Team Based Learning (TBL) is a teaching strategy that is increasingly utilized in medical education. TBL is described as the “bringing together of theoretically based and empirically grounded strategies for incorporating the effectiveness of small-group learning into large-group lecture-oriented sessions.” This method was first developed and described by Michaelsen et al., for large classes in business school. It has three repeating phases.

**Phase 1:** learners read and study material independently outside of the classroom and complete an individual readiness assurance test.

**Phase 2:** learners convene in pre-assigned small groups of 5-7 students, review the study materials, and retake the readiness assurance test as a group. A consensus is formed about each answer and at this point, the instructor determines whether the students have mastered the core concepts for the class and are able to move onto phase 3.

**Phase 3:** all teams work on the same tasks at the same time and are provided the opportunity to apply their new knowledge. As the teams arrive at different solutions, class discussion is promoted and this further maximizes the learning experience.

“Pure” TBL includes all three phases but there is room for flexibility. The instructor is allowed to selectively include one or more phases depending on the contextual demands of their course or a particular session. However, it appears the TBL process is more successful with closer adherence to Michaelsen’s principles.

Currently there are three modes of instruction typically used in medical schools across the country: lecture based, problem based learning (PBL), and a combination of lectures with small group teaching. The University of Hawai‘i John A. Burns School of Medicine currently has a curriculum comprised of a combination of PBL, didactic lectures, laboratory dissection, community health, and clinical experiences. Since the medical school opened in 1965, its curriculum has been constantly evolving so that the school remains at the leading edge of medical education reform. Originally introduced as a two-year program, it evolved into a four-year degree-granting curriculum in 1973.

A “pure” PBL approach was introduced in 1989, which has subsequently developed into the current hybrid approach. A traditional lecture-based curriculum is the most common strategy utilized by many US medical schools. This teaching method has been challenged over the years because of its passive form of learning. Although adding small group teaching, or PBL, to lecture-based programs increases active learning, it requires more faculty resources.

Studies have provided empirical evidence of favorable learning outcomes with TBL. However, its total effectiveness in medical education has not been extensively studied. The measured benefits of TBL include: increased student engagement, higher-quality communication processes, increased National Board of Medical Examiners (NBME) shelf exam scores, and the fostering of active participation by providing incentives for pre-class preparation and in-class group discussions. In addition, student performance-focused studies have suggested that TBL may benefit academically “at risk” students the most. This is because these students are forced to study consistently throughout the course, are provided regular feedback, and are given the opportunity to develop their higher reasoning skills by problem solving. Similar to a PBL curriculum, students that usually study alone appreciate learning in teams during the TBL process, thereby developing the understanding and skills needed to work productively in task-groups. It is well known that truly effective learning teams will typically outperform their own best member and therefore improve learning for all members of the group. In addition, the requirement of having to keep up with the material, in contrast to the more usual mode of “cramming” before an exam, is also a benefit for those potentially struggling students, as pre-clinical students often feel overwhelmed by the volume of information to be absorbed through individual study. Michaelsen considers the peer assessment at the end of the process a key component for the TBL paradigm because it helps to ensure student accountability. Introducing TBL into a traditional lecture based curriculum can be difficult, as the concept of peer assessment may be unfamiliar and difficult for students. Many students report that initially they felt very uncomfortable with this new method. After course completion, it was clear that many students belonging to a traditional education approach were unskilled in team-work, which led to difficulty in convincing the students that TBL had a positive impact on their learning.

An obvious benefit of TBL is that it allows a single instructor to manage multiple small groups simultaneously in one classroom. This eliminates some of the human resource issues associated with PBL and promotes active learning without requiring large numbers of small group facilitators. Unlike some forms of active learning, the instructor retains control of content and acts as a facilitator and content expert. TBL is a method of small group instruction that retains some of the benefits of traditional teacher-led instructional methods since it is learner centered but instructor led. Repeated use and faculty “buy in” of TBL are essential to improve both the student’s and instructor’s ability to perform the process. The introduction of TBL into curriculum also requires a highly coordinated effort to prevent over-burdening the students with multiple simultaneous tests and reading assignments especially during exam time.

Even though TBL has been used successfully in non-medical curricula for over 20 years, some medical schools have only recently adopted TBL as an instructional strategy. Encouragingly, faculty are often positively influenced to use TBL due to improvements in students’ preparation and attendance, quality of in-class discus-
ision, and academic performance. Like PBL, TBL requires students to independently investigate multiple sources of information in preparation for group discussion. Working within small groups and obtaining regular feedback are documented benefits of both teaching methods. With increasing budget limitations and strained faculty resources in medical schools, the option of TBL, with a relatively high student to faculty ratio, may be attractive.

Although peer evaluation is an area that students have struggled with at schools that introduce TBL into their curriculum, students at JABSOM are more likely to be comfortable with this process due to their exposure to evaluation in PBL. After over twenty years of a PBL format, is it time for JABSOM to integrate TBL strategies into its medical student curriculum? Would this improve the student’s learning experience, help improve academic scores, especially at the lower end, and solve budgetary constraint issues?

There are key differences between TBL and PBL. While both require students to work collaboratively and to be active learners, TBL starts with a case or “problem scenario” that leads to the identification of relevant learning topics while TBL begins with a teacher-assigned topic of study. In PBL, assessment of the mastery of learned material occurs through revisiting the case or scenario, while TBL utilizes readiness assurance quizzes. The PBL process can also directly promote clinical problem-solving skills, while TBL focuses on the application of assigned learning topics. Fortunately, the differences between PBL and TBL make them highly complementary rather than conflicting. JABSOM may be particularly well-positioned to introduce TBL in its medical education curriculum. The fact that JABSOM heavily utilizes PBL may better prepare students for the team-based aspects of learning and peer assessment required of TBL. Rather than introducing TBL from the starting point of a traditional lecture-based curriculum, JABSOM will have the benefit of introducing TBL to students who are already experienced in many of the learning skills that facilitate success in TBL.

TBL is increasingly being utilized in the teaching of anatomy. Because TBL shifts the instructional focus from knowledge transmission to knowledge application, it is an attractive strategy to adopt for medical anatomy. It requires students to learn anatomical facts, from which anatomical concepts for clinical problem solving are constructed. As an example, Wright State University School of Medicine has introduced TBL into the year 1 anatomy program and throughout the year 2 pathology program.\(^3\) Student evaluations of TBL indicate that it was a viable alternative to their previous teaching strategy as it helped them understand anatomical concepts, encouraged clinical problem solving, and generated questions and discussion. In addition, the students felt TBL provided good content review and helped them study consistently. This study also confirmed that among students in the lowest academic quartile, there was less deterioration of knowledge after active learning with TBL. Learning to work constructively with peers during the pre-clinical curriculum may aid in developing teamwork skills that enhance student ability to participate effectively within patient care teams during the clinical years. The improvement of teamwork skills is a vital part of professional growth. As medical schools increasingly create integrated and interdisciplinary courses during the preclinical years, TBL can become an important instructional tool. This may become crucial if the NBME removes the USMLE Step 1 exam in preference of combining the Step 1 and 2 exams at the end of the medical degree, essentially merging pre-clinical and clinical examination.

In summary, TBL has many features that make it applicable to medical education courses in the preclinical sciences. It is an active learning process that promotes both the learning of factual material as well as higher-level cognitive skills. It uses small groups of teams and requires team members to work collaboratively. It requires fewer faculty than traditional small-group exercises or PBL. Due to the teaching style, faculty are engaged with the students compared to a traditional lecture format and they can quickly assess their student achievement. TBL also requires consistent student preparation and attendance, gives students an opportunity to learn about working within teams, and how to evaluate themselves. To remain in the forefront of medical education in the United States, the current PBL curriculum at JABSOM begs challenging. The integration of TBL may be a start. A specific area might be in the teaching of Anatomy where the TBL method has been shown to benefit medical students’ learning of the subject.\(^3,4\)

References


Paʻahana: diligent, focused