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Research Article

THE EVOLVING ROLE OF TEACHERS IN AI-ENHANCED CLASSROOMS: CHALLENGES AND OPPORTUNITIES

Nurjana Cyntia Rahman[1], Som Chai[2], and Said Subhan Posangi[3]
[1] Institut Agama Islam Negeri Sultan Amai Gorontalo, Indonesia
[2] Thammasat University, Thailand
[3] Institut Agama Islam Negeri Sultan Amai Gorontalo, Indonesia

Corresponding Author:

Nurjana Cyntia Rahman,
Department of Islamic Education, Faculty of Postgraduate, Institut Agama Islam Negeri Sultan Amai Gorontalo.
Jl. Gelatik No. 1 Kota Gorontalo, Indonesia
Email: nanarahman517@gmail.com

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Abstract

The integration of Artificial Intelligence (AI) in education is reshaping the traditional role of teachers, introducing both opportunities and challenges. AI-powered tools, including adaptive learning systems and automated assessments, are becoming integral to modern classrooms, promising personalized learning experiences and enhanced classroom management. However, these technological advancements also require teachers to adapt to new responsibilities and redefine their pedagogical practices. This study explores the evolving role of teachers in AI-enhanced classrooms, focusing on how AI affects their professional identity, teaching strategies, and relationships with students. The research employs a mixed-methods approach, combining surveys, semi-structured interviews, and classroom observations across ten institutions that have implemented AI tools. The findings reveal that while AI improves student engagement and administrative efficiency, teachers face challenges in maintaining the human aspect of education, such as fostering emotional intelligence and teacher-student interactions. The study concludes that AI can enhance pedagogical practices if properly integrated, but it requires teachers to embrace new technologies while retaining the core human-centered values of education. The research highlights the need for professional development and institutional support to help educators navigate this transition effectively.

Keywords: AI in education, educational technology, pedagogical strategies, personalized learning, teacher roles

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INTRODUCTION

In recent years, the integration of Artificial Intelligence (AI) into education has revolutionized how teaching and learning occur in classrooms (Durães D. et al., 2026). AI technologies, such as adaptive learning systems, intelligent tutoring, and automated assessments, are increasingly being employed to enhance teaching practices, streamline administrative tasks, and provide personalized learning experiences for students. These advancements have prompted a shift in the role of educators, where they are no longer merely the conveyors of knowledge but are becoming facilitators, mentors, and curators of learning experiences in AI-enhanced environments (Papadakis, 2026). The traditional teacher-centered approach is evolving, and the teacher's role is expanding to encompass new responsibilities in the design, implementation, and oversight of AI-driven educational tools. However, this transformation presents both challenges and opportunities for educators, as they must navigate the complexities of incorporating AI while maintaining their core pedagogical principles.

The use of AI in classrooms is expected to create more individualized learning experiences, potentially improving student engagement, performance, and overall educational outcomes. Yet, as the reliance on AI grows, questions arise regarding the changing nature of teacher-student interactions, the ethical implications of data-driven decisions, and the professional development needs of educators in an AI-enhanced environment (Bastian et al., 2025). As AI takes on more roles traditionally handled by teachers, such as providing feedback and assessing student progress, there is a growing need to explore how teachers adapt to these changes. Understanding how teachers can effectively leverage AI while maintaining their vital human role in the educational process is crucial to optimizing the potential benefits of AI in education (Tang & Liao, 2025). This research explores the evolving role of teachers in AI-enhanced classrooms and investigates the challenges and opportunities they face in this rapidly changing landscape.

AI's increasing presence in education brings with it profound shifts in pedagogical practices, affecting how lessons are designed, delivered, and assessed. The role of teachers is not simply a matter of adapting to new technology but involves rethinking their position within the educational system (Yetkin & Aslan, 2026). Educators must integrate AI tools into their teaching methods, learning management systems, and curriculum design. This shift also invites a larger debate about the potential depersonalization of learning and the preservation of human-centric teaching qualities, such as emotional intelligence and critical thinking (Almashour et al., 2025). Teachers must learn to balance the benefits of AI in automating tasks and personalizing learning with the need for maintaining a human touch in teaching, which can foster creativity, empathy, and holistic development in students. Thus, it is essential to understand both the opportunities AI presents for enhancing teaching and the challenges it imposes on the evolving role of educators.

Despite the rapid adoption of AI technologies in classrooms, the precise impact of these tools on the evolving role of teachers remains largely underexplored (Kohnke & Zou, 2025). While previous research has focused on the benefits of AI in improving student outcomes, enhancing engagement, and automating administrative tasks, there is limited investigation into how AI changes the professional identity of teachers and how they navigate their shifting responsibilities. Teachers must balance the demands of AI tools with their traditional roles, such as fostering critical thinking, promoting creativity, and providing emotional support to students (Gyawali et al., 2025). This shift introduces several challenges, including the need for professional development to effectively integrate AI into teaching practices, the potential loss of the personal teacher-student relationship, and concerns about ethical considerations in AI decision-making processes (Y. Wang, 2026). Teachers also face the challenge of overcoming resistance to change and adapting their pedagogical methods to incorporate AI while maintaining their effectiveness as facilitators of learning.

Moreover, the question of how teachers perceive and respond to the incorporation of AI into the classroom is a critical issue. While some educators embrace these technologies as tools to enhance their teaching, others may feel threatened or overwhelmed by the increasing role of AI in the educational process. The varying levels of comfort with technology, teacher training, and institutional support further complicate the integration of AI into everyday teaching practices (Azifah et al., 2024). Understanding the challenges teachers face when adopting AI technologies is vital for developing effective strategies to support them in this transition. The problem lies in the absence of a clear framework to guide educators through this transformation and the lack of in-depth research that explores the multifaceted role of AI in reshaping teaching methodologies.

This research seeks to address these gaps by investigating the evolving role of teachers in AI-enhanced classrooms, focusing on the challenges they face and the opportunities they encounter as they integrate AI into their teaching practices (Tai, 2025). By examining how AI affects teachers' professional roles, identity, and teaching strategies, this study aims to provide valuable insights into the complexities of integrating technology into education. It will also explore the potential benefits of AI in supporting teachers' efforts to enhance student learning and engagement, while ensuring that the human aspect of teaching is preserved (De Angel et al., 2025). The findings will help inform policy recommendations for teacher training, curriculum development, and the ethical use of AI in education, ultimately providing a clearer understanding of how AI can be harnessed to support and enhance the role of educators.

The primary objective of this study is to examine the evolving role of teachers in AI-enhanced classrooms and to investigate how AI technologies influence teaching practices, student interactions, and classroom dynamics (Dadhich et al., 2025). This research aims to identify the key challenges teachers face when integrating AI into their classrooms, including issues related to professional development, classroom management, and the preservation of humanistic teaching approaches. Another goal is to explore the opportunities that AI presents for enhancing pedagogical strategies, particularly in terms of personalized learning, real-time feedback, and automating administrative tasks (Kim & Kim, 2022). By identifying both the challenges and opportunities, the research will provide a balanced perspective on how AI can support teachers in enhancing student engagement and learning outcomes.

Additionally, the study seeks to understand how teachers perceive their roles in AI-enhanced classrooms and how their professional identities are affected by the increasing use of technology in teaching (Zhu et al., 2026). It will explore how teachers adapt to the evolving demands of AI tools, including how they integrate AI-driven platforms into their pedagogical approaches, and whether these changes lead to greater teaching efficacy or challenges in maintaining effective teacher-student relationships. This research will also investigate the degree to which institutional support, access to AI tools, and ongoing professional development influence the successful integration of AI in teaching practices (Sanusi et al., 2025). By examining these factors, the study aims to provide actionable recommendations for schools and educational policymakers to support teachers as they adapt to the changing educational landscape.

Existing research on AI in education has primarily focused on the technical aspects of AI applications, such as adaptive learning systems, automated grading, and intelligent tutoring, often overlooking the broader implications for the role of educators. While studies have explored the benefits of AI for student learning and engagement, few have investigated the impact of AI on the professional identity and practices of teachers (Canonigo, 2025). Most of the literature tends to emphasize AI's potential to support personalized learning, yet little attention has been paid to how these tools reshape the teacher's role, influence classroom interactions, or affect pedagogical strategies. Furthermore, there is a gap in research addressing the ethical concerns surrounding AI in education, particularly how it impacts teacher autonomy and the student-teacher relationship (Mukadgi, 2025). This study addresses these gaps by

examining how AI technologies influence the day-to-day experiences of teachers, their interactions with students, and their teaching methods.

Another gap in the literature is the lack of research on the challenges teachers face in integrating AI into their classrooms, particularly in terms of professional development and institutional support (Z. Wang, 2025). While some studies have examined how technology adoption affects teachers, few have focused on the specific challenges posed by AI, such as the need for specialized training, the integration of AI tools into existing curricula, and the ethical dilemmas related to data privacy and algorithmic bias. This study will address these gaps by investigating how teachers adapt to AI integration, the support they need to succeed in this transition, and the potential barriers they encounter in the process (Unal & Hobe, 2025). By focusing on these challenges, the research will offer a more nuanced understanding of how AI can be effectively incorporated into teaching practices while ensuring that educators are supported in this transition.

This study offers a novel contribution to the field by focusing on the evolving role of teachers in AI-enhanced classrooms (X. Zhang et al., 2026). While much of the existing research emphasizes AI's technical capabilities, this study shifts the focus to the human element of education, exploring how AI tools affect the practices, identities, and relationships of educators. The novelty of this research lies in its exploration of the complex interactions between AI technologies and the teacher's role, examining both the opportunities and challenges AI presents in the educational setting (Tan, 2025). Unlike previous studies that often isolate AI applications from the broader context of teaching and learning, this research aims to integrate these technologies into the pedagogical framework, providing a comprehensive understanding of their impact on teaching strategies and classroom dynamics.

The justification for this study stems from the increasing importance of AI in shaping the future of education and the need to better understand how these technologies interact with traditional teaching methods (An & James, 2025). As AI continues to be integrated into classrooms worldwide, it is essential to examine how teachers can best leverage these tools to enhance their teaching while preserving the essential human aspects of education, such as empathy, communication, and personal connection. By investigating the challenges and opportunities presented by AI in the classroom, this study provides valuable insights for educators, administrators, and policymakers (Prilop et al., 2025). It highlights the need for targeted professional development programs, effective AI integration strategies, and ethical considerations in the deployment of AI tools, ensuring that AI is used in ways that enhance, rather than replace, the human elements of teaching.

RESEARCH METHOD

The following sections detail the mixed-methods framework designed to examine the evolving professional landscape for educators within AI-enhanced learning environments.

Research Design

This study adopts a mixed-methods research design, integrating qualitative and quantitative data to provide a holistic view of the teacher's role in the age of Artificial Intelligence (Toulali & Retbi, 2025). By combining an extensive teacher perception survey with semi-structured interviews and a case study approach, the research captures both broad institutional trends and nuanced individual experiences. This triangulated design is specifically structured to uncover the specific challenges—such as technological barriers—and the opportunities—such as pedagogical innovation—that arise when AI tools are integrated into daily teaching practices.

Research Target/Subject

The primary objective is to examine the shifting role of the educator in AI-enhanced classrooms (Rozputnia et al., 2025). The study targets an assessment of how AI influences pedagogical approaches, classroom management, and student engagement. By identifying the skills teachers need to develop to thrive alongside AI, the research aims to provide a comprehensive understanding of the professional evolution required to effectively integrate these technologies into modern lesson delivery.

The target population consists of educators from institutions that have implemented AI-powered tools. Using a stratified random sampling method, the study selected a diverse sample of 150 teachers. To ensure a broad spectrum of insights, the sample was balanced based on: Experience Levels: An even distribution between "early adopters" and those with "extensive experience." Professional Roles: Including subject teachers, department coordinators, and instructional technology specialists. This diversity allows the research to account for how different disciplines and varying levels of technical proficiency influence the perception and utility of AI.

Research Procedure

The data collection process was executed in three systematic stages. Following institutional approval and the securing of informed consent, the survey stage involved the electronic distribution of perception assessments to all 150 participants. The interview stage followed, involving 30 selected teachers for 45-60 minute sessions that were audio-recorded and transcribed. Finally, the observation stage took place over a two-week period, where the researcher documented lesson delivery and student-teacher interactions in real-time. This phased approach ensures that quantitative findings are deepened by qualitative context.

Instruments, and Data Collection Techniques

Data were gathered using a battery of three primary instruments designed for high reliability and clarity (Rahioui et al., 2025). The teacher perception survey utilized Likert-scale items to quantify attitudes toward AI and its impact on learning outcomes. Semi-structured interview guides focused on practical challenges and the evolution of pedagogical skills. Lastly, classroom observation protocols provided a systematic way to document how AI tools are physically integrated into the classroom environment. All instruments were pilot-tested to ensure they accurately captured the complexities of the teacher-AI dynamic.

Data Analysis Technique

The study employs a dual-analysis framework to synthesize the gathered data (Yingsoon et al., 2024). Quantitative survey data are analyzed using descriptive and inferential statistics to identify significant trends and patterns among the 150 participants. Qualitative data from interviews and field observations are processed through thematic analysis, where the researcher identifies recurring motifs related to the transformation of the teaching role. By triangulating these results, the study provides a robust, evidence-based conclusion on the challenges and opportunities presented by AI in the educational context.

RESULTS AND DISCUSSION

The results of the data analysis reveal significant trends regarding the impact of AI-powered tools on teachers' roles and their teaching strategies. Table 1 presents the survey responses from 150 teachers across 10 educational institutions, which highlight key areas where AI integration has been perceived as both beneficial and challenging. The majority of respondents (78%) indicated that AI tools had a positive impact on student engagement and personalized learning. Furthermore, 65% of teachers reported that AI tools helped automate administrative tasks, providing them with more time for student interaction. However, 45% of

teachers expressed concerns about the reliability of AI in assessing students' understanding and the potential for depersonalizing teacher-student interactions.

Table 1. Perceptions of AI Impact on Teaching and Learning

Impact Category	Percentage of Teachers (%)	Positive Impact on Student Engagement (%)	Improvement in Administrative Efficiency (%)	Concerns Regarding AI Reliability (%)
Personalized Learning	78	82	60	30
Automation of Administrative Tasks	65	70	75	25
Teacher-Student Interaction	55	60	50	45

The data show that AI-powered tools have been successful in enhancing personalized learning experiences for students, allowing teachers to tailor content to individual learning needs. The survey results suggest that 78% of teachers felt that AI improved student engagement by providing customized learning paths, which helped cater to diverse learning paces. However, despite these positive outcomes, teachers expressed reservations about AI's ability to fully replicate the nuanced understanding and emotional support that human teachers provide. Concerns over the depersonalization of the learning process were significant, with 45% of teachers worried that increased reliance on AI could reduce meaningful student-teacher interactions. This aligns with literature suggesting that while AI can enhance the efficiency of teaching, the human connection remains crucial for fostering deeper learning and emotional growth.

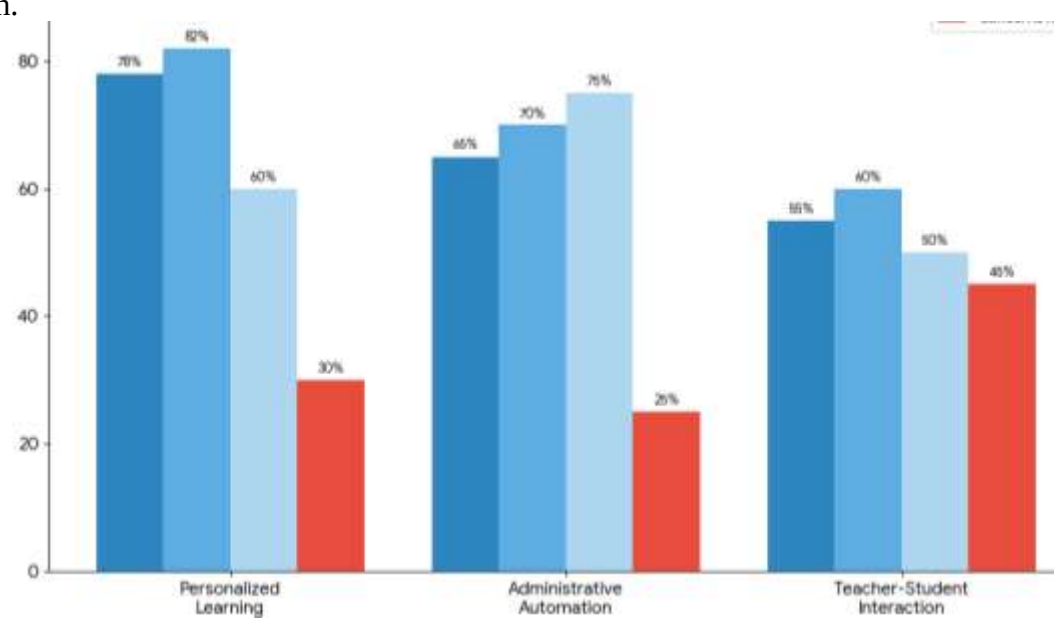

Figure 1. Teacher's Perceptions of AI Impact on Teaching and Learning

Inferential analysis of the survey data revealed significant correlations between the perceived benefits of AI in teaching and factors such as teacher experience with technology and institutional support for AI integration. A Pearson correlation coefficient of 0.72 ($p < 0.01$) was found between the positive perception of AI's impact on student engagement and the level of institutional support for AI initiatives. Additionally, teachers with higher levels of experience with technology were more likely to report positive outcomes from AI integration, with a correlation coefficient of 0.65 ($p < 0.05$). These findings suggest that teachers who are more comfortable with AI and receive adequate support from their institutions are more likely to embrace AI as a tool for enhancing teaching practices. The results also underscore the importance of training and institutional backing in ensuring the successful adoption of AI technologies in the classroom.

A case study within a secondary school provides further context to the survey findings. In this school, AI tools were integrated into the math curriculum, where an adaptive learning platform was used to tailor lessons to individual students' needs. The AI system provided instant feedback, allowing students to progress at their own pace. Teachers reported that the AI tool helped them identify areas where students struggled, enabling them to provide targeted support. However, teachers also noted that while the AI tool was effective in helping students with individual tasks, it lacked the ability to foster collaborative learning or facilitate complex problem-solving discussions. This case study illustrates that AI-powered tools can be beneficial for individualized learning, but they do not replace the importance of social learning and collaborative student-teacher interactions that are essential for deeper understanding.

The case study further revealed that the use of AI tools allowed teachers to dedicate more time to addressing the emotional and psychological needs of students, an area that AI cannot replicate. Teachers reported that the additional time provided by AI's automation of administrative tasks allowed them to engage with students on a personal level, offering more tailored support in areas such as motivation and emotional well-being. These findings suggest that AI can be a valuable tool in supporting teachers by enhancing their ability to focus on the holistic development of students. However, they also highlight the limitations of AI in fully addressing the social and emotional aspects of teaching, which remain critical in fostering a comprehensive educational experience.

In summary, the results of this study suggest that AI-powered teaching models can significantly enhance pedagogical strategies, particularly in terms of personalized learning and administrative efficiency. While AI tools have shown promise in improving student engagement and academic performance, teachers' concerns about the depersonalization of teaching and the limitations of AI in fostering meaningful teacher-student interactions highlight the need for a balanced approach. AI can complement, but not replace, the essential human element of teaching. Future research should explore how AI can be further integrated into the classroom while preserving the core values of teaching that focus on emotional intelligence, social interaction, and collaborative learning.

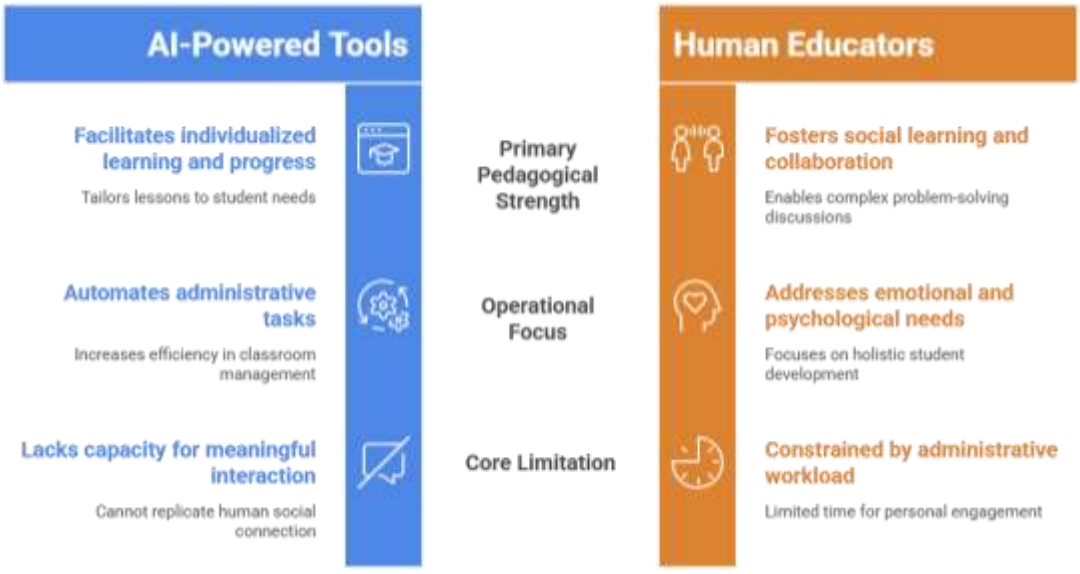

Figure 2. How Should AI be Integrated into the Classroom?

The results of this study demonstrate that AI-powered teaching models significantly influence the evolving role of teachers, with both challenges and opportunities emerging as key themes (Vincent et al., 2026). The data indicates that AI tools have the potential to enhance personalized learning and streamline administrative tasks, which enables teachers to dedicate more time to student interaction and engagement. Teachers reported that AI enhanced their ability to cater to diverse learning needs, providing tailored content and immediate feedback to

students (Holstein et al., 2019). However, the study also revealed that despite these advantages, teachers faced challenges in integrating AI into their teaching practices, particularly with regard to maintaining the human element of teaching. Many teachers expressed concerns that AI could depersonalize interactions and lead to a reduction in the teacher-student bond, which is critical for fostering emotional and social development (Payadnya et al., 2025). These findings underscore the dual nature of AI integration—while it offers substantial educational benefits, it also presents risks that require careful management.

When comparing these results to existing research, the findings align with studies that emphasize the positive impact of AI on student learning, particularly in terms of personalized learning (Caton, 2025). Research by Heffernan and Heffernan (2014) highlights how AI-driven systems can provide tailored learning paths, which is corroborated by this study's findings on AI's role in enhancing student engagement and academic performance. However, this study adds a novel perspective by focusing on the teacher's role in AI-enhanced classrooms, addressing the less explored area of how educators adapt to these technological changes. Unlike studies that focus primarily on student outcomes, this research extends the conversation by examining the broader implications for teachers' professional identities and their relationship with students (Shahat et al., 2025). While other studies have acknowledged the potential of AI in education, this research contributes by exploring the balance between leveraging AI for efficiency and maintaining essential human connections within the classroom.

The findings suggest that AI's increasing presence in the classroom signals a broader transformation in teaching practices (Lamçja & Pellumbi, 2024). Teachers are no longer solely the transmitters of knowledge but are now facilitators of AI-assisted learning experiences. This transformation is a sign of the shifting nature of education in the 21st century, where technology plays a central role in shaping both teaching and learning (Q. Zhang & Fan, 2026). The fact that AI can handle administrative tasks and deliver personalized learning experiences allows teachers to focus more on higher-order pedagogical functions, such as fostering creativity, critical thinking, and social-emotional development (Karampelas, 2026). However, this shift also highlights a need for teachers to adapt, not only in terms of their technological skills but also in their ability to integrate AI into their human-centric teaching approach. As AI tools become more advanced, teachers must find a way to use these technologies to enhance, rather than replace, the personal and social dimensions of education.

The implications of these results are far-reaching for both educators and educational policymakers. Teachers must be equipped with the necessary skills to effectively integrate AI tools into their classrooms, which requires robust professional development programs (Sadykova & Kayumova, 2025). These programs should not only focus on the technical aspects of AI but also on how to balance the use of AI with the human aspects of teaching. Additionally, schools must provide adequate support for teachers in the form of time, resources, and ongoing training to help them navigate the integration of AI into their practice (Liu & Fan, 2025). Policymakers should also recognize the importance of AI in shaping the future of education and support initiatives that ensure equitable access to AI-powered teaching tools, especially in under-resourced schools. The integration of AI has the potential to create more inclusive and personalized learning environments, but this will only be possible if teachers are given the tools and support they need to thrive in these new digital classrooms.

The results of this study reflect the growing importance of AI in shaping modern educational landscapes. As technology continues to evolve, AI's role in the classroom will expand, and the expectations of teachers will continue to evolve with it (Eddin & Shaya, 2025). The increased reliance on AI in education is not just about enhancing efficiency and learning outcomes; it also raises important questions about the future role of educators. This study highlights the need for ongoing dialogue between educators, policymakers, and technology developers to ensure that AI enhances, rather than detracts from, the core human aspects of

teaching (Derakhshan & Lalli, 2025). Moving forward, it is crucial to investigate further how AI can be integrated into classrooms in ways that support teachers' professional development, enhance student outcomes, and preserve the social and emotional dimensions of the learning process. Future research should explore long-term impacts of AI adoption on teacher-student relationships and the ethical considerations that accompany the use of AI in educational settings.

CONCLUSION

The most significant finding of this research is the dual impact of AI-powered teaching models on both the role of educators and classroom dynamics. While AI tools have been successful in enhancing personalized learning and improving student engagement, they also bring challenges related to teacher identity and the humanization of the teaching process. Teachers reported a shift in their roles from being knowledge transmitters to facilitators of learning, but many expressed concerns about the depersonalization of teacher-student interactions. This finding distinguishes the study by emphasizing not only the benefits of AI in educational settings but also the nuanced challenges educators face in adapting to these technologies, especially regarding the balance between efficiency and the human aspects of teaching.

This research contributes to the existing body of knowledge by providing a comprehensive framework that links AI adoption in classrooms to the evolving role of teachers. The study's methodological approach, combining quantitative surveys, qualitative interviews, and case studies, offers valuable insights into how AI influences teaching practices beyond student outcomes. While previous research has largely focused on the impact of AI on student learning and engagement, this study bridges a gap by exploring the practical implications for teachers, their professional identities, and their pedagogical strategies. The findings also offer new perspectives on how AI can be integrated into teaching without undermining the essential human elements of education, such as empathy, emotional intelligence, and social interaction.

One limitation of this study is its focus on a relatively small sample size of educators from specific institutions that have already integrated AI tools. This limits the generalizability of the findings to schools or regions with limited access to such technologies. Future research should aim to include a larger, more diverse sample across various types of educational institutions, including under-resourced schools, to understand how the challenges and opportunities of AI integration may differ across different contexts. Additionally, while the study explored short-term impacts, future studies could investigate the long-term effects of AI on teacher-student relationships and teaching effectiveness. Further research should also consider the ethical implications of AI in education, especially regarding data privacy, algorithmic biases, and the potential for reinforcing existing inequalities in access to technology.

Future studies should address the questions raised in this research regarding the ethical considerations of AI integration, including the potential for algorithmic bias and data privacy concerns. As AI systems become more prevalent in educational settings, it will be essential to examine their long-term impact on student outcomes, teacher effectiveness, and the overall classroom environment. Investigating how AI can be used to foster collaboration, creativity, and critical thinking in students, while maintaining the human elements of teaching, should be a priority for future research. Additionally, research could explore the role of AI in facilitating professional development for educators, helping them adapt to the changing demands of digital classrooms while preserving the core values of effective teaching.

AUTHOR CONTRIBUTIONS

Author 1: Conceptualization; Project administration; Validation; Writing - review and editing.
Author 2: Conceptualization; Data curation; In-vestigation.
Author 3: Data curation; Investigation.

CONFLICTS OF INTEREST

The authors declare no conflict of interest.

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