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Article

The Role of Teachers and Learners in the Age of AI

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Abstract: Artificial intelligence is bringing major changes to the field of education and is influencing how teachers teach and how learners learn. In today's classrooms, teachers are not only providers of knowledge but also act as guides who help students understand and use digital tools effectively. AI makes it possible to design learning experiences according to individual needs, which helps teachers give more attention to developing skills like critical thinking, creativity, and problem-solving. Learners are also becoming more active participants in this new system. Instead of only listening, they explore topics on their own, use online platforms, and learn at their own pace. This approach increases their independence, confidence, and ability to continue learning throughout life. It also encourages collaboration and better understanding of subjects through interactive methods.

However, the use of AI in education also creates some challenges. Issues such as data privacy, unequal access to technology, and over-reliance on digital systems must be carefully managed. It is important to ensure that technology supports learning without reducing the importance of human interaction. In conclusion, both teachers and learners must adjust to these changes in a thoughtful way. AI should be used as a helpful tool rather than a replacement for teachers. A balanced use of technology and human effort can improve the quality of education and make learning more inclusive and effective for everyone.

Keywords: Artificial Intelligence, Teachers, Learners, Digital Education, Personalized Learning, Critical Thinking, Technology in Education.

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1. Introduction

The twenty-first century has witnessed remarkable technological advancements, among which artificial intelligence has emerged as one of the most transformative innovations. AI refers to the ability of machines and computer systems to perform tasks that normally require human intelligence, such as learning, reasoning, problem-solving, and decision-making.[1] The integration of AI into education is changing traditional teaching-learning processes and creating new possibilities for knowledge acquisition.

Education has always adapted to social and technological changes. From oral traditions to printed books, from blackboards to smart classrooms, each transformation has influenced the role of teachers and learners. Today, AI represents another significant milestone in this evolutionary process. Educational institutions across the world are increasingly adopting AI-driven tools such as adaptive learning platforms, intelligent tutoring systems, automated assessment mechanisms, and virtual classrooms.[2]

The purpose of this paper is to critically examine the changing roles of teachers and learners in the age of AI and to analyze both opportunities and challenges associated with AI-based education.

2. Understanding Artificial Intelligence in Education

Artificial intelligence in education refers to the application of intelligent technologies to enhance teaching, learning, administration, and educational decision-making.[3] AI systems can collect and analyze learner data, identify learning patterns, and provide customized educational content.

Examples of AI applications in education include: Intelligent tutoring systems, automated grading systems, learning analytics, speech recognition tools, virtual learning assistants, chatbots for academic support, and personalized learning platforms.[4] These technologies aim to make education more accessible, efficient, and learner-centered.

AI also supports multilingual education, inclusive classrooms, and special-needs learning. Through machine learning algorithms, educational systems can adapt instructional materials according to learners' cognitive levels, preferences, and progress.

3. Research Methodology

This study employs a qualitative descriptive research design based on an extensive review of academic literature. The objective is to examine the evolving roles of teachers and learners in the age of Artificial Intelligence (AI) by synthesizing existing theoretical and empirical studies published in education, educational technology, and artificial intelligence.

The study follows a systematic literature review (SLR) approach. Relevant publications were identified from reputable academic databases, including Scopus, Web of Science, IEEE Xplore, SpringerLink, ScienceDirect, UNESCO reports, OECD publications, and peer-reviewed journal articles. Keywords such as Artificial Intelligence in Education, AI and Teachers, AI and Learners, Personalized Learning, Digital Education, and Educational Technology were used to retrieve the literature.

The collected sources were screened based on relevance, credibility, publication quality, and recency. After the selection process, the literature was analyzed using thematic content analysis, allowing the identification of major themes related to the changing responsibilities of teachers, learner autonomy, AI-supported teaching practices, ethical concerns, and future educational trends. The findings were interpreted by comparing perspectives from different scholars and international organizations to provide a comprehensive understanding of AI's impact on contemporary education.

4. Results and Discussion

The review demonstrates that Artificial Intelligence has fundamentally transformed the traditional responsibilities of teachers. Rather than functioning solely as knowledge transmitters, teachers increasingly serve as facilitators, mentors, instructional designers, and ethical leaders. AI-powered educational platforms automate repetitive instructional tasks such as grading, attendance management, and individualized content delivery, enabling teachers to devote more attention to higher-order educational objectives including critical thinking, creativity, collaboration, and socio-emotional learning.

The findings are consistent with previous studies indicating that AI complements rather than replaces human educators. Human judgment, empathy, classroom management, and moral guidance remain irreplaceable aspects of effective teaching.

4.1 The Changing Role of Teachers in the Age of AI

Traditionally, teachers were considered the primary source of knowledge. In the digital era, however, information is available through multiple sources. As a result, the role of teachers is evolving from information providers to facilitators, mentors, and learning designers.[5]

4.2 Teachers as Facilitators

AI allows students to access information independently. Therefore, teachers now guide learners in identifying authentic sources, evaluating information critically, and applying knowledge effectively. In an AI-rich classroom, the teacher's task is no longer to deliver all content but to design learning experiences that promote inquiry. For instance, when students use ChatGPT or other generative AI tools for assignments, teachers must facilitate discussions on source credibility, bias detection, and the ethical use of AI-generated text. This shift demands that teachers develop new competencies in digital literacy and information curation. They also need to structure activities where AI outputs become the starting point for deeper analysis rather than the final product. Case studies from Finland and South Korea show that facilitator-teachers spend more time on Socratic questioning and project supervision than on direct instruction, resulting in higher student engagement.[6]

4.3 Teachers as Mentors

AI may provide academic support, but emotional guidance, ethical development, and social mentoring remain human responsibilities. Teachers help students build confidence, motivation, empathy, and resilience. Research by Hattie indicates that teacher-student relationships have an effect size of 0.72 on achievement, far exceeding most technological interventions. In the AI age, mentoring extends to digital well-being: teachers monitor signs of screen fatigue, cyberbullying, and AI-induced anxiety. They also model how to handle failure when algorithms give unexpected feedback. Mentorship now includes teaching students to set learning goals with AI dashboards, interpret their own analytics without discouragement, and maintain a growth mindset when adaptive systems label them as "below proficiency."

4.4 Teachers as Curriculum Designers

AI-generated analytics allow teachers to identify student strengths and weaknesses. Based on such data, teachers can redesign lesson plans, assignments, and classroom activities. Learning management systems like Canvas and Moodle now integrate predictive analytics that flag at-risk students. Teachers use this data to differentiate instruction, creating tiered tasks for advanced, proficient, and struggling learners. Moreover, teachers curate and sequence AI tools themselves: selecting which chatbot for language practice, which simulation for science, and which automated essay feedback system aligns with learning outcomes. This design role requires TPACK — Technological Pedagogical Content Knowledge — a framework arguing that effective teaching with technology occurs at the intersection of content, pedagogy, and technology.[7] Teachers also become evaluators of AI tools, piloting them, assessing algorithmic bias, and deciding whether a tool's pedagogical value outweighs its cost.

4.5 Teachers as Ethical Guides

With increasing use of digital tools, teachers must educate students about digital ethics, privacy, academic honesty, and responsible technology usage.[8] They lead discussions on questions like: Who owns data generated by a student's interaction with an AI tutor? Is it plagiarism to submit AI-assisted writing? How do we recognize when an algorithm reinforces stereotypes? Teachers now embed digital citizenship across subjects, not just in computer classes. They also advocate for institutional policy, serving on committees that draft AI-use guidelines. In higher education, faculty are redefining assessment to include oral defenses and process portfolios that cannot be outsourced to AI.

Thus, AI does not diminish the importance of teachers; rather, it expands their professional responsibilities and elevates the human aspects of teaching.

5. The Changing Role of Learners in the Age of AI

AI has transformed learners from passive recipients of information into active participants in knowledge construction.[9]

5.1 Personalized Learning

AI-based systems adapt learning content according to individual abilities, pace, and interests. Learners receive customized exercises, feedback, and recommendations. This individualized approach improves comprehension and academic performance. Platforms like Khan Academy's Khanmigo or Duolingo's AI tutor adjust difficulty in real time. A learner struggling with Persian verb conjugations might receive extra micro-lessons and contextual examples, while an advanced peer is pushed toward poetry analysis. Personalization also addresses learning disabilities: text-to-speech for dyslexic students, visual supports for ADHD, and speech recognition for learners with motor impairments.[10] However, personalization requires learners to develop self-regulation. They must interpret dashboards, set goals, and decide when to bypass AI suggestions. Research shows that without metacognitive training, learners either over-trust or under-trust AI recommendations, both of which harm outcomes.

5.2 Self-Directed Learning

Learners can access educational materials anytime and anywhere through digital platforms. This flexibility promotes autonomy and lifelong learning habits.[11] Students can explore online courses, participate in webinars, use educational applications, and conduct independent research. The AI age accelerates the shift from "teacher-centered" to "learner-centered" paradigms described by Knowles. A first-year university student in Araria can now audit MIT lectures, practice Persian with an AI interlocutor, and test knowledge via adaptive quizzes before class. This agency develops key 21st-century skills: initiative, time management, and resource evaluation. Yet self-direction is not automatic. Learners need scaffolding to avoid distraction and superficial browsing. Teachers therefore teach strategies like the "playlist model," where students choose from curated AI and human resources to meet a competency.

5.3 Collaborative Learning

AI-enabled platforms support peer interaction through discussion forums, virtual classrooms, and group projects. Collaboration enhances communication skills and cross-cultural understanding. AI tools like automated grouping algorithms can form teams based on complementary skills rather than friendship, improving project outcomes. Translation bots and multilingual chatbots allow Persian learners in Bihar to collaborate with peers in Tehran or Dushanbe in real time. AI can also moderate discussions, summarize threads, and ensure equitable participation by prompting quieter students. These features transform collaboration from a logistical challenge to a pedagogical asset.

5.4 Critical and Creative Thinking

By automating repetitive tasks, AI allows learners to focus on higher-order thinking skills such as analysis, synthesis, creativity, and innovation.[12] When grammar checks and basic calculations are handled by software, students can spend class time debating ethical dilemmas or designing solutions to local problems. Generative AI further serves as a "cognitive partner": a learner might ask it to brainstorm metaphors for a Persian essay, then critically select and refine them. This partnership demands new literacies — prompt engineering, output evaluation, and intellectual humility. Assessments must therefore shift from recall to tasks like "improve this AI draft" or "identify three biases in this AI summary," measuring the learner's ability to think with, not against, the machine.

6. Benefits of AI in Teaching and Learning

The integration of AI in education offers multiple advantages.

6.1 Improved Accessibility

AI makes education accessible to students in remote and underserved areas through online learning platforms.[13]

6.2 Real-Time Feedback

AI systems provide immediate feedback on assignments, quizzes, and exercises. This helps learners identify mistakes quickly and improve performance.

6.3 Administrative Efficiency

Teachers can automate attendance, grading, scheduling, and reporting tasks. This saves time for instructional activities.

6.4 Inclusive Education

AI supports students with disabilities through speech-to-text systems, text-to-speech systems, visual recognition tools, and translation applications.

7. Challenges Faced by Teachers and Learners

Despite its advantages, AI also presents significant challenges.

7.1 Digital Divide

Unequal access to technology creates educational inequality. Students in rural and economically disadvantaged communities may lack internet connectivity and digital devices.[14] In Bihar, the ASER 2022 report found that only 28% of rural households had internet access usable for education. AI-powered personalization is meaningless if a student cannot log in. The divide is not only about hardware; it includes digital literacy, electricity reliability, and language barriers, as most AI tools prioritize English. Institutions adopting AI must therefore budget for device lending, offline AI apps, and community Wi-Fi. Policy frameworks should treat broadband as educational infrastructure, similar to textbooks.

7.2 Data Privacy

AI systems collect large amounts of student data. Protecting privacy and ensuring ethical data usage are major concerns. Learning analytics track clicks, pauses, errors, and even eye movements. Without strong governance, this data can be misused for commercial profiling or surveillance. The EU's GDPR and India's DPDP Act 2023 impose strict consent and minimization rules, but many edtech vendors operate in legal gray zones. Teachers and learners need training to read privacy policies and demand data transparency. Schools should appoint data protection officers and prefer open-source AI tools where data stays on local servers.

7.3 Overdependence on Technology

Excessive reliance on AI may reduce independent thinking and human interaction. Students may become dependent on automated solutions. A 2023 study in _Computers & Education_ found that learners who used AI writing tools for all drafts showed weaker revision skills over a semester. The "automation bias" — trusting machine output uncritically — is a real cognitive risk. Classrooms must therefore include "unplugged" periods and assignments that prohibit AI, ensuring foundational skills are retained. Teachers should model productive friction: deliberately posing problems where AI fails, to remind students of human insight.

7.4 Teacher Training

Many educators lack technical skills needed to effectively integrate AI into classrooms. Professional development programs are essential. One-off workshops are insufficient. Effective training follows the TPACK model, blending technology with pedagogy and content over sustained communities of practice. In-service teachers need time, incentives, and technical support to experiment. Universities must also reform pre-service http://B.Ed. curricula to include AI literacy, data ethics, and prompt design. Without this, the risk is a two-tier system where only young or urban teachers use AI effectively.

7.5 Ethical Concerns

Issues related to algorithmic bias, surveillance, and academic integrity must be addressed. AI trained on biased data can reinforce gender or caste stereotypes in examples and feedback. Facial recognition for attendance raises consent issues. The line between AI-assisted and AI-plagiarized work is still being negotiated. Institutions need clear honor codes updated for the AI era, plus AI-detection tools used cautiously to avoid false accusations. Ethically, the goal is "AI for human

flourishing," not efficiency alone.

8. Human Values in AI-Based Education

Education is not merely about information transfer. It involves moral development, emotional intelligence, social responsibility, and cultural understanding.[15] AI can process data, but it cannot replace human empathy, moral judgment, cultural sensitivity, and inspirational leadership. Teachers remain central to nurturing these human qualities. Similarly, learners must use AI responsibly and ethically.

9. Future Prospects of AI in Education

The future of education will likely involve greater collaboration between human intelligence and artificial intelligence.

Emerging trends include: Virtual reality classrooms, AI-powered language learning, predictive learning analytics, intelligent educational robots, and global collaborative learning environments.[16]

9.1 Hybrid Human-AI Pedagogy

The next decade will not be "AI vs teacher" but "teacher with AI." We will see co-teaching models where an AI tutor handles drill and practice while the human teacher leads Socratic dialogue. In language education, AI chatbots will provide unlimited conversation practice, freeing class time for culture, literature, and pragmatics. For Persian, this could mean AI that distinguishes Tehrani, Dari, and Tajiki inputs and gives dialect-aware feedback.

9.2 Lifelong and Micro-Credential Learning

AI will map individual skill gaps and recommend micro-courses from global providers. Learners will accumulate digital badges verified by blockchain, shifting focus from degrees to competencies. Teachers will become learning pathway advisors, helping students navigate this market. Universities like Purnea University may partner with AI platforms to offer stackable credits in Persian, combining local instruction with global content.

9.3 Ethical and Regulatory Evolution

Governments will move from banning AI to regulating it. Expect "AI nutrition labels" for edtech, detailing data use, bias audits, and pedagogical evidence. UNESCO's _Recommendation on the Ethics of AI_ will shape national policies. Teachers' unions will negotiate workload limits for AI monitoring tasks.

9.4 Emphasis on Human-Only Skills

As AI handles more cognitive routine, curricula will pivot to what machines cannot do: ethical reasoning, cross-cultural negotiation, creativity with constraints, and care. Persian programs might assess students on _ta'arof_ improvisation with humans, not chatbots. The teacher's role as a moral and cultural exemplar will intensify.

Teachers will become digital leaders, and learners will become global knowledge creators. Educational institutions must invest in infrastructure, policy frameworks, teacher training, and ethical guidelines.

10. Conclusion

Artificial intelligence is transforming education in profound ways. It is redefining the roles of both teachers and learners and creating opportunities for personalized, flexible, and inclusive learning. Teachers are evolving into facilitators, mentors, curriculum designers, and ethical guides, while learners are becoming active, independent, and collaborative participants. At the same time,

challenges such as digital inequality, privacy concerns, ethical dilemmas, and technological dependence require careful attention. The future of education lies not in replacing human educators with machines but in creating a balanced partnership between technology and human wisdom. When AI is used responsibly, it can enrich educational experiences and contribute to a more inclusive and knowledge-driven society.study.

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