JOURNAL OF THE BEST AVAILABLE EVIDENCE IN MEDICINE

https://doi.org/10.63720/v2i1003

Online Learning in Medical Education Post-COVID-19 and in the Era of Artificial Intelligence: Lessons Still Being Learned

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Medical education is being reshaped by two major technological disruptions: the rapid expansion of online learning since the COVID-19 pandemic and the equally rapid adoption of artificial intelligence (AI) in teaching, assessment, and clinical training. These developments are often treated as distinct phases of change. In reality, they are part of the same broader challenge: educational institutions have repeatedly adopted new technologies faster than they have developed the pedagogic, ethical, and regulatory frameworks needed to use them well.[1–3]

In this issue of the Journal of the Best Available Evidence in Medicine, Elsaid's article supports findings by our group and others of how COVID-19 pandemic forced medical schools worldwide into emergency adaptation.[3–6] Lectures moved online, tutorials became virtual, and institutions that had previously regarded remote learning as supplementary suddenly depended on it to remain viable. The transition was uneven, but it demonstrated an important truth: medical education can be delivered flexibly, at scale, and with meaningful student engagement when circumstances demand it.[1,3,6] Yet the pandemic also exposed structural weaknesses, including inadequate digital infrastructure, poorly prepared faculty, inconsistent quality assurance, and assessment systems not designed for remote delivery.[1,3,6] Those weaknesses are not confined to low-resource settings or to a particular geographical region, they are visible internationally; although often magnified where infrastructure, funding, and institutional support are limited. In some countries, pedagogical institutions, improvised with freely available platforms and personal devices; in others, learning management systems and simulation tools were rapidly expanded. But across settings, the same core lesson emerged: temporary adaptation is not the same as durable reform. The online pivot worked because it had to, not because most institutions were truly ready for digitally mature medical education.[1,5,6]

The rise of generative AI now presents a second once-in-a-life-time opportunity that cannot and should not be ignored. AI tools can summarise literature, generate draft learning materials, supports individualized feedback; it simulates patient scenarios, and assists with administrative teaching tasks.[2,3,7] These capabilities offer genuine promise. Used appropriately, AI could reduce routine burdens on faculty, enhance access to educational support, and help learners engage with material in more personalized ways. At its best, AI could strengthen education by allowing teachers to spend more time on teaching other important soft skills, mentorship, professionalism, and critical thinking in clinical decision-making rather than repetitive content delivery.[7,8]

However, the risks are equally real. Generative AI can produce inaccurate or fabricated information, obscure the source of reasoning, and encourage superficial learning when students substitute generated answers for intellectual effort.[7,8] It may also amplify inequities if reliable tools are available only to well-resourced institutions or to students who can independently access them. Concerns about plagiarism, hidden authorship, algorithmic bias, privacy, and assessment validity are no longer hypothetical. They are current educational challenges.[3,7,8] The central question, therefore, is not whether AI should be allowed into medical education. It is already present. The more urgent question is whether educators and institutions will govern its use intelligently or continue to respond after the event.

Invited: 19/04/2026

OPEN ACCESS

Published online: 26/05/2026

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Three priorities should define the next phase of health professional education reform: First, faculty development must become central rather than optional. Many educators remain uncertain about how AI works, what its limitations are, and how it should be incorporated into teaching. Without adequate preparation, faculty responses are likely to oscillate between uncritical enthusiasm and defensive resistance. Neither is sufficient. Educators need structured development in the practical use of AI, in prompt-aware assessment design, in verification of AI outputs, and in methods to preserve deep learning and professional accountability. Second, institutions and regulators should establish clear frameworks for responsible AI integration. These frameworks should address acceptable use, disclosure of AI assistance, data privacy, transparency, authorship boundaries, bias monitoring, and the redesign of assessment. Policies should not merely prohibit misuse; they should guide legitimate educational use. Medicine is not unique in facing AI, but it is distinctive in that shortcuts in training will negatively affect the quality of patient care. Educational governance, therefore, is also a patient safety issue. Third, students must be taught AI literacy as a core professional competency. Future physicians will work in environments shaped by clinical decision support, predictive analytics, documentation tools, and AI-assisted workflows. Medical students should learn not only how to use AI, but also how to question it, verify it, identify hallucinations, recognize bias, and remain accountable for the judgments made in their name. Critical appraisal, long central to evidence-based medicine, must now extend to machine-generated outputs.

The article confirms how the pandemic has prepared medical education for this moment. It showed that institutions can change rapidly, but it also points to the cost of improvisation without strategy. AI presents another opportunity to modernize learning, but this time the response must be more deliberate. Medical schools should not simply insert AI into existing curricula; they should reassess how best to preserve rigor, equity, human judgment, and professional identity in an increasingly digital environment.

The future physician will be trained in an AI-enabled world and will practice in one. Preparing that physician is not optional. It is an academic duty, a professional obligation, and an ethical necessity.

Disclosure Statement

The author declares no conflicts of interest.

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