

# Artificial Intelligence's Challenges in Medical and Dental Education

Nayab Amin

Department of Dental Materials, Rehman College of Dentistry, Peshawar, Pakistan

**A**rtificial intelligence (AI) has transferred from presentation slides to application in educational institutions, laboratories, and healthcare facilities. It currently generates treatment plans, assesses radiographs, and suggests succeeding actions at the point of intervention in medicine and dentistry. Medical and dental education is rapidly embracing AI, which opens new avenues for independent learning, simulation training, and effective evaluation.<sup>1,2</sup> However, our institutional curriculum, evaluation methods, faculty training, and administration are struggling to adapt this shift. AI cannot be legally and ethically included into healthcare education until several significant challenges are addressed.

Potential worsening of intellectual skills is one serious concern. Over-reliance on algorithmic help could cause learners to forgo the growth in ability to solve problems and diagnose.<sup>3</sup> AI can offer direction; it cannot take the place of the intricate judgment that comes from human experience and skill. AI-driven applications for assignments and projects have increased the probability of academic dishonesty. Learning outcomes may be weakened if learners rely on automated outputs instead of putting out real effort. Thus, evaluation must emphasize on intellectual thinking, decision making power and clinical application.<sup>4</sup> The successful use of AI in education requires access to imaging and medical records for precise data. This raises concerns about consent, data privacy, and bias associated with algorithms. Training an AI algorithms on skewed or inadequate data runs the risk of sustaining errors that could impair patient care and learning. Many educators are not ready to cope with AI due to unawareness of skills, tools and unbiased grading. Periodic workshops and collaborative resources can boost self-assurance and connect AI to educational objectives.<sup>5</sup> Education in healthcare emphasizes empathy, communication, and patient care in addition to technical knowledge. Although AI can simulate situations, it is unable to replicate genuine human interaction.<sup>6</sup> Therefore, AI should be used as supportive tool while ensuring growth of students in both interpersonal and technological skills.

AI does neither offer a quick solution to expertise nor represent an observational threat to clinical judgment. It effectively amplifies both negative behaviours and good didactics.<sup>7</sup> It is our responsibility to establish the frameworks in the medical and dental domains where amplification fosters professional

growth and patient safety, such as transparent policies, synchronized curricula, more sophisticated assessments, and professionals who are willing to ask questions. The real challenge for educators is not just to embrace new technology but to make sure AI is a supportive tool that improves clinical judgment, critical thinking, and patient-centred care while maintaining the vital human element that characterizes the healing professions.

## References:

1. Abdulakhadov JQ, Oxunov BM. A review of advancements of artificial intelligence in dentistry. *Web of Medicine: Journal of Medicine, Practice and Nursing*. 2025 Mar 12;3(3):118-42.
2. Khakpaki A. Advancements in artificial intelligence transforming medical education: a comprehensive overview. *Medical Education Online*. 2025 Dec 31;30(1):2542807.
3. Zhai C, Wibowo S, Li LD. The effects of over-reliance on AI dialogue systems on students' cognitive abilities: a systematic review. *Smart Learning Environments*. 2024 Jun 18;11(1):28.
4. Nwozor A. Artificial intelligence (AI) and academic honesty-dishonesty nexus: Trends and preventive measures. *AI and ethics, academic integrity and the future of quality assurance in higher education*. 2025;27.
5. Baurasien BK, Alareefi HS, Almutairi DB, Alanazi MM, Alhasson AH, Alshahrani AD, Almansour SA, Alshagag ZA, Alqattan KM, Alotaibi HM. Medical errors and patient safety: Strategies for reducing errors using artificial intelligence. *International journal of health sciences*. 2023 Jan;7(S1):3471-87.
6. Fuchs A, Passarella A, Conti M. Modeling, replicating, and predicting human behavior: A survey. *ACM Transactions on Autonomous and Adaptive Systems*. 2023 May 29;18(2):1-47.
7. Lin H, Chen Q. Artificial intelligence (AI)-integrated educational applications and college students' creativity and academic emotions: students and teachers' perceptions and attitudes. *BMC psychology*. 2024 Sep 16;12(1):487.

## Corresponding Author:

Nayab Amin

Department of Dental Materials, Rehman College of Dentistry, Peshawar, Pakistan  
Email:nayab.amin@rmi.edu.pk

Received: February 4, 2025

Revised: February 25, 2025

Accepted: March 7, 2025

DOI: <https://doi.org/10.52442/jrcd.v6i1.168>