

Review article

How to cite: Supelano Londoño, M. L. (2025). La Inteligencia Artificial como aliada en la educación superior: más allá del aula. *Estrategia y Gestión Universitaria*, 13(2), e8968. <https://doi.org/10.5281/zenodo.17535089>

Received: 20/08/2025

Accepted: 31/10/2025

Published: 10/11/2025

Corresponding author:



msupelanolo@uniminuto.edu.co

Conflict of interest: the authors declare that they have no conflict of interest, which may have influenced the results obtained or the proposed interpretations.

Mary Lizeth Supelano Londoño ¹
Corporación Universitaria Minuto de Dios
UNIMINUTO
<https://orcid.org/0009-0003-2560-7490>
msupelanolo@uniminuto.edu.co
Colombia



Artificial Intelligence as an ally in higher education: beyond the classroom

La Inteligencia Artificial como aliada en la educación superior: más allá del aula

Inteligência Artificial como aliada no ensino superior: para além da sala de aula

Abstract

Introduction: education has undergone a significant transformation in both learning and teaching approaches. Conceived as a fundamental process for human development, it has begun to embrace emerging technologies, including artificial intelligence, while upholding diversity and strengthening the connection between educators, learners, and knowledge. **Objective:** to analyze how artificial intelligence has evolved from an emerging trend to an essential tool within and beyond the classroom in higher education, addressing its impact beyond traditional teaching paradigms. **Methodology:** an argumentative reflection was conducted based on the observation of current cases involving the use of artificial intelligence in university settings. This was complemented by a literature review of publications from 2020 to 2025 and the use of support tools such as Jenni AI and Scite AI to organize and explore the most relevant academic sources. **Results:** various applications of artificial intelligence in higher education were identified, including virtual assistants, adaptive learning platforms, automated learning algorithms, and predictive analytics. **Conclusion:** artificial intelligence does not pose a threat, provided its implementation adheres to ethical principles and takes into account existing technological gaps.

Keywords: Artificial intelligence, higher education, learning, classroom, technology

Resumen

Introducción: la educación ha experimentado un cambio significativo en la manera de aprender como en la de enseñar. Entendida como un proceso necesario para el desarrollo humano ha comenzado a abrirse a nuevas tecnologías entre ellas la inteligencia artificial, respetando la diversidad y la consolidación del vínculo entre docentes, estudiantes y saberes.

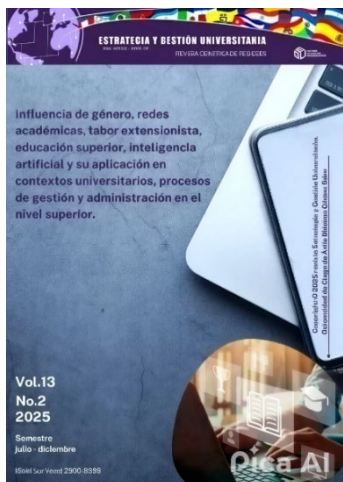
Objetivo: analizar cómo la inteligencia artificial ha dejado de ser una tendencia emergente para convertirse en una herramienta esencial dentro y fuera del aula en la educación superior, abordando su impacto más allá de la enseñanza tradicional. **Metodología:** se realizó una reflexión argumentativa a basada en la observación de casos actuales de uso de inteligencia artificial en el contexto universitario, completada con una revisión bibliográfica de literatura publicada entre 2020 y 2025, y el uso de herramientas de apoyo como Jenni IA y Scite AI para organizar y explorar las fuentes académicas más relevantes. **Resultados:** se identificaron diferentes usos de la inteligencia artificial en la educación superior, la inclusión de asistentes virtuales, plataformas de aprendizaje adaptativo, algoritmos de aprendizaje automatizado y análisis predictivo. **Conclusión:** la inteligencia artificial no representa una amenaza, siempre que su implementación respete los principios éticos y considere las brechas tecnológicas existentes.

Palabras clave: Inteligencia artificial, educación superior, aprendizaje, aula, tecnología

Resumo

Introdução: a educação passou por uma transformação significativa tanto nas formas de aprender quanto de ensinar. Compreendida como um processo essencial para o desenvolvimento humano, começou a incorporar novas tecnologias, entre elas a inteligência artificial, respeitando a diversidade e fortalecendo o vínculo entre docentes, discentes e saberes. **Objetivo:** analisar como a inteligência artificial deixou de ser uma tendência emergente para se tornar uma ferramenta essencial dentro e fora da sala de aula no ensino superior, abordando seu impacto para além da educação tradicional. **Metodologia:** foi realizada uma reflexão argumentativa baseada na observação de casos atuais de uso da inteligência artificial no contexto universitário, complementada por uma revisão bibliográfica de literatura publicada entre 2020 e 2025, além da utilização de ferramentas de apoio como Jenni IA e Scite AI para organizar e explorar as fontes acadêmicas mais relevantes. **Resultados:** foram identificadas diversas aplicações da inteligência artificial no ensino superior, incluindo assistentes virtuais, plataformas de aprendizagem adaptativa, algoritmos de aprendizagem automatizada e análise preditiva. **Conclusão:** a inteligência artificial não representa uma ameaça, desde que sua implementação respeite os princípios éticos e considere as desigualdades tecnológicas existentes.

Palavras-chave: Inteligência artificial, ensino superior, aprendizagem, sala de aula, tecnologia



Introduction

In recent decades, we have witnessed significant transformations in the ways humanity produces, circulates, and appropriates knowledge (Túñez-López et al., 2019). The emergence of digital technologies, particularly Artificial Intelligence (AI), represents a paradigm shift that impacts, among other areas, educational systems, challenging traditional strategies of teaching, learning, assessment, and institutional management (Bermeo-Paucar, 2024; Cisneros et al., 2023). Higher education, as a space for generating advanced knowledge and scientific production, has not remained unaffected by these transformations; rather, it serves as a privileged venue for experimentation, implementation, and critical reflection on the effects of AI in educational processes (Avellaneda-Callirgos et al., 2025; Gallifa et al., 2021).

Today, much of the literature and public debate tends to focus almost exclusively on the use of AI related to the classroom, overlooking the multiple ways in which this technology comprehensively transforms the university ecosystem (Donayre Bohabot et al., 2024). The article presented here aims to consider Artificial Intelligence as an agent of structural change in higher education, extending beyond didactic use to lines of work related to academic management, student support, scientific research, institutional governance, and strategic planning. AI transforms higher education, impacting far beyond the traditional classroom.

Recent research explores how AI can enhance teaching, learning, administration, and student support while presenting challenges and opportunities for the future of universities. According to Nimbalegundi et al. (2024), AI has demonstrated its potential to transform numerous fields, and education is no exception. In the same vein, González (2023) argues that this tool is powerful and is generating a revolution in the way teaching and learning occur. AI is a technology that drives education at all levels, from early childhood to higher education, showing positive advancements in teaching, although caution is currently warranted regarding interactions with these technological applications. This overview of AI-generated (GenAI) tools for higher education, such as ChatGPT, MidJourney, or Codex, also highlights "AI-driven learning." AI technologies, including natural language processing (NLP), automated performance enhancement (APE), intelligent tutoring systems (ITS), personalized learning systems (PLS), virtual reality (VR), and augmented reality (AR), can be applied across various areas of teaching, learning, research, and societal service. According to Porayska-Pomsta et al. (2022), these applications offer significant potential to transform educational processes.

Historically observing AI, we note that university systems have undergone many stages; initially, it was not a promising prospect. Earlier technologies preceding AI, such as basic computing or virtual learning environments, showed important changes in teaching modalities. AI goes further by incorporating the ability to learn, adapt, and make decisions based on patterns derived from massive data analysis (Marr, 2020). This quality renders AI a technology endowed with agency, capable of mediating academic, administrative, and scientific processes in real-time and simultaneously redesigning institutional practices, thus posing new epistemological, ethical, and political challenges.

One of the most evident contributions of AI in the realm of higher education is its ability to adapt learning, personalizing diverse content and various pedagogical

strategies to the characteristics of each student. Platforms based on machine learning algorithms can detect behavioral patterns, reinforcement needs, or specific cognitive strengths, providing timely feedback and personalized guidance (Luckin et al., 2016). This capability has proven to be not only adaptive but also inclusive, generating concern and fear regarding the misuse of private data, the opacity of algorithms, and the risk of reproducing structural biases (Williamson & Eynon, 2020). AI is not only articulated through the pedagogical dimension but also subtly yet substantially modifies academic and administrative management processes. Various universities have begun to integrate institutional intelligence systems that, through the collection and analysis of massive data, allow for anticipating trends, identifying dropout risks, optimizing resource usage, or designing more efficient strategic interventions (Daniel, 2015).

Scientific research has been impacted by AI, facilitating the systematic organization of data, automated literature review, experimental design, and result prediction. In fields such as biomedicine, economics, or engineering, researchers have incorporated algorithmic models to analyze complex databases, identify correlations, and generate hypotheses with a level of precision and speed unattainable through traditional methods (Jordan & Mitchell, 2015).

While these tools amplify the evolutionary capabilities of academic workers, they also raise questions about the boundaries that demarcate human authorship and technical intervention, challenging conventional notions of creativity, originality, and research ethics. The implementation of AI in education enables personalized learning experiences and provides students with content and feedback tailored to their individual needs and learning styles (López et al., 2023). This personalization fosters student engagement and enhances learning outcomes by addressing specific knowledge gaps and learning preferences (Dey et al., 2025).

In this context, the use of AI in higher education highlights epistemological and pedagogical tensions that cannot be overlooked. From an epistemological perspective, we must question how knowledge is produced through automated models: Is AI an ally in higher education? This is a reflection we must confront. From a pedagogical standpoint, we need to learn how to interact with the tools that technology offers, training both educators and students in the new roles they must establish with AI in a context where intelligent technologies mediate, ensuring that the use of AI does not exacerbate inequalities or undermine the principles of educational justice. Ethically, there must be normative frameworks and guiding principles regarding data usage, algorithm transparency, and the establishment of human-centered AI.

In light of this landscape, the present article aims to construct a broad, rigorous, and proactive analysis of the role of Artificial Intelligence as a strategic ally in the transformation of higher education. We start from a holistic conception of the educational phenomenon, recognizing the interdependence between the pedagogical dimension, the institutional dimension, the technological dimension, and the cultural dimension. Through a review of updated literature, the study analyzes concrete experiences of AI implementation in universities from different parts of the world, identifies emerging opportunities and risks, and ultimately

proposes a set of recommendations for the ethical, critical, and consistent integration of these technologies in higher education.

Methodology

The methodology of this review is framed within a qualitative approach, in accordance with the proposals of Gómez (2012), who defines it as “the discipline that is responsible for the critical study of the procedures and means applied by humans to achieve and create knowledge in the field of scientific research.” Consistent with this, the methodology focuses on understanding complex social phenomena from the participants’ perspectives, aiming to explore meanings, experiences, and perceptions through content analysis (Mativi et al., 2020).

To address the research question, a list of inclusion and exclusion criteria was generated prior to conducting the bibliographic search. The inclusion criteria focused on documents (books and articles) that discuss the impact of artificial intelligence on higher education and that had been published between 2020 and 2025 (see Table 1).

Table 1

Eligibility criteria

Criterion	Description
Year of Publication	Articles or documents published between 2015 and 2025 were selected.
Language	Only articles or documents written in English or Spanish were included.
Type of Document	Only peer-reviewed articles, collections of web pages, books and book chapters, and peer-reviewed conference papers were considered.
Thematic Relevance	• Studies must specifically address the impact of AI on higher education. • Expansion of educational impact. • Optimization of institutional processes.

- Transformation of the teaching and student roles.
- Contribution to educational quality and equity.
- Response to contemporary challenges.

Text Accessibility	Only the documents that were accessible were taken into account, under the presumption of full access in the complete format.
-----------------------	---

Study Quality	The quality was assessed using the Mixed Methods Appraisal Tool (MMAT), and only high-scoring studies were included.
---------------	--

Source: Author’s own elaboration.

As exclusion criteria, articles from journals without an ISSN (International Standard Serial Number) or those that did not meet the quality evaluation established by the Mixed Methods Appraisal Tool (MMAT) were eliminated. The MMAT, developed by Honga et al. (2019), includes five criteria for evaluating the quality of qualitative studies, randomized controlled trials, non-randomized studies, descriptive quantitative studies, and mixed methods studies. Including this evaluation criterion ensured that only high-quality academic articles were included in the study.

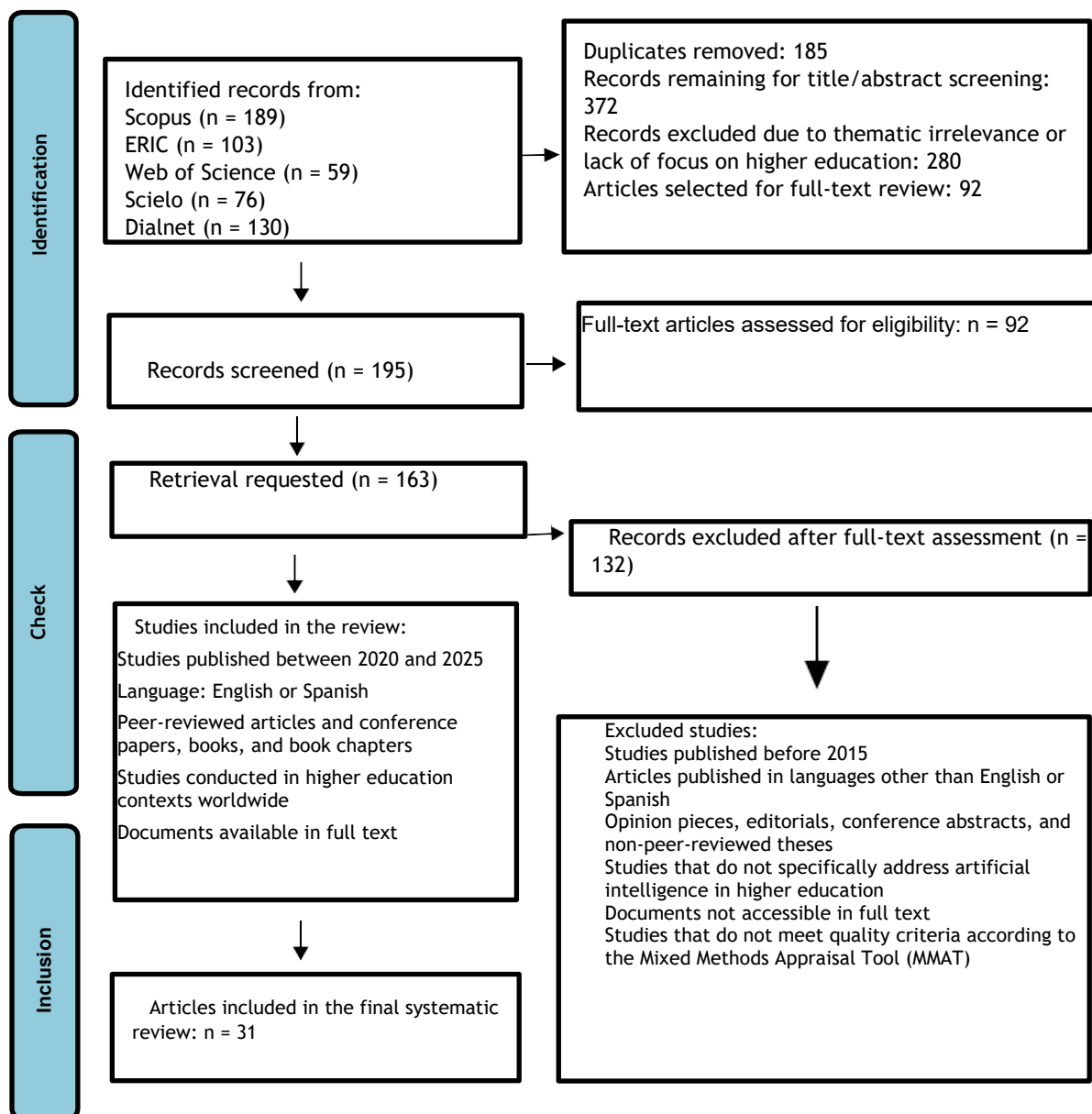
The bibliographic search was conducted between January and June 2025. The databases used included Scopus, Web of Science, Erih Plus, Scielo, and Dialnet. Keywords in both Spanish and English were employed, such as "inteligencia artificial en educación superior," "Machine Learning en universidades," "impacto de IA en el aprendizaje universitario," "Artificial Intelligence in higher education," "AI in university learning," "beyond the classroom," and "Inteligencia Artificial en la Educación Superior: Aplicaciones y Perspectivas".

This approach allowed for the identification of a total of 163 documents that met the inclusion criteria. After a thorough review, 31 articles were selected, classified, and interpreted, utilizing the PRISMA statement (Page et al., 2021).

Figure 1

Flow diagram based on the PRISMA statement

Identification of studies through databases and records



Source: Author's own elaboration.

To evaluate the quality of the selected studies, a checklist based on standard methodological criteria was applied, considering both internal and external validity, clear presentation of methods and results, and the relevance of the study to the research question. Each study was assigned a quality score, and only those achieving high ratings were included in the final analysis. This qualitative assessment ensures

that the findings of the review possess a level of confidence that allows for the contribution of relevant insights to the field of artificial intelligence in higher education.

Following this, a synthesis of the data extracted was conducted using a thematic approach, which reveals trends and common patterns in the findings among the reviewed studies, as well as comparative benchmarks based on the type of AI used and the educational context. The results are presented in a narrative format, guided by tables and figures that summarize the findings.

The integration of AI in higher education not only optimizes educational processes but also opens new avenues for pedagogical innovation and continuous improvement (Ojha et al., 2023). The use of AI is essential for enhancing learning and teaching (Ayala-Pazmiño, 2023).

Results and discussion

The results of this systematic literature review (SLR) are classified into different emerging categories that have surfaced following the analysis of the 27 publications selected for this review. These emerging categories represent the main findings of the research, linked to the inclusion of artificial intelligence in higher education, describing both the advantages and the ethical and practical issues that have been uncovered. A synthesis of the reviewed articles is presented, along with the categorization of the emerging findings.

The academic and administrative role of artificial intelligence in education

According to Ahmad et al. (2022), teachers are responsible for instruction in any educational setting. However, they undertake additional tasks. Aside from academic responsibilities, most of educators' time and resources are devoted to administrative tasks. Mendieta Lucas et al. (2025) and Álvarez-Carrión et al. (2025) agree that AI applications not only assist in academic and administrative education but also enhance their effectiveness. AI provides support to educators in various tasks, such as Learning Analytics (LA), Virtual Reality (VR), Grading/Evaluation (G/A), and Admissions. It minimizes the administrative workload on teachers, allowing them to focus more on teaching and student guidance.

Therefore, AI facilitates the automation of administrative tasks and the provision of immediate feedback (Trávez Tipan, 2024). This frees up time for educators to concentrate on teaching and curriculum development, thereby improving the quality of education. AI platforms can offer personalized feedback on student performance, identify areas for improvement, and suggest additional resources to strengthen their skills (Tarisayi, 2023). However, the adoption of AI in higher education is not without challenges.

Among the primary obstacles are ethical and privacy concerns, as well as the necessity to ensure that the implementation of these technologies does not perpetuate existing biases or exclude marginalized groups (Zhang, 2023). It is

essential for institutions to develop clear and transparent policies to guide the use of AI and ensure its ethical and equitable application (Spivakovsky et al., 2023; Tao et al., 2021).

The use of artificial intelligence in an academic environment

AI is a branch of computer science focused on creating intelligent machines capable of simulating human intelligence, behavior, and learning (Márquez Benavides et al., 2023; Oliver, 2021). The academic community has not remained immune to the allure of AI. The purpose of this work is to analyze and discuss the implications of AI in academic environments, allowing readers to engage in a critical debate regarding the use of artificial intelligence in an academic setting. AI has the potential to accelerate scientific discoveries, open doors to knowledge, and facilitate advancements in various fields of study (Maceri & Coll, 2024; Rodríguez Padilla et al., 2024). Public universities can harness the power of AI to enhance research capabilities and personalize education (Márquez Benavides et al., 2023).

The integration of artificial intelligence technologies in higher education has enabled significant personalization of learning. According to Rodríguez-Chávez (2021) and Jaramillo (2024), the use of Machine Learning and Deep Learning algorithms has allowed for adaptation to the individual needs of students, thereby enhancing their academic potential.

In this regard, educators are attempting to experiment with these tools by modifying the types of tasks they assign; this is referred to as "emerging pedagogies." While AI can assist in educational contexts, it is crucial for educators to understand these systems so they can make informed decisions, and if they choose to integrate them, do so within a framework of coherent didactic strategies (Sánchez Vera, 2024).

Artificial intelligence in the context of teacher training

The new information society presents significant challenges that, in turn, demand substantial changes in the training frameworks of educational institutions. AI offers a wide range of benefits in education but also presents a series of challenges. At the higher education level, there is an urgent need for planning, designing, developing, and implementing digital competencies, with the aim of training and graduating better professionals who can compete in technological environments (Ayala-Pazmiño, 2023).

AI provides powerful tools to adapt teaching to the individual needs of students, thereby enhancing the effectiveness and overall educational experience (Cobos Velasco, 2023; Meza Arguello et al., 2025). Recent studies highlight that AI in virtual classrooms of higher education can facilitate continuous tracking of student progress, allowing for faster feedback and early identification of learning difficulties (Cherrez Escobar et al., 2024; Mar Cornelio et al., 2024). Additionally, AI in personalized learning has been shown to promote the creation of more inclusive educational environments, effectively addressing the diverse needs of students (Ortiz Aguilar et al., 2024). While this technological advancement poses ethical and privacy challenges, particularly regarding the collection and use of personal data (Velasco, 2023).

Reflection and collaboration in educational environments

The teacher, as a critical and reflective practitioner, must participate in the creation of pedagogical knowledge and in decision-making processes regarding educational practices. Early experiences in the classroom constitute a key period in the professional development of teachers (Gómez, 2009).

The implementation of AI in higher education presents significant challenges, including ethical issues, privacy concerns, and the need to reform academic policies to ensure educational integrity and quality (Bennett, 2023). The risks associated with the adoption of AI in education include potential job losses and biases inherent in automated systems (George & Wooden, 2023).

Practical and ethical recommendations for using AI

When implementing AI in any domain, especially higher education, it is essential to consider practical and ethical considerations to maximize the benefits of AI tools while minimizing the risks associated with their use

The following recommendations are based on current research:

- **Practical recommendations**

Artificial intelligence has evolved significantly since its origins in the 1950s, when Turing and other pioneers raised questions about the ability of machines to think. Its development has transformed numerous fields, including education, where AI-based technologies have revolutionized teaching and learning methods, allowing for educational personalization and optimization (Alcocer, 2024). AI has proven to be a promising tool in education, with significant implications for how teaching and learning occur. The inclusion of AI in education has provided an impetus for the recommendation of educational content, enabling personalized and efficient learning (León Granizo, 2024). However, it is important to recognize that AI does not operate independently; its implementation in higher education includes several key aspects. It is crucial to provide adequate training for educators and administrative staff, not only in the technical use of AI platforms but also in their pedagogical integration within the classroom (Younas et al., 2023).

- **Ethical recommendations**

AI has emerged as a powerful tool in both scientific and social fields, enhancing education and research through new methods of teaching and access to knowledge. However, its adoption poses significant ethical and moral challenges, such as the need to address transparency, biases, and discrimination (Cárdenas, 2024). The use of AI in education from an ethical perspective should consider its impact on educational contexts as a breeding ground for the ethical and political challenges faced by society. This allows for an understanding of its scope and depth, proposing measures to address these challenges (Rodríguez, 2024). The implementation of AI in higher education must adhere to ethical and transparent principles to maximize its benefits and minimize risks. The algorithms used must be transparent and auditable, enabling students and academic staff to understand how automated decisions are made and to question and correct possible errors (Agbese

et al., 2023).

As previously indicated, the results obtained from this literature review provide a comprehensive view of the integration of AI in higher education. The following sections will interpret the results and discuss how they differ from previous research, if applicable, and what implications they hold for education.

Comparison with previous studies

The findings of this review align with and expand the existing literature on the integration of AI in higher education, demonstrating that AI is changing the university environment. This change is evident not only in the pedagogical domain but also in academic management, scientific research within educational institutions, student support, and institutional decision-making. This structural transformation transcends traditional educational approaches and invites a critical examination of the role of technology in the educational process.

Among the most notable findings is AI's ability to promote personalized teaching. Platforms driven by machine learning algorithms allow for interaction and the creation of adaptive content tailored to each student's needs. This represents a step toward a more inclusive and student-centered education, as suggested by López et al. (2023) and Dey et al. (2025). However, concerns arise regarding unethical practices related to data privacy, algorithm transparency, and the potential perpetuation of structural biases (Williamson & Eynon, 2020).

Scientific research is increasingly vulnerable as AI enables the processing of large volumes of information, identifying complex correlations and generating hypotheses with greater precision. However, this capability raises questions about human authorship and presents new epistemological and ethical challenges, particularly regarding the originality of produced knowledge (Jordan & Mitchell, 2015; Marr, 2020). From a qualitative perspective, this article helps to understand the opportunities and threats emerging from the use of AI in educational contexts. While AI is viewed as a strategic ally for educational enhancement, its usage must be critical, ethical, and contextualized. It is not merely about adopting new technological tools but about rethinking their use, the paradigms under which they operate, educational justice, and continuous improvement.

Ethical and practical challenges

Despite the numerous advantages, the implementation of artificial intelligence in higher education poses ethical and practical issues. Data privacy risks and algorithmic bias are essential concerns that must be addressed (Quinto Ochoa, 2024; Gallent-Torres et al., 2024). From this perspective, the lack of integrated training for teaching staff and insufficient technological infrastructure are practical obstacles that could hinder the effective implementation of AI (Hemachandran et al., 2022). These challenges highlight the need to create clear regulations and policies to ensure the proper use of AI in educational environments.

Practical and ethical recommendations

For successful implementation, a series of practical and ethical recommendations should be followed. First, teaching and administrative staff must receive adequate training to effectively manage all the aforementioned tools. In

addition, universities should invest in increasing technological infrastructure to support these initiatives (Varela, 2023).

From an ethical standpoint, it is essential to develop algorithms that are used transparently and are auditable; this way, risks can be minimized, and it can be ensured that automated decisions are fair and equitable. Educators should be involved in the AI implementation process, as it will be an ally in organizing classes and other activities with students. It is crucial that technologies adapt to the real needs of both students and teachers.

Implications for future research

The findings of this review highlight the need to continue research on the use of AI in various educational settings, particularly in areas that still present significant challenges. Future research should focus on developing and testing different methodologies used for the implementation of AI in educational contexts, considering important aspects such as student diversity, cultural and religious differences, and technological infrastructure.

Conclusions

This literature review examines how artificial intelligence can be integrated responsibly and equitably within educational settings, aiming to maximize its positive effects while minimizing the negative ones. The results of this research demonstrate AI's capacity to adapt learning and enhance students' academic performance. These findings align with previous studies that establish its efficacy as an educational tool while identifying new impacts, such as improvements in school management and the promotion of a humanistic approach to education.

Among the benefits of using artificial intelligence is its ability to generate personalized teaching methods tailored to students' needs, leading to better academic performance. AI acts as an automator of administrative tasks, freeing educators from operational activities and allowing them to focus on curriculum development and instructional quality. Furthermore, its implementation facilitates immediate and personalized feedback, enhancing learning acquisition and fostering collaborative and interactive environments based on augmented and virtual realities, significantly increasing students' understanding and retention of knowledge.

In the broader context of educational research, these elements align with the growing digitalization and personalization of learning. The comparison with other reviewed studies indicates coherence in describing the advancements achievable through artificial intelligence, as well as in identifying the ethical and practical challenges that must be addressed for effective implementation. Artificial intelligence offers the potential to transform higher education, provided it is used cautiously and measures are taken to avoid biases, thus ensuring equitable access for all students.

Recognizing the limitations of the study, it is relevant to note that the review

is based on research published between 2020 and 2025, which may exclude some pertinent work due to temporal constraints. Nevertheless, this work opens new lines of inquiry and may inspire future researchers to explore how artificial intelligence continues to position itself as a valuable and just ally in the educational field.

References

- Agbese, M., Mohanani, R., Khan, A., & Abrahamsson, P. (2023). Implementing AI ethics: Making sense of the ethical requirements. *Proceedings of the 27th International Conference on Evaluation and Assessment in Software Engineering*, 740-753. <https://doi.org/10.1145/3593434.3593453>
- Ahmad, S. F., Alam, M. M., Rahmat, M. K., Mubarik, M. S., & Hyder, S. I. (2022). Academic and administrative role of artificial intelligence in education. *Sustainability*, 14(3), 1101. <https://doi.org/10.3390/su14031101>
- Alcocer, A., Cabrera, A., & García, E. (2024). La inteligencia artificial en la educación: Desafíos éticos y perspectivas hacia una nueva enseñanza. *Latam. Revista Latinoamericana de Ciencias Sociales y Humanidades*, 5(6). <https://doi.org/10.56712/latam.v5i6.3019>
- Álvarez-Carrión, J. A., Guerrero-Jirón, J. R., & Ramírez-Morales, I. E. (2025). Inteligencia Artificial en la Educación Superior: transformación académica, desafíos éticos y estrategias para la garantía de derechos. *MQRInvestigar*, 9(1), e224. <https://doi.org/10.56048/MQR20225.9.1.2025.e224>
- Ayala-Pazmiño, M. (2023). Inteligencia artificial en la educación: Explorando los beneficios y riesgos potenciales. *593 Digital Publisher CEIT*, 8(3), 892-899. <https://doi.org/10.33386/593dp.2023.3.1827>
- Bennett, L. (2023). Optimising the interface between artificial intelligence and human intelligence in higher education. *International Journal of Teaching, Learning and Education*, 3(1). <https://doi.org/10.22161/ijtle.2.3.3>
- Bermeo-Paucar, J., Pérez-Martínez, L., & Villalobos Antúnez, J. V. (2024). Inteligencia Artificial Educativa. “Quinta ola”, Conectivismo e Innovación Digital Pedagógica. *European Public & Social Innovation Review*, 9, 1-17. <https://doi.org/10.31637/epsir-2024-1599>
- Bolaño-García, M., & Duarte-Acosta, N. (2024). Una revisión sistemática del uso de la inteligencia artificial en la educación. *Revista Colombiana de Cirugía*, 39(1), 51-63. <https://doi.org/10.30944/20117582.2365>
- Cárdenas, R., & Rascón, A. (2024). El uso ético y moral de la inteligencia artificial en educación e investigación. *Ciencia Latina. Revista Científica Multidisciplinar*, 8(5), 3243-3261. https://doi.org/10.37811/cl_rcm.v8i5.13801
- Castro, M., Ortega, C., Alvarado, N., & Sánchez, R. (2023). Inteligencia artificial en el contexto de la formación docente. *Reciamuc*, 7(4), 153-161. [https://doi.org/10.26820/reciamuc/7.\(4\).oct.2023.153-161](https://doi.org/10.26820/reciamuc/7.(4).oct.2023.153-161)

- Cherrez Escobar, G. D., Escobar Arcos, P. G., Grijalva Ramos, S. L., Tisalema Mayorga, V. del P., & León Delgado, J. A. (2024). Análisis del Aprendizaje en Estudiantes en Entornos Educativos Virtuales con el Uso de Inteligencia Artificial. *Ciencia Latina Revista Científica Multidisciplinar*, 8(6), 3908-3921. https://doi.org/10.37811/cl_rcm.v8i6.15133
- Cobos Velasco, J. C. (2023). El papel de la inteligencia artificial en la personalización del aprendizaje. *Revista Ingenio Global*, 2(1), 4-12. <https://doi.org/10.62943/rig.v2n1.2023.57>
- Cobos Velasco, J. C. (2023). El papel de la inteligencia artificial en la personalización del aprendizaje. *Revista Ingenio Global*, 2(1), 4-12. <https://doi.org/10.62943/rig.v2n1.2023.57>
- Cornelio, O. M., Rodríguez Rodríguez, A., Solórzano Álava, W. L., Amén Mora, P. G., Santos Mera, L. M., & Pinargote Bravo, B. J. (2024). *La inteligencia artificial: Desafíos para la educación*. Editorial Internacional Alema. <https://editorialalema.org/libros/index.php/alema/article/view/34>
- Daniel, B. (2015). Big data and analytics in higher education: Opportunities and challenges. *British Journal of Educational Technology*, 46(5), 904-920. <https://doi.org/10.1111/bjet.12230>
- Dávila Cisneros, J. D., Flores Limo, F. A., Barrios Tinoco, L. M., Cavero Aybar, H. N., Calizaya Alarcón, V. G., Medina Romero, M. Á., & Romero Flores, R. A. (2023). Adjustment of Peruvian university students to artificial intelligence. *Arts Educa*, 36. <https://artseduca.com/submissions/index.php/ae/article/view/145>
- Dávila-Cisneros, J. D., Fernandez-Celis, M. P., Tello-Flores, R. Y., & Puican-Carreno, A. (2024). Análisis de la comunicación alumno-profesor en la enseñanza universitaria. *Episteme Koinonía*, 7(14), 40-62. https://ve.scielo.org/scielo.php?script=sci_abstract&pid=S2665-02822024000200040&lng=es&nrm=iso&tlng=es
- Dey, A., Ganguly, A., Banik, I. R., Bhuiya, S., Sengupta, S., & Das, R. (2025). Smart Recommendation system in E-Learning using machine learning and data analytics. *SN Computer Science*, 6(6). <https://doi.org/10.1007/s42979-025-04249-x>
- Donayre Bohabot, C. C., Palacios-Serna, L. I., & Dávila Cisneros, J. D. (2024). Intrinsic motivation according to developmental stages in post-pandemic students. *Salud, Ciencia Y Tecnología - Serie De Conferencias*, 3, 706. <https://doi.org/10.56294/sctconf2024706>
- Gallent-Torres, C., Arenas Romero, B., Vallespir Adillón, M., & Foltýnek, T. (2024). Inteligencia artificial en educación: Entre riesgos y potencialidades. *Práxis Educativa*, 19, 1-29. <https://doi.org/10.5212/PraxEduc.v.19.23760.083>
- Gallifa, J., Sangrà, A., & Grau Vidal, F. X. (2021). *Transformar la universidad: Desafíos, oportunidades y propuestas desde una mirada global*. Editorial UOC

- George, B., & Wooden, O. (2023). Managing the strategic transformation of higher education through artificial intelligence. *Administrative Sciences*, 13(9), 196. <https://doi.org/10.3390/admsci13090196>
- Gómez, J. (2009). Reflexión y colaboración en los entornos educativos: Hacia la profesionalización docente. *Teoría de la Educación. Revista Interuniversitaria*, 8. <https://doi.org/10.14201/3109>
- Gómez, S. (2012). *Metodología de la investigación*. Red Tercer Milenio.
- González, G. (2023). Inteligencia artificial y educación superior: Una lectura desde la gobernanza universitaria. *Curriculum: Revista de Teoría, Investigación y Práctica Educativa*, (36), 51-60. <https://doi.org/10.25145/j.curricul.2023.36.03>
- Hong, Q. N., Pluye, P., Fàbregues, S., Bartlett, G., Boardman, F., Cargo, M., ... & Vedel, I. (2018). Mixed methods appraisal tool (MMAT), version 2018. *Registration of copyright*, 1148552(10), 1-7. <https://bmjopen.bmj.com/content/bmjopen/11/2/e039246/DC3/embed/inline-supplementary-material-3.pdf>
- Jaramillo, D. (2024). La gestión escolar basada en inteligencia artificial para mejorar el rendimiento académico. *South Florida Journal of Development*, 5(5), e3914. <https://doi.org/10.46932/sfjdv5n5-016>
- Jordan, M. I., & Mitchell, T. M. (2015). Machine learning: Trends, perspectives, and prospects. *Science*, 349(6245), 255-260. <https://doi.org/10.1126/science.aaa8415>
- León-Granizo, O., Neil, C., & Jiménez, C. (2024). La inteligencia artificial en la educación y sus implicaciones: Un mapeo sistemático de la literatura. *Revista Conectividad*, 5(1), 49-66. <https://doi.org/10.37431/conectividad.v5i1.102>
- López López, H. L., Rivera Escalera, A., & Cruz García, C. R. (2023). Personalización del aprendizaje con inteligencia artificial en la educación superior. *Revista ReDTIS*, 7(1), 123-128. <https://doi.org/10.61530/redtis.vol7.n1.2023.165.123-128>
- Luckin, R., Holmes, W., Griffiths, M., & Forcier, L. B. (2016). *Intelligence unleashed: An argument for AI in education*. Pearson Education. <https://discovery.ucl.ac.uk/id/eprint/1475756/>
- Maceri, S. B. y Coll, A. J., (2024) El futuro de la ciencia y la inteligencia artificial en el descubrimiento científico: Algunos interrogantes. *Energeia*, 8; 1; 12-2024; 51-71. <https://ri.conicet.gov.ar/handle/11336/261048>
- Márquez Benavides, L., Moreno Goytia, E. L., & Gonzalez Ramirez, L. F. (2023). El uso de la inteligencia artificial en un entorno académico. *Ciencia Nicolaita*, (89). <https://doi.org/10.35830/cn.vi89.721>
- Marr, B. (2019). *Artificial intelligence in practice: how 50 successful companies used AI and machine learning to solve problems*. John Wiley & Sons. https://books.google.com/books/about/Artificial_Intelligence_in_Practice



http://html?id=UbalDwAAQBAJ&utm_source=chatgpt.com

- Mativi, C. S., Niveiros, S. I., & Júnior, J. B. A. C. (2020). Softwares de análisis de datos cualitativos (QDA): Un análisis de artículos publicados en las bases de datos SPELL y SciELO. *Revista Estudos e Pesquisas em Administração*, 4(2), 156-173. <https://doi.org/10.30781/repad.v4i2.10318>
- Mendieta Lucas, L. M., Garzón Moreno, G. J., Enríquez Delgado, R. A., & Martínez Ángulo, M. A. (2025). Evolución e innovación digital en la educación superior como impulso para el fortalecimiento institucional: aplicación de inteligencia artificial en la gestión académica y administrativa para una toma de decisiones más eficiente y sostenible. *Reincisol.*, 4(7), 2469-2492. [https://doi.org/10.59282/reincisol.V4\(7\)2469-2492](https://doi.org/10.59282/reincisol.V4(7)2469-2492)
- Meza Arguello, D. M., Obando Burbano, M. de los Ángeles, Franco Valdez, J. L., & Simisterra Muñoz, J. M. (2025). El uso de la inteligencia artificial como recurso pedagógico en la educación superior: experiencias de los docentes. *Sage Sphere International Journal*, 2(2), 1-10. <https://doi.org/10.63688/jrd8es89>
- Nimbalagundi, S., Bagawan, A., & Katageri, C. (2024). Artificial intelligence in higher education. *International Research Journal on Advanced Engineering and Management (IRJAEM)*. <https://doi.org/10.47392/irjaem.2024.0406>
- Ojha, S., Mohapatra, S., Narendra, A., & Misra, I. (2024). From robots to books: An introduction to smart applications of AI in education (AIED). In *Lecture Notes in Electrical Engineering* (Vol. 1196, pp. 311-322). Springer Nature. https://doi.org/10.1007/978-981-97-7862-1_21
- Oliver, N. (2021). *Inteligencia artificial, naturalmente: un manual de convivencia entre humanos y máquinas para que la tecnología nos beneficie a todos*. Ministerio de Asuntos Económicos y Transformación Digital. <https://digital.casalini.it/9788492546626>
- Ortiz Aguilar, W. O., Benites, M. R. T., Isaac, R. M., Parejo, E. E. V., & Álvarez, A. V. (2024). Didáctica de la educación superior virtual: actualidad y perspectivas. *Editorial Tecnocientífica Americana*, 300, 1-157. <https://doi.org/10.51736/jcyemy48>
- Porayska-Pomsta, K., Holmes, W., & Nemorin, S. (2022). The ethics of AI in education. *ArXiv*, abs/2406.11842. <https://doi.org/10.4324/9780429329067>
- Quinto Ochoa, E. D., Mazzini Moran, J. D. R., Erráez Mantilla, S. N., & Suasnabas Pacheco, L. S. (2024). Integración de la IA en la educación: Desafíos y oportunidades. *Recimundo*, 8(1), 193-202. [https://doi.org/10.26820/recimundo/8.\(1\).ene.2024.193-202](https://doi.org/10.26820/recimundo/8.(1).ene.2024.193-202)
- Rodríguez, A. (2024). Hacia un marco ético de la inteligencia artificial en la educación. *Teoría de la Educación. Revista Interuniversitaria*, 36(2), 79-98. <https://doi.org/10.14201/teri.31821>
- Rodríguez, G. D. L. C. L., & Baquerizo, R. M. P. (2024). Integración de la ia en la transferencia de los conocimientos científicos en el contexto universitario.

In *Estrategias innovadoras en la transferencia de conocimientos científicos* (pp. 83-102). Dykinson.

<https://www.torrossa.com/en/resources/an/5852009#page=83>

Rodríguez-Chávez, M. (2021). Sistemas de tutoría inteligente y su aplicación en la educación superior. *RIDE. Revista Iberoamericana para la Investigación y el Desarrollo Educativo*, 11(22). <https://doi.org/10.23913/ride.v11i22.848>

Spivakovsky, O. V., Omelchuk, S. A., Kobets, V. V., Valko, N. V., & Malchukova, D. S. (2023). Institutional policies on artificial intelligence in university learning, teaching and research. *Information Technologies and Learning Tools*, 97(5), 181-202. <https://doi.org/10.33407/itlt.v97i5.5395>

Tarisiy, K. S. (2024). Strategic leadership for responsible artificial intelligence adoption in higher education. *CTE Workshop Proceedings*, 11, 4-14. <https://doi.org/10.55056/cte.616>

Trávez Tipan, A. V. (2024). La gestión administrativa: el cambio de estrategias gracias a la incursión de la inteligencia artificial. *Revista Social Fronteriza*, 4(5), e45424. [https://doi.org/10.59814/resofro.2024.4\(5\)424](https://doi.org/10.59814/resofro.2024.4(5)424)

Varela, Y. (2023). La inteligencia artificial y el futuro de la educación superior. *Horizontes Pedagógicos*, 25(1), 1-13. <https://doi.org/10.33881/0123-8264.hop.25101>

Vera, L. P., & Sánchez, S. F. (2021). La base de datos científica como recurso de búsqueda para investigadores noveles. *Innovación e Investigación Educativa para la Formación Docente*, 1184-1191. <https://doi.org/10.2307/j.ctv2gz3t2s.98>

Williamson, B., & Eynon, R. (2020). Historical threads, missing links, and future directions in AI in education. *Learning, Media and Technology*, 45(3), 223-235. <https://doi.org/10.1080/17439884.2020.1798995>

Younas, A., Subramanian, K., Haziazi, M., Hussainy, S., & Kindi, A. (2023). A review on implementation of artificial intelligence in education. *International Journal of Research and Innovation in Social Science*, 7(8), 1092-1100. <https://doi.org/10.47772/ijriss.2023.7886>

Zhang, J. (2023). Impact of artificial intelligence on higher education in the perspective of its application of transformation. *Lecture Notes in Education Psychology and Public Media*, 2, 822-830. <https://doi.org/10.54254/2753-7048/2/2022483>

About the main author

Mary Lizeth Supelano Londoño: Master's degree in Educational Technology and Digital Competencies from the International University of La Rioja (UNIR). Specialist in Project Management and professional in Financial Administration, both degrees awarded by the Minuto de Dios University Corporation. Software Analysis and Development Technologist from SENA. Currently, he serves as a research group leader at the Minuto de Dios University.

Declaration of author responsibility

Mary Lizeth Supelano Londoño: 1: Conceptualization, Data curation, Formal analysis, Research, Methodology, Resources, Software, Supervision, Validation/Verification, Visualization, Writing/original draft and Writing, review and editing.

Special Acknowledgments:

Financing:

Own resources.