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Editorial

Teaching anatomy: Tomorrow never knows

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Abstract

Historically, anatomical dissection provides a comprehensive underpinning of human structure and pathology through unique, hands-on exposure. Today, the countryside of medical education is undergoing significant changes, influenced by new technological innovations. Faculty will have to come up with methods that will be reliable enough for measuring medical students' performance, which relates to human anatomy curricula both in the short run and in the long run. Integration of digital educational tools in human anatomy education enhances medical students' interest in learning anatomical knowledge and helps them retain the information. Nowadays, human anatomy is no longer considered a dissection-based, research-led discipline. However, there is no consensus among educators as regards what should be considered the best ways of teaching/learning human anatomy. Digital educational tools are not replacements for the anatomical dissection but only complements it.

Keywords:
anatomical dissection; digital educational tools; human anatomy

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Introduction

The change of teaching/learning profile of human anatomy.

Many anatomy educators around the world maintain that learning through hands-on dissection and the exploration of dissected donor bodies is an essential part of medical education [1], [2], [3], [4]. This long-established educational approach allows learners to explore spatial relations among structures of the human body and supports appreciation of variation in human bodies. Furthermore, it can provide opportunities to practice critical thinking skills through active learning and engagement with the human form. These experiences could solidify students' understanding and provide a strong underpinning in knowledge of human anatomy. Anatomy education with dissection is so much more than mere knowledge gained about the parts of the human body and how they relate [5]. Rather, this anatomy learning environment can be interpreted as the first clinical discipline in medical education, approached through learning with and from the bodies of donors who consented to this process. This anatomy learning environment models' clinical settings serves as a training ground for the acquisition of not only cognitive but also emotional and social competencies, including teamwork and ethical reasoning [6], [7]. Medical doctors need to know quite enough human anatomy to examine, diagnose and treat patients. Nowadays human anatomy is no longer considered a dissection-based, research-led discipline. And circumstances such as the increasing number of medical students, limited resources, and lesser time devoted to human anatomy teaching/learning process per the new curriculums have compelled almost every anatomist to use new educational techniques. The new digital educational tools allow medical students to interact with three-dimensional models of anatomical structures, providing a more immersive and engaging learning experience than lectures, atlas and traditional textbooks. Medical students can manipulate anatomical models, search for different layers of the body, and even perform virtual dissections without the need for cadavers. It makes the teaching/learning process more skillful and accessible. Current literature highlights the potential of these new technological innovations in the study of human anatomy, primarily in helping medical students learn complex anatomical concepts and improve their clinical reasoning skills [7], [8], [9]. New technological innovations in the teaching of human anatomy could be useful both for medical students to develop professional knowledge and for faculty to develop improved teaching methods for this vast and complex subject, especially given the increasing shortage of cadavers in many medical schools [3], [4], [5]. A possible drawback of the new technological innovations is the lack of tactile feedback. In the coming years, anatomical education is likely to be shaped by advances in technology (mainly applications of artificial intelligence) and also by new perspectives [4], [5], [6], [7]. Therefore, anatomy professors have to identify and use appropriate teaching strategies to attract and retain the attention of these medical students. Medical educators should develop reliable and valid methods for assessing student outcomes that are appropriate for short-term and long-term human anatomy education programs [2], [7]. Faculty should consider expanding relevant human anatomy programs for medical students using new digital educational tools and incorporating them into mainstream curricula. Integrating new technological innovations into medical education not only improves knowledge retention, on the other hand also prepares students for the technologically advanced medical landscape they will encounter in their careers [10], [11]. Diversification of learning resources and

the new learning expectations of today's generations are reforming medical studies [11], [12]. The teaching of human anatomy is undergoing a process of methodological transformation driven by the digitization of education. Faculty members must be prepared to develop strategies that will transform the medical education system by integrating new technological innovations in response to the unique characteristics of medical students' new generations. Anatomy serves as the gateway to both medical education and medical practice; the study of medicine cannot exist without it, as it represents the fundamental starting point for the field. Integrating the traditional method of dissection with modern tools is essential for teaching anatomy [13], [14]. It forms the basis on which all other sciences related to humans, their diseases and their treatment are based. In this context, new digital educational tools have emerged as a pedagogical tool of great interest, not as a substitute for dissection, but as an additional resource that transforms the way students interact with the anatomical structures of the human body [15], [16]. Some reviews on this issue suggest that although digital dissection can improve initial understanding, cadaveric dissection generally provides better long-term retention of anatomical knowledge [12], [17], [18]. Also, other studies found that students who participated in anatomical dissection showed better persistence in post-test assessments compared to those who used new technological innovations [19], [20], [21], [22], [23]. Human anatomy is a morphological science that is understood and assimilated not only through sight, but also through touch, plane study, tissue resistance, and physical relationships between structures. The integration of new digital educational tools in the education of human anatomy can increase the interest of medical students in anatomy knowledge and improve the retention of this information. However, today there is no agreement on which methods are best for teaching/learning human anatomy. Medical students need a solid technological foundation as well as a comprehensive education on new high-tech innovations to drive innovation in their healthcare setting. On the other hand, students and medical doctors need to know enough about human anatomy to examine, diagnose and treat patients [11], [13], [17], [21]. New digital educational tools cannot replace anatomical dissection but complement it and may change the teaching/learning profile of human anatomy. It is not a disclosure that a combination of learning methods for human anatomy produces the best results.

Notes on Contributors

RRR was involved in the study by conceptualizing the idea, reviewing the literature, data acquisition, formal analysis designed and writing the original draft.

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The author declares that has no competing interests.

Data Availability Statement

Data supporting this research are available in the original publications that were cited in the reference section. The author declares not any specify AI applications has been use to help or collaborate to search and write this paper.

Competing Interests

The authors have declared that no competing interests exist.

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