

Editorial

Volume 22 Number 2, April 2023

Revolutionizing Medical Education with Artificial Intelligence (AI) – The New Norm

“Eventually, doctors will adopt AI and algorithms as their work partners. This levelling of the medical knowledge landscape will ultimately lead to a new premium: to find and train doctors who have the highest level of emotional intelligence.”- Dr Eric Topol.¹

Of late, the world is abuzz with ChatGPT. The initial reviews portray it's impact in all fields of life to be phenomenal. Medical education and in particular surgical training is no exception due to the exponential interest in Artificial intelligence (AI).

AI is transforming the medical field in numerous ways, and similarly in the realm of surgical training. The use of AI technology in medical education has revolutionized the way medical students learn and practice surgical techniques, offering new opportunities for training, precision, and customized learning. AI-powered simulators, virtual reality training, precision surgery, remote training, and customized learning experiences are just some of the ways AI is improving surgical training in medical education.

Experts are now acknowledging that AI will become an essential tool in medical education and embracing it, especially in postgraduate surgical training. The use of AI technology in postgraduate medical education has revolutionized the way trainees learn and has enhanced the surgical training process. AI has made it possible for medical students to learn and practice surgical techniques in a simulated environment, reducing the risk of errors during surgery. Some examples of the use of AI in surgical training include:

Simulation-based training: One of the most significant advantages of utilising AI in surgical training is that it allows for simulation-based training. Medical students can

use AI-powered simulators to learn and practice surgical techniques in a safe and controlled environment. These simulators provide feedback on the student's performance and help identify areas that need improvement. For instance, Simulab's TraumaMan simulator provides medical students with a realistic surgical environment for training in trauma surgery.

Customized learning: AI technology can help customize the learning experience for medical students. The technology can use data to track a student's progress and identify areas of strength and weakness. This information can then be used to tailor the learning experience to meet the needs of the individual student. Osso VR provides a customized learning experience for medical students by tracking their performance and providing feedback to help them improve their skills.

Virtual reality training: Virtual reality (VR) is another area where AI technology has transformed surgical training. VR provides medical students with a simulated environment where they can practice surgical techniques and procedures. VR technology can simulate the environment of an operating room and help medical students become familiar with the equipment and tools used during surgery. Fundamental VR provides medical students with a VR environment for training in orthopaedic surgery.

Precision surgery: AI technology can help surgeons perform surgeries with greater precision. Machine learning algorithms can analyse data from previous surgeries to identify patterns and trends that can help surgeons make more informed decisions. The da Vinci surgical system uses AI technology to enhance the surgeon's control and precision during surgery is a case in point.

Remote training: AI technology can provide medical students with remote training opportunities. This technology allows trainees to learn and practice surgical techniques from anywhere in the world. Remote training can be particularly beneficial in areas where access to surgical training is limited. For example, the Touch Surgery app provides medical students with remote training in surgical procedures.

AI technology has certainly revolutionized surgical training in medical education. AI-powered simulators, customized learning experiences, virtual reality training, precision surgery, and remote training are just some of the ways AI has transformed surgical training. As AI technology continues to advance, we can expect to see even more innovative applications in surgical training and medical education. This will be in the form of virtual reality simulators to precision surgery robots. AI is transforming the way we teach and learn surgical techniques, providing opportunities for both trainer and trainees to enhance their skills and provide better quality education.

As technology continues to develop, we can expect further innovation in the field, ultimately providing the next generation of surgeons with the tools they need to provide the highest level of care to their patients. As trainers, we must embrace these technologies to our advantage and steer the technology in accordance with ethical values and impart this knowledge to our future medical practitioners.

While it should not be seen as a hindrance, it must also not be seen as cheat codes in obtaining knowledge. All these should be achieved with the concept of *Iqra'* (the quest for knowledge) and *Rahmatan lil 'Alamin* (a responsible individual benefiting self and community) at the core of imparting knowledge.

REFERENCES

1. Topol EJ. Deep medicine: how artificial intelligence can make healthcare human again. New York: Basic Books, March; 2019.
2. Tang YM, Chau KY, Kwok APK, Zhu T, Ma X. A systematic review of immersive technology applications for medical practice *and* education - Trends, application areas, recipients, teaching contents, evaluation methods, and performance. Educational Research Review. 2022 Feb;35:100429.
3. Evgeniou E, Loizou P. Simulation-based surgical education. ANZ Journal of Surgery. 2012 Oct 22;83 (9):619–23.

ASST. PROF. DR. FAIDZAL OTHMAN

Head, Department of Surgery
Kulliyah of Medicine,
IIUM Kuantan Campus

ASST. PROF. DR. SORAYA ISMAIL

Deputy Dean, Student Development & Community
Engagement, Kulliyah of Medicine,
IIUM Kuantan Campus