


Artificial intelligence and its use in the educational process

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ABSTRACT

The objective of this study was to analyze the impact of the use of artificial intelligence on the educational process. In this study, an integrative review was carried out using the SciELO and Google Scholar platforms to search for relevant scientific articles. The search was conducted using specific keywords and defined inclusion criteria, resulting in the selection of 4 full papers published in 2024. The analysis of the studies revealed an understanding of the impact of Artificial Intelligence (AI) on education, highlighting both its potential benefits, such as the personalization of teaching and the provision of immediate feedback, and the ethical and practical challenges associated with its implementation. AI has redefined traditional educational paradigms, requiring continuous adaptation by educators and institutional policies. Personalization of teaching and automated text analysis have emerged as crucial aspects, enabling new forms of adaptive and effective learning. However, it was crucial to address challenges such as data privacy, algorithmic bias, and fairness in access to AI technologies, ensuring an ethical, inclusive, and transparent approach. Continuous training of educators and collaboration between different stakeholders have been identified as key to maximizing the benefits of AI in education and mitigating its risks. Ongoing research into AI in education has been singled out

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as essential to explore its potential in a responsible and sustainable way, developing fair, inclusive, and respectful educational practices. All in all, the studies analyzed offered a comprehensive understanding of the impact of AI on education, emphasizing the importance of a collaborative approach to guide educational policies and pedagogical practices adapted to the era of Artificial Intelligence.

Keywords: Artificial intelligence, Education, Technology.



INTRODUCTION

Over the last few decades, technology has evolved and transformed the way people live, work and communicate. From the first personal computers to mobile devices and the Internet of Things, each technological advance has expanded human capabilities and enabled new ways of interacting with the world. The rapid evolution of technology continues to shape people's daily lives, driving innovations in all areas of society (OLIVEIRA et al., 2023).

In the educational context, technology plays an increasingly important role in facilitating learning and access to knowledge. Digital tools, such as computers, tablets, and educational software, have been incorporated into classrooms to enrich the teaching-learning process. Online platforms offer educational resources that are accessible anytime and anywhere, expanding education opportunities and empowering students to learn at their own pace and interests (AGUIAR, 2023).

In recent years, Artificial Intelligence (AI) has emerged as a technology with the potential to radically transform education. AI offers a range of applications in education, from intelligent tutoring systems to automated data analysis and personalization of teaching. With sophisticated algorithms, AI can adapt to students' individual needs, offering personalized feedback and stimulating critical thinking (RODRIGUES; RODRIGUES, 2023).

However, the advancement of AI in education also raises ethical and practical issues that need to be carefully considered. Issues such as student data privacy, algorithmic bias, and fairness in access to AI technologies are concerns that require a responsible and transparent approach. In addition, it is crucial to ensure that AI complements, and not replaces, human interaction in education, recognizing the irreplaceable value of educators in the educational process (TELES; NAGUMO, 2023).

Despite the challenges, the potential of AI in education is promising. With an ethical and collaborative approach, one can make the most of the benefits of AI to create more adaptive, inclusive, and effective learning environments. Ongoing research and dialogue between educators, technology developers, and policymakers are essential to ensure that AI in education is used responsibly and equitably, preparing students to meet the challenges of the twenty-first century (FERNANDES, 2023).

Thus, taking into account these circumstances, the objective of this study was to analyze the impact of the use of artificial intelligence on the educational process. It is hoped that the results of this research will provide a deeper understanding of the effects of artificial intelligence on education, contributing to the development of more effective educational practices that are adapted to the demands of the digital age.

In addition, it seeks to identify the potential benefits of integrating artificial intelligence into the educational environment, while examining the challenges and ethical considerations that arise



with its implementation. Understanding the impact of artificial intelligence on education is critical to informing future policies, pedagogical practices, and research to promote quality education that prepares students for the ever-evolving world.

METHODOLOGY

The methodology adopted in this study was an integrative review, which combines systematic analysis and literature review to address the topic in question in a broad and comprehensive way. To carry out this review, the SciELO and Google Scholar platforms were used, which are considered reliable and comprehensive sources of scientific articles.

The search for articles was conducted in a structured manner, using specific keywords and search descriptors relevant to the topic under study. Boolean operators such as AND and OR were employed to combine the search terms and ensure a comprehensive search, including both general and specific terms related to artificial intelligence and education.

The inclusion criteria were defined in order to select the most relevant articles for the scope of the research. Only full scientific articles, published in 2024, and that were fully available were considered. In addition, only Brazilian articles and those directly associated with the use of artificial intelligence in the educational process were included.

After the initial search, the articles were selected based on their relevance to the research objective and their contribution to the development of knowledge about the impact of artificial intelligence on education. The selected articles were then submitted to a detailed analysis, which involved critical reading and synthesis of the information presented.

The analysis of the articles occurred initially through the reading of the abstracts and titles of the articles. Subsequently, the selected articles were read in full for a deeper understanding of their content and contribution to the topic under study. During this stage, the main concepts, methodological approaches, and results presented in each study were identified. In addition, the authors' conclusions and considerations were highlighted, especially in relation to the impact of artificial intelligence on the educational process. As a result, a sample of 4 scientific articles was obtained.

RESULTS AND DATA ANALYSIS

Through this research, it was possible to select four scientific articles, as shown in chart 1.



Table 1. Selected articles

Authors	Objective	Methodology	Conclusion
Santos et al. (2024)	Analyze the growing impact of Artificial Intelligence (AI) on education	Systematic review	This study investigated the impact of Artificial Intelligence (AI) on education, aiming to understand how it is transforming pedagogical practices and identify the benefits, challenges, and ethical and social implications of its implementation. Using a systematic literature review methodology, relevant studies on AI in education were analyzed, allowing a detailed and structured understanding of the topic, minimizing biases. The results revealed that AI plays a significant role in personalizing teaching, contributing to more adaptive and student-centered learning environments. It redefines the role of the educator and improves the effectiveness of the learning process by highlighting innovations such as smart tutoring systems and adaptive learning platforms. However, significant challenges were also identified, especially in relation to ethical and digital inclusion aspects, such as data privacy, algorithmic bias, and accessibility of technology. It is concluded that AI has a transformative potential in education, offering opportunities to enrich and personalize the learning experience, but its implementation requires ethical reflection and efforts to ensure digital inclusion. Educators, policymakers, and technology developers must collaborate to maximize the benefits of AI in education while mitigating its risks and challenges. As technology advances, education must evolve responsibly and effectively, ensuring equitable benefits for all students.
Souza e Cardoso (2024)	Discuss and identify potential aspects of artificial intelligence for education, as well as the challenges of its implementation in the educational process	Bibliographic research	The text highlights the urgent need to adapt educational practices and institutional protocols to deal with the issues arising from the proliferation of content generated by Artificial Intelligence. The importance of ensuring an efficient and continuous learning process for the success of pedagogical activities and the development of students is highlighted. With advancements in artificial intelligence technology occurring at a rapid pace, the challenges around the use of these technological resources increase, necessitating an emerging sophistication of educational models. In addition, the need to develop tools to promote a more comprehensive and efficient educational policy is emphasized. It also emphasizes the importance of cultivating academic honesty and reinforcing the value of original work in educational settings.
Oliveira Filho et al. (2024)	Analyze the application of artificial intelligence (AI) in education, highlighting its revolutionary potential in pedagogical practice	Bibliographic research	The application of Artificial Intelligence (AI) in education represents a revolution in pedagogical practices, promoting personalization, immediate feedback, critical thinking, and collaborative learning. However, it is essential to address the associated ethical challenges, such as student privacy, algorithmic bias, and accountability in automated decisions. Guidelines for the responsible use of AI aim to mitigate these challenges by establishing ethical standards, promoting transparency, and ensuring equity of access. Continuous training of educators is crucial to maximizing the benefits of AI, empowering them to guide students responsibly and critically. Collaboration between educators, technology developers, and policymakers is essential to adapt educational practices to the demands of the digital age. In the future, the deeper integration of AI into education will drive continuous technological advancements, redefining teaching methods and transforming the concept of learning while maintaining a balance between innovation and ethics.
Meroto et al. (2024)	Explore the potential of Artificial Intelligence to transform teaching and learning methods	Bibliographic research	Artificial Intelligence (AI) has significant transformative potential in education, from personalizing teaching to automated text analysis, enriching the educational process. However, it is crucial to address ethical challenges such as data privacy, algorithmic bias, and fairness in accessing AI technologies. An ongoing commitment to transparency, ethics, and inclusion is essential. The balanced application of AI should complement traditional methodologies while preserving human interaction essential in education. Although AI offers new possibilities, it is essential to reflect on ethical, practical, and humanistic aspects. Ongoing research into AI in education is crucial to explore its potential while ensuring fair, inclusive, and respectful practices.

Source: Survey data (2024).

The study conducted by Santos et al. (2024) comprehensively addresses the impact of Artificial Intelligence (AI) on education, seeking to understand its transformations in pedagogical practices, as well as to identify the benefits, challenges, and ethical and social implications of its



implementation. To this end, the researchers used a systematic literature review methodology, which is recognized for its ability to provide a detailed and structured understanding of the topic while minimizing bias.

The results obtained reveal that AI plays a significant role in the personalization of teaching, contributing to the development of more adaptive and student-centered learning environments. This implies a redefinition of the role of the educator, who starts to act more as a facilitator of the learning process, and also in improvements in the effectiveness of teaching, highlighting innovations such as intelligent tutoring systems and adaptive learning platforms.

However, the study also identifies significant challenges associated with the implementation of AI in education, especially with regard to ethical and digital inclusion aspects. Issues such as data privacy, algorithmic bias, and accessibility of technology emerge as important concerns to address. This underscores the need for continuous ethical reflection and efforts to ensure digital inclusion, in order to avoid widening inequalities in access to education.

The study's conclusion highlights the transformative potential of AI in education, providing opportunities to enrich and personalize the learning experience. However, its implementation must be accompanied by a careful analysis of the risks and challenges involved, as well as measures to mitigate them.

In this regard, collaboration between educators, policymakers, and technology developers is key to maximizing the benefits of AI in education while ensuring a responsible and equitable approach. Thus, the study highlights the importance of a responsible and effective evolution of education as technology advances, aiming to ensure equitable benefits for all students and minimize any potential negative impacts.

Souza and Cardoso (2024) emphasize the urgency of adapting educational practices and institutional protocols in the face of the growing proliferation of content generated by Artificial Intelligence (AI). This need for adaptation is crucial to deal with emerging challenges and ensure an efficient and continuous learning process, promoting the success of pedagogical activities and the development of learners.

The rapid evolution of AI technology poses new challenges to the use of these technological resources in education, requiring an increasing sophistication of existing educational models. As a result, it is imperative to develop tools and approaches that enable a more comprehensive and efficient educational policy, capable of harnessing the potential of AI in a productive and ethical manner.

In addition, the study highlights the importance of cultivating academic honesty and reinforcing the value of original work in educational settings. In a context where AI can generate



content in an automated way, it is essential to foster a culture that values authenticity and academic integrity, encouraging the production of genuine and original knowledge by students.

Therefore, the work of Souza and Cardoso (2024) highlights the pressing need for adaptation and sophistication of educational practices in the face of advances in AI. This includes the development of more comprehensive educational policies, the strengthening of academic honesty, and the enhancement of the value of original work, contributing to a more efficient, ethical, and development-centered education for learners.

The study conducted by Oliveira Filho et al. (2024) highlights the revolutionary impact of Artificial Intelligence (AI) on education, providing a significant transformation in pedagogical practices. The application of AI in this context is highlighted as a tool that promotes the personalization of teaching, offering immediate feedback to students, stimulating critical thinking, and fostering collaborative learning. These aspects underscore AI's ability to adapt to individual student needs and create more dynamic and engaging learning environments.

The study also addresses, however, the ethical challenges inherent in the use of AI in education. Issues such as student privacy, algorithmic bias, and accountability in automated decisions are mentioned as significant concerns that must be addressed. In this sense, guidelines for the responsible use of AI are proposed as a way to mitigate these challenges by establishing ethical standards, promoting transparency, and ensuring equity of access.

Continuous training of educators is identified as a crucial element to maximise the benefits of AI in education. Empowering educators to responsibly and critically guide students in the face of the use of these emerging technologies is essential to ensure that the potential of AI is fully realized. Collaboration between educators, technology developers, and policymakers is highlighted as key to adapting educational practices to the demands of the digital age. This interdisciplinary collaboration is necessary to ensure that educational policies and technologies used are aligned with ethical principles and the best interests of students.

Finally, the study suggests that the deeper integration of AI into education will drive continued technological advancements, redefining teaching methods and transforming the concept of learning. However, the importance of maintaining a balance between innovation and ethics is underscored, ensuring that the use of AI in education truly benefits all learners and promotes a fairer and more inclusive society.

Meroto et al. (2024) highlight the significant transformative potential of Artificial Intelligence (AI) in education, ranging from the personalization of teaching to automated text analysis, thereby enriching the educational process. This perspective highlights AI's ability to adapt to individual student needs and to offer resources that complement and enhance traditional teaching methodologies.



However, the study also underscores the importance of addressing the ethical challenges associated with implementing AI in education. Issues such as data privacy, algorithmic bias, and fairness in access to AI technologies emerge as fundamental concerns that must be carefully considered. In this context, the need for an ongoing commitment to transparency, ethics, and inclusivity is emphasized, ensuring that the use of AI in education benefits all students in a fair and equitable manner.

One crucial aspect highlighted by the study is the importance of maintaining a balance between the application of AI and the preservation of human interaction essential in education. Although AI offers new possibilities and tools to improve the teaching-learning process, it is essential to recognize and value the role of educators and human interaction in the integral formation of students.

In addition, the study emphasizes the need for continued reflection on ethical, practical, and humanistic aspects related to the use of AI in education. This entails a critical and reflective approach that considers not only the technical benefits of AI but also its social, cultural, and ethical impacts.

The study underscores the importance of ongoing research into AI in education to explore its potential in a responsible and sustainable manner. Through this research, it is possible to develop fair, inclusive, and respectful educational practices, ensuring that AI is used as a tool to promote educational and social progress in an equitable and ethical manner.

FINAL THOUGHTS

The analysis of the studies reveals a holistic view on the impact of Artificial Intelligence (AI) on education. These studies highlight not only the potential benefits of AI in personalizing teaching, providing immediate feedback, and enriching the educational process, but also the ethical and practical challenges that arise with its implementation.

The research reveals that AI is redefining traditional paradigms of education, transforming pedagogical practices and requiring continuous adaptation from educators and institutional policies. Personalization of teaching and automated text analysis emerge as crucial points, offering new possibilities for adaptive and effective learning.

However, ethical challenges such as data privacy, algorithmic bias, and fairness in access to AI technologies require a careful and transparent approach. Continued reflection on these aspects is essential to ensure that the use of AI in education is ethical, inclusive, and equitable. Continuous training of educators and collaboration between different stakeholders, including educators, technology developers, and policymakers, are identified as key elements to maximize the benefits of AI in education while mitigating the associated risks and challenges.



The research highlights the importance of ongoing research into AI in education to explore its potential in a responsible and sustainable manner. Through this research, it is possible to develop fair, inclusive, and respectful educational practices, ensuring that AI is used as a tool to promote educational and social progress in an equitable and ethical manner.

Therefore, the studies analyzed offer a comprehensive and multifaceted understanding of the impact of AI on education, emphasizing the importance of a responsible and collaborative approach to maximize its benefits and mitigate its challenges. These conclusions are essential to guide educational policies and pedagogical practices adapted to the era of Artificial Intelligence.



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