



AI DRIVEN FUTURE AND ROLE OF TEACHERS: AN EXPLORATIVE STUDY ON PRE-SERVICE TEACHER EDUCATORS

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Abstract

The rapid growth of Artificial Intelligence (AI) has brought about remarkable changes in almost every sector, including education. AI-powered technologies, such as adaptive learning systems, intelligent tutoring tools, and automated assessment software, are reshaping classrooms worldwide. The presence of AI in education has transformed how teachers plan lessons, deliver instruction, and evaluate students. However, the growing use of technology has also raised questions about the future role of teachers. This paper explores how the teaching profession can evolve in an AI-driven future while preserving the essential human qualities that machines cannot replicate—empathy, creativity, and ethical judgment. Drawing from current global and Indian studies, the paper examines teacher educators' attitudes towards AI, the challenges they face, and the competencies required to integrate AI responsibly. The paper argues that teachers are not being replaced by AI but are being called to redefine their professional identities. By rethinking professionalism in the age of AI, the study contributes to a deeper understanding of how teacher educators can integrate AI tools effectively while maintaining human-centered teaching values, develop ethical awareness, and promote continuous professional development for teacher educators. The findings reveal that, when effectively used, AI can enhance personalized learning, reduce workload, and empower teachers to focus on higher-order thinking, mentoring and lastly inform policy making and curriculum development.

Keywords: Artificial Intelligence, teacher professionalism, digital literacy, ethics in education, personalized learning, teacher development, future education.

Introduction

Artificial Intelligence (AI) is transforming the nature of education at a pace that has never been observed before. From automated grading tools to chatbots that assist students 24/7, AI has gradually become a constant presence in schools and universities. As a researcher in education, I recognize that the rise of AI has created both opportunities and challenges for teachers. It is now essential to explore what it means to be a teacher in an age where technology can simulate the aspects of human intelligence.

Traditionally, teachers have been viewed as a primary source of knowledge. They guided learning, motivated students, and assessed their progress through direct human interactions. However, in the AI era, the teacher's role is expanding beyond knowledge transmission. Teachers have become facilitators, mentors, and critical evaluators of digital learning. They must now manage human-machine collaboration, interpret learning analytics, and design activities that combine human empathy with digital precision.

AI can enhance classroom experience through adaptive learning platforms that tailor content to individual needs. It can help identify learning difficulties early, provide personalized feedback, and support students with disabilities. However, the adoption of AI also brings ethical and pedagogical concerns, such as bias in algorithms, depersonalization of learning, and fear that technology may eventually replace teachers.

Therefore, this study aims to understand how the teaching profession can adapt to these transformations. The central argument is that the future of education lies not in replacing teachers but in empowering them to work alongside AI systems in a balanced and human-centered way.

Review of Literature

Indian Studies

Several Indian studies have investigated the impact of technology and artificial intelligence on teacher professionalism and competence. Selvam (2017) analyzed teacher educators' perceptions of educational technology concerning professional satisfaction, revealing that most educators exhibited an average level of technological competence, thereby indicating a need for training programs to enhance digital literacy. Rashid (2020) examined the relationship between professional commitment and attitudes toward information and communication technology (ICT) among teachers in Kashmir. This study identified a positive correlation between teachers' ICT awareness and their professional dedication, suggesting that technology use fosters engagement and creativity in teaching. Rani (2023) explored techno-pedagogical competence among school teachers, finding a strong association between technology skills, professional commitment, and attitudes toward innovation. Teachers who adopted digital tools demonstrated increased motivation and flexibility. Walia and Kumar (2022) conducted an exploratory study on educators' awareness of AI in Punjab, reporting that despite India's technological advancements, many educators lacked AI-specific training and infrastructure, leading to limited implementation. Babu and Suneela (2023) linked digital competence to teacher effectiveness and organizational commitment, confirming that teachers with digital skills exhibited higher performance and greater professional satisfaction. Collectively, these studies underscore that while Indian educators acknowledge the potential of AI and ICT, a gap persists between awareness and practical readiness. Teachers need structured professional development programs to integrate AI ethically and effectively in classrooms.

Foreign Studies

International literature offers significant insights into the impact of artificial intelligence (AI) on educators. Ng and Leung et al. (2023) highlighted the necessity of AI competencies for teachers in the post-pandemic era. Their research indicated that AI facilitates personalized learning but also identified challenges such as inadequate training, technical difficulties, and insufficient funding. Ghamrawi et al. (2023) investigated whether AI expands or diminishes teacher leadership. They concluded that AI can empower educators to concentrate on collaboration and creativity, yet it may also curtail autonomy if implemented without clear

guidelines. Kohnke, Zou, and Moorhouse (2024) examined the phenomenon of "technostress" among English language teachers utilizing AI tools. Their findings revealed that abrupt exposure to complex technologies induced anxiety and diminished confidence among educators. However, training and peer support were found to significantly alleviate stress levels. Davoodi (2024) analyzed professional development programs that introduced AI to teachers. Following targeted workshops, participants reported increased confidence, trust, and motivation to integrate AI-based tools into their teaching practices. Velander et al. (2024) assessed Swedish teachers' understanding of AI and found that most possessed incomplete or incorrect knowledge regarding AI's capabilities. The study underscored the necessity for systematic AI literacy programs for educators. Trust, Whalen, and Mouza (2023) addressed the ethical challenges posed by generative AI tools such as ChatGPT. They argued that teacher education programs must equip educators to manage issues related to plagiarism, misinformation, and academic integrity in AI-mediated environments. Collectively, these international studies suggest that the teaching profession is entering a new phase that necessitates emotional resilience, ethical awareness, and lifelong learning.

Objectives of the Study

The main objectives are:

1. To investigate how professionalism of teacher educators can be rethought in the era of AI.
2. To examine the perceptions and attitudes of teacher educators towards the implementation of AI in teaching learning.
- 3 To identify the competencies and skills required for teacher educators to adapt to AI driven environment.

Research Questions

1. How are the roles and responsibilities of teacher educators evolving in response to the integration of AI into their professional practices?
2. What are teacher educators' perceptions and attitudes toward the implementation of AI in teaching and learning?
3. What competencies and skills do teacher educators need to effectively adapt to AI-driven educational environments?
4. Is there any difference in professionalism between male and female teacher educators regarding to implications of AI?

Methodology and Analysis of Data

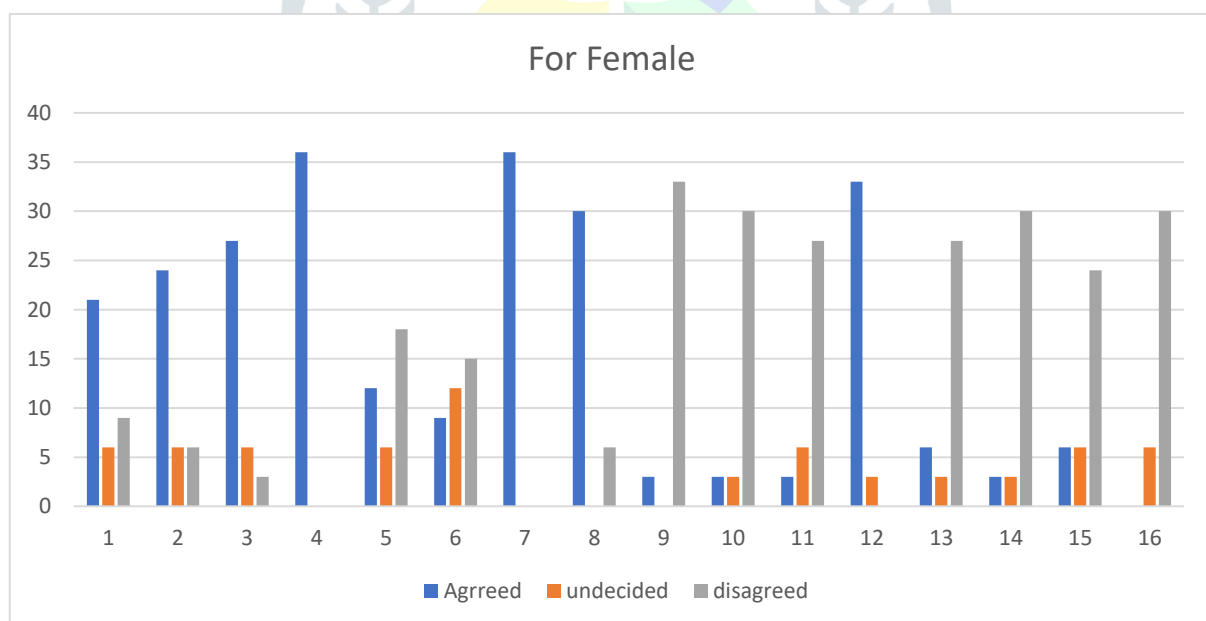
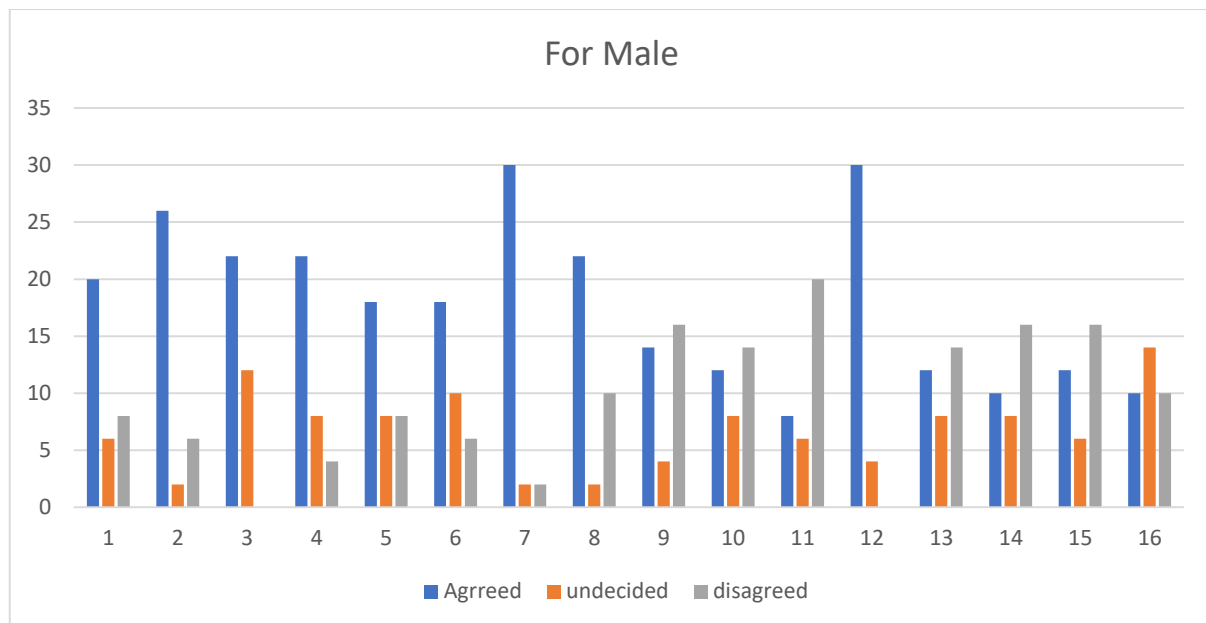
This paper is grounded in a descriptive and analytical approach, combining secondary research with conceptual analysis. The researcher reviewed recent studies, reports, and policy documents related to AI and teacher professionalism. Sources include peer-reviewed journals, educational reports, and international policy frameworks such as UNESCO and India's NEP 2020. The analytical framework has adopted in the study for identifying patterns, similarities, and contrasts between various studies.

The study has taken pre-service teacher educators, i.e. M.Ed. students of Department of Education, Visva-Bharati, Santiniketan, West Bengal as a **sample**, where 34 male students and 36 female students, total 70 students were selected from two parallel semesters of Master of Education, i.e. semester II and IV. The study had also examined how AI has changed teacher educators' roles? , what challenges teachers face? , and what competencies they need to succeed? The broad and comparative perspective of the study focuses on extended involvement in the field, observing pre-service teacher educators in their real context and filling of questionnaire. In the first round of data collection an observation schedule was used to gather their viewpoints regarding the integration of technology in their curriculum and their own personalized usages of technology in finishing any work or doing any assignments. Afterwards in second round their views were

taken for what type of professionalism is needed for AI integration in classroom? , their attitude and perception towards the use of AI driven instructions and lastly, what type of skills and competencies they have required for easy use of AI in classrooms? In the end of data collection several other views have been recollected about their challenges and obstructions for not having proper facilities and no proper learning environment. But in particular the study played an important role not only by providing future professional epistemic fluency, but also providing a space for situated learning to the future teacher educators.

Findings and Discussion

Responses for Objective 1-



Redefining Teacher Professionalism

The concept of professionalism in teaching is evolving. In an AI-driven environment, professionalism extends beyond content knowledge and pedagogy to include digital and ethical literacy. Teachers must now act as **designers of learning environments** rather than mere instructors. They must also become **critical users of data**, ensuring that AI tools are applied responsibly and fairly.

Teachers' Attitudes Toward AI

The majority of teachers show a mix of optimism and anxiety toward AI. They appreciate AI's potential for personalizing learning and automating routine tasks, however they also raise concerns about loss of autonomy and human connection. Teachers with higher digital confidence tend to adopt AI tools more positively. This suggests that ongoing professional development and organizational support are vital for overcoming fear and resistance.

Skills and Competencies Required

To succeed in AI-enhanced education, teachers require three broad sets of competencies:

1. **Technological Literacy:** Understanding how AI works, using digital platforms, and troubleshooting tools.
2. **Ethical and Reflective Thinking:** Evaluating the impact of AI on privacy, fairness, and equity.
3. **Emotional Intelligence:** Maintaining empathy and social interaction in technology-mediated learning.

Ethical and Social Implications

AI is not free from bias or error. Algorithms can reinforce social inequalities if not monitored carefully. Teachers play an essential role in ensuring that AI promotes inclusion rather than exclusion. They must teach students to question data, recognize bias, and use technology responsibly.

Gender and Equity Considerations

Studies show that female educators frequently show more concern about ethical aspects of AI but also show stronger adaptability in learning new technologies. Equal access to AI training and leadership opportunities should therefore be ensured regardless of gender or background.

Human-AI Collaboration

The best educational outcomes occur when human expertise and AI systems work together. AI can analyze patterns and offer insights, while teachers interpret these insights with empathy and context. The future of teaching thus depends on cooperation instead of competition between humans and machines.

Institutional and Policy Support

Teachers need environments that encourage experimentation and learning. Educational institutions must invest in digital infrastructure, provide regular training, and create peer-learning communities. Policymakers should promote guidelines on ethical AI use and ensure that teachers have a voice in shaping technological reforms.

Educational Implications

- **Teacher Education and Training :** AI literacy should become a mandatory part of teacher training programs. Modules on digital ethics, data privacy, and responsible AI use should be introduced at both pre-service and in-service levels.
- **Curriculum Design:** Curriculum frameworks should integrate AI tools that support critical thinking and creativity rather than rote memorization. Teachers should guide students to use AI for exploration and innovation.
- **Ethical Guidelines:** Institutions should establish clear codes of conduct for using AI in teaching and assessment to prevent misuse and protect student data.
- **Inclusive Education:** AI tools can bridge gaps for students with special needs through personalized support and adaptive technologies. Teachers must be trained to use AI inclusively.

- **Research and Collaboration:** Teachers should collaborate with technologists and policymakers to co-design tools that serve pedagogical goals rather than purely technological interests.

Conclusion

The AI-driven future presents both promise and pressure for educators. While AI can perform certain mechanical and analytical tasks better than humans, it cannot replace the warmth, empathy, and moral reasoning that define great teachers. The researcher concludes that AI should be considered as a partner, not a rival, in the learning process. Teachers must consistently enhance their digital and ethical skills while maintaining their human-centered approach to education.

The future of teaching will rely on **human–AI harmony**, where machines handle data and routine tasks, and teachers nurture imagination, values, and critical thinking. Policymakers must ensure equitable access to AI tools and offer teachers ongoing professional support. The success of AI in education ultimately depends on the teacher's ability to adapt, reflect, and lead in this technological transformation.

References

- Babu, K., & Suneela, R. (2023). *Exploring the interplay of digital competence, teacher effectiveness, and organizational commitment among secondary school educators*. Journal of Educational Research, 12(3), 45–59.
- Blundell, C. (2024). *Using design thinking to embrace the complexities of teacher learning-practice with digital technologies*. Teaching and Teacher Education, 126, 104036.
- Davoodi, A. (2024). *Crafting innovative paths in non-linear professional learning for bilingual education: The role of connectivism in the age of AI*. International Journal of Educational Research, 128, 102322.
- Ghamrawi, N., Shal, R., & Ghamrawi, R. (2023). *Exploring the impact of AI on teacher leadership: Regressing or expanding?* Educational Management Review, 41(2), 121–136.
- Kohnke, L., Zou, D., & Moorhouse, B. (2024). *Technostress and English language teaching in the age of generative AI*. Computer-Assisted Language Learning, 37(5), 432–448.
- Ng, D., & Leung, E. (2023). *Teachers' AI digital competencies and twenty-first-century skills in the post-pandemic world*. Education and Information Technologies, 28(2), 1891–1910.
- Rani, P. (2023). *Techno-pedagogical competence of teachers in relation to school environment and professional commitment*. Indian Journal of Teacher Education, 15(1), 67–78.
- Rashid, M. (2020). *Professional commitment and teachers' attitude towards ICT among secondary school teachers in Kashmir*. Journal of Education and Practice, 11(5), 35–46.
- Selvam, R. (2017). *Perception of teacher educators on educational technology in relation to professional competency and satisfaction*. Tamil Nadu Teachers Education Journal, 6(2), 98–112.
- Trust, T., Whalen, J., & Mouza, C. (2023). *ChatGPT: Challenges, opportunities, and implications for teacher education*. Computers & Education, 196, 104696.
- Velander, K., Taiye, A., Otero, J., & Milrad, M. (2024). *Artificial intelligence in K–12 education: Teachers' understanding and implications for learning*. European Journal of Education, 59(1), 1–17.
- Walia, S., & Kumar, P. (2022). *Tech transition: An exploratory study on educators' AI awareness*. International Journal of Educational Technology, 10(4), 223–240.