

## Team-based learning: from principle to application

Team-based learning (TBL) is a recent phenomenon in medical education. First introduced in schools of business, many medical schools are considering this teaching method to replace or supplement large group lectures. TBL is an active small-group based instructional strategy that can be used on groups as large as 200. Unlike some of the other popular methods (such as problem-based learning), TBL is teacher-directed, good for any skill-based information and encourages team development. Each step in the TBL process will be described in detail. However, variations can occur based on the context of the learning situation.

### Group formation

Well-formed groups are essential to the TBL process. When forming teams, the instructor must ensure equal distribution of resources to maximize participation. Students should be divided into teams based on the amount of previous clinical exposure and experience. Those with a lot of experience would be distributed among each group to ensure heterogeneity. The process for group formation should be transparent and should most likely occur with the students. Each group should have 5-7 students to achieve maximum discussion and team cohesion.

### Pre-readings

Each TBL session should have readings for the students to master before coming to the session. The readings should provide the students with an understanding of the basic concepts of the particular session. Guide your students by providing them with session objectives prior to or in sync with the readings and prepare your Readiness Assurance Tests based on those objectives.

### Individual Readiness Assurance Test

Upon entering the classroom for the TBL session, the instructor will give an individual readiness assurance test (IRAT). The IRAT ensures individual accountability for the assigned readings and is generally a true-false/multiple-choice quiz. The students are directly accountable for self-preparation because the individual scores should count as part of the course grade.

### Group Readiness Assurance Test

The group readiness assurance test (GRAT) includes the exact questions provided on the IRAT. During the group test, each member must voice and defend his or her choice on every question. Such discussions provide immediate feedback and clear evidence of both the degree to which individual members have prepared for the group work and the importance of obtaining input from everyone on all-important decisions. Students are held accountable for this portion of the exercise in two ways. First, the students receive a grade (as a group) for their answers on the GRAT. Second, students who come to class unprepared invariably receive a low peer evaluation.

An important aspect of the GRAT is the use of the "IF-AT" forms. The form is given to record the group's answer to each question. When the group decides on the best answer, they will scratch off the

appropriate letter on the form. If there is a \* beneath the answer, they got the question correct. If there isn't a \*, the group must keep scratching off until they find the correct answer. Points are generally assigned as follows:

- Correct answer on the first scratch: 3 points
- Correct answer on the second scratch: 2 points
- Correct answer on the third scratch: 1 point
- Correct answer on the fourth scratch: 0 points

The students may appeal the instructor's grading by writing why they thought the question was unfair or by providing good evidence (from prior readings, research, etc.) that supports their answer(s). The students may write the appeal in class. However, the discussion regarding the instructor's decision will occur outside of normal class time.

### Application Assignment

Once the GRAT session has concluded, the instructor will introduce an application exercise to the groups. The application encourages the students to use the knowledge gained in the pre-readings and RAT exercises in a clinical situation. In order to encourage effective teamwork and problem-solving, use the 4 Ss:

- Significant problem: Groups should work on a problem that is significant.
- Same problem: Groups should work on the same problem, case or question.
- Specific choice: Groups should be required to use course concepts to make a specific choice.
- Simultaneous reporting: Groups should report their choices simultaneously to encourage accountability.

Good application assignments are generally clinical vignettes or situations followed by multiple choice questions. The instructor will pause after each group completes one multiple-choice question and ask that the students display their group responses simultaneously. This encourages the students to keep their answers (despite popular opinion by other groups) and requires each group to defend their decision. The process of defending and discussing all feasible answers results in increased learning.

Alternative application exercises can also be considered. Keep in mind however that an assignment that requires extensive writing or research will encourage students to divide the group work and the team consensus and discussion may be lost.

### Grading

TBL encourages student involvement in setting the grading criteria. Most instructors will set a range for weighting each component of the experience. In general, the IRAT, GRAT and AFEs are given a 20 % to 50% range. Learners who are new to TBL tend to give a higher percentage to the individual score because they feel they have control over it. In a short while, the students will see what the research has shown. The highest performing individual score is lower than the poorest performing team score.

Peer evaluation is also an important aspect of the grading criteria. Several forms have been developed and are available at the team-based learning hub at the University of British Columbia at [http://teambasedlearning.apsc.ubc.ca/?page\\_id=176](http://teambasedlearning.apsc.ubc.ca/?page_id=176).

Team based learning provides many advantages in the medical education classroom. It encourages deep learning and teamwork skills that are necessary in the modern practice of medicine. TBL is teacher-centered and encourages students to apply the basic concepts to clinical situations. While research regarding the modality is young, early studies show increased student engagement, positive attitude towards learning and improved performance on standardized tests over time.

If you have additional questions regarding TBL or would like to schedule one-on-one time to develop TBL curriculum, please contact Faculty Development at [alberry@mail.ucf.edu](mailto:alberry@mail.ucf.edu). Also, keep an eye on the Faculty Development calendar of events for upcoming workshops ([www.med.ucf.edu/academics/faculty\\_affairs/calendar.asp](http://www.med.ucf.edu/academics/faculty_affairs/calendar.asp))

### References

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