

Artificial intelligence and the future role of teachers: Opportunities, challenges, and emerging professional responsibilities

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Abstract

Artificial intelligence (AI) is increasingly influencing educational practice through applications such as personalised learning, automated assessment, learning analytics, and generative AI tools. These developments have generated debate regarding the future role of teachers and the extent to which AI may transform educational work. Drawing on the perspective of human–AI complementarity, this conceptual article examines how AI is reshaping teaching by creating new opportunities, introducing significant challenges, and expanding teachers' professional responsibilities. The discussion highlights the potential of AI to support personalised instruction, timely feedback, data-informed decision-making, and professional learning. At the same time, concerns about academic integrity, algorithmic bias, data privacy, and digital inequality continue to pose significant educational and ethical challenges. The article argues that AI is unlikely to replace teachers because effective teaching depends on human capacities such as pedagogical judgment, ethical reasoning, creativity, and socio-emotional support. Consequently, teachers are increasingly expected to facilitate learning, critically evaluate AI-generated information, provide ethical guidance, and promote AI literacy. The article concludes that the future of education depends on productive collaboration between teachers and AI rather than technological substitution.

Keywords: *Artificial Intelligence, Teacher Roles, Teacher Education, AI Literacy, Human–AI Complementarity*

1. Introduction

Artificial intelligence (AI) has moved from a specialised technological domain to a visible presence within educational settings. Intelligent tutoring systems, learning analytics platforms, automated assessment tools, and generative AI applications such as ChatGPT increasingly support teaching and learning activities across educational levels. Recent developments in generative AI have accelerated scholarly and public debate about the future of teaching, as these systems can generate text, answer questions, provide feedback, and assist learners in ways previously associated with human expertise (Kasneci et al., 2023; UNESCO, 2023).

The growing presence of AI has prompted contrasting interpretations of its educational significance. Some scholars argue that AI can enhance instructional effectiveness through personalised learning pathways, timely feedback, and data-informed decision making (Holmes et al., 2019). Others caution that excessive reliance on AI may raise ethical concerns about bias, privacy, transparency, and academic integrity (Selwyn, 2019; UNESCO, 2023). These competing perspectives indicate that discussions about AI in education extend beyond technological capability and increasingly focus on the changing nature of educational work.

At the centre of this debate lies the question of how AI may reshape teachers' roles. Earlier technological innovations often promised to transform teaching, yet evidence suggests that technology rarely replaces educators because teaching involves complex pedagogical, social, and ethical responsibilities that extend beyond information delivery (Luckin, 2018). While AI may automate selected routine tasks, teachers continue to interpret learning needs, cultivate meaningful relationships, support student well-being, and exercise professional judgment in unpredictable educational contexts.

This article examines how AI influences the future role of teachers by analysing emerging opportunities, persistent challenges, and evolving professional responsibilities. The discussion argues that AI does not diminish the importance of teachers. Instead, AI may increase the value of distinctly human capabilities such as critical judgment, ethical reasoning, creativity, and socio-emotional support. Understanding this transformation remains important because teacher education institutions and policymakers must prepare educators for a rapidly changing technological landscape.

Unlike many discussions that focus primarily on the capabilities or limitations of AI technologies, this article examines the future role of teachers through the lens of human–AI complementarity and identifies emerging professional responsibilities that may define teaching in AI-supported educational environments.

2. Conceptual Framework: Human–AI Complementarity in Education

Understanding the future role of teachers requires a conceptual perspective that moves beyond the simplistic question of whether artificial intelligence will replace human educators. Much of the public discourse surrounding AI in education tends to frame the relationship between technology and teachers as a competition in which advances in automation gradually reduce the need for human involvement. However, contemporary educational scholarship increasingly challenges this assumption and instead proposes a complementary relationship between human expertise and artificial intelligence (Holmes et al., 2019; Luckin, 2018). From this perspective, the educational significance of AI lies not in replacing teachers but in reshaping how human and technological capabilities interact to support learning.

The principle of human–AI complementarity rests on the recognition that humans and intelligent systems possess different strengths. AI systems can process large volumes of data, identify patterns, generate rapid feedback, and perform repetitive tasks with considerable efficiency. These capabilities enable AI to support activities such as adaptive learning, automated assessment, and learning analytics (Zawacki-Richter et al., 2019). Nevertheless, educational practice extends beyond information processing and task automation. Teaching requires contextual understanding, ethical judgment, interpersonal communication, creativity, and sensitivity to learners' emotional and social needs. Current AI systems demonstrate limited capacity to perform these functions in ways that reflect the complexity of authentic educational relationships.

Luckin (2018) argues that the most productive educational use of AI involves creating a partnership in which technology augments human capabilities rather than replacing them. Within such a partnership, AI may support teachers by generating insights from learner data, identifying areas of academic difficulty, and automating routine administrative tasks. Teachers, in turn, interpret these insights, adapt them to specific educational contexts, and make decisions that reflect pedagogical goals and learner well-being. This relationship suggests that educational effectiveness depends not on the independent performance of either teachers or AI systems, but on their capacity to collaborate.

The concept of complementarity also helps explain why technological advancement has not historically eliminated the need for teachers. Educational technologies have repeatedly transformed instructional practices, yet teachers have remained central because learning involves social interaction, motivation, identity development, and moral guidance in addition to knowledge acquisition (Selwyn, 2019). AI may alter how teachers perform their work, but it does not remove the need for professional judgment when addressing diverse learner needs and complex classroom situations. Consequently, the emergence of AI may increase demand for those aspects of teaching that rely most heavily on human capabilities.

A complementary framework further highlights the importance of maintaining human oversight in AI-supported educational environments. Although AI systems can provide recommendations and generate educational content, these outputs are not inherently objective or error-free. Teachers, therefore, serve as critical evaluators who assess the appropriateness, accuracy, and ethical implications of AI-generated information. UNESCO (2021) emphasises that human agency and accountability should remain central principles in the development and use of AI. Applying this principle to education suggests that teachers must retain responsibility for decisions that influence learning, assessment, and student welfare.

The human–AI complementarity framework provides a useful lens for understanding the opportunities and challenges discussed throughout this article. Opportunities emerge when AI supports teachers in ways that enhance professional effectiveness, whereas challenges arise when technological capabilities are viewed as substitutes for educational judgment and human relationships. Consequently, the future of teaching may depend less on technological sophistication and more on educators' and institutions' ability to establish productive partnerships between human expertise and artificial intelligence.

Viewed through this framework, the central issue is not whether AI will replace teachers but how educational systems can harness AI while preserving the human qualities that underpin

meaningful learning. This perspective informs the subsequent discussion of opportunities, challenges, and evolving professional responsibilities in the AI era.

3. Artificial Intelligence and the Transformation of Educational Practice

Artificial intelligence has begun to alter educational practice by expanding the capacity of digital systems to support learning, assessment, and instructional decision-making. Unlike earlier educational technologies that primarily delivered content, contemporary AI systems can analyse learner data, adapt instructional pathways, generate feedback, and respond to user inputs in real time (Holmes et al., 2019). These capabilities have positioned AI as a significant component of ongoing efforts to personalise learning and improve educational efficiency across diverse contexts.

One prominent contribution of AI lies in its ability to support personalised learning. Traditional classroom instruction often requires teachers to address the needs of students with varying abilities, interests, and learning speeds within limited instructional time. AI-powered systems can assist this process by analysing patterns in learner performance and recommending activities that align with individual learning needs. Research on intelligent tutoring systems suggests that adaptive technologies can provide targeted support and immediate feedback, which may enhance learner engagement and achievement when integrated appropriately into teaching practices (Ma et al., 2014; Zawacki-Richter et al., 2019). Consequently, AI has strengthened the possibility of tailoring instruction to individual learners at a scale that would be difficult to achieve through human effort alone.

In addition to personalising learning, AI increasingly influences educational assessment. Automated scoring systems, learning analytics platforms, and generative AI applications can evaluate student responses, identify learning gaps, and generate feedback quickly. Such capabilities may reduce administrative burdens that often consume substantial portions of teachers' time (Luckin, 2018). Nevertheless, educational assessment involves more than efficiency. Teachers frequently interpret contextual factors, assess higher-order thinking, and exercise professional judgment when evaluating student work. Therefore, AI may support assessment processes, but current evidence does not suggest that it can fully replicate the nuanced evaluative practices that characterise effective teaching.

Recent advances in generative AI have further accelerated discussions about educational transformation. Tools such as ChatGPT can generate explanations, summarise information, answer questions, and assist with content creation. These capabilities have expanded access to educational support while simultaneously raising concerns regarding accuracy, bias, and academic integrity (Kasneci et al., 2023; UNESCO, 2023). The educational significance of generative AI, therefore, extends beyond technical functionality. Its widespread adoption challenges conventional assumptions about knowledge production, assessment design, and learner autonomy, prompting educators to reconsider established pedagogical practices.

Despite these developments, the impact of AI on education remains shaped by human decisions rather than solely by technological capability. Selwyn (2019) argues that educational technologies often reflect broader social, political, and institutional priorities rather than functioning as neutral tools. From this perspective, the transformative potential of AI depends on how educators, institutions, and policymakers choose to integrate these systems into

teaching and learning processes. As a result, understanding AI requires attention not only to technological innovation but also to the educational values that guide its implementation.

Taken together, current developments indicate that AI is transforming several dimensions of educational practice, including personalised learning, assessment, and instructional support. However, these transformations do not eliminate the need for teachers. Instead, they create new conditions under which teachers must exercise professional judgment and pedagogical expertise. This evolving relationship between AI and educational practice provides the foundation for examining the opportunities that AI may create for teachers.

4. Opportunities Created by Artificial Intelligence for Teachers

Artificial intelligence may create significant opportunities for teachers by enhancing instructional effectiveness, reducing routine administrative tasks, and supporting more informed educational decision-making. Although public discussions often focus on the possibility of technological replacement, much of the current literature suggests that AI functions more effectively as a tool that augments rather than substitutes teacher expertise (Holmes et al., 2019; Luckin, 2018). This perspective shifts attention from concerns about displacement to questions regarding how teachers can use AI to strengthen educational practice.

One important opportunity lies in AI's potential to support personalised instruction. Teachers frequently encounter classrooms characterised by diverse learning needs, abilities, and interests. Meeting these varied needs through conventional instructional approaches can prove challenging, particularly in large classes. AI-enabled systems can analyse learner performance data and provide recommendations that help teachers tailor instruction to individual students (Zawacki-Richter et al., 2019). Such insights may allow educators to identify struggling learners, recognise emerging learning patterns, and adjust instructional strategies more effectively. Consequently, AI may strengthen teachers' capacity to address learner diversity without diminishing their central role in the educational process.

Another notable opportunity concerns the provision of timely feedback. Feedback plays a crucial role in promoting student learning, yet teachers often face substantial constraints on the time available for detailed evaluation. AI-based assessment tools can assist by generating preliminary feedback, identifying common errors, and monitoring learner progress across multiple tasks (Luckin, 2018). While teachers retain responsibility for interpreting student performance and providing meaningful pedagogical guidance, AI may reduce the workload associated with routine assessment activities. This support can enable teachers to devote greater attention to instructional planning and learner engagement.

AI also has the potential to enhance data-informed decision-making in educational settings. Educational institutions increasingly collect large volumes of learner data, yet teachers may struggle to turn it into actionable insights. Learning analytics systems can identify patterns related to participation, achievement, and engagement, thereby supporting instructional decisions grounded in empirical evidence (Ifenthaler & Yau, 2020). However, the value of such systems depends on teachers' ability to interpret and apply the information appropriately. Therefore, AI may expand access to educational insights, but professional judgment remains essential for transforming those insights into effective teaching practices.

Beyond classroom instruction, AI may contribute to teachers' professional learning and development. Generative AI tools can assist educators in designing lesson plans, preparing instructional materials, generating examples, and exploring alternative pedagogical approaches. Recent evidence suggests that teachers increasingly use AI applications as professional support tools rather than merely as classroom technologies (Kasneci et al., 2023). Such uses may reduce preparation time and expose educators to new instructional possibilities. Nevertheless, effective utilisation requires critical evaluation because AI-generated content may contain inaccuracies, biases, or pedagogical limitations.

The opportunities associated with AI extend further to fostering innovation in teaching practices. Traditional instructional models often position teachers as primary sources of information. In contrast, AI-supported environments may allow educators to devote greater attention to facilitating inquiry, collaboration, critical thinking, and problem-solving. Holmes et al. (2019) contend that AI can automate selected routine functions, thereby creating opportunities for teachers to focus on higher-order educational goals that require human interaction and professional expertise. From this perspective, AI may encourage a shift from information transmission toward more learner-centred pedagogical approaches.

Taken together, the available evidence suggests that AI offers several opportunities to enhance teachers' professional work. Personalised instruction, timely feedback, data-informed decision-making, professional learning support, and pedagogical innovation represent important areas in which AI may strengthen educational practice. However, these opportunities do not emerge automatically. Their educational value depends on thoughtful implementation and teachers' critical engagement. This consideration becomes particularly important when examining the challenges and risks that accompany the growing integration of AI into educational settings.

5. Challenges and Risks Associated with Artificial Intelligence in Education

Despite its potential benefits, integrating artificial intelligence into education poses several challenges that may complicate teaching practice and raise important ethical concerns. While AI can support instructional activities and administrative processes, its adoption also requires educators to address issues related to academic integrity, algorithmic bias, data privacy, and equitable access. These concerns suggest that the educational value of AI depends not only on technological capability but also on the conditions under which institutions and teachers employ these systems.

A major challenge concerns the growing threat to academic integrity posed by generative AI tools. Applications such as ChatGPT can produce essays, summaries, and responses that resemble human-authored work, making it increasingly difficult to determine the originality of student submissions. Recent studies indicate that generative AI has intensified concerns regarding plagiarism, authorship, and the validity of conventional assessment practices (Kasneci et al., 2023; Tlili et al., 2023). As a result, teachers may need to redesign assessment tasks to emphasise critical analysis, authentic performance, and reflective engagement rather than simple information reproduction. The challenge, therefore, extends beyond detecting misconduct and involves rethinking how educational institutions evaluate learning in an AI-rich environment.

Another significant concern relates to algorithmic bias and the reliability of AI-generated outputs. AI systems learn from existing datasets, which may contain social, cultural, or

historical biases. Consequently, AI applications can reproduce or even amplify the inequities present in the data on which they were trained (UNESCO, 2021). Furthermore, generative AI tools occasionally produce inaccurate or fabricated information while presenting it with apparent confidence. Such limitations may undermine educational quality if learners accept AI-generated content uncritically. Teachers, therefore, assume an increasingly important role in helping students evaluate information, verify sources, and develop critical digital literacy skills. Data privacy and surveillance pose additional challenges as AI use grows in educational settings. Many AI-driven platforms collect extensive data on learner behaviour, performance, and engagement patterns. Although these data can support personalised learning and learning analytics, concerns arise regarding informed consent, data ownership, and the potential misuse of sensitive information (Williamson & Eynon, 2020). Educational institutions must therefore balance the benefits of data-driven insights with the responsibility to protect student privacy. In this context, teachers often serve as intermediaries, helping students navigate the ethical implications of digital technologies while advocating responsible data practices.

The increasing reliance on AI also raises concerns about the potential erosion of human judgment in educational decision-making. AI systems can generate recommendations regarding learning pathways, assessment outcomes, and instructional interventions. However, educational decisions frequently require contextual understanding, professional discretion, and sensitivity to individual learner circumstances. Selwyn (2019) argues that excessive faith in technological solutions may encourage educators and institutions to overlook the social and relational dimensions of teaching. Consequently, teachers must remain cautious consumers of AI-generated recommendations rather than treating algorithmic outputs as objective or infallible sources of guidance.

A further challenge concerns the persistence of digital inequalities across educational contexts. Access to advanced technologies often varies across socioeconomic conditions, institutional resources, and geographical locations. Students and teachers in under-resourced settings may have limited opportunities to benefit from AI-supported learning environments, thereby widening existing educational disparities (UNESCO, 2023). The promise of AI-enhanced education may therefore remain unevenly distributed unless policymakers and institutions address issues of accessibility and digital infrastructure. This challenge highlights the broader social context within which educational technologies operate.

Collectively, these challenges demonstrate that adopting AI in education involves complex pedagogical, ethical, and social considerations. Concerns about academic integrity, bias, privacy, overreliance on technology, and unequal access suggest that AI cannot serve as a straightforward solution to educational problems. Instead, teachers must critically evaluate AI tools while safeguarding educational values and learner interests. These evolving responsibilities point to a fundamental transformation in teachers' professional roles, one that warrants closer examination.

6. Emerging Professional Responsibilities of Teachers in the AI Era

The growing integration of artificial intelligence into educational environments is reshaping teachers' professional responsibilities rather than diminishing their importance. Although AI can perform selected instructional and administrative functions, it cannot fully replicate the complex human capacities that underpin effective teaching. Consequently, the expansion of AI

in education requires teachers to assume new responsibilities while strengthening several existing dimensions of professional practice. These evolving responsibilities highlight a transition from the traditional role of information provider toward a more multifaceted role that combines pedagogical, ethical, and relational expertise.

One emerging responsibility is to facilitate learning rather than serve primarily as a transmitter of knowledge. Historically, teachers have often served as the primary source of information in classrooms. However, learners now access information through diverse digital platforms, including AI-powered systems that generate explanations and respond to questions in real time. In such contexts, the value of teaching increasingly lies in guiding learners to interpret, apply, and critically evaluate information rather than merely acquiring it. Luckin (2018) argues that educators remain essential because meaningful learning requires human support in reasoning, reflection, and knowledge construction. As AI expands access to information, teachers may therefore devote greater attention to cultivating deeper forms of understanding.

A second responsibility concerns the critical evaluation of AI-generated content. Generative AI systems can produce convincing responses, yet they may also generate inaccurate, incomplete, or biased information. Research indicates that large language models can create content that appears credible despite containing factual errors or unsupported claims (Kasneci et al., 2023). Consequently, teachers must help students develop the capacity to question sources, verify information, and recognise the limitations of algorithmic outputs. This responsibility extends beyond traditional information literacy because it requires learners to understand how AI systems generate content and why those outputs may not always be reliable.

Ethical guidance represents another increasingly important dimension of teachers' professional work. The use of AI in education raises questions related to fairness, transparency, accountability, privacy, and academic integrity. UNESCO (2021) emphasises that educational stakeholders should promote the ethical development and use of AI while protecting human rights and social inclusion. Within educational settings, teachers occupy a strategic position because they directly influence students' attitudes and behaviours regarding technology use. As a result, teachers may play a crucial role in helping learners navigate ethical dilemmas associated with AI while fostering responsible and informed digital citizenship.

The AI era also increases the importance of teachers as designers of meaningful learning experiences. While AI systems can generate content and recommend learning activities, they do not possess a comprehensive understanding of classroom dynamics, learner motivation, or contextual educational needs. Effective learning environments require thoughtful alignment among learning objectives, instructional strategies, assessment practices, and student characteristics. According to Holmes et al. (2019), AI functions most effectively when educators integrate technological capabilities within pedagogically sound learning designs. Therefore, rather than reducing professional expertise, AI may heighten the importance of instructional design as a core teaching competency.

In addition, teachers continue to serve as providers of socio-emotional support, a responsibility that remains difficult to automate. Learning involves emotional, motivational, and interpersonal dimensions that extend beyond cognitive performance. Students frequently seek encouragement, empathy, reassurance, and personal guidance from educators, particularly during periods of academic uncertainty or personal difficulty. Although AI systems can

simulate conversational interaction, current technologies lack genuine emotional understanding and the ability to build human relationships. Selwyn (2019), therefore, cautions against the assumption that technological systems can replace the relational aspects of teaching. The enduring importance of socio-emotional support suggests that human connection remains central to educational practice despite technological advancement.

Finally, teachers increasingly assume responsibility for fostering AI literacy among learners. As AI becomes embedded in social, professional, and educational contexts, students require knowledge and skills to engage with these technologies critically and responsibly. Long and Magerko (2020) define AI literacy as a set of competencies that help individuals understand, evaluate, and interact effectively with AI systems. Teachers, therefore, face the challenge of preparing learners not only to use AI tools but also to recognise their capabilities, limitations, and societal implications. This responsibility aligns with broader educational goals that emphasise critical thinking, informed participation, and responsible technology use.

Taken together, these emerging responsibilities suggest that AI is redefining rather than reducing the professional role of teachers. Facilitation of learning, critical evaluation of information, ethical guidance, instructional design, socio-emotional support, and AI literacy promotion are areas where human expertise remains indispensable. The future of teaching may therefore depend less on competing with intelligent technologies and more on cultivating the uniquely human capacities that technology cannot easily reproduce. Such a transformation carries important implications for teacher education and professional development.

7. Implications for Teacher Education and Professional Development

The evolving role of teachers in AI-supported educational environments necessitates corresponding changes in teacher education and professional development. If educators are expected to facilitate learning, evaluate AI-generated information, address ethical concerns, and promote AI literacy, teacher preparation programmes must equip them with the knowledge and competencies required to fulfil these responsibilities effectively. Consequently, the integration of AI into education presents not only a technological challenge but also a significant educational and professional development agenda.

A fundamental priority involves strengthening AI literacy within teacher education programmes. Teachers cannot guide students in the responsible use of AI if they lack a clear understanding of how these technologies operate and influence learning. AI literacy extends beyond technical proficiency and encompasses awareness of AI systems' capabilities, limitations, risks, and societal implications (Long & Magerko, 2020). Teacher education institutions may therefore need to incorporate foundational AI concepts into pre-service preparation programmes so that future educators can engage critically with emerging technologies rather than merely adopting them as instructional tools.

In addition to AI literacy, teacher education programmes should place greater emphasis on digital pedagogical competence. Effective technology integration requires more than familiarity with digital tools. Teachers must understand how technological resources align with learning objectives, instructional strategies, and assessment practices. Research on educational technology consistently demonstrates that pedagogical considerations exert a stronger influence on learning outcomes than the technology itself (Koehler et al., 2013). As AI applications become more common in classrooms, teacher preparation programmes may need

to focus on helping educators make informed pedagogical decisions regarding when, how, and why AI should support learning activities.

Ethical competence represents another essential area for professional preparation. The increasing use of AI raises questions concerning data privacy, transparency, bias, intellectual ownership, and responsible technology use. UNESCO (2021) emphasises the need for educational systems to promote ethical approaches to AI implementation that safeguard human dignity and social justice. Teachers frequently serve as the first point of guidance when students encounter ethical issues related to technology use. Therefore, teacher education programmes should prepare educators to recognise ethical challenges and facilitate informed discussions about the responsible use of AI in educational settings.

Continuous professional development also assumes greater importance in the context of rapid technological change. AI technologies evolve at a pace that often exceeds the capacity of formal teacher preparation programmes to comprehensively address emerging developments. Consequently, professional learning cannot remain confined to pre-service education. Rather, teachers require ongoing opportunities to update their knowledge, evaluate new technologies, and refine instructional practices. Trust et al. (2016) argue that contemporary professional learning increasingly depends on flexible and collaborative models that support continuous knowledge development. Such approaches may help educators respond more effectively to technological innovations and changing educational demands.

Institutional support further influences teachers' capacity to engage meaningfully with AI. Even highly motivated educators may struggle to integrate AI effectively if schools and educational systems lack appropriate infrastructure, policy guidance, or professional learning opportunities. Successful implementation requires coordinated efforts among teacher education institutions, schools, policymakers, and technology providers. Williamson and Eynon (2020) note that discussions of AI in education often focus on technological possibilities while overlooking the organisational and policy conditions necessary for meaningful educational change. Therefore, institutional readiness remains an important factor in determining whether AI enhances or hinders teaching practice.

Finally, teacher education must preserve the human dimensions of teaching while embracing technological innovation. The growing presence of AI may encourage a narrow emphasis on technical competencies if educational programmes focus exclusively on technological skills. However, the future role of teachers continues to depend on professional judgment, ethical reasoning, communication, empathy, and the ability to foster meaningful human relationships. These capacities remain central to educational practice because they address dimensions of learning that current AI systems cannot adequately replicate. Consequently, teacher education should seek a balanced approach that combines technological preparedness with the development of enduring professional values and human-centred pedagogical expertise.

Overall, the emergence of AI in education requires a reconsideration of how teachers are prepared and supported throughout their professional careers. Strengthening AI literacy, digital pedagogical competence, ethical awareness, continuous professional learning, and institutional support may help educators navigate the opportunities and challenges associated with AI. Such efforts are likely to play a critical role in ensuring that technological innovation enhances rather than diminishes the educational mission of teaching.

8. Conclusion

Artificial intelligence is reshaping educational practice by expanding opportunities for personalised learning, assessment, and instructional support. However, the growing presence of AI does not diminish the importance of teachers. Rather, it highlights the continuing value of human capabilities that remain difficult to automate, including pedagogical judgment, ethical reasoning, creativity, and socio-emotional support.

From a human–AI complementarity perspective, this article argues that the future of teaching lies in collaboration rather than substitution. While AI can assist with routine and data-intensive tasks, teachers remain responsible for interpreting educational contexts, supporting learner development, and ensuring that technology serves meaningful educational purposes. Consequently, the professional role of teachers is evolving from knowledge transmission towards learning facilitation, critical evaluation of AI-generated information, ethical guidance, and AI literacy promotion.

These developments carry important implications for teacher education and professional development. Preparing educators for AI-supported learning environments requires attention not only to technological competence but also to the human-centred dimensions of teaching. Ultimately, the educational value of AI will depend less on technological sophistication and more on how effectively teachers integrate these tools to enhance learning while preserving the human foundations of education.

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Conflict of Interest

The authors declare that they have no conflict of interest.

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