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The Impact of Artificial Intelligence on Medical Education: A Systematic Review

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Since 2022, Artificial Intelligence (AI) use has become popular across many sectors in India, including medical education. Artificial intelligence (AI) has transformed from a computational tool to a general-purpose technology shaping society through automation, prediction, personalization, and large-scale technology support. In summary, this review highlights the substantial potential of AI across various healthcare domains. This review explores the current role of AI in medical education, highlighting its applications, benefits, challenges, and future directions. In conclusion, AI has the potential to significantly enhance medical education and prepare future physicians for an increasingly technology-driven healthcare environment.

Keywords: artificial intelligence, generative artificial intelligence, medical education, AI literacy, healthcare education, curriculum development, ChatGPT

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1. Introduction

AI is increasingly embedded in everyday life—search engines, recommendation systems, fraud detection, workplace automation, medical imaging support, and public-service analytics. (Sarun et al., 2026) The landscape of medical education is rapidly evolving with technological advancements, particularly through the integration of generative AI systems influencing how future healthcare professionals learn, study, and practice medicine. (Park et al., 2026) The rapid advancement of artificial intelligence (AI) has revolutionized both medical education and healthcare by delivering innovative tools that enhance learning and improve overall outcomes.(Sami et al., 2025)

The World Medical Association suggests for a change in medical curricula and educational opportunities for physicians, medical students, health administrators, and other health care professionals to foster a better understanding of the various aspects of the healthcare AI, both positive and negative. (WMA - the World Medical Association-WMA Statement on Augmented Intelligence in Medical Care, 2024)

The Standing Committee of European Doctors in 2019 recommended the need for AI systems to be integrated into medical education, residency training, and continuing medical education courses to increase awareness of the proper use of AI. (Bisdas et al., 2021)

Even in 2009, virtual slides were already in use for teaching and continuous education and first attempts to introduce them into routine work had begun. At that time the implementation of a complete connected AI supported system was in its Primitive stage. (Kayser et al., 2010) Integration of AI tools, including platforms like ChatGPT, is increasingly relevant in medical education and practice. (Malik et al., 2019)

A 2024 study highlighted the use of new AI tools that have aided medical students in learning of clinical and surgical skills. These AI tools evaluate students in real-time and provide feedback for improvement. (Zhang et al., 2023)

According to a study conducted medical trainees at Carle Illinois College of Medicine (CIMED) and Carle Health in Champaign-Urbana, Illinois from February to May 2025 concluded that participants ranked the usefulness of AI across five contexts: medical knowledge, patient care, research and innovation, and understanding health systems. (Park et al., 2026) AI is growing into the public health sector and is going to have a major impact on every aspect of primary care.(Malik et al., 2019)

As AI continues to expand in healthcare, incorporating AI education in undergraduate medical education will be highly beneficial for future medical practice, reaching trainees early in their careers (Sami et al., 2025) Artificial intelligence presents a transformative opportunity as a learning tool in medical education, offering personalized, adaptive learning experiences that can significantly enhance student outcomes (Chan & Zary, 2019)

While this provides a clear direction for curriculum development, a major challenge persists: medical schools struggle to introduce new AI-related content amid already constrained curricular time and resources. (Chang & Sreedhar, 2026) A profound understanding of medical students' use of artificial intelligence (AI) applications and their perceptions is essential for promoting responsible adoption and guiding integration into education. (Elsayed et al., 2026)

2. Challenges Faced While Implementing of AI in Medical Education: (Uribe et al., 2025)

1. Lack of faculty expertise for AI Integration.
2. Limited awareness of available AI tools in Medical Professionals
3. Limited time and curriculum space infrastructure.
4. Ethical concerns in Clinical practice
5. Difficulty in balancing traditional and innovative teaching methods

According to studies done n Medical Fraternity, faculty utilized AI for evaluation, assessment, and reflective writing analysis. Students used AI for personalized learning, enhancing communication, and problem-based learning.(Kattan et al., 2026)

3. Key Pillars of the Curriculum Framework Must Include: (Loizos Symeou et al., 2025)

1. Addressing the risks and opportunities presented by GenAI.

2. Promoting transparent communication
3. Ensuring responsible use by students and educators
4. Safeguarding academic integrity.
5. Practical recommendations for AI usage
6. Classroom integration
7. Policy formulation

The guidelines emphasise the balance between, on the one hand, leveraging AI to enhance educational experiences, and, on the other maintaining critical thinking and originality. (Loizos Symeou et al., 2025)

4. Common Concerns

1. Misinformation (Bianchi & Zheng, 2025)
2. Data Privacy (Bianchi & Zheng, 2025)
3. Fabricated References (Bianchi & Zheng, 2025)
4. Ethical Use In Clinical Contexts (Bianchi & Zheng, 2025)
5. Inconsistent Outputs (Astbury et al., 2026)
6. Technical Limitations(Astbury et al., 2026)
7. Algorithmic Bias (Astbury et al., 2026)

Studies suggest that the primary applications of GenAI were in learning resource development and assessment, with reported benefits such as time savings, personalized learning and reduced resource use. (Astbury et al., 2026)

5. Conclusion

GenAI supports personalised and self-directed learning. (Pham et al., 2025) GenAI's capability to summarize complex data and generate responses in various conversational styles or literacy levels makes it particularly valuable since it has the potential to alleviate the burden of clinical documentation on health care professionals (HCPs). (Sanchez et al., 2025)

Generative artificial intelligence (GenAI) is transforming higher education by enabling rapid learning resource development, enhancing student engagement, and supporting authentic assessment. (Bawn et al., 2026) While the technology offers opportunities to enhance teaching and assessment, its implementation requires consideration of reliability, ethical concerns and educator preparedness. (Astbury et al., 2026)

To realise its full potential and ensure responsible use, research should focus on developing standardised governance frameworks, empirically validating outcomes, developing faculty in AI literacy, and improving technical infrastructure for low-income contexts. (Amankwaa et al., 2025)

Future research should concentrate on implementing real-time AI-driven feedback systems during preclinical training and advocate for more precise definitions to support consistent AI application and evaluation in medical education. (El-Hakim et al., 2025)

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