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Artificial Intelligence in Education: Systematic Review of Perspectives, Benefits and Challenges in Teaching Practice

Inteligencia artificial en la educación: Revisión sistemática de perspectivas, beneficios y desafíos en la práctica docente

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ABSTRACT

The objective of this systematic review is to analyze teachers' perspectives, benefits, and perceived challenges in the implementation of artificial intelligence (AI) in education from 2020 to 2024. The PRISMA model was used to select a total of 53 studies that met the inclusion criteria. Data were extracted and evaluated to synthesize teachers' perceptions, the pedagogical and administrative advantages of AI, and the main barriers to its adoption in the educational field. The analysis revealed that teachers value AI primarily for its ability to personalize learning and optimize administrative tasks; however, they also express ethical concerns about privacy and equity, as well as technical limitations related to infrastructure and insufficient training. Among the most prominent challenges are the lack of technical skills and skepticism toward technology in certain educational contexts. Although AI offers significant potential to enhance education, its success depends on a balanced integration that respects the teacher's role and promotes ethical and equitable implementation. This review highlights the need for educational policies that support continuous training and promote equal access to AI technologies.

Keywords: artificial intelligence, teaching practice, systematic review, personalized learning, ethical challenges.

RESUMEN

El objetivo de esta revisión sistemática es analizar las perspectivas, beneficios y desafíos percibidos por los docentes respecto al uso de la inteligencia artificial (IA) en la educación entre 2020 y 2024. Se utilizó el modelo PRISMA para seleccionar un total de 53 estudios que cumplen con los criterios de inclusión. Los datos fueron extraídos y evaluados para sintetizar las percepciones de los docentes, las ventajas pedagógicas y administrativas de la IA, así como las principales barreras para su adopción en el ámbito educativo. El análisis reveló que los docentes valoran la IA principalmente por su capacidad de personalizar el aprendizaje y optimizar tareas administrativas, aunque también expresan preocupaciones éticas sobre privacidad y equidad, así como limitaciones técnicas relacionadas con infraestructura y capacitación insuficiente. Entre los desafíos más destacados se encuentran la falta de competencias técnicas y el escepticismo hacia la tecnología en algunos contextos educativos. Aunque la IA ofrece un potencial significativo para mejorar la educación, su éxito depende de una integración equilibrada que respete el rol del docente y promueva una implementación ética y equitativa. Esta revisión resalta la necesidad de políticas educativas que apoyen la formación continua y promuevan un acceso igualitario a las tecnologías de IA.

Palabras clave: inteligencia artificial, práctica docente, revisión sistemática, personalización del aprendizaje, desafíos éticos.

INTRODUCTION

Artificial intelligence (AI) has emerged over the past decade as a transformative technology across multiple sectors, including education. In the context of education, AI offers significant opportunities to improve teaching and learning by automating processes, personalizing instruction, and supporting pedagogical decision-making (Chounta et al., 2021; Kim and Kim, 2022). AI tools, such as intelligent tutoring systems, adaptive learning platforms, and educational data analytics applications, have begun to redefine the role of the teacher and pedagogical strategies in classrooms. However, the use of AI in education also poses significant challenges, ranging from ethical concerns and data privacy to teacher resistance to incorporating new technologies due to a lack of preparation and training (Celik, 2023; Pratama et al., 2023).

This systematic review seeks to synthesize recent research on teachers' perceptions, benefits, and challenges of using AI in education. The included studies cover the period 2020-2024, a stage characterized by the massification of public-friendly AI platforms, such as ChatGPT, launched in November 2022, which marked a milestone in the accessibility of advanced chatbots and unleashed a global boom in their educational use. These platforms have facilitated teachers' access to AI through simple interfaces, allowing them to implement this technology without the need for specialized knowledge in programming or data analysis.

Seen in this way, the teacher is not directly confronted with AI, but with its practical applications, such as chatbots, which are presented as tools that simplify complex tasks. However, for the teacher, who is usually not a programmer or AI expert, the internal functioning of these systems remains a "black box", generating automated responses whose underlying logic is opaque. This perception influences confidence and strategies for integrating AI into the classroom. Through a systematic literature review, this article examines how teachers

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perceive these technologies, the specific benefits they see in their implementation, and the obstacles they face in adopting them.

The relevance of this work lies in the need to have a clear and updated overview of the impact of AI on teaching practice. Understanding teachers' perceptions and experiences is essential to design policies and training programs that allow them to maximize the benefits of AI and address its challenges. In turn, the findings of this review can guide educational AI researchers and developers in creating tools that respond to the specific needs of the classroom.

State of the Art

Research on artificial intelligence in education (AIEd) has seen significant growth over the past two decades. This advancement reflects its potential to personalize learning, optimize administrative tasks, and transform pedagogical practices. According to the review by Chen et al. (2020), AI technologies, such as intelligent tutoring systems and chatbots, have been instrumental in facilitating personalized teaching and automating administrative functions, improving the quality of learning.

A mapping of the evolution of knowledge in AIEd highlights the central role of technologies such as natural language processing, educational data mining, and deep learning, according to the literature review by Feng and Law (2021). These techniques have been extensively applied in personalized learning design, adaptive assessments, and intelligent tutoring systems, key areas in the transformation of education.

Systematic reviews also underline the need to critically assess the ethical and practical challenges in implementing AI. Zawacki-Richter et al. (2019) point out that ethical risks, such as algorithmic bias and lack of transparency, limit the adoption of these technologies in educational contexts, especially in higher education.

In the context of early education, Crescenzi-Lanna (2022) highlights that, although AI applications have a positive impact on teaching, there are concerns about data privacy and the effects on human interaction in educational settings. This reinforces the need for ethical and pedagogical approaches in the design and implementation of AI systems in early childhood education.

On the other hand, Talan (2021) conducted a bibliometric study that identifies trends in AIed, highlighting that most research is concentrated in countries such as the United States, the United Kingdom, and Taiwan. This analysis highlights the importance of interdisciplinary approaches that include pedagogical, ethical, and technological perspectives to address limitations in access and adoption of these tools.

In the field of 21st century skills education, Trisnawati et al. (2023) argue that AI has the potential to enhance competencies such as critical thinking and collaboration. However, they warn that its excessive use could reduce students' ability to think independently, underlining the need for a balance between human-machine interaction.

They evidence the literature a consensus on the positive impact of AI on learning personalization and administrative optimization. However, ethical, technical, and pedagogical limitations underscore the importance of continued research and integrative policies to ensure effective and equitable implementation in diverse educational contexts. This literature review constitutes a solid framework to contextualize the findings of this systematic review and its contribution to current knowledge at the intersection between AI and education.

Objective

The main objective of this review is to systematically analyse teachers' perspectives on the use of AI in education, the benefits they perceive in its implementation and the challenges they face. This review specifically addresses the following research questions:

- What are teachers' perceptions and attitudes towards the use of AI in education?
- What benefits of AI are reported in teaching practice?
- What are the challenges in implementing AI in the educational field?

METHODS

This systematic review was conducted using the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) framework, which is recognized for its rigor in literature synthesis studies. To ensure the relevance and timeliness of the findings, inclusion criteria were established that restricted the selection to studies published between 2020 and 2024. This period was chosen due to the increase in publications on AI applied to education in recent years, which is considered a response to the accelerated advance of digital technologies and their integration into the educational environment. The studies had to directly address the implementation, benefits, challenges, or perspectives of teachers on the use of AI in educational contexts, from primary to higher levels, with an emphasis on pedagogical applications. Likewise, only research from indexed scientific journals was included, in order to ensure a high standard of quality and reliability. Studies published before 2020, as well as those that focused exclusively on the technical development of AI without a direct connection to its pedagogical use. The search strategy was rigorously designed to cover a wide variety of well-known academic databases in the educational and technological fields, including Scopus, ERIC, Web of Science, Scielo, and Redalyc. To ensure the exhaustiveness and accuracy of the results, structured search formulas were used that combined relevant key terms using Boolean operators. These formulas included specific combinations such as "artificial intelligence in education" AND "teachers' perspectives on AI" OR "AI challenges in education." In addition, variations in the key terms were used to address synonyms and related concepts, such as "AI in teaching" OR "educational impacts of AI," depending on the search fields available in each database.

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Each search formula was adjusted to fit the specific functionalities of the different databases, respecting their syntax and order. For example, in databases such as Scopus and Web of Science, the use of connectors such as AND, OR and parentheses was prioritized to structure complex queries, while in regional databases such as Scielo or Redalyc, searches were simplified with exact phrases to capture relevant publications in Spanish. Field filters such as "title," "abstract," and "keywords" were also included to optimize the relevance of the results.

The initial search yielded a total of 418 potential articles. To ensure thematic relevance, additional language filters were applied, limiting the results to publications in English and Spanish, which represented the languages handled by the review team. This multilingual approach allowed research from various regions to be captured, broadening the geographic scope, but ensuring linguistic consistency for the interpretation and detailed analysis of the texts.

Finally, the search formulas and specific criteria were fully documented to ensure replicability and transparency in the methodology, allowing future researchers to reproduce the process or adapt it to new research approaches.

The study selection process followed the four stages established by the PRISMA framework: identification, screening, eligibility and inclusion. In the first stage, 418 potential studies were identified using the search terms previously mentioned. Subsequently, 145 duplicate studies were eliminated and the remaining 273 were screened, reviewing their titles and abstracts to determine their alignment with the review objectives. This phase allowed us to discard studies that did not specifically address AI in education, systematic reviews and meta-analyses, or that, although they mentioned the topic, focused on areas outside of teaching practice, such as the design of algorithms or the analysis of large volumes of educational data without a practical application in the classroom. At the end of the screening, 113 studies were obtained that advanced to the eligibility stage. In this third phase, the full texts of the studies were reviewed to verify that they met the inclusion criteria in an exhaustive manner, leaving a total of 53 studies for final inclusion and in-depth analysis of their findings.

Data extraction was carried out using a structured form that allowed the key information of each selected study to be captured and organized. This form included details such as the author and year of publication, the main objective of the research, the methodology used (whether qualitative, quantitative or mixed), and the main findings in relation to the implementation of AI in educational contexts. Attention was also paid to the limitations recognized by the authors themselves, such as the sample size, the geographical context, and the generalization of the results, which facilitated a critical interpretation of the findings. This systematic extraction stage was carried out thoroughly, allowing the data to be organized in a homogeneous manner and providing a solid basis for the comparative analysis of the different investigations.

To assess the methodological quality of the studies, the Critical Appraisal Skills Programme (CASP) guide was used, which offers a rigorous approach to analyzing the validity and applicability of qualitative and quantitative research. Each study was assessed for the clarity and consistency of its design, the transparency of the data collection and analysis process, and the appropriateness of the conclusions based on the data presented. In addition, special attention was paid to the possible presence of biases, both in the selection of the sample and in the interpretation of the results.

RESULTS

Overview of Studies

The final sample of 53 studies on the implementation of AI in education spans a period between 2020 and 2024, covering a notable geographic diversity, with research coming from North America, Europe, Asia, and Latin America. The most represented countries in these studies include the United States, China, and European countries, such as Germany and the United Kingdom (Table 1). However, contributions from emerging regions in the field of educational AI, such as the Middle East (United Arab Emirates) and Africa (Nigeria), also stand out, suggesting a global interest in the adoption and study of AI in different educational and socioeconomic contexts.

The majority of studies (39%) use quantitative methodologies, such as structured surveys and advanced statistical analysis, to measure factors such as acceptance, willingness, and self-efficacy in the use of artificial intelligence (AI) in education (Table 2). Qualitative approaches (35%) employ interviews and focus groups to explore subjective experiences and perceptions, including ethical and pedagogical challenges.

Eighteen percent opt for mixed methodologies that combine quantitative and qualitative data, while 8% rely on iterative designs such as design-based research (DBR) to develop AI-related curricula. This methodological diversity reflects an interest in integrating objective and subjective analyses to address both the practical impacts and contextual challenges of AI in educational settings.

In terms of objectives, most studies explore two main lines: (1) teachers' perceptions and attitudes towards AI as an educational tool and (2) the factors that facilitate or hinder its implementation in the classroom. Some studies stand out for focusing on specific contexts, such as STEM education (science, technology, engineering and mathematics) and language teaching, where AI is used to personalize and enhance the learning of technical and linguistic skills. Particular approaches to equity and ethics in the use of AI are also identified, especially in studies from Europe and the United States, indicating a concern about the social and ethical impacts of AI in education.

This exhibition provides a comprehensive overview of current trends in the use of AI in education, highlighting both the predominant methodological approaches and the thematic and regional areas of greatest interest over the past five years.

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Table 1. *Countries presenting research on the use and perceptions of AI among teachers*

Country	Number of Studies	Authors
EE.UU.	7	Kim y Kim (2022), Antonenko y Abramowitz (2023), Lee & Perret (2022), Williams et al. (2021), Wood et al. (2021), Ottenbreit-Leftwich et al. (2023), Kaplan-Rakowski et al. (2023)
Hong Kong	4	Yau et al. (2023), Chiu et al. (2022), Chiu (2021), Wang & Cheng (2021)
Spain	4	Leoste et al. (2021), Dúo et al. (2023), De Vega-Martín et al. (2022), Delgado de Frutos et al. (2024)
Ecuador	4	Tobar et al. (2024), Morocho Cevallos et al. (2023), Apolo et al. (2024), Jara (2024)
China	3	An et al. (2023), Qin et al. (2020), Wang et al. (2023)
Türkiye	3	Gocen & Aydemir (2020), Sabuncuoglu (2020), Hopcan et al. (2024)
Germany	2	Lindner & Berges (2023), Zhang et al. (2023)
India	2	Joshi et al. (2021), Kashive et al. (2020)
United Arab Emirates	2	Al Darayseh (2023), ElSayary (2023)
Indonesia	2	Sumakul et al. (2022), Pratama et al. (2023)
United Kingdom	2	Cukurova et al. (2019), Kaplan-Rakowski et al. (2023)
South Korea	2	Choi et al. (2022), Yang (2022)
Israel	2	Nazaretsky et al. (2022), Nazaretsky et al. (2021)
Bulgaria, Greece, Italy, Romania	1	Polak et al. (2022)
Estonia	1	Chounta et al. (2021)
Sweden	1	McGrath et al. (2023)
Nigeria	1	Ayanwale et al. (2022)
Belgium	1	Henry et al. (2021)
Thailand	1	Boonmoh et al. (2021)
Mexico	1	Salas-Rueda et al. (2022)
Africa	1	Sanusi et al. (2022)
Palestine	1	Abdelmoneim et al. (2024)
Grecia	1	Mystakidis & Christopoulos (2022)
Paraguay	1	Sosa et al. (2024)

Table 2. *Designs, methods, instruments and samples of scientific literature*

Design	Methods	Instrument	Sample	%
Quanti	-Descriptive -Experimental -Correlational	-Online surveys -Likert scales -Questionnaires	3 – 3164	39%
Quali	-Thematic analysis -Discourse analysis	-Interviews -Open-ended questions -Focus groups	5 – 276	35%
Mixed	-Sequential -Explanatory -Exploratory	-Structured surveys -Semi-structured interviews	8 – 800	18%
DBR	-Iterative testing -Curriculum development	-Pre/Post tests -Observations -Participant feedback	~18	8%

Teachers' perspectives on AI

Analysis of teachers' perceptions reveals a wide range of attitudes towards AI in education, marked by diversity in pedagogical beliefs, level of familiarity with the technology, and context of application (Table 3). Overall, teachers recognize the potential of AI to improve teaching and facilitate personalized learning. This perception is especially found in studies analyzing its impact in STEM areas and language teaching, where AI supports teachers in personalizing tasks and scaffolding complex content (Kim and Kim, 2022; An et al., 2023).

However, a significant proportion of teachers express concerns about ethics and equity in the use of AI. These concerns focus on the risk of bias in algorithms and technological dependence, which could shift the teaching role towards more technical tasks. This tension between enthusiasm for AI and ethical concerns is particularly evident in studies conducted in higher education contexts and in countries with advanced technological regulations, such as the United States and Europe (McGrath et al., 2023; Nazaretsky et al., 2022).

Differences in AI adoption and perception also reflect teachers' pedagogical beliefs. Those with constructivist approaches show a greater willingness to integrate AI as a pedagogical tool, while teachers with more transmissive views show resistance due to the perception of AI as a replacement for their role in the classroom (Choi et al., 2022). Additionally, AI acceptance levels are closely linked to factors such as self-efficacy and technological familiarity, which underlines the need for specific professional development programs that improve teachers' technological competencies (Al Darayseh, 2023; Antonenko and Abramowitz, 2023).

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Table 3. *Teachers' perspectives on AI in education*

Category	Characteristics	Studies
Optimism and Potential	Teachers see AI as a tool that facilitates personalized learning and administrative support.	Kim and Kim (2022); Sumakul et al. (2022)
Ethical and Equity Concerns	Fears about biases, technological dependency, and loss of the teacher's role.	McGrath et al. (2023); Nazaretsky et al. (2022)
Influence of Pedagogical Beliefs	Teachers with constructivist approaches show greater acceptance, while those with transmissive approaches are more skeptical.	Choi et al. (2022); Yau et al. (2023)
Need for Training and Support	The lack of digital skills limits AI adoption; the need for continuous training is highlighted.	Al Darayseh (2023); Antonenko and Abramowitz (2023); Lindner and Berges (2023)
Regional Inequalities	Disparities in access to technology and institutional support limit AI integration in certain contexts.	Sanusi et al. (2022); Apolo et al. (2024)

Benefits of AI in teaching practice

The implementation of AI in the educational field has been perceived as a valuable tool for the personalization and efficiency of teaching and learning processes. In the reviewed studies (Table 4), the benefits of AI in education are grouped into three main areas: personalized learning, support in administrative tasks, and scaffolding in complex content.

Table 4. *Benefits of AI in teaching practice*

Category	Description	Studies
Personalized Learning	AI allows the adaptation of content and methods to the individual profile of each student, improving motivation and learning effectiveness.	Kim and Kim (2022); Sumakul et al. (2022); Pratama et al. (2023)
Support for Administrative Tasks	AI tools automate tasks such as assessment and planning, freeing up time for pedagogical activities.	Nazaretsky et al. (2022); ElSayary (2023)
Scaffolding in Complex Content	AI facilitates access to advanced knowledge through reasoning models and individualized examples.	Kim and Kim (2022); McGrath et al. (2023)

First, one of the most frequently mentioned benefits is AI's ability to personalize learning, adapting content and methods to each student's individual needs. AI facilitates the creation of differentiated learning paths, which is particularly useful in STEM education contexts and language teaching, where AI tools can offer expert models and real-time feedback to improve students' skills (Kim and Kim, 2022; Sumakul et al., 2022). This personalization helps maintain motivation and promotes more meaningful and effective learning by adjusting the pace and level of complexity of the content to each student.

Second, AI has been shown to be an ally in performing administrative tasks. Tools such as AI-Grader allow teachers to automate assessment tasks, freeing up time for them to focus on more complex pedagogical activities (Nazaretsky et al., 2022). This automation also contributes to reducing the margin of error and improving assessment accuracy, which is a key benefit in contexts with high volumes of students or assignments. In addition, AI can facilitate lesson planning and organization, helping teachers design programs and activities that respond more effectively to classroom needs (ElSayary, 2023).

Finally, scaffolding in complex content is another of the highlighted benefits. AI provides reasoning models and examples that allow students to approach difficult topics with greater support, especially in areas such as scientific writing and the development of critical thinking skills (Kim and Kim, 2022; McGrath et al., 2023). This support contributes to strengthening the understanding of advanced topics and developing higher cognitive skills in students. However, some teachers highlight the need to balance this automated support with human guidance to avoid excessive dependence on technological tools.

Challenges in AI implementation

Implementing AI in education faces several challenges, ranging from a lack of teacher training to ethical concerns and technical limitations. These obstacles reflect both the level of teacher preparation and the complexity of the technological and regulatory environments in which AI is embedded (Table 5).

Table 5. *Challenges in implementing AI in education*

Challenge	Description	Studies
Lack of Training	Teachers lack technical and pedagogical skills to use AI, limiting its effective integration.	Chounta et al. (2021); Polak et al. (2022)
Ethical Concerns	Concerns about privacy, equity, and bias in AI algorithms, which could perpetuate inequalities.	McGrath et al. (2023); Akgun and Greenhow (2022)
Technical Limitations	Lack of infrastructure, resources, and connectivity in certain regions limits AI use in education.	Morocho Cevallos et al. (2023); Sanusi et al. (2022)
Resistance to Change	Skeptical attitudes towards AI, based on perceptions of threats to teaching and dehumanization.	Joshi et al. (2021); Delgado de Frutos et al. (2024)

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One of the most common challenges is the lack of teacher training. Most teachers lack the technical skills necessary to use AI tools in the classroom, which limits their ability to effectively integrate this technology (Chounta et al., 2021; Polak et al., 2022). This is directly related to the scarcity of specific AI training programs, which not only develop technical skills but also address pedagogical and ethical aspects associated with the technology.

In addition, there are serious ethical concerns among teachers, mainly related to data privacy and equity in the use of AI. Many teachers fear that AI may compromise student privacy and increase inequalities by favoring those with better access to technology (McGrath et al., 2023; Akgun and Greenhow, 2022). These concerns also include the risk of bias in AI algorithms, which could perpetuate stereotypes and unfair practices in the classroom. Another prominent challenge is technical limitations, such as a lack of infrastructure and resources in many educational centers. In regions with less access to technology, such as certain areas of Latin America and Africa, the lack of connectivity and adequate equipment makes it difficult to implement AI tools (Morocho-Cevallos et al., 2023; Sanusi et al., 2022). This creates a significant technological gap that limits the potential of AI to contribute to inclusive education.

Finally, resistance to change is a relevant obstacle. Some teachers, especially those with more traditional pedagogical approaches, show a skeptical attitude towards AI, seeing it as a threat to their role in the classroom. This resistance is based on the belief that technology can dehumanize teaching and replace direct interaction between teachers and students (Joshi et al., 2021; Delgado de Frutos et al., 2024). These challenges underscore the need for a comprehensive approach to AI adoption in education, including ongoing training, technical support, security and transparency measures, and strategies to address ethical and cultural concerns.

Limitations of the Studies

The review of studies on the implementation of AI in education reveals several limitations that affect the representativeness and generalizability of the results (Table 6). First, the small sample size is a common limitation in multiple studies. Research such as Chounta et al. (2021) and Nazaretsky et al. (2022) present small samples in relation to the total number of teachers, which restricts the ability to extrapolate their findings to broader populations.

This problem is exacerbated in studies carried out in specific contexts, such as in Turkey or the United Arab Emirates, where the sample size is insufficient to represent the diversity of educational experiences in these countries.

Another obstacle is the lack of geographical and disciplinary representativeness. Many studies focus on very particular educational regions or contexts, such as certain disciplines (e.g., STEM) or specific geographic areas (e.g., South Korea, Nigeria). This limits the applicability of findings to other educational contexts, as noted by Choi et al. (2022) and Al Darayseh (2023). This limitation is especially problematic in research where teachers come from a single discipline, which reduces the possibility of applying the results to teachers from other areas.

Table 6. *Limitations of studies on AI in education*

Type of Limitation	Description	Studies
Small Sample Size	Small samples limit the generalization of findings to larger populations.	Chounta et al. (2021); Nazaretsky et al. (2022)
Lack of Representativity	Studies limited to a specific region or discipline restrict the applicability of results.	Choi et al. (2022); Al Darayseh (2023)
Limited Generalization	Use of self-reported methods and online surveys can introduce biases into results.	Jara (2024); Apolo et al. (2024)
Tool Diversity	Focusing on a single AI tool limits understanding of its use in different contexts and disciplines.	Nazaretsky et al. (2022); Celik (2023)

Limited generalizability is also affected by the use of self-reported methods and online surveys, which, although useful for collecting data quickly, can introduce significant biases into the results. Studies such as Jara's (2024) rely on self-reported data, which can influence the accuracy of the recorded perceptions, especially in relation to the acceptance and understanding of AI.

Finally, there is a lack of diversity in the AI tools investigated. Some studies focus on a single tool or a single type of technology, limiting the understanding of AI as a whole in education. For example, Nazaretsky et al. (2022) exclusively study the AI-Grader in the context of biology, which restricts the applicability of the results to other areas or types of AI.

These limitations highlight the need for future research with more representative samples, methodologies that include geographic and disciplinary diversity, and the study of a broader range of AI tools to obtain more robust and generalizable conclusions about their impact in education.

DISCUSSION

Analysis of teachers' perceptions of artificial intelligence (AI) in education reveals a generally positive assessment of its potential, especially in terms of learning personalization and administrative support. These findings are consistent with previous research, such as Chen et al. (2020), which documented how intelligent systems in education enable real-time content adaptation, optimizing teaching-learning processes and

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improving knowledge retention in key areas such as science and mathematics. Furthermore, Polak et al. (2022) highlighted a favorable attitude among teachers toward teaching digital skills using AI tools, although they also pointed out limitations in advanced technical skills, underlining the need for additional training.

However, alongside perceived benefits, fundamental ethical dilemmas arise that require further attention. Teachers express concerns about inherent bias in AI algorithms, privacy of student data, and technological dependency. These dilemmas not only affect the acceptance of AI, but could delimit what is socially permissible and ethically accepted within the educational field. Ahmad et al. (2021) highlighted that AI algorithms can perpetuate inequalities if not managed properly, posing serious risks to educational equity. This type of bias could discourage teachers and educational communities from adopting AI, especially in contexts where justice and equality are central values.

In this sense, ethics can constitute both a regulatory boundary and a starting point for new prospective research. The inclusion of clear ethical frameworks in the implementation of AI can help build trust among teachers, guiding them towards responsible and sustainable uses. These frameworks should address key questions: What type of data is acceptable to collect? How is transparency guaranteed in AI decision-making processes? And, above all, what mechanisms can be implemented to avoid the amplification of existing inequalities? This forward-looking approach, in addition to strengthening trust in technology, could serve as a model for other areas where AI is being integrated.

On the other hand, the diversity in teachers' pedagogical beliefs also significantly influences their willingness to adopt these technologies. Teachers with constructivist orientations see AI as a complementary tool that enables the co-creation of knowledge and encourages critical thinking. Goksel and Bozkurt (2019) emphasize that this constructivist perception facilitates the integration of AI, while teachers with more traditional approaches may see it as a threat to the human role in the classroom. This contrast underlines the importance of addressing these differences through professional development programs that, in addition to teaching technical skills, contextualize AI within inclusive pedagogical frameworks.

The administrative benefits of AI are also highlighted, especially in the automation of tasks such as assessment and planning, allowing teachers to spend more time on strategic pedagogical activities. Ahmad et al. (2022) noted that tools such as learning analytics and automated assessment systems optimize time management, while contributing to improving educational quality by offering more accurate and real-time feedback. However, this administrative optimization must be balanced with the need to maintain the centrality of teachers in pedagogical decision-making.

Despite these advantages, challenges related to teacher training and technical limitations in specific contexts represent significant barriers. Zawacki-Richter et al. (2019) highlighted a persistent disconnect between the development of AI technologies and the pedagogical preparation of teachers to use them, reinforcing the need to design training programs that integrate both technical and ethical aspects. These programs could not only address current limitations, but also strengthen teachers' trust in AI as an educational tool.

Although teachers' perceptions towards AI are mostly positive, the ethical dilemmas and practical challenges associated with its adoption cannot be ignored. Ethics should not only be seen as a limit that restricts the use of AI, but as a guide for its responsible implementation. This approach could set the foundation for a more equitable and effective adoption of AI in education, turning current dilemmas into opportunities to strengthen both teaching practice and trust in these emerging technologies.

Limitations of the study

This literature review, although exhaustive in its analysis of recent studies on AI in education, presents some limitations inherent to the selection process and the scope of the included articles. First, the review was restricted to studies published between 2020 and 2024, which could have excluded previous relevant research that provides background or long-term trends in the use of educational AI. Furthermore, although a rigorous search strategy was used, some articles may not have been considered if they were not indexed in the reviewed databases. Another limitation is the reliance on studies with varied methodologies and, in some cases, small samples and geographically specific contexts, which limits the representativeness of the findings. Finally, this review is subject to the interpretation of the results according to the established categories, which could introduce a bias in the synthesis of findings due to the subjectivity in the classification and grouping of research.

CONCLUSION

This systematic review on the use of AI in education allows us to synthesize the main perspectives, benefits, and challenges perceived by teachers in the implementation of this technology. The findings highlight a growing interest in AI as an educational tool that facilitates personalized learning, optimizes the management of administrative tasks, and provides support in the learning of complex content. However, significant challenges persist, such as a lack of teacher training, ethical concerns about privacy and equity, technological infrastructure limitations in some regions, and resistance to change by some educators.

This review underlines the need to develop comprehensive educational policies that facilitate access to AI technologies and address ethical and equity aspects to create inclusive and sustainable learning environments. Likewise, the importance of continuous and specific training for teachers is fundamental to maximize the potential of AI in education and ensure its effective and responsible implementation.

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Although this review provides an updated analysis, future research should expand the diversity of contexts and AI tools studied, as well as consider more representative and longitudinal samples to strengthen the validity of the findings. Ultimately, the success of AI in education will depend on a balanced integration that respects and complements the irreplaceable role of the teacher in the teaching-learning process.

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