disabilities, that provide welcoming spaces for students in situations of vulnerability, that arrange furniture so as to allow different modes of social interaction, and that make materials available in accessible formats for students with sensory disabilities are concretely materializing their commitment to intersectional inclusion.

INTERSECTORAL POLICIES AND THE TRANSVERSALITY OF INCLUSION

Intersectional inclusion cannot be the school's sole responsibility. An educational policy that truly intends to guarantee the right to education for all students, regardless of their identity markers, must articulate itself with other sectoral policies in a systematic and planned manner.

The relationship between education and health is particularly critical. Students with mental health issues, trans students who require hormonal follow-up, students with disabilities who need therapeutic support, and students in situations of severe food insecurity cannot have their educational needs dissociated from their health needs. A school that ignores the health dimension of its students is inevitably producing exclusions that no pedagogical methodology, however sophisticated, will be able to compensate for.

School transportation is another critical node of intersectoral policies. In Brazil, difficulty in accessing school due to distance, precarious public transportation, or the inaccessibility of vehicles for people with disabilities constitutes one of the principal factors behind school dropout among students from rural areas, distant peripheries, and among students with motor disabilities. Ensuring that all students can get to school is a logistical precondition for any inclusion policy.

Transversality, as proposed by Alê Lopes (2019) in dialogue with Akotirene's (2019) intersectional perspective, implies that the commitment to inclusion must run through all subjects, all spaces, and all practices of the school — it cannot remain restricted to a specific subject or to a themed week on the school calendar. Education for diversity is not an additional content item to be fitted into an

already overloaded curriculum; it is a perspective that should reconfigure the school's entire pedagogical organization.

DISCUSSION: CHALLENGES OF MANAGEMENT AND TEACHING

DECONSTRUCTING STRUCTURAL PREJUDICE: CONTINUING EDUCATION AS AN IMPERATIVE

The implementation of an intersectional perspective in school first runs up against the prejudices of education professionals themselves. This is not, here, a moral critique of teachers and administrators as individuals: it is a matter of recognizing that all subjects are formed by and within social structures that naturalize certain hierarchies and render others invisible. A teacher who grew up in a racist, sexist, and ableist society is not immune to these prejudices simply because they exercise a profession dedicated to human development — which makes reflection on how these structures translate into differentiated pedagogical expectations especially urgent, as analyzed by Patto (1999).

Continuing education, in this context, is not only desirable, but imperative. It must, however, go beyond occasional trainings on diversity that often limit themselves to transmitting information without fostering the reflective process necessary for changing practice. Effective continuing education for intersectional sensitivity must create spaces for self-analysis, in which teachers can examine their own prejudices and the ways they translate into pedagogical practices that are differentially exclusionary.

It is essential, in this formative process, to deconstruct the narrative that attention to diversity is a form of “help” to disadvantaged groups — as if inclusion were a favor the school does for certain students, to the detriment of educational quality for others. This narrative is not only mistaken, but perversely counterproductive: it positions diversity as a problem and inclusion as a sacrifice, when, in reality, schools that work with the complexity of diversity tend to produce richer, more creative, and more democratic learning environments for all students — something the intersectional perspective of Akotirene (2019) and Lopes (2019) decisively helps to demonstrate.

THE ROLE OF SCHOOL LEADERSHIP IN BUILDING SAFE SPACES

The school principal and pedagogical coordination occupy a strategic role in implementing an intersectionally sensitive school culture. School management defines the formal and informal norms that structure institutional life: what is tolerated, what is punished, which narratives are legitimized, and which are silenced. School leadership that does not understand intersectionality tends to produce management practices that, even when well-intentioned, replicate the exclusions they intend to combat.

The construction of safe spaces — in the sense of environments in which all students can express themselves without fear of persecution, humiliation, or invisibilization — is a primary responsibility of school management. This implies the creation of clear protocols for handling cases of discrimination and violence, the establishment of accessible and confidential reporting channels, and the guarantee that incidents will be treated seriously and consistently, regardless of the identity of the victim or the aggressor.

School leadership must also be attentive to unnecessary bureaucratic requirements that, often inadvertently, discriminate against students because of their origin or social condition. Forms that assume heterosexual nuclear families, documents requiring proof of residence in contexts of housing instability, enrollment processes that do not offer options for registering non-binary gender identities — these apparently neutral bureaucratic elements are, in practice, mechanisms of exclusion that operate silently upon the most vulnerable bodies.

TENSIONS AND RESISTANCES: THE CONTEMPORARY POLITICAL CONTEXT

It is impossible to discuss the implementation of an intersectional perspective in Brazilian schools without recognizing the adverse political context in which this implementation occurs. In recent years, Brazil has experienced a wave of political and cultural conservatism that has produced systematic attacks on diversity and inclusion agendas within the school environment, under labels such as “gender

ideology,” among others. Teachers who work with these themes have been the target of complaints, institutional pressure, and, in some cases, administrative and legal proceedings.

This context does not invalidate the need for the intersectional perspective — on the contrary, it makes it even more urgent. But it does require that teachers and administrators committed to this perspective act with awareness of the risks involved and with the necessary protection strategies. The building of support networks among professionals, articulation with social movements and civil society organizations, and the grounding of pedagogical practices in solid legal frameworks are important resources for navigating this hostile context without relinquishing the commitment to inclusion.

Brazilian legislation, in this regard, offers robust support for intersectional education. The 1988 Federal Constitution, the Law of Guidelines and Bases of National Education (LDB), the Statute of the Child and Adolescent (ECA), the Brazilian Inclusion Law, and a series of other regulations jointly guarantee the right of all students to an education that respects their dignity, promotes equality, and combats all forms of discrimination. The teacher who works from an intersectional perspective is not violating any norm: they are fulfilling constitutional mandates that the school is obligated to realize.

FINAL CONSIDERATIONS

This article began from a simple premise, but one with radical consequences: the students who arrive at Brazilian schools are not abstract and uniform subjects, but concrete beings traversed by multiple social markers that combine in specific ways to produce singular educational trajectories. Ignoring this complexity, however comfortable simplification may be, is not a neutral pedagogical option — it is a political choice that produces and reproduces exclusions.

Intersectionality, as this work has sought to demonstrate, offers an epistemologically rigorous and politically committed response to this complexity. It is not merely an academic theory to be debated at conferences and in specialized publications: it is a concrete tool that can and should transform teachers’ everyday practices, the culture of schools, and the architecture of educational policies. It is, ultimately, a

way of seeing — and of refusing to cease seeing — the subjects whom the school so often renders invisible.

The analysis undertaken in this article showed that the Brazilian school faces concrete and urgent intersectional challenges. The school dropout of trans students and transvestites — documented by ABGLT (2016) — the under-schooling of Black students with disabilities, the silencing of the experiences of LGBTQIA+ youth from peripheral areas are phenomena that educational models based on single identity axes are incapable of adequately diagnosing and, therefore, confronting. The incorporation of the intersectional perspective into teacher education and school management is not a theoretical luxury: it is a practical necessity so that inclusion ceases to be rhetoric and becomes reality.

The pedagogical strategies proposed — the use of active methodologies and cultural productions, everyday welcoming practices, intersectoral articulation, and continuing education — do not exhaust the possibilities for action, but they offer an initial concrete repertoire for teachers and administrators who wish to translate their commitment to diversity into effective school practices. Intersectionality, as Crenshaw (1989), Akotirene (2019), Gonzalez (1984), and the other authors mobilized throughout this work have shown, asks not only that the world be better understood: it asks that it be transformed.

May the Brazilian school progressively become a space in which no student needs to cease being who they are in order to gain access to knowledge. May the “identity avenues” that traverse each student body be recognized not as obstacles to learning, but as the very richness that makes the educational process human, plural, and transformative. This is the horizon that the intersectional perspective invites us to build — and the school is, perhaps, the most powerful place to begin.

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REALIZATION:

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