
**FROM ADOPTION TO ACCOUNTABILITY: GOVERNING ARTIFICIAL INTELLIGENCE (AI)
AND ITS SUBSETS IN MEDICAL AND DENTAL EDUCATION**

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The rapid integration of artificial intelligence (AI) into medical and dental education marks a transformative shift in how knowledge is produced, delivered, and assessed. From adaptive learning systems to generative tools, AI is reshaping medical and dental learning environments globally. This adoption is accelerating, affecting governance frameworks.¹ This growing imbalance raises a fundamental question for medical and dental governance. How can medical and dental institutions ensure the responsible and ethical use of AI while maintaining professional standards?

Current evidence indicates that AI is a core component of medical and dental education, moving beyond its earlier role as a supporting tool.^{2,3} It is increasingly used for simulation-based training, clinical decision support, and automated assessment. A recent analysis underlines that generative AI, a subset of AI, has significant potential to enhance personalized learning and clinical training, but it also raises critical concerns about accuracy, ethical use, and reliability.^{4,5} These concerns are relevant to medical and dental education and health professions education, where compromised learning or inconsistent assessment may eventually affect patient safety. In Pakistan, the regulatory landscape is changing to address these challenges, with regulatory bodies recently strengthening their educational and ethical frameworks, including updated accreditation standards, competencies, and codes of conduct for medical and dental institutions.⁶ The updated ethics code emphasizes accountability, integrity, and patient safety, requiring institutions to provide high standards in teaching and professional conduct. These structures do not clearly address AI, but they can provide a strong regulatory foundation for AI governance. Pakistan's National Artificial Intelligence Policy 2025 signals a strategic national commitment to AI integration.⁷ The policy emphasizes ethical AI distribution, data protection, and the development of a secure and inclusive AI network, along with inspiring objectives for capacity building and workforce development.^{8,9}

These initiatives are accompanied by growing recognition within medical and dental institutes that AI literacy and governance must become integral to medical and dental training and continuing professional development.^{10,11} Despite these advances, a critical implementation gap remains. Policies and frameworks provide direction, but institutions often lack operational clarity on how to govern AI in routine academic practice. Uncertainty remains around the appropriate use of AI in assessments, writing, and research, and many faculty members lack adequate training to use these tools effectively. Evidence suggests that although healthcare professionals have positive attitudes toward AI, effective implementation requires structured training and institutional support.¹² Moreover, administrative policies should focus on specific steps, such as establishing a clear policy for AI use, ensuring fair assessments, and incorporating AI literacy into the curriculum, so that governance is context-sensitive. In Pakistan, where access to technology and digital resources is uneven, AI may benefit some learners more than others if not carefully managed. Building trust is essential in this transition. AI integration in medical and dental education requires transparency, accountability, and ongoing evaluation. Medical and dental professionals should initiate the development of inclusive, adaptable frameworks aligned with national and global priorities. AI policies in Pakistan mark important progress, where the focus must now shift to sensible implementation. Moving from adoption to accountability is essential to ensure that AI strengthens learning, preserves professional integrity, and improves healthcare outcomes.

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