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WHEN AI ENTERS THE CLASSROOM: PERSPECTIVES AND PARADIGMS

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ABSTRACT

The research aimed to analyze how the introduction of Artificial Intelligence (AI) in classrooms transforms educational paradigms and what perspectives arise with this change. The methodology adopted was bibliographic, with analysis of academic sources on the use of AI in education, its pedagogical applications, challenges and benefits. Topics such as personalization of teaching, new pedagogical approaches, the impact of AI on knowledge management and learning assessment were addressed. The results indicated that AI promoted the personalization of teaching, providing an adaptation to the individual learning pace and increasing student engagement. Changes in educational paradigms have been observed through the introduction of active methodologies, which prioritize student autonomy. However, the main challenges identified were technological, financial, and pedagogical barriers, as well as issues related to ethics and privacy in the use of AI. The analysis indicated that the continuous training of educators and the appropriate infrastructure are essential for the implementation of AI in schools. The final considerations highlighted the relevance of AI for inclusive and personalized education, but pointed out the need for studies on the long-term impact of this technology on education and its social and pedagogical implications.

Keywords: Artificial Intelligence. Education. Personalization of Teaching. Active Methodologies. Technological Challenges.

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INTRODUCTION

The use of Artificial Intelligence (AI) in education has been consolidated as one of the impactful transformations in recent decades. Initially restricted to areas such as science and technology, AI has begun to occupy a growing space in several sectors, including education. The use of advanced technologies in the classroom, such as adaptive learning systems, virtual assistants, and content personalization algorithms, is changing the way teaching is administered and how students interact with knowledge. AI has the potential to offer innovative solutions that can transform the way information is transmitted and assimilated, enabling the personalization of teaching, the analysis of learning data in real-time, and the automation of repetitive tasks. In a global context in which digitalization is present, it is essential to reflect on the implications of this change, the challenges it presents, and the opportunities that arise with the insertion of AI in everyday pedagogical practices.

The justification for choosing this theme lies in the impact that Artificial Intelligence has on educational practices, creating new perspectives and paradigms that should be discussed and understood by educators, managers, and researchers. The transformation that AI proposes is not limited to the application of new technologies, but also involves changing how teaching and learning are understood, approached, and executed. As new tools are incorporated into the educational process, questions arise about the limits of teachers' autonomy, the preparation of students to deal with these technologies, and inequalities in access to these innovations. In a scenario in which teaching is guided by data and algorithms, it is essential to critically examine the role of AI in classrooms and how it can be used in an ethical and inclusive way, ensuring that all students have the same learning opportunities. The relevance of the theme is also reflected in the urgency of understanding the social, pedagogical and technological implications of this educational revolution that is underway, especially in contexts of educational inequality.

The problem question that guides this research is: How does the introduction of Artificial Intelligence in classrooms transform educational paradigms and what perspectives arise with this change? This question seeks to analyze not only the technological aspects involved, but also the changes in pedagogical methods, the reactions of educators and students, and the challenges that education faces when incorporating these new technologies. Understanding these aspects will allow us to assess the effectiveness of AI

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as a tool for educational transformation, as well as to identify the possible consequences for the future of teaching and learning.

The objective of this research is to analyze how the implementation of Artificial Intelligence in educational practices changes the paradigms of teaching and learning, exploring the perspectives and challenges it presents in the current context of education. Throughout the text, the impact of AI on the educational process, the new emerging pedagogical models, and the ethical and social issues surrounding the use of these technologies in classrooms will be investigated.

This text is structured in different sections that aim to provide an analysis of the theme. The first section presents the theoretical framework, with a review of the main theories that underlie the use of Artificial Intelligence in education. Then, three development topics argue the application of AI in pedagogical practices, the challenges of its implementation, and the new paradigms that arise with the introduction of these technologies. The research methodology will be presented, highlighting the process of survey and analysis of the sources used. The discussion and results section will examine the main findings of the research, and finally, the final considerations will bring a reflection on the impacts of AI on education and future prospects.

THEORETICAL FRAMEWORK

The theoretical framework of this work is structured in order to provide an understanding of the use of Artificial Intelligence in education, addressing the main conceptions and theories related to the subject. At first, a historical and conceptual view of Artificial Intelligence will be presented, with emphasis on its early developments and initial applications in the educational field. Next, the technological foundations that underpin AI will be discussed, including machine learning algorithms, learning, and the implications for the teaching-learning process. In addition, the theoretical framework explores the pedagogical perspectives on the introduction of AI in classrooms, addressing the transformations in educational paradigms and the pedagogical challenges that arise with the integration of these technologies. Throughout this section, the relevance of understanding AI not only as a technological tool, but as a transformative agent in pedagogical practices, allowing new forms of personalization of teaching and new approaches to knowledge management will be highlighted.

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ARTIFICIAL INTELLIGENCE IN THE TEACHING-LEARNING PROCESS

Artificial Intelligence has been consolidated as a strategic tool in the teaching-learning process, offering new possibilities for personalization and optimization of pedagogical methods. Several studies point out that the use of virtual assistants and adaptive platforms are clear examples of how AI can be applied in the classroom. The research carried out by Cardoso; Silva; Bragion; Andrioli; Chaves (2023) discusses the growing presence of artificial intelligence in education and its potential for personalizing teaching. The authors point out that:

> Our objective was to present through this review, a discussion about AI, specifically its application in education, a brief historical review over the decades and a presentation of the foundations of the processes that conceived it. Based on the analyses carried out, it was possible to observe both an increase in the presence and potential of AIs in everyday life, as well as the expansion of possibilities that technology can offer in education, including the adaptation of learning, accessibility and analysis of data, and the optimization of some processes (Cardoso; Silva; Bragion; Andrioli; Chaves, 2023, p. 22).

The results obtained in the research show that AI can be a promising resource for the modernization of educational practices, contributing to inclusive learning. According to Picão, Gomes, Alves, Barpi, and Luccheti (2023), AI has been used to create personalized learning systems, which adjust content according to the performance and needs of each student. This allows for continuous adaptation to the individual pace of learning, providing an efficient and inclusive educational experience. For educators, these technologies offer a way to monitor student progress, as the tools can provide immediate *feedback* on students' interactions with content, allowing for accurate and timely pedagogical intervention.

In addition, the research presents an experimental study in which a *chatbot based on* ChatGPT-3'*s artificial intelligence* was developed for interaction with students. About this experiment, the authors state that:

> To validate the prototype, a QR Code will be made available to students of the Intervention Projects III – 2023 discipline, of the Specialization course in Information and Communication Technology in Education – IFSP Capivari. This code will allow students to connect and interact with Palominha (*Chatbot*). This intervention will offer students the opportunity to test Palominha's functionalities in a real learning environment. They will be able to interact, ask questions, receive answers and explore the possibilities. It is important to inform that the prototype was developed from the free layer of the *ChatGPT-3* API, and that this layer expired during the preparation of this work. Therefore, the functionalities of Palominha (*Chatbot*) will be limited to what was previously programmed in *Dialogflow* (Cardoso; Silva; Bragion; Andrioli; Chaves, 2023, p. 21).

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This approach highlights the potential of *chatbots* to enhance interaction in the educational environment, while also highlighting the technological limitations that need to be considered when implementing these tools. In addition, the application of AI in teaching is also reflected in the transformation of knowledge management and learning assessment. As Cruz, Toledo, and Ferreira (2023) highlight, AI allows an analysis of educational data generated during students' interactions with education systems, facilitating information management and monitoring academic performance. By using data analysis algorithms, intelligent systems are able to identify learning patterns, predict difficulties, and suggest personalized pedagogical interventions, which can transform the way assessment is carried out. AI, therefore, contributes not only to the creation of adapted content, but also to the accurate assessment of the skills acquired by students, making the learning process dynamic and focused on the needs of each individual (Giraffa & Kohls-Santos, 2023).

In line with this scenario, AI also has the potential to redefine traditional teaching and assessment methods. Duque *et al*. (2023) argue that the implementation of AI tools in the classroom can improve the quality of teaching by providing continuous and real-time evaluation, as well as *feedback*. The automation of some administrative tasks, such as the correction of exercises and the analysis of test results, can free educators to focus more on individual monitoring of students and pedagogical interaction. In this way, AI not only supports teaching, but also contributes to the improvement of educational management and performance evaluation, reflecting on the quality of the teaching-learning process.

CHANGES IN EDUCATIONAL PARADIGMS WITH AI

The introduction of Artificial Intelligence (AI) in classrooms is promoting significant changes in educational paradigms, in the way teaching is structured and implemented. AI has been touted as a transformative force, capable of modifying traditional teaching methods and making room for new dynamic and student-centered pedagogical approaches. The results of a survey indicate that higher secondary students have a positive perception of the use of generative artificial intelligence in their learning. The study highlights that:

> Students value the use of innovative tools when receiving their classes, as they develop a deeper understanding of the topics. In fact, 73.4% of students consider their experience using artificial intelligence tools to be positive or very positive. Among the benefits they recognize from the use of this technology are that it provides them with additional and innovative information on a topic sought (52.63%), explains them in a simple and clear way (20.55%) and stimulates their

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> school education in a personalized way (26.31%) (Alpizar Garrido; Martínez Ruiz, 2024, p. 85).

In this sense, Bacich and Moran (2018) state that active methodologies, which gain prominence with the support of AI, enable interactive and personalized learning, in which students are not only passive receivers of information, but active participants in the construction of knowledge. In this context, AI acts as a tool that favors collaborative learning and the personalization of content, adjusting it according to the individual needs of students, which can result in an inclusive education adapted to different learning paces.

In addition, the integration of technologies in the school curriculum has been considered a necessary strategy for the improvement of education. According to Duque *et al*. (2023), the implementation of technologies, such as AI, in the school curriculum is essential to prepare students for the digital future and the technological job market. This integration is not limited only to the use of digital tools in specific disciplines, but seeks a transformation in the teaching-learning processes, where technology becomes a transversal element, present in all areas of knowledge. AI allows for the creation of a flexible and dynamic curriculum, which can be adjusted to reflect changing educational needs and societal demands.

However, with the introduction of new technologies in the school environment, the educator's attributions are also being resignified. Giraffa and Kohls-Santos (2023) highlight that, although AI can automate several pedagogical tasks, the educator remains essential in the teaching-learning process. Technology does not replace the teacher, but complements him, providing him with time to interact with students and to develop innovative and meaningful pedagogical practices. In this new scenario, the educator assumes the role of mediator and facilitator, guiding students in the use of technological tools and stimulating critical reflection on the content learned. Thus, AI can be seen not only as a support tool, but as an ally in strengthening pedagogical practice and transforming traditional teaching methods, making the educational environment collaborative and adapted to the demands of contemporary society.

CHALLENGES OF IMPLEMENTING AI IN SCHOOLS

The implementation of Artificial Intelligence (AI) in schools, despite its many advantages, faces a number of challenges that need to be overcome to ensure sustainable

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adoption. Among the main obstacles are the technological, financial, and pedagogical barriers that limit the full integration of this technology into the school environment.

According to Ferrarini, Saheb, and Torres (2019), schools often lack the necessary infrastructure, such as fast internet networks and adequate devices, which makes it difficult to use AI-based tools. In addition, the lack of financial resources prevents many institutions from investing in the necessary technologies, which ends up generating inequality in access to these innovations, especially in public schools and in less favored regions. Other researchers address the challenges and possibilities that generative artificial intelligence offers for education, emphasizing that:

> The possibilities offered by the use in class sessions are highlighted and future directions for research in this field are suggested. Likewise, the challenges associated with the implementation of generative artificial intelligence are discussed and a relevant strategy to transform learning environments is considered, which must be approached in a reflective and incremental manner with attention to the particularities of each context (Alpizar Garrido; Martínez Ruiz, 2024, p. 87).

Thus, the implementation of AI in teaching must be carefully planned, considering the specificities of school environments to maximize its benefits without compromising the quality of learning. Another challenge is related to pedagogical barriers. Giraffa and Kohls-Santos (2023) argue that, despite the growing interest and availability of technological tools, many educators still have difficulties integrating AI into their pedagogical practices due to a lack of understanding about how to use these technologies. The shift to digitalized teaching requires a rethinking of traditional methodologies, which can be a time-consuming and challenging process for teachers who are unfamiliar with new technologies. This scenario is aggravated by the resistance of some educators to the adoption of technologies, which can be seen as a threat to their traditional role in the classroom.

In this context, the continuing education of educators is a fundamental aspect to overcome these barriers. As Cruz, Toledo, and Ferreira (2023) highlight, teacher training is essential for them to understand the potential of AI and use it in the classroom. Continuous training should not only cover the use of technological tools, but also reflect on the pedagogical implications of AI, so that educators feel prepared to adapt their practices to the new demands of teaching. The implementation of training programs that include training on educational data management and the use of AI tools can be a strategy to train teachers, allowing them not only to use technologies, but also to integrate them in a meaningful way into pedagogical practices.

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In addition, adequate infrastructure is another essential element to ensure the effectiveness of AI implementation in schools. According to Picão, Gomes, Alves, Barpi, and Luccheti (2023), it is necessary for schools to have resources such as stable internet networks, computers, and mobile devices, which are indispensable for the use of AI tools. Without these basic capabilities, the use of AI becomes unfeasible or, at best, inefficient. Therefore, it is essential that there is an investment in technological infrastructure in schools, so that AI can be implemented effectively, ensuring that all students have equal access to new educational tools.

METHODOLOGY

The present research is characterized as a bibliographic research, with the objective of exploring the perspectives and paradigms associated with the introduction of Artificial Intelligence (AI) in classrooms. The research was conducted based on the analysis of secondary sources, such as academic articles, books, dissertations, and other scientific publications that address the topic of AI in education. This stems from the authors' analysis:

> The choice of methodology should consider the nature of the research problem, the objectives of the study, and the available resources. Thus, it is understood that different methods have particular applications and may be adequate to meet the specific demands of academic and scientific investigations (Santana; Narcissus; Fernandes, 2025, p. 8).

Considering this methodological perspective, a qualitative approach was chosen, allowing a critical analysis of the selected works, focusing on identifying the main trends, challenges and innovations related to the application of AI in the educational context.

Data collection was carried out through research in academic databases, such as *Scielo*, Google Scholar, *SpringerLink*, among others, using keywords related to the theme, such as 'Artificial Intelligence', 'Education', 'Educational Technology', 'AI in the classroom', among others. Articles and books were selected that provided an insight into the applications of AI in education, its advantages, limitations, and implications. The techniques used for data analysis involved the critical reading of the selected publications, the categorization of the main themes discussed in the works and the synthesis of the results found, allowing an understanding of the impact of AI on education (Narciso; Santana, 2024).

The table below presents a synthesis of the main references used for the elaboration of this research, organized according to the author, title, year and type of work,

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allowing a view of the sources consulted and the contributions that each of them brought to the discussion of the theme.

Chart 1: Main References Used in the Research

Author(s)	Conforming title published	Year	Type of Work
BACICH, L.; MORAN, J. (Orgs.).	Active methodologies for innovative education: a theoretical-practical approach.	2018	Book
FERRARINI, R.; SAHEB, D.; TORRES, P. L.	Active methodologies and digital technologies.	2019	Journal Article
CARDOSO; SILVA; BRAGION; ANDRIOLI; CHAVES	The use of Artificial Intelligence in Education and its benefits: an exploratory and bibliographic review.	2023	Journal Article
PICÃO, GOMES, ALVES, BARPI; LUCCHETI	Artificial intelligence and education: how AI is changing the way we learn and teach.	2023	Journal Article
CRUZ, K. R. da; TOLEDO, R. da S.; FERREIRA, P. S.	AI in the classroom: how Artificial Intelligence is redefining teaching methods.	2023	Journal Article
DUQUE, R. C. S. *et al.*	Artificial intelligence and the transformation of higher education: a look into the future.	2023	Journal Article
GIRAFFA, L.; KHOLS-SANTOS, P.	Artificial Intelligence and Education: concepts, applications and implications in the teaching practice.	2023	Journal Article
RODRIGUES, O. S.; RODRIGUES, K. S.	Artificial intelligence in education: the challenges of *ChatGPT.*	2023	Journal Article
ARAÚJO, F. J.; FAVARATO, C. C.; AMBROZIO, A. J. R.	Artificial intelligence in the classroom: the future of education.	2024	Journal Article
ALPIZAR GARRIDO, L. O.; MARTÍNEZ RUIZ, H.	*Perspective of high school students regarding the use of generative artificial intelligence in their learning.*	2024	Journal Article

Source: authorship.

After inserting the table, it can be highlighted that the sources consulted allowed an analysis of the use of Artificial Intelligence in education. The selected references address different aspects of the topic, from the theoretical foundation to discussions on pedagogical practices, the benefits and challenges of implementing AI in schools. The table aims to facilitate the visualization of the works that support the research and provides a basis for the analysis and interpretation of the data collected, contributing to the construction of the theoretical framework and the foundation of the discussions that will be developed throughout this work.

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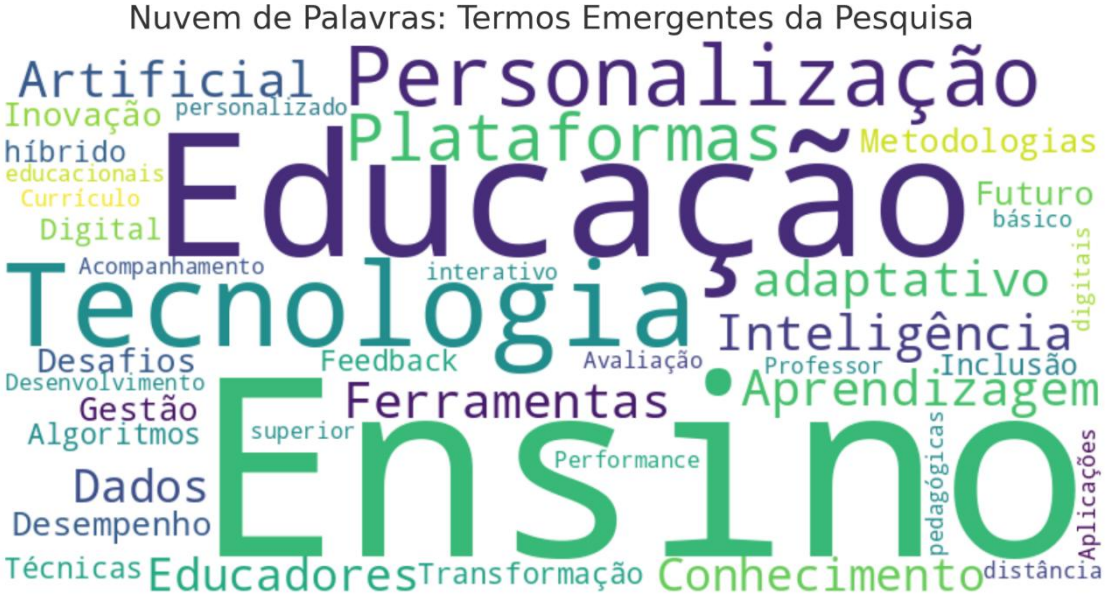
RESULTS AND DISCUSSION

The word cloud presented below highlights the frequent and significant terms found in the frame of reference. These terms are central to understanding the topic addressed in this research and will be explored in subsequent topics, as well as in the results and discussions. The visualization of the keywords allows a quick identification of the main concepts that guide the analysis of Artificial Intelligence in the educational context. From this cloud, it is possible to observe the predominance of terms such as 'education', 'teaching', 'learning', 'personalization' and 'technologies', which will be dealt with in the following chapters.

Image 1 - Word Cloud



Source: authorship.

These terms reflect the diversity and complexity of AI's impact on education, ranging from its practical applications, such as adaptive teaching tools, to the challenges and perspectives related to its use in educational settings. The word cloud serves as a guide for readers, providing an overview of the topics that will be discussed and analyzed throughout the work.

POSITIVE IMPACTS OF AI ON EDUCATION

The use of Artificial Intelligence (AI) in education has generated several positive impacts with regard to the personalization of teaching and increased student engagement.

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AI allows educational processes to be adapted to the specific needs of each student, offering student-centered teaching that is adjusted to their learning pace.

According to Bacich and Moran (2018), the personalization of teaching, through AI, allows content to be adapted according to the performance and learning preferences of each student, promoting efficient and inclusive education. This type of adaptation allows students to advance according to their own ability, reducing the frustration and disinterest caused by homogeneous teaching rhythms.

The research carried out by Araújo, Favarato, Ambrozio, Moreira, Rodrigues, and Miranda (2024) highlights that the integration of Artificial Intelligence (AI) in education represents a transformation in the teaching-learning processes, going beyond the simple adoption of new tools. The authors state that:

> Throughout the study, it was observed that the integration of AI in the school environment goes far beyond the simple adoption of new tools. It is a profound reconfiguration of the educational ecosystem, which affects not only teaching methods, but also the relationships between teachers and students, the forms of evaluation, and the very conception of what it means to learn and teach in the twenty-first century (Araújo; Favarato; Ambrozio; Moreira; Rodrigues; Miranda, 2024, p. 5998).

This argument shows that the advancement of AI in education requires a new paradigm, in which technology must be used strategically to enhance human interaction and ensure meaningful and inclusive learning. In addition, the use of AI enables greater student engagement, as the technologies used offer dynamic and interactive activities, which maintains interest and motivation during the learning process (Giraffa & Kohls-Santos, 2023).

In addition, AI provides continuous adaptation to each student's individual learning pace, an essential characteristic for success in contemporary education. As Cruz, Toledo, and Ferreira (2023) argue, AI allows the creation of educational platforms that adjust content according to the student's responses and performance, ensuring that learning is effective. This continuous adaptation is essential to meet the diversity of students in the classroom, enabling each one to receive the necessary support according to their difficulties and advances. With this, AI contributes not only to the personalization of teaching, but also to the construction of a learning environment where all students have the opportunity to reach their full potential.

Examples of educational platforms that use AI to improve the quality of teaching are diverse and demonstrate the practical applicability of this technology in education.

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Ferrarini, Saheb, and Torres (2019) highlight that platforms such as *Khan Academy*, which uses AI to provide personalized content, and *DreamBox*, which adapts math teaching to each student's pace, are examples of how AI can transform the learning experience. These platforms not only adapt the content but also provide real-time feedback, helping students correct their difficulties immediately. In addition, these tools offer educators data on student performance, allowing them to adjust their pedagogical approaches. Thus, AI establishes itself as a tool to improve the quality of teaching, making it dynamic, personalized, and oriented to the individual results of students.

CHALLENGES AND LIMITATIONS OF AI IN EDUCATION

The implementation of Artificial Intelligence (AI) in education, while bringing numerous benefits, also presents significant challenges, which need to be considered to ensure ethical adoption of this technology. One of the main challenges is the inequality in access to the technologies necessary for the implementation of AI. As Duque *et al*. (2023), AI, like any other advanced technology, can intensify educational disparities between institutions that have adequate financial resources and infrastructure and those that face difficulties in this regard. In many regions and schools, especially in poor contexts, access to computers, quality internet, and AI software is still a privilege restricted to a few institutions. This unequal access prevents all students from benefiting from the advantages that AI offers, perpetuating educational and social inequalities. Thus, while AI can be a tool to personalize and optimize teaching, its implementation without an appropriate infrastructure can result in digital exclusion and deepening existing inequalities.

In addition, over-reliance on machines is another risk that comes with the implementation of AI in education. Giraffa and Kohls-Santos (2023) argue that while AI has the potential to facilitate teaching, there is a danger of an over-reliance on technologies, which can lead to a decrease in human interaction in the educational process. The constant presence of automatic systems can reduce the active role of educators and limit the development of students' social and emotional skills. Therefore, it is essential that AI is used as a support tool and not as a substitute for traditional teaching, which involves human interaction and the development of critical skills. In this sense, human intervention continues to be indispensable to ensure that machines do not take control of the educational process inadequately, keeping education centered on the human being and on interpersonal relationships.

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Finally, ethics and privacy in the use of AI in education are issues that require special attention. The collection of student data and the monitoring of their performance, processes carried out by AI-based systems, raise concerns about the security and misuse of information. Picão, Gomes, Alves, Barpi, and Luccheti (2023) point out that the use of AI involves the collection of sensitive personal data, which can pose a significant risk to students' privacy if this data is not processed. Ethics in the use of AI involves transparency in the process of collecting and using data, ensuring that student information is protected from unauthorized access and that its use is done responsibly and with proper consent. In addition, there needs to be a discussion about the limits of automation in teaching, ensuring that AI does not reinforce prejudices or discrimination, but is instead used in an inclusive and fair way for all students. Thus, the implementation of AI in education must be accompanied by ethics and privacy policies, which ensure that the benefits of technology are enjoyed in a fair and responsible manner.

THE FUTURE OF AI IN EDUCATION

The future of Artificial Intelligence (AI) in education points to a technological evolution that can further transform educational practices. Emerging trends indicate that AI will continue to play a central role in personalizing teaching, offering sophisticated solutions to meet the individual needs of students. According to Picão, Gomes, Alves, Barpi, and Luccheti (2023), it is expected that, with the advancement of technology, AI systems will become accurate in analyzing student performance, allowing teachers to offer specific monitoring. AI could, for example, anticipate each student's learning difficulties, adapting content and teaching methods in an efficient and agile way. This type of evolution will allow for adaptive education, where teaching strategies are continuously aligned with the needs of students, enhancing the learning process.

In addition, AI should expand its presence in schools, integrating itself intensively into the curriculum and pedagogical resources used in institutions. According to Giraffa and Kohls-Santos (2023), one of the future trends is the growing use of AI-based educational platforms that enable flexible and accessible teaching. It is hoped that AI technologies will allow not only the adaptation of content, but also the development of new forms of interaction between students and teachers. AI could be used to create immersive learning experiences, such as virtual teaching environments, in which students will be able to explore content in an interactive and dynamic way. This type of application can bridge the

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gap between theory and practice, allowing students to experience knowledge in a concrete and engaging way.

At the same time, the future of AI in education will also depend on its ability to adapt to new educational and societal demands. Duque *et al*. (2023) highlight that, as AI develops, new teaching methodologies may emerge, driven by the technology's ability to process large volumes of data and offer immediate *feedback*. This will enable a continuous evolution in educational practices, making them dynamic and interactive. In addition, AI is expected to integrate holistically into the school curriculum, not only as a pedagogical tool, but as an essential component in training students for the digital future. In this context, schools and educators will play a fundamental role in preparing students to interact with these new technologies in a critical and ethical way, which will require a reconfiguration of pedagogical practices and teacher training. Thus, the future of AI in education promises to be marked by a growing impact on the personalization of teaching, accessibility, and the way students and teachers relate to the learning process.

FINAL CONSIDERATIONS

The final considerations of this research aim to synthesize the main findings related to the introduction of Artificial Intelligence (AI) in classrooms and answer the research question: How does the introduction of Artificial Intelligence in classrooms transform educational paradigms and what perspectives arise with this change? Throughout the research, it was possible to see that AI has been consolidated as a tool for transformation in educational practices, providing a personalization of teaching, an adaptation to the individual learning rhythm and a significant impact on knowledge management and learning assessment. The application of AI in the classroom offers the possibility of creating interactive and dynamic learning environments, adjusted to the specific needs of each student, which contributes to increased engagement and educational effectiveness.

In addition, the research revealed that the introduction of AI in teaching is promoting changes in traditional pedagogical methods, challenging conventional approaches and driving the adoption of new methodologies, such as active methodologies. The new pedagogical approaches that emerge with the use of AI prioritize personalized learning and student autonomy, moving away from the traditional teacher-centered teaching model. The integration of AI into the school curriculum also contributes to the creation of an adaptable

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and flexible learning environment, which is essential to meet the diversity of learners and the demands of a digitalised society.

However, the survey also identified significant challenges related to the implementation of AI in schools, such as technological, financial, and pedagogical barriers, as well as ethical and privacy issues. The lack of adequate infrastructure, especially in public schools and in regions with fewer resources, makes it difficult to fully adopt this technology. The need for continuing education for educators was another central issue, since teacher training is essential to ensure the use of AI tools and for them to be able to integrate these technologies in a meaningful way into their pedagogical practices. The research also pointed out the importance of ensuring that AI is used ethically, with due respect for student privacy and ensuring that an over-reliance on technology is not created.

Regarding the contribution of the study, this work provided an analysis of the impacts of AI on education, addressing both the benefits and limitations of this technology. The research allowed us to better understand how AI can be integrated into pedagogical practices and how it can transform teaching and learning methods, providing inclusive, personalized, and efficient education. In addition, the findings highlight the need for public policies that promote equitable access to technology and the continuing education of educators, in order to ensure that all students can benefit from the innovations brought by AI.

However, the research also reveals the need for other studies that deepen the findings presented here. Although it has been possible to identify the main benefits and challenges of implementing AI, many aspects still need to be investigated, such as the impact of AI on the formation of students' socio-emotional skills, the long-term implications of personalization of teaching, and how AI can influence the relationship between educators and students. In addition, it is necessary to investigate the application of different types of AI in specific educational contexts, such as basic and higher education, to better understand how these technologies can be optimized to meet the demands of different age groups and areas of knowledge. Thus, the continuity of research on the use of AI in education is essential for the development of strategies and for overcoming the challenges identified in this research.

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