EDITORIAL

Team Based Teaching: Strategy to Learn Anatomy in Large Group

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Teaching Anatomy is fundamental for pre-clinical years in medical institutes. Many medical schools deliver anatomy content through cadaveric dissection, prosected bodies, plastic models, web-based classrooms, Anatomy studios or even 3D visualization in small as well as large group sessions[1,2]. Mostly theoretical content is delivered through large group teaching due to a large number of students with a limited number of cadaveric bodies, high number of contact sessions, shortage of trained anatomists, overcrowding, and teacher-centered formats[3,4]. This issue is especially prevalent in public sector institutes. In public-sector medical colleges, additional constraints such as limited resources, budgets, infrastructure for small group sessions, limited access to cadavers and models, heavy teaching loads, and competing administrative responsibilities further exacerbate this issue. Large lecture halls become the default method of delivery, not because it is educationally ideal, but because it is administratively feasible. Yet these environments frequently encourage surface learning, passive note-taking, and short-term memorization behaviors misaligned with the demands of clinical practice. Every physical assessment, surgical procedure, and diagnostic evaluation performed within the context of healthcare, relies upon a sound understanding of anatomy and physiology. Consequently, when students are enrolled into overpopulated public school classrooms, many of these students will not be able to effectively convert structural relationships to functional. When students face difficulties relating concepts of anatomy/physiology to their future roles as healthcare providers, these deficits not only affect their immediate academic performance but also have long-term implications for patient safety[5].

It is therefore increasingly difficult to justify the pedagogies that primarily transmit only information rather than cultivate active, accountable, and clinically relevant learning. Although advanced learning tool modifications such as multimedia or learning management systems are helpful, they do not resolve the deeper learning and problem-solving competency-based expectations from the medical professionals. The purpose of anatomy education is to prepare safe and reflective medical personnel; pedagogical

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approaches must explicitly foster application of knowledge, peer collaboration, and readiness for clinical reasoning[6].

Team-based learning (TBL)—with its structured sequence of guided preparation, readiness assurance testing, and collaborative application exercises—offers a powerful response to the entrenched challenges of large-group teaching, particularly in resource-constrained public institutions[7]. In the last two decades, multiple research exploration in context with TBL in health professions education has revealed enhancement of student learning, engagement, and teamwork. Systematic reviews have consistently reported improvements in students' academic performances, problem-solving skills, and professional attitude with TBL implemented in high fidelity. Crucially, TBL is designed for large cohorts. A single skilled facilitator can guide multiple teams working simultaneously, making it highly compatible with public-sector realities where expanding faculty numbers is rarely feasible[7].

Research has shown that, in large cohort studies, teaching anatomy through traditional lectures supplemented with team-based learning (TBL) improves examination outcomes and fosters positive learner perceptions. Students frequently report that TBL increases accountability for preparation, deepens clinical reasoning, and encourages articulation of anatomical relationships. These benefits arise not from additional teaching hours, but from restructuring how existing time is used[8].

The process of TBL based on individual readiness-assurance (IRAT) for every learner, is particularly valuable in large public classrooms. It ensures early identification of misconceptions, provides immediate feedback, and promotes disciplined study habits so individuals take the responsibility for self-exploration of the concepts. Team application exercises (tRAT) provide students with opportunities to integrate conceptual knowledge with clinical reasoning, transforming learning from passive reception into collaborative problem-solving. TBL is mainly aligned with the patient-centered and outcomes-based curricula of medical education[1]. Logistics for TBL directly address the persistent constraints of large group interactive sessions in the public sector environment. Application problems can be facilitated in large lecture halls using simple tools such as response cards or structured reporting. Faculty time is re-directed towards guiding discussion rather than repeating content. This model simultaneously enhances learning quality and preserves scalability[1].

The literature demonstrates that during COVID-19 related disruptions to face-to-face instruction, blended models integrating traditional lectures with online TBL maintained continuity of structured interaction.

In order for a medical education programme to successfully adopt TBL, it is necessary for the institution to commit to the process, along with commitment from faculty to develop effective materials and procedures for preparing students to use TBL[9]. Faculty development is critical in developing, engaging, and facilitating authentic application exercises for the students. The structure of the assessment should encourage student preparation and teamwork, as well as reasoning skills, rather than just passive attendance. In addition, students who have only participated in a teacher-centered learning environment, may be apprehensive about using TBL for peer assessment and evaluation, particularly in a public-sector institution, where academic competition and anxiety levels tend to be elevated. However, with an appropriate orientation to this method of learning and implementation of TBL supported by the institution, research shows that student acceptance of peer assessment and evaluation increases significantly[10].

Although TBL does not supersede traditional educational methods, such as cadaveric dissection, prosection, or simulation, it offers the educational framework to enhance the development and use of these methods. Incorporating radiological and three-dimensional (3D) virtual anatomy technologies into TBL application exercises enhances opportunities for greater vertical and horizontal integration of anatomical education throughout the medical education curriculum[10].

The available literature clearly documents that TBL allows for enhanced knowledge retention, increased learner engagement, development of teamwork and shared skills, and application of the knowledge of anatomy to clinical practice by medical students, especially at public-sector educational institutions where there has been extensive growth in student enrolment and limited resources, thus, rendering reliance on traditional lecture-based methods of teaching less effective than the TBL approach (with its continuous feedback mechanism creating a better educational environment for students, and allowing for in-depth development of concepts). Therefore, the real question becomes whether all medical schools are prepared to support the implementation of TBL with appropriate planning and preparation. Implementing TBL in any instructional setting relies primarily upon the leadership of an institution, allocation of resources, and the involvement and training of students, faculty and staff, as well as the reform of the assessment process. Even more basic philosophical changes are necessary: recognizing that the students are not merely passive recipients of an expert's teaching but rather active participants (partners) who construct their own understanding of clinically relevant anatomy[11,12].

In order to ensure that we are truly preparing graduates who are capable of utilizing their anatomical knowledge to reason clinically, collaborate effectively, and continue their learning independently, we must adapt the way we approach anatomy education. Team-Based Learning (TBL) is a structured approach that is supported by research and can provide a better framework for producing successful students in larger classroom environments. Its adoption is not simply an instructional option; it is an ethical response to the realities of contemporary medical education and the responsibilities we hold towards future patients.

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