

Revolutionising Medical Training : Integrating Artificial Intelligence (AI) and Multimedia into Skill Based Learning

Anupam Prakash¹, Pooja Gautam²

¹Director Professor & Head, ²Assistant Professor, Department of Medicine, Lady Hardinge Medical College, New Delhi, India

Corresponding Author: Dr. Anupam Prakash, Room No. 119, Dept. of Medicine, Academic Block, Lady Hardinge Medical College, Shahid Bhagat Singh Marg, New Delhi-110001, India.

Phone- +91-8588885305 Email: prakashanupam@hotmail.com

Received: 01st April 2024

Accepted: 02nd May 2024

How to Cite this Article: Prakash A., Gautam P. Revolutionising Medical Training : Integrating artificial intelligence (AI) and Multimedia into skill based learning. J Int Med Sci Acad 2024;37(4):172-175.

Access this article online : www.imsaonline.com



Artificial Intelligence (AI) has rapidly transformed our era, and continues to do so. The journey began in the 1950s, when Alan Turing—the father of computer science—asked a bold question: “Can machines think?” His answer came in the form of the Turing Test, a simple yet profound experiment designed to blur the line between human and machine intelligence. Just a few years later in 1956, John McCarthy officially coined the term “Artificial Intelligence” [1,2]. AI can be simply described as *the ability of machines to mimic intelligent human behaviour, including problem solving and learning*.

Whether we are aware or not, we all are using AI in our daily life, whether it's Siri responding to voice commands, ChatGPT engaging users in human-like conversation, Google maps predicting traffic jams, or AI-powered bots transforming customer service, the impact of AI is undeniable.

In today's digital era, AI technology has revolutionized various sectors of society including health care and medical education. The emergence of AI in healthcare has transformed the way we diagnose, treat and monitor patients. It can analyse and interpret vast amount of medical data, quickly and accurately and enhance visual learning. Use of AI in the field of education is referred to as Artificial Intelligence in Education (AIED).

AI helps patients in understanding their symptoms and also helps them how to seek treatment. In some cases, AI assistants have even recommended cancer treatments with accuracy or surpassing that of human experts. These systems can process and analyze enormous amounts of data in seconds, a task that would take humans, days or weeks. AI is already showing promise in robotic-assisted surgeries, virtual nursing assistants, and the analysis of medical images. More importantly, it is helping patients and physicians alike: diagnosing diseases, assessing risks, predicting treatment outcomes, managing complications, and offering ongoing support.

The field of education has seen multiple phases of evolution. With technological advancements, and in the wake of recent pandemic, the learning preferences of both students and teachers have shifted

from chalkboards to digital modes of learning and teaching. Students today are more comfortable watching educational videos, taking online quizzes, and engaging with chatbots for instant academic assistance.

This shift reflects a transformation on how teaching and learning are perceived in a digital era. One of the important aspects of AI is its ability to process and analyse vast quantities of complex data. In the medical context, this includes electronic health records, imaging, genomics, and scholarly literature. It helps in rapid and precise analysis of a wide range of individual parameters, including age, genetic profile, environmental exposures, and ethnicity. By integrating and interpreting complex datasets, AI can enhance diagnostic accuracy, predict disease risk more effectively, and support the development of personalized treatment plans. Moreover, AI systems are capable of identifying patterns and correlations that may not be obvious to us, allowing for early detection of diseases and suggesting preventive measures accordingly. This not only improves patient outcomes but also contributes to a more better approach to healthcare. In addition, the use of AI can lead to significant cost reductions by streamlining diagnostic processes, minimizing trial-and-error in treatment selection, and optimizing resource allocation.

The integration of **Natural Language Processing (NLP)**; a form of AI application, in various aspects of healthcare like **prescription writing, radiology image reporting, and clinical documentation** is becoming increasingly important. In **prescription writing**, NLP tools help to identify medication errors, noting potential drug interactions, and even recommending standardized drug names to avoid confusion. However, without proper training, the use of these tools can lead to over-reliance or misinterpretation—potentially compromising patient safety. The field of **radiology**, is already witness to the immense benefits of NLP. AI-powered tools are assisting radiologists by converting speech to text, auto-generating summaries, and extracting structured data from unstructured narratives [3].

It is crucial to remember that **technology should assist, not**

replace, clinical judgment. That balance can only be achieved through structured training programs that helps healthcare professionals to understand, interpret, AI driven tools responsibly. The rapid advancement of artificial intelligence (AI) in medical education, offers powerful tools for remote learning and clinical training. It helps by enabling medical students to access a wide range of educational resources and participate in virtual lectures, seminars, and conferences. Additionally, telemedicine platforms that integrate AI-driven algorithms for patient triage and remote consultations provides opportunities for students to observe real-time clinical interactions, thereby enriching their practical understanding and clinical decision-making skills [4,5]. Apart from this, pattern recognition through AI, helps students in understanding better.

We as physicians must know how to integrate data analysis into clinical decision support system which in turn can finally help in prescription, drug interaction alarms, workflow tools, diagnostics, and many more by taking data from electronic health record (EHR), guidelines, and medical literature across the globe [6].

Ability to deliver **personalized learning experience** is an important aspect of AI, which helps students in understanding complex medical concepts more efficiently. No two students learn in exactly the same way — some grasp complex concepts visually, while others may benefit more from repetition or hands-on application. AI algorithms can analyse individual learning patterns, identify strengths and weaknesses, and adapt educational content accordingly. This tailored approach not only keeps students more engaged, but also allows them to learn more efficiently leading to improved academic performance and better patient care.

The different teaching modalities with the help of AI can be classified into four categories:

1. Instructivist learning, where the student learns on his/her own with the help of machine
2. Constructivist learning, usually exploratory learning environments, learning by chatbots and AI collaborative learning
3. Teacher supporting, where teaching assistants will help in test generation, scoring and student attention, and emotion detection even
4. System supporting, which can be mostly used in educational data mining or as a research tool.

In medical curriculum in addition to this, the following methods may be helpful like teaching and assessment methods, image learning, diagnostics, patient handling, robotic surgeries, simulation learning in skill laboratories and statistical analysis of huge health data with predictive analysis.

Equally transformative is AI's role in **simulating real-life clinical scenarios**. Traditional medical training emphasized more on lectures, textbooks, and had limited hands-on experience. AI-driven simulations can now allow students to practice procedures, diagnose virtual patients, and make clinical decisions in a controlled, risk-free environment. These simulations can be repeated, paused, and adapted, offering a level of flexibility. More importantly, these simulations help in building confidence, sharpening clinical reasoning, and prepare students for the real-life patient care.

As we look toward the future, it is clear that AI's potential to personalize learning and simulate clinical practice makes it an indispensable part of skill based learning and modern medical education.

AI-powered educational tools offer the doctors realistic, hands-on

experience, **bridging the gap between theory and practice**. One of the most persistent challenges in medical education remains the gap between theoretical knowledge and practical application. Despite rigorous academic training, many students struggle to translate what they learn in textbooks into real-world clinical decision-making. This is where artificial intelligence (AI) offers a transformative solution.

These tools help doctors to learn, practice, and refine their skills. Through virtual simulations, adaptive learning platforms, and real-time feedback systems, AI helps students to apply theoretical concepts in practical scenarios. Instead of passively memorising information, students are now actively engaging with patient cases, making diagnostic decisions, and receiving instant guidance on their performance. This strengthens their ability to think more rationally, thereby improving patient care.

The integration of AI in medical education is about enhancing it. It is a tool which is powerful, flexible, and responsive, that can help ensure that tomorrow's doctors are not only well-informed but also well-prepared. In an era where lives often depend on swift, sound medical judgment, bridging the gap between knowing and doing is imperative. With so many benefits of AI, there definitely come certain challenges like:

- **Integration into Existing Curriculum**

Incorporating AI tools and technologies into existing medical curricula requires planning and strategic implementation. Training educators to effectively utilize AI technologies and interpret AI-driven insights is essential for meaningful interpretation.

- **Ethical Consideration**

Key concerns centre around **patient privacy, informed consent, data security, and algorithmic accountability**. AI systems require vast amounts of data to function effectively, often sourced from real patient records. There are several ethical and academic integrity concerns, including authorship disputes, copyright issues, authenticity, plagiarism, and the potential misuse of AI-generated content in assessments [7]. To ensure reliability and educational value, AI models used in medical training should be developed using high-quality, verified instructional materials and data sources that are accurate, evidence-based, and as free from bias as possible. To alleviate concerns over data privacy and potential information leakage, algorithms must be made under restricted access protocols. Such safeguards are essential to uphold ethical standards and ensure the responsible integration of AI in medical education.

- **Resistance to Change and Adoption**

The integration of artificial intelligence (AI) into medical education is likely to encounter resistance from a range of stakeholders, including educators, regulatory bodies, and academic institutions. This resistance may be due to job displacement where in there is reduced requirement of traditional teaching staff. It may also be when medical educators may lack the necessary training to effectively use AI tool. Moreover, the resistance may be due to overreliance on AI, which may erode the human element in medical practice, which is of importance in ethical care.

- Further, the **security of educational platforms** employing AI must be a priority. Medical data is a prime target for

cyberattacks, and breaches can have far-reaching consequences. Institutions must therefore invest in robust data protection strategies and establish clear policies for ethical AI use.

In conclusion, the integration of artificial intelligence into medical education brings numerous advantages, including personalized learning experiences, realistic simulated practice scenarios, and enhanced diagnostic tools. AI is providing a platform on how medical professionals are trained, making education more adaptive, efficient, and precise. By embracing these technologies, we can better prepare future healthcare providers with the skills and knowledge they need to deliver high-quality, patient-centered care in an increasingly complex medical field.

There are definitely challenges in integrating AI in medical education pertaining to ethical concerns, data privacy, however the benefits are undeniable. AI provides an opportunity to build a healthcare system that is smarter, more responsive, and genuinely patient-centered.

Conflict of Interest:	Author declare no COI
Ethics:	There is no ethical violation as it is based on voluntary anonymous interviews
Funding:	No external funding
Guarantor:	Dr. Anupam Prakash, will act as guarantor of this article.

Reference

1. McCarthy J. What is artificial intelligence? Available from <http://jmc.stanford.edu/artificial-intelligence/what-is-ai/> Accessed on 25th August 2025.

2. Turing AM. *Computing Machinery and Intelligence*. Parsing the Turing Test. Dordrecht: Springer Netherlands; 2009;23–65.

3. Bobba PS, Sailer A, Pruneski JA, Beck S, Mozayan A, Mozayan S, et al. Natural language processing in radiology: Clinical applications and future directions. *Clin Imaging* 2023;97:55–61.

4. Locke S, Bashall A, Al Adely S, Moore J, Wilson A, Kitchen GB. Natural language processing in medicine: A review. *Trends Anaesth Crit Care* 2021;38:4–9.

5. Kuziemyky C, Maeder AJ, John O, Gogia SB, Basu A, Meher S, et al. Role of artificial intelligence within the telehealth domain. *Yearb Med Inform* 2019;28:35–40.

6. Sutton RT, Pincock D, Baumgart DC, Sadowski DC, Fedorak RN, Kroeker KI. An overview of clinical decision support systems: Benefits, risks, and strategies for success. *NPJ Digit Med* 2020;3:17.

7. Boscardin CK, Gin B, Golde PB, Hauer KE. ChatGPT and generative artificial intelligence for medical education: potential impact and opportunity. *Acad Med*. 2024;99(1):22–7.

