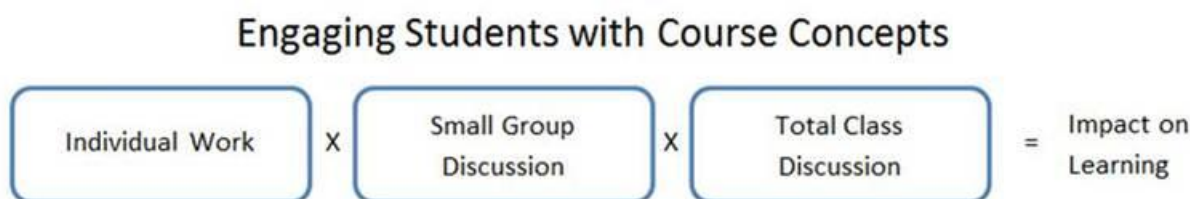# Team-Based Learning

The team-based learning (TBL) described here is Dr. Larry Michaelsen's system, which is distinct from other types of team-based group work.

Dr. Michaelsen's TBL is an active learning technique that must implement several key elements in order to work. By "work," I mean actively engage students so that they learn concepts and how to use them to a very deep level that persists well after the end of the course.

The key elements of the approach are:

1. A balance of ongoing individual and group accountability.

2. Diverse teams work on linked, mutually reinforcing assignments that involve making choices about the same, significant problems and simultaneously report back to the class.

3. Students practice give-and-take interactions and exchange ideas within and between groups.

Engaging Students with Course Concepts

Individual Work X Small Group Discussion X Total Class Discussion = Impact on Learning

Photo Credit: Michaelsen, Undated.

1. Ongoing Accountability

Individual Accountability

Instructors promote responsible individual behavior by requiring individual assignments (especially graded ones) prior to group discussion (e.g., requiring students to submit written concept summaries at the beginning of class on group assignment days). Another method is using procedures or assignments that cause members to express their point of view during group discussions, such as assigning one team member to make sure that everyone is asked to provide input. The third method is to include peer evaluation in the grading system.

The most typical way to promote individual accountability is by using the Readiness Assurance Process. In this process, students are required individually to complete a multiple-choice test on pre-assigned readings and to submit their answers at the beginning of class (This link shows what the answer forms look like: http://www.epsteineducation.com/home/about/how.aspx). Next, groups re-take the same test and turn in their group-agreed-upon answers for immediate scoring. By this method, students are

accountable because their individual scores count. Also, during the group test, students defend their choices on nearly every question and the immediate marks feedback from scoring the group test shows the importance of obtaining input from everyone on all important decisions. And, non-contributors are likely to receive a low peer evaluation mark.

Group Accountability

Groups are held accountable by mixing small group and total class discussions. Group assignments must require a tangible output. And, that output should enable both prompt quality assessment and inter-group comparisons.

Linked and Mutually Reinforcing Assignments - "4 S's"

Ensure that the assignments are linked and mutually reinforcing through a series of stages. This enables students to build on lessons learned from assignments in the early stages as they complete subsequent stages. To achieve the maximum impact, assignments at each stage should be characterized by "4 S's", whereby teams:

1. Work on a **S**ignificant problem, from students' point of view.

2. Work on the **S**ame problem (students can then learn from the differences in the way different teams grappled with the same issues).

3. Make a **S**pecific choice. When students have to decide on a specific action, they are more "invested" in the outcome and learn more deeply than when they just respond to a hypothetical question.

4. **S**imultaneously report: All students benefit when they hear how others dealt with similar issues at the time of their own group report-back to the class, while their interest and attention is heightened.

Having groups write a term paper or any other kind of lengthy document is not a good group assignment because they tend to just divide up the work and there is little meeting of the minds or discussion of ideas in the production of the final report. If the group work product involves a written submission, it is much more challenging to make the group create a 1-page solution to a problem.

An example of this comes from the medical field, where a series of case files were used to develop medical students' diagnostic skills. A conventional group work approach in which groups were required to write a series of one-page memos identifying a preliminary diagnosis for each patient was disappointing because individual students worked with only part of the cases because groups delegated the work to individual members. Also, correcting the assignment took so long that students had lost interest in the feedback when they finally received it. By instead using the Readiness Assurance Process (described above), students mastered basic concepts and the groups developed a norm of seeking input from each member before reaching a decision. Then, on the day of the in-class activity, the instructor

adds a vital piece of new information to a set of pre-assigned cases and gives groups a specified length of time to either:

1. Select the most likely diagnosis from a set of options, or

2. Commit to a position even though they do not have enough information to make a definite diagnosis.

Groups then simultaneously hold up a legal-sized sheet of paper on which they have recorded their choices. A lively discussion within the groups was followed by a vigorous interchange between groups in full class discussion. Students thus mastered diagnostic skills in a realistic setting much more deeply than otherwise would be the case.

2. Adopt Practices that Stimulate Idea Exchange

Optimal conditions for student learning in groups require assignments and conditions that foster give-and-take group interaction. Also needed is a diversity of opinions, ideas, and perspectives within each group.

Assignments That Require Group Interaction.

Assignments that require students to use course concepts to make difficult choices (e.g., the medical example above) produce high levels of both interaction and learning. By contrast, assignments that can be completed by independent individual work often get delegated to one member in the group while the others coast. Also, long writing assignments usually mean group discussions focus on working out who will write which piece of the total product.

Remove Barriers to Participation

Often, members of new groups are reluctant to speak out. A typical response to this problem is assigning roles within the group, e.g., recorder, summarizer, devil's advocate, and so on. A more powerful approach is using permanent groups and assignments, practices, and a grading system that fosters the development of group identity. Over time, groups become more cohesive. Trust and support typically develop so that even quiet members are drawn into intense give-and-take interactions with little worry about offending or being misunderstood. Individual group members come to see their own success as tied to the success of their group, with the result that they are motivated to invest considerable personal energy into doing group work.

In-Class Group Work.

Interaction is also likely to be limited unless groups do their work in class. In many cases, the effort involved in meeting outside of class is so great that students will meet just long enough to divide up the work. They will then complete the assignment individually and learn little from each other. Such group output is group work in name only, and group cohesiveness is not likely to develop.

Create Diverse Groups

Expose students to new ideas by making groups of 5-7 members, and as diverse as possible. Firstly, identify the dimensions that make a difference in student performance (e.g., majors, previous course work, relevant job experience, various backgrounds, etc.). Secondly, assign students to groups so that member assets and liabilities are spread as evenly as possible across groups.

Benefits of TBL for Students

Students benefit from engaging in peer assessment and evaluation. Judgment by peers provides a more significant motivation to produce high-quality work than assessment by a single instructor. Also, when students become assessors, they develop a more thoughtful understanding of the processes involved in the activity, and of their own work. Peer assessment and evaluation also help students take more control over their learning through development of critical analysis of the work of others. Peer assessment also helps students scrutinize the purposes and objectives of a course, which in turn helps connect what they are learning to a larger framework, fostering critical thinking about the subject area (Cestone *et. al.,* 70).

Implementation Tips for Instructors

To use team-based learning effectively, instructors must create a climate for student-centered learning, respond to individual student needs, and guide learners through their own discovery by asking open-ended questions as they engage in reflective dialogue and critical thinking.

Facilitation skills are vital: guiding the groups and managing the classroom environment while helping students to learn for themselves rather than being told. TBL facilitators must not only possess excellent questioning skills that will focus classroom conversations, but must also be able to provide positive feedback for participation, require that students summarize key points raised in the discussion, and ultimately facilitate student learning through critical reflection. Good questions draw out student justifications (e.g., "Tell me about your thinking." "Did anyone have a close second choice?" "What would make this answer correct?" "Can anyone add to this?") (Lane, 60).

During the initial TBL activity, the instructor must continually monitor the progress of each group by circulating around the room as the students are working. This lets them know that you care about and follow what they are doing—and that they are not teaching themselves. Guide students to do their own reasoning by asking open-ended questions that keep them focused on the issues and promote increasingly complex thinking. Keep the learning process moving by having students talk, discuss, and argue among themselves about the issues and the most appropriate strategy for applying the content to make a decision (Lane, 59).

Another of the biggest skill challenges to new team learning instructors designing effective group assignments. This requires imaginative creation of purposeful tasks that result in meaningful application of course content (Lane, 56).

"No Fair—We're Teaching Ourselves"

Two typical sources of student resistance to TBL are concerns about grades (especially group and peer evaluation grades) and the opinion that students are teaching themselves. Student concerns about grades can be addressed by a grade weighting assignment that increases student acceptance of and commitment to the grading process. See some of the examples below.

Students sometimes feel like they are teaching themselves when novice TBL instructors simply replace their lectures with a series of individual and group readiness assessment tests without providing opportunities to adequately engage with the content and apply it in meaningful ways. Don't overdo a good thing. A good rule of thumb is to have no fewer than four and no more than seven individual and group readiness assessment tests during the academic term.

The "we are teaching ourselves" perception can also occur when there are too many assigned readings, or the wrong kinds of readings (e.g., confusing or dense ones that require students to dedicate countless hours of study to memorize intricate details, but then be tested on the general concept sonly).

Another source of frustration for students is Readiness Assessment Tests that are too long, too detailed, or not reflective of what students have read and learned (Lane, 57).

Instructors can establish their credibility as content experts through guided questions, instructor feedback, and limited full-class discussions while allowing students multiple opportunities to engage and apply the content in enjoyable ways. As we establish credibility, students learn that they are not on their own and that there is value-added because we are guiding them through the instructional process (Lane, 58).

UNB Examples

Team-Based Learning in French at UNB

Muriel Chaput used elements of TBL in her large first year French courses (approx. 85 students) to increase students spoken French skills through practice, something difficult to achieve in large language classes using conventional means. She created diverse groups selected according to perceived level of speaking ability, motivation, exposure to the language, etc., based on a survey of Likert-style rating questions.

The groups did group tests in Michaelsen's style, in which individuals answer initially on one answer card, then negotiate the answers afterwards in groups on a quiz scratch card, receiving a group mark for each question, based on the number of tries to get the correct answer, in addition to their individual marks. Also, more than half the course time was dedicated to listening and/or speaking group activities, where material studied could be applied and practiced. For example, each group would write a reconstruction of a short video conversation (first individually, then as a group) that used the key words and phrases of the day. After each activity, the groups had to complete and hand in worksheets which

were later used in the evaluation of group contribution, together with an individual peer evaluation form. Establishing individual accountability within the groups is a key aspect of TBL.

Students were asked for feedback on the techniques (two midterm feedback forms, and one specific poll on group tests), and a couple of adjustments were made based on this feedback.

More specific information is contained in the links below:

- Details *(links to "experimenting with TBL" PDF)*
- Likert-style group placement questionnaire *(links to Likert Questionnaire PDF)*
- Students midterm feedback *(links to Midterm Feedback PDF)*

Team-Based Learning in Kinesiology at UNB

Cynthia Stacey used TBL methods to make the course interesting for her students by:

- Encouraging students to develop responsibility for their own learning.
- Helping students have 'good' group work experiences.
- Using class time in a more student-centered and productive way.
- Engaging students in the learning process.

So, with her 50 Recreation and Sports Studies 3001 students she used many methods to randomly assign students to 10 groups of 5 each. The teams negotiated the weighting of the class mark between individual and team work, the latter being assessed through peer evaluation. As with French, there were individual tests followed by group tests (RATs, Readiness Assurance Tests) on the same material, in this case on assigned readings. And group work also involved article critiques and presentations. The presentations were in Pecha Kucha style: 20 seconds, timed, for which students have to create storyboard and practice in advance.

The readings on the quizzes also involved question grade appeals forms on which students could make the argument that they understood the concept but the question was sufficiently poorly worded as to be ambiguous or confusing. The results of the RATs showed that the group test scores are higher than the individual scores, in keeping with Michaelsen's findings. This goes against the assumptions of many students skeptical of group work who feel that they know more right answers than the group, and they will be outvoted by the group and that will drag down their marks.

Feedback was sought from students on the team process and the class for the purpose of continuous improvement.

Team-Based Learning in Nursing at UNB

Linda Duffett-Legere and Kathy Wilson used TBL methods in a first year undergraduate Nursing course, Nursing as a Profession. They randomly put students into diverse teams of 5 or 6 students and one of the teams' first tasks was to negotiate the weighting between individual and group work components

for their group work, including RATs on each of 5 module readings (specifically iRATs—individual Readiness Assessment Tests and tRATs—team Readiness Assessment Tests, of 10-15 multiple choice questions each). Each team came to a consensus about the weighting, then a spokesperson for each team negotiated with all the other teams' spokespersons in a "fish bowl" at the front of the class, with the other students watching. Team assignments also included Web site evaluations, a case study analysis, and producing a YouTube video on a topic relevant to the nursing profession, presented on the last day of class.

Team members were required to rate the value of other team members contributions to their group work, and to explain to each person why they gave the rating they did. They were given a set number of marks to divide between the members, which forced them to rank order team members' contributions because giving everyone the same number of marks would result in everyone getting a C for that portion of the course mark.

With funding from UNB's Teaching and Learning Priority Fund, the two professors had a group work mobile application created for the course in which all the course information, module readings, assessments, and resources were available, which also had bookmarking and note taking functionality. The mobile app worked on tablets, smart phones, and computers. The 5 course modules were colour coded on the app and notes that students made using the app were also colour coded according to their corresponding module. Work could be submitted using the mobile device and the marks for work returned through the app by the professors would transfer to the Desire2Learn (UNB's Learning Management System) online grade book.

Why do TBL?

In all three cases, student marks stayed more or less the same or improved only slightly compared to previous methods. This begs the question, "Why make the effort?" Well, the assessment items aren't really set up to measure the achievement of the goals for using TBL, which include:

- Enriching the learning experience for students
- Helping students master concepts more deeply so they will be able to remember and use them after the course is completed, and
- Reaching students who aren't the typical "academic types."

Certainly, keeping students more engaged and more likely to remain at UNB is being achieved based on positive feedback on using TBL methods. Engaging with course content more deeply could show up in entry level questionnaires for future courses, should such tests be given and data compiled for the same course before and after using TBL. And student interviews and student persistence data could be used to could determine whether students are less likely to drop out. Regular class attendance increased in all three cases above.

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