

Integrating Artificial Intelligence into Teaching Strategies & Student Assessments

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The success of a medical education activity (e.g., Continuing medical education, board reviews, clinical teaching) is grounded in the thoughtful planning and development of the curriculum intended to meet the desired educational goals. Interestingly, selecting the most appropriate teaching or instructional strategy in addition to the corresponding assessment methods may be the difference between improving learning outcomes or missing an educational opportunity altogether. For this reason, it has been recently recognized that adopting a multimodal approach when selecting instructional methods is the best strategy to increase the chances of success of the educational activity (Dong et al., 2021; Thomas et al., 2015). In this vein, educational research suggests that the best way to teach in the modern educational setting is by combining multiple pedagogical resources to complement one another, where students learn more effectively when multimodal and system-based approaches are integrated or supplement each other (Estai & Bunt, 2016). Despite being developed in 1955, the use of artificial intelligence (AI) applications has exponentially increased over the recent years, a revolution that is posited to add tools to enhance medical education (Chan & Zary, 2019). Can the medical education arena use this technology to improve teaching and assessment strategies in medical education? The answer to this question is a resounding yes.

Although multimodal teaching strategies have been considered the most effective, most theorists and medical educators agree that a curriculum rich in active learning (AL) strategies is superior to passively listening to the information in lectures in promoting better retention and application of new knowledge (Bucklin et al., 2021). The process of AL comprises the use of a variety of learning activities such as flipped classroom, think-pair-share, turn and talk, and bulleted breaks during lectures requiring learners to construct, understand, and comprehend the knowledge derived from their educational experience "while simultaneously improving knowledge gain and recall abilities." (Bucklin et al., 2021; Graffam, 2007). Not surprisingly, AL also involves strategies to promote Intentional engagement; hence, AI may provide the means to support such a learning strategy. It is essential to point out that traditionally the clinical setting as a teaching environment might be more suited to other strategies, such as the one-minute preceptor and SNAPPS, both involve an AL and engagement owing to the learner-centered education model (Cayley, 2011).

Research suggests that AI's primary uses in medical education are learning support assessment of students' learning and, to a minimal degree, curriculum review (Chan & Zary, 2019). Providing constant (24/7) feedback and guided learning pathways might be possible by adding AI technologies as educational tools. Subgroup analysis revealed that medical undergraduates are the primary target audience for AI use. However, challenges of AI implementation in medical education could mainly involve assessing AI's effectiveness in improving educational outcomes and technical challenges while developing AI applications. Artificial Intelligence (AI) in medical education can facilitate complicated tasks and improve overall teaching efficiency, including access to a study companion or tutor available 24/7 (Masters, 2019). For example, AI could help automate written response assessment, provide reliable feedback on medical management plans and imaging, and prepare students one-on-one or in a classroom setting to study and prepare for tests, among other applications. In addition, AI education-driven platforms may prepare learners one-on-one, in a simulated classroom, or clinical setting to study and prepare them for tests, clinical encounters, and specific clinical skills.

Recently, the platform [edYOU](#) has proposed and developed AI technology to securely expose learners to a virtual instructor who can talk, listen, and answer in real-time. Moreover, the cutting-edge platform enables users to train the AI with various data sources, such as manual data ingestion, cloud data, video and audio media, meeting recordings, and written documents. Hence the platform adapts to the learner's need and even points to areas needing improvement in their educational journey. With time many of these AI technologies can make their way to the clinical setting to optimize decision making and assist physicians in the proper diagnosis and treatment of a patient. The possibilities are enormous!

In sum, multimodal educational strategies involving AL seem to be the best models for medical education. Many teaching methodological improvements could be obtained by AI adoption as it is in the medical profession and medical education. AI applications may provide the means to promote a more engaging teaching and educational environment as part of AL strategies. Educational research aimed to introduce AI into the medical school curriculum for medical professionals to understand AI algorithms better and maximize its use is warranted.

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