Editorial

Minds, Machines, and Classrooms: The Impact of Artificial Intelligence on Teaching and the Way Ahead

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How to cite:

Shobha Bagai. (2025). Minds, Machines, and Classrooms: The Impact of Artificial Intelligence on Teaching and the Way Ahead. *Vantage: Journal of Thematic Analysis*, 6(2), 106-108. https://doi.org/10.52253/vjta.2025.v06i02.106

1. INTRODUCTION

History was created in 1997, when IBM's Deep Blue defeated the then world chess champion Garry Kasparov. With its brute force computing power, IBM's Deep Blue, could process more than 200 million possible chess moves per second. 2025 - almost three decades later, that moment feels idiosyncratic. Today's machines are capable of not just calculating but they can generate art, write essays, compose music, and even hold conversations that mimic humans. What began as an inquiry into whether machines could 'out-smart' us has become a deeper inquiry: how do minds and machines now think together?

From the pre-historic times, humanity has been defined by the tools that we have invented. Starting from the basic stone tools created by humans in the early stone age, to the complex metallic tools and progressing to technological advancements in the twenty first century, every significant evolution has reshaped how we live, work, and understand ourselves. Today, we are once again at the threshold of the fourth industrial revolution where artificial intelligence and machine learning stand at the forefront of innovation.

The growth of artificial intelligence since the beginning of this century has been exponential.

Machines are now proficient in demonstrating, learning, adaptability, and creativity rather than following rigid instructions. Models based on generative AI now have the power to write novels, compose poetry, draft legal documents, mimic human behaviour with astonishing expertise. Motor skills that were uniquely attributed to humans have been taken over by robotics. At the same time, the sciences of the mind—cognitive psychology, neuroscience, linguistics—are unravelling the mysteries of consciousness, memory, and perception. This dual evolution of intelligent systems and cognitive science challenges whether algorithms "understand" or merely recognise patterns. We are now seeking answers if machines can deepen the knowledge of the human brain. As Mahatma Gandhi quoted, machines are not meant to dominate humans but serve them.

The emergence of artificial intelligence is making its impact on the society we live in. The effect of the advancement in artificial intelligence is making its mark in our job profile. Jobs related to manufacturing, transport, logistics, retail, commerce, customer and financial services are now being threatened. But on the other hand, there is a demand of human resources in the field of data analysis, AI agent management, cybersecurity and digital content curation. Enhanced algorithms in machine learning

are reviewing legal contracts, robotic systems are managing warehouses, and AI models are assisting in journalism, healthcare diagnostics, and law. This dual process of displacement and creation compels societies to rethink and reskill themselves in order to compete in an automated age.

Education, like these other sectors, is not secluded from the effects of AI. With the onset of technology, teaching is at the centre of this change, amending the way teachers instruct, students learn, and even the functioning of the classrooms. Unlike industries where tasks can be fully automated, teaching involves a human intervention that cannot be easily replaced. Yet, there is a significant scope of AI in education, with the potential to personalise learning, automate routine tasks, and expand access to knowledge. This raises pressing questions: How does AI affect teaching? What opportunities and risks accompany its use? And how can educators ensure that AI enhances, rather than undermines, the human dimensions of learning?

2. EFFECTS OF AI ON TEACHING

The influence of AI on teaching is visible across several dimensions, beginning with the promise of personalised learning. AI systems can adapt content to the pace, interests, and needs of individual learners, allowing students to progress at their own rhythm while addressing gaps more effectively. Platforms such as Khan Academy's Khanmigo (Khan Academy, 2023) or India's DIKSHA (DIKSHA, 2017) illustrate how AI-driven personalisation can enhance multilingual, localised access to quality content and narrow inequities in learning outcomes.

Equally important is the ability of AI to reduce administrative burdens on teachers. Tasks such as grading, attendance tracking, and generating reports often consume substantial time that could otherwise be devoted to meaningful student interaction. Tools like Gradescope (Turnitin, 2018) demonstrate how automation enables teachers to focus more on mentoring, critical discussion, and creativity in the classroom. AI also powers intelligent tutoring systems that provide feedback outside school hours. Carnegie Learning's MATHia (Carnegie Learning, 2023), for instance, acts as a personal math coach, supplementing formal instruction while addressing the persistent shortage of human tutors, particularly in under-resourced schools.

Beyond personalization and automation, AI contributes to learning analytics that inform pedagogy. AI can gather data based on student's performance and achievement that can be collated to yield insights. Based on these insights, teachers can modify their pedagogy for each individual. One such example is University of Michigan's ECoach personalised, web-based project (University of Michigan, 2022) that provides personalised feedback to the students along with helping the teachers to track their learning progress. This enables the students to get timely advice and support in their learning ability.

Accessibility of the learning material, particularly in the mother tongue of the students, is also a major focal point. Microsoft and Google, two of the leading technology companies, have introduced AI-powered assistive tools such as Microsoft's Immersive Reader (Microsoft, 2023) and Google's Live Caption (Gadgets 360, 2024) respectively with a view to expand participation for learners with disabilities or language barriers, ensuring more inclusive classrooms. By removing traditional obstacles to participation, such innovations redefine equity in education. Taken together, these examples illustrate how AI is less about replacing teachers and more about reshaping their roles—freeing them to emphasise creativity, mentorship, and holistic development while delegating repetitive tasks to machines.

3. CHALLENGES AND CONCERNS

Just as every coin has two sides, application of AI in teaching is not devoid of the complex challenges that it poses. Over-dependence on technology risks narrowing education to mere transfer of information, diminishing the teacher's role as mentor, guide, and moral compass. Equally concerning is the issue of bias and inequality. AI systems are only as reliable as the data on which they are trained. Any flaws in the data can reproduce and amplify existing social biases. Further, disparities in infrastructure risk deepening the digital divide. The elite institution with available advanced AI resources gets an edge over the underfunded educational institutes.

Another issue raised due to infiltration of AI is the concern of data privacy and security. AI systems often require access to large volumes of sensitive student data, creating risks of misuse, surveillance, and breaches of trust. AI driven proctoring tools such as Proctorio (Proctorio, 2013) requires students to necessarily install spywares on their devices. The personal data of students including their biometric data is open to being compromised for commercial gain, identity theft and surveillance tracking. The lack of the preparedness of teachers to integrate AI effectively into their pedagogy and their concern about being displaced by technology aggravate their resistance to its adoption. Without structured

professional development, AI's benefits may remain concentrated in privileged contexts, leaving other classrooms behind.

4. THE WAY AHEAD

For AI to serve education meaningfully, it must be embraced as a partner rather than a competitor. Machines may excel at managing routine, repetitive, and large-scale data tasks, but their ability to create, empathise, and judge as humans do is still vague. Preserving this human-centred perspective is essential if AI is to strengthen rather than undermine the values of education.

Conformity to ethical usage will play a critical role in coming days. Further, AI systems must be designed and deployed with fairness, transparency, accountability, and respect for privacy. UNESCO's guidance on AI in education provides a strong framework for developing responsible national and institutional policies (UNESCO, 2023). Equally vital is teacher training and capacity-building. India's National Education Policy 2020 (Government of India, 2020) rightly emphasises digital readiness, but real progress requires sustained investment in equipping educators with both technical skills and ethical literacy.

Integrity and honesty must remain core to this transformation. Public-private partnerships, open-source resources, and targeted government support can help democratise access, ensuring that AI benefits are not restricted to affluent classrooms but extend to underprivileged communities as well. At the philosophical level, the way forward lies in harmonising technology with humanity. As the American Writer Elbert Hubbard observed that a single machine may be capable of doing the work of fifty ordinary men but no machine would be ever able to replace the work of an extraordinary person. While AI may be able to reproduce knowledge, it is teachers who recreate knowledge by cultivating wisdom, imagination, and values.

5. CONCLUSION

Artificial intelligence is reshaping teaching by enabling personalisation, automation, accessibility, and analytics. At the same time, it raises serious concerns about bias, inequality, privacy, and inadequate preparedness. The future of education must be guided by responsible innovation, where AI complements rather than replaces teachers. By prioritising ethics, equity, and teacher empowerment, education systems can ensure that intelligent technologies amplify human potential while preserving the irreplaceable human dimension of learning.

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