
**Categories:** Active Learning, Team Based Learning, Peer Teaching, Discussion, Mathematics

**Summary**

This article, which offers a comprehensive guide for implementing Team Based Learning (TBL) in mathematics courses, begins with a brief overview of the techniques origins and its benefits. Team Based Learning was developed in the 1970s originally as a methodology for medical training, and was then applied within a business context. The method relies on three essential elements: preliminary readings and assignments; individual and team based assessments of the preliminary work; and, additional tasks conducted in teams. According to the authors the approach has a number of benefits for learning at the college level including improved quality and quantity of preparatory work, increased opportunities for in-class discussion of mathematical concepts and applications, increased ability to support students struggling with particular concepts, and broad use of active mathematical practice in the classroom.

This introductory commentary is followed by a broad, yet detailed discussion of the process of implementing TBL. In this section, the authors offer a series of recommendations. First, they suggest using TBL in conjunction with lecture, tutorials, and any number of other teaching and learning methodologies. Along these lines, they recommend using a TBL session once every two weeks, and as such, once per course module. Courses employing TBL should begin with instructors splitting students up into homogeneous (based on preparatory levels) teams of three to four students in the first week of the semester. The course should be divided into modules of two to three weeks duration, and reading/work assignments should be given to students for completion prior to the first lecture of any given module. On the day of the first lecture of a module, class begins with students taking a brief, multiple-choice Readiness Assessment Test (RAT) that assesses the materials covered in the preparatory homework. After the six to ten minutes allotted for students to complete the RAT, they submit their answers, and then proceed to join their teams, which collectively take the test again. In the team based test, students discuss their responses and decide on the best solution to the questions, which they then answer using an Immediate Feedback Assessment Technique (IF-AT). If a team answers incorrectly, they may then reconsider the problem and then pick a different response. The scoring system used to measure performance on the team based tests is based upon the number of attempts needed by the team to arrive at the correct response, and both individual and team RATs are utilized in determining individual students’ final grades. After the completion of the individual and team RATs, the rest of the session is taught in a “normal fashion.” Towards the end of each module, time is spent on an additional team based task focused on application of the concepts learned in the module.

Having outlined the process for implementing TBL, the authors turn their attention to a number of considerations and details necessary for successful employment of the approach. First and foremost, the
authors emphasize the need to create an appropriate environment. This entails careful and thorough explanation, to the students, as to how TBL works, how it will impact students’ grades, and perhaps most importantly, the rationale behind its use. The authors also suggest taking measures to allay students concerns by minimizing the total impact of team based elements on final grades, and by running a practice TBL session.

The second key aspect of successful implementation discussed by the authors pertained to the selection of pre-class assignments. Here they provided a detailed chart listing the pros and cons of a variety of source options for readings and work tasks, but one common consideration noted by the authors was the need to ensure that these assignments were germane to the topics covered in the module and could be formatted to fit a RAT. They also offered considerable detail concerning the form and function of the RATs. The authors suggested that RATs include six to ten questions and take no more than ten minutes, depending on the level of computation necessary. In regards to the team based RATs, the authors offered a grading scale that worked on an inverse relation to the number of attempts made per question; thus, if a team got the correct answer in one attempt, it received three points, and then for each additional attempt its score decreased by one. Finally, the authors noted the importance of allowing time for a post-RAT discussion, so that teams could conduct additional group assessment.

The article concludes with a breakdown of a potential grade structure for a TBL based course and a few additional issues for consideration. Team based elements in the form of team RATs and additional tasks given towards the end of each module accounted for 8% and 12% of the final grade respectively. Individual based RATs counted for 10% of the final grade. The remaining seventy percent of final grades were determined by more traditional assessment elements: final exam, 50%, and additional individual assignments or midterm exam 20%. The authors also offer the following concluding comments: they highlight the importance of utilizing a physical space conducive to team work, emphasize the need for instructors to ensure that all students are engaged in the team based activities, and suggest that practitioners interested in using TBL try to watch some sessions in action before trying to implement them.

Applications

The entire point of this article is to provide instructors with a readymade blueprint for utilizing Team Based Learning. While instructors may wish to examine additional sources for further evidence of its results and additional ideas about team based activities, this article could be used as the primary guide for constructing a TBL course in mathematics. The article is, of course, relevant to implementation of TBL in fields other than mathematics, as its primary concerns deal with the structure of such a course and the process by which it is employed. Thus, one could easily follow the outline provide here and simply adapt the method for a non-mathematics course. The article does, however, have one potential limitation. One could look at the framework developed by the authors and question both the need to continue to rely so heavily on traditional teaching methodologies and to so dramatically limit the impact of the TBL elements on students’ final grades. Indeed, in these aspects the article seems somewhat counterproductive to the overarching objective of achieving more engaged, active learning in the classroom.
Citations of Interest
