EDITORIAL

# Artificial Intelligence in Anatomy: Potential Uses and Challenges

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AI is the name of advanced technology that enables machines to simulate human intelligence and behaviour which has already been used and will continue in future as well to transform whole generations. It is widely opted not only at the industrial level but also in large numbers used for educational purposes and in research [1].

The subject of Anatomy is taught in the first two years of undergraduate and it is considered as a core component of medical curriculum. It provides the basis for clinicians to explore skills in diagnoses, treatments and management which are essential for safe medical drill. Anatomy is a highly volatile, complex subject and without continuous revision and recall it is difficult to memorize for the long term. However, with the proper approach and appropriate guidance, it can be explored. For this new innovative technologies and teaching methods should be incorporated for both learning and assessment of anatomy [2]. There are a large number of benefits to incorporating AI in anatomy for in-depth-learning, distance teaching, quick feedback from students, engagement of students in large as well as in small group teaching sessions through digital 3D anatomy for hidden structures, interactive teaching educational tools *e.g*. (socrative, Kahoot, pedlet). Digital anatomy through 3D printing of the human body is the latest discipline that allows excelling in digital medical technologies [3]. Almost all leading medical schools venturing into digital anatomy as an area of growing interest and importance. There has been a clear shift in the last decade from traditional cadaveric-based anatomy curricula to 3D digital imaging, 3D reconstruction, and artificial intelligence [4]. Gamified technological tools based on artificial intelligence have functionalities which can help students of undergraduate to understand and learn anatomy and also enable them to identify and recognize human anatomical structures anytime, anywhere because it is designed for mobile apps. Anatomy education based on artificial intelligence in medical schools has had to adapt to the integration of new innovative teaching modalities. Assimilation of educational technologies has gained distinction mainly because it has been proven as a tool for the retention of anatomy. AI is currently transitioning from theoretical to practical not only during the first two years of medical students but also during clinical curriculum such as in radiology, emergency, internal medicine and neurology. Morphological Anatomy can be taught in detail by incorporating computer software that presents animated anatomical images which have already had a positive impact on the practical learning of human anatomy [5]. It became insufficient for students to rely only on traditional approaches (printed atlases and textbooks) to meet the emerging demands of the era. Due to this with the advent of AI, a transition occurs to generate accurate, detailed and customized anatomical illustrations to retain complex anatomical concepts of the human body. Visual representations of anatomical illustrations are an essential tool for educators, AI-powered text-to-image generators in developing anatomical illustrations of human skulls, hearts brains *etc*. A few examples of these are Craiyon V3, Microsoft Binge Image Creator, and Stable Diffusion [6].

AI-infused anatomy education excels in areas such as object matching, pattern recognition and image identification. Thus, AI benefits students in identifying not only primitive anatomical structures, relations, functions, and innervations but also unobserved anatomical structures [7]. During the period of the COVID-19 pandemic in 2020, there was a rapid shift to emergency distance learning resulted in the adaptation of many new learning and teaching approaches in the subject of anatomy for a better understanding of undergraduate students in an artificial intelligence context. However, all the faculty, and health care professionals were trained and educated to use artificial intelligence to maintain factual knowledge secondly more important how to use it in future also [8]. One more example of AI in anatomy teaching is ChatGPT. No doubt it increases students' engagement, and ability to learn and has strong text analysis. However, Chat GPT faces many challenges and limitations. ChatGPT forces human beings to explore more, to change the original way of teaching and learning. However, the creativity of human beings is not replaced by artificial

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machines and human beings are always creators of machines [9].

It is a big challenge for the faculty of Anatomy but in future, there should be a combination of virtual assistants and artificial intelligence which will improve the learning and academic performance of undergraduate students in medical colleges. In this era of the digital world, students are deeply engaged through social networks, AI-based game tools and online platforms. The traditional classroom should be changed to make educational practices more interactive and attractive [10].

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