PRÁTICAS EDUCATIVAS, MEMÓRIAS E ORALIDADES

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Implications of AI in the school environment and pedagogical practices

ARTICLE

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Abstract
This article aims to critically reflect on the impacts of Artificial Intelligence (AI) in the school context, analyzing its possibilities, challenges, and limitations within the teaching and learning process. The study also seeks to examine the use of Artificial Intelligence (AI) in education, identifying its potential and challenges in the educational context. Methodologically, the research adopts a qualitative approach, relying on a bibliographic review of journals indexed in Capes, Scielo, and BDTD. The results indicate that AI provides benefits for both teachers and students. However, they also highlight the need to develop pedagogical strategies that enhance the use of these tools in a critical and responsible manner.
Keywords: Artificial Intelligence. Education. Technology. Possibilities.

Implicações da IA no ambiente escolar e nas práticas pedagógicas

Resumo
Este artigo tem como objetivo geral refletir criticamente os impactos da Inteligência Artificial (IA) no contexto escolar, percebendo suas possibilidades, desafios e limitações no processo de ensino-aprendizagem. O estudo também tem como finalidade refletir sobre o uso da Inteligência Artificial (IA) na educação, percebendo suas possibilidades e seus desafios no contexto educacional. Metodologicamente, a pesquisa tem abordagem qualitativa e apropria-se de uma pesquisa bibliográfica em portais de periódicos da Capes, Scielo e BDTD. Os resultados apontaram que a IA traz benefícios tanto para o corpo docente e discente escolar. No entanto, aponta a necessidade do desenvolvimento de estratégias pedagógicas para potencialização do uso das ferramentas de forma crítica e responsável.
Palavras-chave: Inteligência Artificial. Educação. Tecnologia. Possibilidades.

1 Introduction

Technology has significantly impacted society, transforming not only the ways of communication but also the modes of production, consumption, and social interaction. This

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process reveals not only advances but also new ethical, economic, and cultural challenges. As Castells (2003) and Lévy (1999) emphasize, we live in a society characterized by information and knowledge, in which digital technology plays a central role in the reorganization of social relations, the world of work, and educational processes. Thus, to think critically about the technological impacts implies recognizing both their potential to promote inclusion and innovation and their risks of deepening existing inequalities and exclusions.

Considering the contemporary context, marked by the growing presence of digital technologies and, in particular, of *Inteligência Artficial – IA* (Artificial Intelligence – AI), it becomes essential to understand its effects on education. The incorporation of these tools into the school environment has the potential to transform pedagogical practices and propose new forms of interaction and learning. However, it also raises questions about ethics, accessibility, inequality, and teacher training. Therefore, this article aims to critically reflect on the impacts of Artificial Intelligence (AI) in the school context, analyzing its possibilities, challenges, and limitations within the teaching and learning process.

The interface between Artificial Intelligence (AI) and education constitutes a contemporary and increasingly relevant field of research, given the accelerated advancement of digital technologies and their integration into different social spaces. In the school setting, fundamental questions arise: in what ways can AI contribute to pedagogical practice and the improvement of the teaching and learning process? What are the real possibilities these tools offer to pedagogical practice and student development? What challenges and limitations must be considered so that its use occurs critically, ethically, and inclusively? In light of this scenario, this study aims to discuss the impacts of AI on education, reflecting on its potential and constraints in the contemporary educational context.

The personal research interest arises from the observation that Artificial Intelligence has been consolidated not only as a support tool for education but also as a phenomenon that permeates different dimensions of contemporary social life. In education, the use of AI-based systems opens new possibilities for personalized learning, monitoring

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student performance, and methodological innovation, while simultaneously raising questions about ethics, equity, and accessibility. Therefore, I propose to investigate how AI can be critically and responsibly integrated into pedagogical practices, contributing to enhance teaching and learning processes and to form individuals capable of acting consciously and reflectively in an increasingly technological society.

Thus, Artificial Intelligence (AI) has gained space in education and, more broadly, in the world, transforming teaching and learning processes and reshaping social, economic, and cultural practices. In the educational field, AI enables tools ranging from intelligent tutoring systems to personalized analyses of student performance, promoting new forms of pedagogical support and monitoring. From a broader perspective, its presence extends into areas such as health, transportation, communication, and the labor market, pointing to profound changes in contemporary society. Authors such as Holmes *et al.* (2019) and Luckin (2018) emphasize that although AI brings significant benefits, its use must be guided by ethical principles, ensuring that technological innovations do not exacerbate inequalities but instead contribute to a fairer and more inclusive human development.

Rodrigues and Rodrigues (2023, p. 2) mention that “social practices, and their relations with new means and media, are what shape new languages and new relationships.” The use of technological and digital resources has become the new “normal.” The virtual world, with its wide range of possibilities and forms of interaction, appears far more attractive than the “real” world. However, schools, in general, still remain detached from technologies in the pedagogical sphere. Even after the pandemic, classes continue to follow a factory-like productive model, characterized by the oral and expository transmission of historically accumulated knowledge—something considerably less engaging than the virtual world available in the palm of one’s hand.

According to Valente (2018, *apud* Santos, 2023), the profile of the modern student has undergone significant evolution, which demands a reassessment of pedagogical and structural strategies in the field of education, so that educational practice remains effective, relevant, and inclusive. In contrast, we currently witness debates on whether to prohibit or

not the use of smartphones by students in classrooms, while schools around the world are experimenting with the implementation and incorporation of Artificial Intelligence (AI) in their pedagogical practices (Figueiredo *et al.*, 2023).

This study is justified by the increasing integration of Artificial Intelligence (AI) into contemporary society and, in particular, into education, which reinforces the need for research that deepens the understanding of its potential and limitations. In the educational context, AI presents itself as a resource capable of promoting personalized learning, optimizing pedagogical practices, and fostering innovation in assessment processes. However, while it opens paths for significant transformations, it also raises concerns regarding ethical aspects, the critical training of teachers, and the risk of intensifying pre-existing inequalities, especially regarding access to digital technologies. Therefore, investigating the impact of AI on education becomes fundamental to guide responsible pedagogical practices, support inclusive public policies, and contribute to building a more democratic school—one capable of integrating technological innovations without losing sight of its commitment to equity and the integral formation of the individual.

This article, therefore, aims to contribute to the discussion on the intersection between AI and education, presenting an analysis of how AI can be employed in the classroom to enrich and improve teaching practices and student learning, while recognizing the challenges and difficulties involved in its implementation in the educational field. In doing so, it seeks to contribute to a more balanced approach to the use of AI in education, highlighting its human, ethical, and social dimensions.

2 Methodology

This study was developed using a qualitative approach, with a basic and descriptive nature. It seeks to identify patterns and establish a dynamic relationship between the real world and the object of study. This form of research allows for detailed investigation and factual description, thus providing an account of the characteristics of a

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given population or phenomenon and establishing relationships among variables (Gil, 2017).

The research design adopted is bibliographic. As explained by Lakatos and Marconi (2011), this type of research establishes a connection between the researcher and what has already been published on the topic under investigation. However, since the relationship between Artificial Intelligence – IA and education is a relatively recent topic, it has increasingly become a subject of contemporary study, which justifies the time frame considered in this research, from 2022 to 2024.

For the study's analysis, data were collected from the journal portals of the *Coordenação de Aperfeiçoamento de Pessoal de Nível Superior – Capes* (Coordination for the Improvement of Higher Education Personnel), the *Scientific Electronic Library Online* – Scielo, and the *Biblioteca Digital de Teses e Dissertações – BDTD* (Digital Library of Theses and Dissertations), using the descriptors "Artificial Intelligence" and "Education," as they synthesize the research topic.

In the first stage, selection was made through the reading of the titles of the documents found. Among the analyzed documents, 15 (fifteen) articles were selected from the Capes journal portal, 10 (ten) from Scielo, and 8 (eight) from the BDTD. In the second stage, the process of collecting information from the articles and dissertations began. Thus, the procedure chosen was to read the abstracts in order to analyze their content. Based on this brief analysis of the 33 (thirty-three) selected works, 8 (eight) addressed the relationship between Artificial Intelligence and education and were selected as the theoretical foundation of the bibliographic research for this article.

Studies that focused on the use of a specific Artificial Intelligence system in education were disregarded. The search prioritized research that approached Artificial Intelligence and education in a broader sense, reflecting on their relationship and/or analyzing their potentialities and challenges.

Table 1 – Data Collection Overview

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Descriptor	Source	Total Records	Total Selected Works
Artificial Intelligence and Education	Capes Journal Portal	15	4
Artificial Intelligence and Education	Scielo	10	3
Artificial Intelligence and Education	BDTD	8	1

Source: Prepared by the author.

From the Capes journal portal, the selected articles were those by Figueiredo, Lopes, Validório, and Mussio (2023); Santos (2023); Santos, Zimmermann, and Guimarães (2022); and Villarroel (2023). From Scielo, the articles chosen were by Azambuja and Silva (2024); Lima, Ferreira, and Carvalho (2024); and Rodrigues and Rodrigues (2024). From the BDTD, the selected work was the dissertation by Domeneghini (2022).

The selected documents are summarized in Table 2:

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Table 2 – List of articles and dissertations from Capes, Scielo, and BDTD

Source	Title	Author(s)	Year
Capes Journal Portal	Desafios e impactos do uso da inteligência artificial na educação.	Figueiredo; Lopes; Validório; Mussio.	2023
Capes Journal Portal	A inteligência artificial na educação: potencialidades e desafios.	Santos.	2023
Capes Journal Portal	A inteligência artificial na educação.	Santos; Zimmermann; Guimarães.	2022
Capes Journal Portal	Reflexões sobre inteligência artificial e os sentidos da prática educativa na contemporaneidade.	Villarroel.	2023
Scielo	Novos desafios para a educação na Era da Inteligência Artificial.	Azambuja; Silva.	2024
Scielo	A automação na educação: caminhos da discussão sobre a inteligência artificial.	Lima; Ferreira; Carvalho.	2024
Scielo	A inteligência artificial na educação: os desafios do ChatGPT.	Rodrigues; Rodrigues.	2024
BTDT	A inteligência artificial como prática mediadora para o ensino e aprendizagem na educação.	Domeneghini.	2022

Source: Prepared by the author.

Thus, through these surveys, the selected studies will be used to compose a bibliographic review of the research, taking into account the highlighted content and their discussion approaches. The collected data were analyzed and synthesized, enabling a more systematic review of the relationship between artificial intelligence and education in contemporary times, identifying its possibilities and challenges.

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3 Education and Technology

Regarding education, there are numerous conceptualizations and interpretations of what it constitutes and how it is constituted. Without intending to delve into a purely theoretical discussion of the topic, we limit ourselves to an approach proposed by Freitag (1986), derived from an extensive theoretical review on the subject. According to the author, among the various conceptualizations of education, there is a convergence of characteristics among authors—or rather, among the majority of them—especially in two points:

> 1. Education always expresses a pedagogical doctrine, which is implicitly or explicitly based on a philosophy of life, and on a conception of human beings and society;
> 2. In a concrete social reality, the educational process occurs through specific institutions (family, church, school, community) that become spokespersons of a particular pedagogical doctrine (Freitag, 1986, p. 15).

As Brandão (2007, p. 7) asserts:

> No one escapes education. At home, in the street, in church or at school, in one way or many, we all intertwine pieces of life with it: to learn, to teach, to learn-and-teach. To know, to do, to be, or to coexist, every day we mix life with education. With one or many: education? Educations (Brandão, 2007, p. 7).

Libâneo (2010), corroborating Brandão (2007), affirms that education must be understood as a multifaceted phenomenon, occurring in diverse spaces, whether institutionalized or not, and under various modalities.

According to Libâneo, there is, therefore, an expansion of the concept of education, resulting from the growing complexity of society and the diversification of educational activities. This context reflects a significant need for the dissemination and internalization of knowledge, skills, ways of being, and ways of acting. Thus, pedagogical practices are required for the socialization of these elements in their varied forms, extending beyond the school and formal teaching time. As Beillerot (1985) states, we live in a pedagogical society.

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In this sense, we agree with Libâneo (2010, p. 30) in defining education as: "the set of actions, processes, influences, and structures that intervene in the human development of individuals and groups in their active relationship with the natural and social environment, within a specific context of relations among groups and social classes".

Given the complexity and breadth of the concept of education, P. H. Coombs, in his book *The World Educational Crisis* (1968), developed the pedagogical categories of informal and non-formal education. He thus presents the distinction among forms of education: formal education, non-formal education, and informal education. According to Coombs (1975), formal education comprises:

> [...] the highly institutionalized, chronologically graded, and hierarchically structured educational system that ranges from the first years of primary school to the last years of university"; non-formal education, "any organized, systematic, educational activity carried out outside the official system framework to facilitate certain types of learning for specific subgroups of the population, both adults and children"; and informal education, "a lifelong process in which people acquire and accumulate knowledge, skills, attitudes, and modes of discernment through daily experiences and their relationship with the environment (Coombs, 1975, p. 27 *apud* Trilla, 2008, p. 32, 33).

Trilla (2008, p. 39), when seeking a methodological criterion for defining forms of education, summarizes that "school-based education would be formal, whereas non-school (but intentional, specific, differentiated, etc.) would be non-formal." He also asserts: "In short, when one talks about non-formal methodologies, what is meant is that these are procedures that, with greater or lesser radicalism, distance themselves from the canonical or conventional forms of school". (Trilla, 2008, p. 40)

In general, understanding the meanings of education and its various forms suggests, in a certain sense, an attempt to maintain or reproduce prevailing social practices or those intended to become prevailing. For this purpose, stereotypes, patterns, and modes of being and acting are created, to which individuals must conform, believe, and reproduce across various spaces. Formal education, represented by school, was conceived as responsible for executing the educational act of forming individuals for the society of its time.

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As Michel Foucault points out in his book *Discipline and Punish*, in the context of industrial society, schools were designed based on military references and prison models of deprivation of liberty. Thus, the school was conceived as a space where “each body is constituted as a piece of a machine” (Foucault, 1977, p. 148). In other words, the institution needed to form trained, prepared individuals ready to deploy their labor power in the activities that underpinned the economy of that period. The educational institution shaped bodies and subjectivities for exploitation and control within the context of capitalist industrial activity, producing docile and useful bodies.

However, as Sibília (2012) states, society has changed. From an industrial era, we have moved into a digital era. The rigid model of formal education no longer corresponds to the demands, habits, customs, and experiences of contemporary society; in other words, it is disconnected from contemporary culture. Contemporary culture is closely linked to technological advances, social media resources, and digital possibilities. As Pierre Lévy (1999) highlights, we live in a cyberculture. In this sense, Lemos (2009, p. 136 *apud* Domeneghini, 2022, p. 19) explains that cyberculture is: “contemporary culture, where diverse digital electronic devices are already part of our reality.”

Nonetheless, schools remain distant from this reality. Formal education continues to operate according to the logic of a past educational era, disconnected from the society in which it is inserted.

Understanding the school as a technology (Sibília, 2012), it is pertinent to ask: by not keeping pace with global developments, is it becoming obsolete? Is it necessary for schools to adapt and prepare their audiences for the complexity of technological advances, both imposed and socially experienced? According to Lyotard (1988; 1993 *apud* Kensky, 2007), the answer is affirmative. The French philosopher argues that this is the dual challenge faced by schools: to adapt and to guide the mastery of new forms of relationships provided by technologies. Technology presents itself as a major challenge, not only for schools but for humankind in contemporary times. According to Lyotard, in order to keep up with the movement of the world, humans must adapt to technological advances, and education must fulfill the role of preparing them for contemporary society and culture.

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However, the challenge goes further, as Jacinski and Faraco (2002) point out:

> The school is not challenged only to meet the demands coming from the external context. What technologies offer in terms of access to information and communication also shakes the very interior of the school, the traditional school paradigms. In other words, the school must fulfill new tasks, but it can no longer do so in the same way, organizing itself according to the old educational paradigms (Jacinski; Faraco, 2002, p. 3).

The means of obtaining information have multiplied. The school is no longer the privileged place for the transmission of knowledge. The teacher is no longer the main source of knowledge. Technologies expand, without limits, the possibilities of acquiring information. In this way, the school and formal education come under scrutiny, becoming tedious for young people due to their teaching model, which is based on rigid disciplines and programs (Jacinski; Faraco, 2002).

Education, therefore, the authors argue, needs to be innovated. To keep pace with global developments, schools must adopt a technological education, as Lyotard (1988; 1993 *apud* Kensky, 2007) affirms, adapting to their historical moment and thus aligning with the possibilities offered by technology and AI.

4 Artificial Intelligence

According to Figueiredo *et al.* (2023), Villarroel (2023), Santos *et al.* (2022), and Lima *et al.* (2024), Artificial Intelligence (AI) is a field of computer science that aims to develop systems capable of performing tasks that generally require human intelligence. AI is related to “the creation of algorithms and computational models that can perceive, reason, learn, and make decisions” (Villarroel, 2023, p. 37).

The concept of AI emerged in the 1950s, when the idea of creating machines capable of performing activities that require human intelligence began to be explored by scientists. However, in the following decades, due to a lack of significant progress, AI development experienced a period of stagnation known as the “AI winter,” during which

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research was largely abandoned. Only in the 1990s did AI research regain momentum, becoming increasingly relevant (Figueiredo *et al.*, 2023; Villarroel, 2023).

Currently, AI is widely used in various ways, such as in personal assistants, medical diagnostics, autonomous vehicles, and video and computer games. In addition, it is applied in areas such as image recognition, machine learning, video production, natural language processing, among others.

According to Azambuja and Silva (2024), current literature identifies three types of AI: Weak AI, Strong (or General) AI, and Superintelligent AI. Weak AI is represented by systems such as chatbots, voice and image recognition systems, and content recommendation systems. This type of AI does not possess its own “consciousness” and operates within predefined parameters and rules. Strong AI, on the other hand, would be an artificial intelligence capable of acting like a human being, with self-awareness and the ability to solve problems, articulate experiences, and “think” in a human-like manner. However, this form of AI does not yet exist in practice. Superintelligent AI would be an artificial intelligence capable of surpassing human abilities in virtually all aspects. This type of AI remains theoretical, and its future existence is uncertain.

Weak AI can be further subdivided into two main types: Generative AI and Interactive AI.

> Generative AI is designed to perform well-defined content creation tasks, such as generating texts, images, music, and programming code. Interactive AI, on the other hand, is designed to interact with users in specific and limited contexts, based on text or voice commands, such as virtual assistants, chatbots, customer service agents, and similar applications (Azambuja; Silva, 2024, p. 3).

As Azambuja and Silva (2024) point out, these two forms of AI can be conflated, since, while generating content, AI systems can interact in real time with users, answering questions, maintaining conversations, and adapting to interactions, as is the case with ChatGPT, for example.

According to Figueiredo *et al.* (2023), AI learning is an area that has received considerable attention. As AI receives more information and data, its performance improves, achieving significant advances in various fields. This technology enables

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systems to learn automatically, without the need for continuous programming, autonomously improving their performance. The system of algorithms and statistical models allows machine learning to "recognize patterns in data and make predictions or decisions based on those patterns" (Villarroel, 2023, p. 38). AI learns automatically from large volumes of data and, based on this information, formulates hypotheses. It therefore performs inductive inference. The likelihood of the generalization being correct will largely depend on the quality of the data obtained (Villarroel, 2023).

The constant and significant advancement of AI in recent years has brought the possibility of transforming it into a technology capable of revolutionizing work and life in society, something that has already become evident in the last decade. As a revolutionary technology, AI carries with it divergent interpretations regarding its use and concerns about its consequences for society. While some celebrate its transformative potential, others analyze the negative impacts it may cause.

Figueiredo *et al.* (2023) highlight that one of the concerns associated with the advancement and development of AI in the technological world is the potential loss of jobs due to automation, which could further deepen economic inequalities in our capitalist society. The potential expansion of unemployment, combined with the skills gap in the labor market, may lead to an unpredictable reconfiguration of the workforce.

Another source of concern relates to ethical issues, such as access to, research on, and use of users' personal data by AI applications, often without proper authorization. As Kate Crawford (2021, *apud* Lima *et al.*, 2024, p. 3) asserts, AI is neither intelligent nor artificial:

> Instead, Artificial Intelligence is embodied and material, made of natural resources, fuel, human labor, infrastructure, logistics, history, and classifications. AI systems are not autonomous, rational, or capable of discerning anything without extensive, computationally intensive training with large datasets or predefined rules and rewards. In fact, AI as we know it depends entirely on a much broader set of political and social structures. Moreover, due to the capital required to build AI at scale and the ways of seeing that it optimizes, AI systems are designed to serve existing dominant interests. In this sense, AI is a record of power (Crawford, 2001, p. 8 *apud* Lima *et al.*, 2024, p. 3, 4).

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In other words, as with technology in general, AI constitutes an environment of economic and social disputes (Lima *et al.*, 2024), involving struggles for power and profit-oriented resources. This reality of contestation also persists in the field of educational technologies, since "any educational technology is a product of conflicts between different agendas and promotes its own ideologies, especially specific values and conceptions of education itself" (Lima *et al.*, 2024, p. 4).

However, despite the existence and contestation of conflicting discourses in the academic world, the analysis of educational technologies has been largely positive. AI can serve as a relevant tool to address longstanding educational problems and presents itself as a resource capable of enhancing pedagogical practices, making them more engaging and effective for students and more dynamic and less exhausting for educational professionals.

5 Artificial intelligence and education: possibilities and challenges

As Figueiredo *et al.* (2023, p. 6) point out, "COVID-19 brought significant changes to the teaching-learning process." Social distancing and the need for virtual classes highlighted the urgency of bringing school practices closer to new teaching models. The use of technological resources posed numerous challenges for both students and teachers. Among these, remote teaching stands out, which required an adequate environment, internet connection, and material technological resources such as smartphones or home computers—devices that were often unavailable to lower-income populations, thus complicating the teaching-learning process.

In addition to material issues, one of the major difficulties was adapting in-person classes to the online format, something new for many teachers. It was necessary for educators to reinvent their pedagogical practices to adjust to the new reality. This was compounded by the challenge of ensuring student interaction and participation during classes (Figueiredo *et al.*, 2023). This situation aligns with Moran's (2015) reflections, who

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emphasizes the need to rethink the teacher's role in the context of digital technologies, not merely as a transmitter of knowledge but as a mediator and guide of learning.

Despite these challenges, the pandemic forced schools to engage with available technological resources for education, such as gamification, distance learning platforms, recorded video lessons, and even the hybrid model, which combines in-person and virtual classes, providing greater flexibility for students (Figueiredo *et al.*, 2023). This experience reflects what Castells (2003) calls a "network society," in which information and communication flows become central to social and educational reorganization.

As can be observed, the use of technologies has brought both benefits and obstacles to school practices. In this context, the use of AI in education has become a significant subject of study and research. Among the positive aspects discussed is the possibility of personalizing teaching. According to Figueiredo *et al.* (2023), Santos (2023), Villarroel (2023), and Azambuja and Silva (2024), algorithms can adapt methodologies and content to the needs and characteristics of each student, ensuring more efficient and satisfactory learning. This personalization aligns with Lévy's (1999) ideas, highlighting the potential of cyberculture to expand collaborative and personalized learning, overcoming rigid teaching models.

With the extensive volume of data accessed by algorithms, AI becomes capable of producing more precise educational adaptations, considering not only students' needs but also their interests and learning styles (Figueiredo *et al.*, 2023; Villarroel, 2023; Azambuja; Silva, 2024). This personalized strategy increases student motivation and engagement, enhancing their interest in school subjects. However, Selwyn (2019) reminds us that the promise of technology does not always materialize equitably, making it necessary to question who truly benefits from these advances and who remains marginalized.

In this sense, as Villarroel (2023, p. 36) points out, "personalization requires time, resources, and a certain level of technological expertise. Not all schools have access to the necessary equipment and programs, which can limit its large-scale implementation." Moreover, such implementation requires teacher training to handle technologies and develop pedagogical activities tailored to students' needs (Figueiredo *et al.*, 2023). In this

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regard, Kenski (2012) emphasizes that the greatest challenge is not merely technological but pedagogical, as it requires a shift in the conception of teaching, emphasizing student autonomy and protagonism.

Another important challenge concerns ethics, especially in public education, where the collection and use of students' personal data raise concerns related to privacy and security. It is necessary to ensure the protection of these data and obtain informed consent for their use (Figueiredo *et al.*, 2023; Villarroel, 2023). This issue relates to Floridi's (2014) discussion on information ethics and the need for clear policies regarding the use of data in digital societies.

In addition to personalizing teaching, AI facilitates the identification of knowledge gaps through individualized feedback, highlighting each student's strengths and weaknesses. The technology can function as an intelligent tutoring system, providing supplementary materials to address learning difficulties (Santos, 2023; Azambuja; Silva, 2024). Unlike a traditional teacher, who considers the needs of a group, intelligent tutoring focuses on the individual.

Student support can be provided through chatbots, virtual assistants, or adaptive learning systems. These tools are notable for being available 24 hours a day, allowing students to access resources whenever necessary (Azambuja; Silva, 2024). They can be used both to overcome difficulties and to deepen knowledge in areas of specific student interest. However, as Freire (1996) reminds us, no technology replaces the dialogical relationship between educator and learner, as the essence of the educational process lies in the human encounter, the problematization of reality, and the collective construction of knowledge.

Alongside intelligent tutoring, gamification of teaching stands out. Through AI, educational environments based on games can be created, using systems of challenges and rewards that make the learning process more engaging and interactive. However, as Villarroel (2023) emphasizes, gamification should not replace traditional teaching-learning methods but rather complement them, enriching the educational experience: "Games

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should be used inclusively as a complement to enrich the educational experience, and not as a substitute for solid pedagogical practices" (Villarroel, 2023, p. 42).

In addition to benefiting students, AI is a valuable tool for teachers. It can assist in pedagogical decision-making, automate bureaucratic processes, and personalize teaching strategies. According to Villarroel (2023), AI can analyze educational data, such as attendance, test performance, and grades, identifying patterns and trends that help improve pedagogical practices. This analysis is useful not only for teachers but also for school management, contributing to the identification of the most effective methods for different classes.

Although AI offers significant advancements, it is essential that teachers interpret the data provided, taking into account contextual and qualitative factors. It is equally necessary to ensure that the analysis is conducted ethically and transparently, preserving student privacy (Villarroel, 2023). On the other hand, automated assessment tools, such as objective test grading, reduce manual workload, allowing educators to focus on more complex activities, such as lesson planning and personalized instruction.

ChatGPT also stands out as a useful tool for teachers. According to Figueiredo *et al.* (2023), its advanced language capabilities provide support in creating lesson plans, activities, and assessments. However, its use may pose ethical issues, such as the risk of plagiarism, since students could simply "copy and paste" AI-generated content without personal effort or effective learning.

Thus, it is evident that AI offers numerous possibilities for education, but it also presents ethical and social challenges. Therefore, it is crucial to develop strategies and policies that promote the critical and responsible use of these tools, mitigating risks such as the dissemination of false information and superficial learning. This reflection aligns with Candau's (2012) proposal, which advocates for education aimed at critical and inclusive citizenship, capable of incorporating technologies without losing sight of the human and social dimensions of the educational process.

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6 Final Considerations

This article sought to critically reflect on the impacts of Artificial Intelligence (AI) in the school context, analyzing its possibilities, challenges, and limitations in the teaching-learning process. To this end, a theoretical study was conducted based on a bibliographic survey of journals from Capes and Scielo, allowing for a more in-depth and consistent discussion.

AI can significantly contribute to pedagogical practice by enabling personalized teaching, individualized student monitoring, and support for teachers' tasks. Resources such as intelligent tutoring systems, chatbots, and gamified environments promote student engagement and motivation, as well as provide immediate feedback and relevant data for pedagogical decision-making. In this way, AI brings the school closer to students' technological reality and expands learning possibilities in a more interactive and flexible manner.

The integration of AI in education requires critical and ethical reflection. Challenges such as unequal access to digital resources, the need for teacher training, risks related to data privacy, and the danger of reducing education to a merely technical dimension must be considered. Thus, the use of AI should occur inclusively and responsibly, not as a replacement for the teacher, but as a supportive tool that enhances the teaching-learning process and contributes to the holistic development of students.

The analysis conducted proved to be highly positive, addressing the topic without falling into reductionism: neither adopting an exclusively negative view of AI as a threat to the educational process nor a purely optimistic perspective that considers it a definitive solution to school problems. On the contrary, it sought to highlight the limits as well as the potential that AI can offer to enrich pedagogical practices and facilitate bureaucratic processes without replacing the human role of the teacher.

Technological advancement is continuous and intrinsic to the logic of the capitalist society in which we live. In this sense, schools that do not connect with this reality risk becoming obsolete, boring, and insignificant for new generations, as Sibília (2012) warns.

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Beyond preparing students for the digitized labor market, the goal is also to develop critical individuals capable of understanding, questioning, and ethically interacting with the technologies that shape contemporary society.

This study thus sheds light on an urgent and contemporary reflection on the educational environment, highlighting both the critiques and difficulties frequently pointed out by teachers and the potentialities of an education capable of engaging with the virtual world. By connecting with students' everyday experiences, AI can make learning more meaningful and support teachers in their pedagogical practices, without losing sight of the centrality of the human dimension in the educational process.

Therefore, this study should not be seen as a definitive conclusion but rather as an initial contribution to an ever-expanding debate. By presenting systematic reflections on the relationship between AI and education, it aims to encourage further research that can deepen and broaden the discussions outlined here.

In this context, we agree with Villarroel (2023, p. 43), who states that "it is not about rejecting technological advances, but about understanding them and incorporating them into the human context without behaving robotically, in light of the functioning of machines." The effectiveness of AI in education will directly depend on how these tools are integrated and used: as support for teachers and students, not as a replacement for human experience and social interaction that characterize the essence of the educational process.

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