A Compact Introduction to

Team-Based Learning

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Welcome to Team-Based Learning

Various paths lead university instructors to Team-Based Learning, but we all have in common two key motivators: 1) the desire to create deep, engaging learning experiences that promote student independence as thinkers; and 2) the desire to make our classrooms places of energy and enjoyment in learning, for our students as well as for ourselves.

Larry Michaelsen originally developed a prototype of what was called "Team Learning" as early as the 1970's in an effort to ensure the benefits of small-group learning in the face of rapidly expanding class size. Bill Roberson, after years of struggle with inconsistent results from student "group work," discovered Team-Based Learning through Michaelsen's early workshops and publications, and finally found in them the means to ensure a positive group dynamic. He has been an avid TBL practitioner ever since.

We have both worked with faculty colleagues who struggled because their teaching failed to engage students, but then suddenly found the tools they needed in the structures and processes of TBL. We also have worked with colleagues who had come to realize, after years of teaching in traditional ways, that their classrooms were having little impact on student learning. When they turned to TBL out of frustration, they discovered in the process that their students were, contrary to outward appearances, highly motivated and intelligent individuals who were hungry for deep learning.

Team-Based Learning is a teaching strategy for creating classrooms that foster student independence and enthusiasm for learning. This short introduction to TBL is a descriptive summary of the essential perspectives, tools and practices you'll need for a first-time successful implementation of the TBL model in your courses. This is not the definitive text on TBL, as it does not provide many examples of specific TBL techniques. We encourage you to use this text as a short-cut reference as you develop your course and lesson plans. For more in-depth information we recommend four publications that provide more fully developed explanations and examples:

- Michaelsen, Knight, and Fink (2004, Stylus), *Team-Based Learning: A transformative use of small groups in college teaching*

- Michaelsen, Parmelee, McMahon and Levine (2008, Stylus), *Team-Based Learning for Health Professions Education*
- Sweet and Michaelsen, eds. (2012, Stylus), *Team-Based Learning in the Social Sciences and Humanities*
- Sibley, Ostafichuk, Roberson and Franchini (2014, Stylus), *Getting Started with Team-Based Learning.*

Additional resources can be found at VIU's web pages dedicated to TBL, on the website of the Team-Based Learning Collaborative (TBLC), https://www.teambasedlearning.org/, and on Jim Sibley's UBC website at http://learntbl.ca/what-is-tbl/.

What does a TBL classroom look like?

Here's a class meeting in Physical Therapy that we recently watched in action.

Sylvia Mitchell enters her classroom on Thursday, just before 9AM. She is pleased to see that all 30 of her students have already gathered and are chatting amongst themselves in their permanent teams (there are 5 of them). She cheerfully makes small talk with students for a few seconds, then starts the class meeting.

"This past Tuesday you took the individual and team RAT (Readiness Assessment Test) on the basic ideas behind creating and choosing treatment plans for clients. Today we're going to look more closely at how those ideas work in reality. Please read the one-page patient data sheet in your folders. Your job is to analyze the situation and condition of this client, and make a determination about how you would respond with treatment, and why."

Students read quietly for about 2 minutes. After students show signs of finishing, she places a slide on the screen and says,

"Here are 4 possible treatment strategies. In your teams I'd like for you to compare and rank them, from most justifiable to least justifiable in this case, given the client data. Be ready to explain why, based on your reading from this past week. Feel free to refer back to your textbooks if you need further clarification of any of the concepts we discussed last time. Write down your team's ranking of these strategies on a piece of paper. You have 10 minutes. Go."

Suddenly the room is loud with a number of voices talking at once. Sylvia wanders about the room listening to the team conversations, but not saying anything to the students. As the 10 minutes come to a close, she glances at the sheets where students are beginning to indicate their ranking of the 4 plans. Most of the 5 teams are close to finished. To the whole room she now says,

*"OK, stop. Please take the blue card from your folder and write down the letter of the treatment plan your team selected as **most justifiable**." The teams finalize their decision*

and write down the number corresponding to their choice. "On the count of 3, please hold up your team's response. One, Two, Three...Show!" 5 cards go up all at once. 3 of them show the same answer, "B." One team answers "C:" and another team answers "D." Sylvia begins the debriefing process by saying, "Interesting spread. Nobody chose A. There seems to be some consensus on that. Mary, what's the reason your team did not put A at the top of your list?

Mary gives an explanation for how treatment plan A ignored a dimension of the case that, according to their readings, is important. Sylvia invites another team to comment ("Did you think the same thing?"), then moves to discussion of the other options: "Let's hear from the team that said "C." Why did you guys conclude that this is a condition that should be treated chemically...?" And so it goes for 20 more minutes, as Silvia asks the teams to respond to each other's reasoning. Through the exchange, Silvia questions (Why? What's your evidence for that? What's your reasoning? How would you respond to that team's argument?) and lets students argue for their analysis and evaluation of the various plans. She facilitates so that students challenge each other's interpretations of key concepts or contradictions in reasoning. She is careful not to divulge her own preference during this exchange.

More than 30 minutes pass in lively analysis and debate, and Silvia now moves toward closure. "I'd like to draw your attention to several important things you said. First of all, kudos to the groups who picked up on the implications of the blood test data. That led you to Plan B, and you made a good case for it. Several of you focused on the patient's present physical condition. That's important to consider, but I'd also suggest you look at the age and history of the patient. That can tell us more than just a snapshot of the present. That longer view might have led us to discount Plan C, and to a lesser extent Plan D. However, several of you saying C and D brought up points worth considering, such as..."

After the summary, Sylvia introduces a new situation: "Let's look at another case, this one a bit more complicated...

What is Team-Based Learning?

In the TBL classroom described above, Sylvia has created conditions where her students can apply and test their preliminary understanding of course content to practice their thinking and gain deeper understanding of the subject matter. She has built a 3-day learning sequence—1) reading, 2) assessment of reading, 3) structured group analysis and decision, 4) whole-class discussion, 5) instructor feedback—around getting students to **ACT decisively and concretely on their own** in the kind of situational complexity they might face as experts in their field or professional decision-makers.

Our example was taken from a course in Physical Therapy, but the same principles apply to any discipline. For example, if we had shown a classroom from a History course we would follow the same pattern:

1. Students read to acquire preliminary factual knowledge of events, people, and historical circumstances, as well as knowledge of historical principles, theories and ways to conduct historical inquiry.
2. Students take a short test to verify their basic understanding of what they have read.
3. Students working in teams are presented with a situation that requires them to compare facts, claims, arguments, or artifacts and make a specific, choice/decision about them using knowledge and informed judgements. In a history course students might typically compare interpretations of a document; or competing, contradictory historical accounts; or theoretical arguments in support of various interpretations. In each case the groups work to analyze the given circumstances of the challenge, then make a claim in the form of a decision among options or within parameters provided.
4. The groups' claims are compared through whole class discussion.
5. The instructor facilitates the discussion and provides feedback at the end of the discussion.

Through the use of carefully designed **application activities** (#3 in our example from History) students are provided context for their learning, and are asked to put concretely into use what they have learned abstractly from the readings. Connecting abstract concepts from the readings to specific decisions and choices during the team application activities is critical for consolidating student learning and deepening their understanding. Our job as instructor is to find or create these situations, cases and scenarios where what students "know" abstractly (via their readings) is put to the test when they try to "use" it to address a specific challenge.

> **Learning to use knowledge to inform and make significant, specific choices/decisions is the central learning outcome of a Team-Based Learning course.**

The social framework of "teams" facilitates the outcome of improved decision-making. The special TBL format of team application activities (see "4-S" below) ensures that students are fully motivated and receive "immediate feedback" to improve their thinking when confronted with specific choices.

The underlying principle of Team-Based Learning may be counter-intuitive at first to some instructors. In more traditional classroom settings it's a common assumption that if we can get students to adopt productive behaviours (read, prepare, take notes, attend class, pay attention, be quiet, etc.), then we can improve their learning. We may even go so far as to impose rules, policies and

penalties whereby we try to coax or coerce these behaviours. When we focus on "behaviours" rather than "outcomes" however, we can suddenly find ourselves on a slippery slope, and land in the role of a policeman or parent trying to control students.

Team-Based Learning classrooms focus, instead, on goals (outcomes) and performance. The reasoning is simple: if we make the expected outcome clear, indicate what a successful performance looks like, design effective, relevant learning activities for practice, and provide tools for feedback and self-assessment, students will figure out for themselves which behaviours are effective or not. Once students take responsibility for their own performance, they will usually abandon behaviours and attitudes that interfere with or undermine success. It is common to see first-time TBL instructors look on with amazement when students adopt, without being coached or coerced, the habits of careful preparation, regular attendance, and open, respectful collaboration with peers.

What makes TBL work?

Few, if any, of the individual elements of the TBL method are unique to TBL: homework reading, reading comprehension tests, small group work, class discussion, peer feedback, etc. Most university instructors, however they teach, use at least some of these techniques at any given moment. ***The special learning dynamic that TBL produces, however, comes from the systematic, way these practices function together, following a specific sequence and leveraging a few key design principles.***

Consider an analogy with aviation. An airplane pilot follows a specialized protocol in order to land her airplane safely every time. This protocol includes multiple steps, often in a specific, pre-determined sequence, each one contributing to the stable, safe descent of the plane, in consideration of weight, elevation, wind direction, speed, other approaching planes, messages from ground control, etc. Following this explicit protocol—with each step supporting specific dimensions of safety and stability—allows a pilot to accomplish the goal of landing a plane securely in a wide range of dynamic or even hazardous conditions.

Similarly, Team-Based Learning provides instructors with reliable protocols for engaging students and promoting their learning. When understood and respected, the protocols help any instructor—even a brand new one—consistently create rich, engaging student experiences, in a wide range of classroom situations, in any discipline.

CAUTION to NEW ADOPTERS: Improvising major changes to the protocols, without anticipating the consequences downstream, can lead to disappointing outcomes.

Here is an example: in a TBL course students read and take a test on what they read **before** the instructor fully explains it. This practice is called "Readiness Assurance Process" (RAP). Instructors new to TBL may feel uncomfortable with this practice, and may feel obligated (in response to student complaints or pleas for mercy) to give a "helping" lecture or provide another type of crutch before the test.

This seemingly student-friendly change of protocol creates problems and will have negative repercussions later on, in surprising ways. Here's why: the Readiness Assurance Process is not designed solely to check whether students understood the assigned reading. The Readiness Assurance Process is also the first step in socializing the teams—which occurs only through a certain amount of student discomfort and struggle.

The **Individual** Readiness Assessment Test (iRAT) comes at the beginning of each TBL learning sequence and occurs without handholding. It challenges students to begin taking personal responsibility for their own learning behaviour. Also, because it is designed to be a slightly difficult, it creates a small amount of "productive frustration" so as to activate the perception that having peers to help might be desirable.

The **Team** Readiness Assessment Test (tRAT—which is the same test taken again, as a team) has a different function: it **replaces** the instructor's handholding. Students struggle together, learn to coach one another, give mutual feedback, and provide the emotional support needed to prevail through the necessary struggle.

The teams begin to bond when faced with real challenges that are beyond the ability of any single individual. When the team performance beats any individual performance (which is almost always the case), the team effort is validated and team cohesion grows. Over the course of several RAP cycles, students begin to experience their personal responsibility toward their teammates, and increasingly realize that they need to come to class prepared in support of the team.

To non-TBL instructors the RATs might look like any other arbitrary use of a stick to get students to read. In reality, the RAT allows and helps students to enter into their teams as equals with confidence and mutual respect, a fundamental condition for high-performing teams.

When teams fail to gel by mid-term, the reason can often be tracked back to a less-than-rigorous implementation of the Readiness Assurance Process. When students feel that other team members are not prepared and are not pulling their weight—what we commonly call "social loafing" or "hitchhiking"—resentment builds and undermines the team's cohesiveness. In non-TBL uses of student collaboration, this is the number one fatal error: failing to put in place mechanisms to hold individuals accountable for their individual preparation, so that they are able to grow into credible, responsible team members.

In short, a TBL instructor needs to stay fully aware of how the various elements of the method are connected and interdependent. Even though it may feel constricting, **we recommend that instructors new to TBL adhere to the protocols as closely as possible throughout the first implementation**, before improvising changes. Doing so will help you "land the plane" reliably, and navigate toward a classroom that fully promotes student buy-in, self-sufficiency and high-impact learning.

Later, after a first implementation, it should become clearer where creative variations can be introduced without diminishing the targeted outcomes.

The 5 Pillars of Team-Based Learning

TBL is a whole course design and management strategy, not a set of techniques to be sprinkled here and there. As a method, it is not complicated, but it requires disciplined commitment to **5 "pillars" of practice**, each being essential to creating and reinforcing the conditions needed for learning at a high level:

A. **Team formation by the instructor,** to ensure the perception of fairness among teams and diversity within teams
B. **Readiness assurance** to motivate individual preparation and promote student competence for working with peers
C. **Team assignments** designed as student-owned decision-making "applications" of content, both to promote deep learning and to ensure high levels of student interest
D. **Immediate feedback** designed to be the natural consequence of the activities, to stimulate engagement, provoke reflection and accelerate learning
E. **Student agency, self-determination** and **accountability**, to promote a fully ***adult*** culture of learning

This list is intended to summarize for new adopters the rationale behind specific TBL practices. Each of the pillars is elaborated below, following the description of the primary TBL Learning Protocol.

The TBL Learning Protocol

Immediately after Day One of a TBL course, once the permanent teams are formed and students have been introduced to the TBL Model, it's time to launch the first learning sequence, (also called a "module" or "cycle,") which is determined by a specific TBL Protocol. This protocol will be repeated four to seven times over the course of one typical, 12-14 week university term. On average, modules extend over 2 weeks each. In most cases, the 4-7 modules constitute the totality of a TBL course. Compressed courses might require fewer modules, or a shorter timeline for each module.

Step One: Students Read (outside of class, before the in-class part of the module begins)

Step Two: Readiness Assurance Process (RAP) (45-90 minutes)
   a) Students take the individual Readiness Assessment Test (iRAT) (closed book, in class)
   b) Student teams take the team Readiness Assessment Test (tRAT) (closed book, in class)
   c) Students make appeals on unfair, erroneous or ambiguous questions (open book, in class)
   d) Instructor addresses student questions, lingering confusion and uncertainties (in class)

Step Three: Application Activities and Assignments (2-4 class meetings)
   - Student teams apply content to make analytical decisions (open book, in class)
   - Students continue to read, problem-solve and practice individually using content (homework outside class)

Step Four: Assessment of Learning (not necessary for all modules)
   - Assessment can include individual or team assignments, or a combination
   - Traditional instruments (tests, papers, projects, etc) can be used for individual assessment
   - Specially formulated "capstone" case or scenario analysis can be used if some assessment of learning by team is desired

Best Practices for the 5 Pillars of TBL

Pillar A: Team formation

Teams are the focal point for most classroom activities in a TBL course. They are the social motor for learning. Ensuring that teams perform well is not a trivial concern, but the key is in the set-up, not the continual coaching. Teams do not need special training in collaboration or special team-building exercises when the conditions are properly set by the instructor. Here are the key "socializing" practices for every TBL instructor.

1. **Teams are permanent over the whole term.** Learning to function as a team takes time. For some teams, it may take weeks for members to learn to work together.
2. **Teams need to be formed immediately at the outset of the course (On Day One, if at all possible)** to communicate clearly the new expectations. You'll need a plan for determining how late-registering students will join existing teams.
3. **Team membership needs to be assigned, not self-selected,** to establish a sense of fairness and to weaken existing alliances. It's best if the team formation process can happen in public. Transparency contributes to the trust and confidence needed for rapid team cohesion.
4. **Teams need to be large (optimally 5-7 members)** in order to have diversity of perspective and depth of resources.
5. **Team formation should ensure even distribution of student assets and liabilities relevant to the course outcomes.** For example, in a course in environmental science, you might want to distribute students with a strong foundational background in chemistry or biology. See the protocol for team formation, below, for ideas on how to accomplish this.
6. **Optional Practice: Teams benefit from giving their team a name,** to reinforce their identity. Using this name regularly in classroom conversations can further help with the process of bonding.
7. **Teams need to be assigned an engaging, decision-based team activity <u>as soon as they have met</u>** for the first time. There are several options. Setting grade weights for the course, determining criteria for "helping behaviour," doing a mini-RAP based on the course syllabus, or a content-related team activity (See 4-S activity design, below) are all potential candidates for a first-day activity that gives students their initial taste of the TBL classroom.

Pillar B: Readiness Assurance

The protocol for the Readiness Assurance Process (RAP) includes 4 steps, which are most powerful when they occur *face-to-face* and *in immediate succession*.

Each element of the RAP has *at least* one critical objective, and therefore should not be omitted:

i. The **iRAT (Individual Readiness Assessment Test)** is a short, closed-book, multiple-choice test that holds students individually accountable for their own efforts to understand course content. The iRAT is the basis for effective team member behaviour.

ii. The **tRAT (Team Readiness Assessment Test)** is a repeat of the iRAT, also closed-book, written immediately after the iRAT, but taken as a team. It fosters team skills by requiring negotiation, and furthers team development by showing students the value of their teams, who almost always outscore any individual.

   "Immediate feedback" on team answers is critical for team development. Immediate feedback can be provided by projecting the answer key on a screen at the end of the tRAT. Alternatively, if available, the use of scratch-off (IF-AT™) answer sheets (purchased through Epstein Education) is especially effective. Visit www.epsteineducation.com to see a wide variety of "lottery-style" answer sheets for different formats of multiple choice questions.

iii. The **Appeals** process follows immediately the tRAT, and invites students to challenge test items that may be flawed, in order to show students that they own their learning, and need to defend it. Teams must submit their appeals in writing and provide evidence and sound reasoning for each appeal.

iv. The instructor's **Clarification**, after the submission of appeals, usually takes the form of a class discussion or short mini-lecture, if needed. This step allows students to get expert feedback *directed to their specific questions* and concerns, but should not turn into an extended lecture. ***Do NOT review the whole RAT—discuss only the questions that everyone missed.***

Key practices for the Readiness Assurance Process (RAP)

1. **The RAP occurs, without exception, at the very beginning of every cycle or module of the course**. (A TBL course typically has 4-7 cycles or modules, in contrast to many traditional courses that are organized by 12-14 separate, weekly units of content).

2. **Do not administer a RAP more often than 6-7 times in a typical 14-week semester.** Overuse of RATs will visibly erode student enthusiasm and motivation for your course.

3. **The reading amount for one RAP needs to provide enough substantial material** to feed team application activities over one whole module (approximately 2-4 class meetings or 3-8 contact hours). The actual amount will vary discipline by discipline and by density of material, so a reading assignment could be 20-30 (dense, highly technical) pages on the low end and 100-300+ pages (such as a whole collection of articles, several textbook chapters, or a whole novel) on the high end. ***It may be necessary to show students early in the course how to read strategically, for broad, contextualized understanding when faced with larger reading assignments.***

4. **Readiness Assessment Test (RAT) questions should target understanding of important concepts, not picky details.** RATs should not be comprehensive exams, but rather a ***sampling*** of student understanding of key ideas and critical differentiations. 10-20 items are sufficient in most cases. A smaller number of high quality, carefully written, challenging questions is the best approach.

5. **Both the iRAT and tRAT are closed-book, in-class tests.** The richness of team discussion during the tRAT comes in part from the members' struggle to reconstruct from memory their understanding of what they read. If students need access to specific technical information from the readings (formulas, equations, obscure values that should not be memorized, for example) to support their thinking, these can be provided with the questions, but be careful that the RAT does not focus on narrow analyses with calculations or the like, as these types of questions will not be highly effective in the tRAT discussion. Keep the questions at the level of conceptual understanding of and differentiation among key concepts.

6. **RAT questions are always in a multiple choice or true-false** answer format in order to create the conditions needed for dynamic team decision-making and immediate feedback during the tRAT. Open-ended questions do not force the kinds of negotiation and convergent thinking that teams need in order to develop as teams. Remember that multiple choice questions can be made highly complex and challenging, by basing them on situations or mini-cases, rather than on factual recall.

7. **Within one RAT, questions should be distributed over levels of difficulty.** See Bloom's Taxonomy for ideas on writing questions at different levels. A few items should be easy to build confidence; a few items need to be hard (complex, ambiguous, nuanced) enough to elicit rich team discussion.

8. **RATs should be challenging. It's better to administer RATs that are slightly too difficult rather than too easy.** Too easy means boredom and low incentive because there's nothing at stake—and one really gifted member can carry the group. Excessively hard means loss of motivation as students can begin to feel that success is out of reach. **Target individual scores averaging 50-70%, with team score averages targeting 80-95%.**

9. **RATs should be administered with time limits.** A 10-question iRAT can usually be written in 6-10 minutes; the tRAT discussion for the same test will generally need 15-20 minutes. These will vary depending on difficulty of the test and the specific population of students. It's important to keep some pressure on students, so aim for the low end, then adjust if needed. A good rule for keeping students on track: once half the teams have finished, the remaining teams have just two minutes more before grades will be calculated and posted.

10. **tRAT scores should be published** on the board or screen for the whole class to see, as part of the feedback process. This allows teams to monitor their own learning and creates a fun, softly competitive atmosphere. In many cases students will alter their expectations of themselves and increase their commitment to preparation when they see how other teams are performing.

11. **The Appeals process should be conducted during the same class meeting in which the RAP occurs.** Do not skip the appeals step and do not make it appear optional or unimportant. Students need to develop the expectation that they, alone, are responsible for evaluating the quality and accuracy of the RAT as a measure of their preliminary understanding of the reading.

    Do not ask, "Are there any appeals?" Rather, create the expectation for appeals. At the end of the tRAT tell students they have 5 minutes to determine which items they wish to appeal. Then give them another 10 minutes or more to write down and submit the reasons for the appeal. If some teams elect not to appeal any questions, have a new assignment or activity ready to keep them productive while the other teams finish.

Pillar C: Team Application Activities

Team application activities in the shape of comparative analysis leading to concrete "decisions" or "specific choices" are the single most important element of Team-Based Learning.

Decisions not only translate knowledge into actions, they are the mechanisms for generating student interest, curiosity and engagement.

Because students have fulfilled their part of the bargain and are known to be prepared (via the Readiness Assurance Process), they need to be challenged in ways that allow them to see for themselves the usefulness of what they have studied. Team application activities need to be hard enough, and contain enough uncertainty or complexity, that the most diligent student cannot simply answer because he/she knows a lot. Design team application activities around decisions that require students to use not only their new knowledge, but also their reasoning and their judgment.

The protocol for developing Team Application Activities is called "4-S" (originally called "3-S" in Michaelsen's original writings) .

I. Conceive the task so that it looks **Significant and therefore interesting *from the student's perspective***. This means that the task will ask students to USE their new knowledge (from the readings) actively in responding to specific, concrete situations. Seeing the immediate utility and relevance of what they have just read is highly empowering and motivating.

II. Require students to think comparatively and make a **Specific choice** among several possible options. This forces students to weigh competing priorities, values, arguments, interpretations, theories and the relevance of specific facts, in making their decision. The answer parameters allow the instructor to anticipate and target the specific terms and concerns of the discussion.

III. Require all teams to work on the **Same** task, so that, when they report their answers to the whole class, they will be able to compare their own response to those of the other teams—for immediate feedback. In this comparative framework, students will naturally and genuinely care about how the other teams responded.

IV. Use report-out techniques allowing **Simultaneous** responses for all teams. When all teams report simultaneously, the comparison is dramatic

and the natural outcome is that groups are fully engaged: they want feedback from and are willing to give feedback to each other. See the practices described below for examples on how to conduct simultaneous reporting.

> **When the teams have made a specific choice in relation to the same significant problem, and then discover via a simultaneous report that other teams made a *different* choice, they are both motivated and intellectually prepared to challenge other teams' answers and defend their own. The instructor then facilitates a comparative, analytical discussion of all answers, where the teams are asked to defend their thinking and respond to one another.**

Proven best practices for <u>*Design*</u> of Team Application Activities

1. **Start with a verb.** If you can find the verb that represents a significant action requiring knowledge of course content (evaluate, assess, diagnose, predict, contrast, compare, rank, categorize, critique, etc.), you're on your way to a good application task. Do not design activities around verbs of state, such as "understand," and "know" or low-level tasks such as "identify", "find" or "match." Team application activities need to be framed as concrete actions in unfamiliar circumstances and new situations, so students can see for themselves the applicability, portability and impact of their knowledge.

2. **Find ideas for team application tasks by looking at what people who work in your discipline do with their knowledge.** Ask, "What kinds of problems do we try to solve? What kinds of questions do we try to answer? How do we use our discipline's information and ideas?" Ask your students to make the kinds of judgments, interpretations, evaluations, predictions and other types of decisions that you, yourself, and other professionals or academics do as the regular part of your work. For example, from our opening story from Physical Therapy, "Look at the data summary provided for this client. Assess and rank the various treatment plans according to their relevance in this case." From History: "Which of the various theoretical explanations of this event is the most convincing?"

3. **Develop Team Application tasks that...**
   ...are based on responses to cases, scenarios, concrete problems, actual questions and inquiries. The goal of a team task is to lead students to "test" and stretch their knowledge by trying to use it in complex, realistic situations.

...ask for the comparative analysis and assessment of objects, statements, claims, theories, arguments, representations, images and other products or tools typical of your field.

4. **Team responses, including those applied to complex scenarios and questions, should be converted to a single, easily visible, focused representation**—letter; number; single word or phrase; image; chart, graph, bullet list—so they can be easily compared across all teams for immediate feedback during the Simultaneous Response phase. The most common technique for simultaneous reporting is to ask teams to reveal their specific choice responses using colored, numbered, or lettered cards. This can also be done using blank sheets of paper, where students write down the letter or number or word of their selection and hold them up at the moment of reveal. Small, hand-held whiteboards also work for this purpose. Clickers can be used, but they are less effective than cards, since they do not communicate immediately and publicly teams' visible ownership of their answers.

   For responses where students are asked to represent their decisions graphically (draw an image or chart) it works well to have teams record their work on poster paper, then simultaneously publish it by attaching it to the wall at a given signal. In these cases, students can then conduct a "gallery walk," in which they roam the room assessing the other team's answers, before engaging in a whole-class, comparative discussion of all responses. For more details on these and other reporting techniques, please see Chapter Seven of *Getting Started with Team-Based Learning*.

5. **Make sure some team application activities count for points or marks.** Mix application tasks that are "formative" or "developmental" (no points) with those that are designed to be capstone-like "challenges" or "show us what you can do" tasks that are scored for points. This ensures accountability for the team's work. A good practice is to do a series of non-scored tasks leading up to the task that is graded.

Proven best practices for <u>M*anagement* *of* Team Application Activities

1. **Limit the time you allow teams for making their collective decision during an activity**, and if possible, use a visible timer (Power Point can be adapted to this purpose). Tell the teams that they will need to produce an answer at the end of the given, announced time limit, whether they have finished discussing or not.

2. <u>**Do not**</u> **assign teams a sequence of several tasks at the same time** (as in a worksheet or list of questions, for example) as this will kill all the energy of both the team discussion and the whole-class discussion. Separate team tasks into clear, single decisions, present them individually, one by one, and discuss fully before moving to the next. For long sequences of activities that include some non-4-S activities, consider alternating individual work (e.g., worksheets or problem sets) with focused team 4-S decision tasks that require conceptual, convergent thinking that is built upon the individual work.

3. **Manage the task by projecting instructions, questions or other prompts on a screen, or by using paper handouts**. This keeps you from having to shout over a loud classroom once discussion is underway.

4. **Leave the teams alone while they are working on a task.** Move around so as to be seen, but so as not to be drawn into a conversation. Do not invite yourself into a team conversation, and deflect questions asking for special help.

5. **If students from one team ask a question during a team activity, push it back to the whole team to consider, if possible.**

6. **If you need to clarify an element of an activity, clarify for the whole class, not for just one team.**

7. **Make the simultaneous report <u>crisp</u>**. (On the count of 3: 1-2-3...SHOW). This will help students see and benefit from the immediate feedback provided by other teams' responses, and will reduce fudging by teams who are uncommitted.

Proven best practices for <u>*Facilitation*</u> of Application Activity Discussions

While 4-S Activity Design ensures student engagement in high levels of thinking, *the actual learning itself is dependent upon effective facilitation by the*

instructor. It is the facilitation process that frames and fosters the in-depth analysis, feedback and reflection. The instructor's role should be that of inquirer, not director. Teams need to be invited to explain their reasoning and defend it vis-à-vis the claims and evidence provided by other teams. An effective facilitator will use questions and "naïve" re-statements of students' claims, to entice students to discover for themselves the consequences of their team decisions. For that purpose, here are a few guidelines for facilitation.

1. **Keep a poker face during facilitation**. Maintain the appearance that all responses could be valid or correct until all have been explained by the teams who represent them. Many an excellent discussion has been undermined by the instructor tipping her hand as to what she considers a "correct" or best answer to be, even before all the teams have finished reporting. It's good practice to let students go down a wrong path, to fully expose their reasoning. When it's finally time for your feedback, point to the strengths of the various team responses, even while pointing students towards a "best" response.

2. **It does not matter if all teams agree** and report the same, "best" or "correct" answer. The learning occurs during the discussion. Teams may have different reasons for arriving at the same answer. Your first response to a simultaneous report, no matter the spread of team answers, is some version of "Why?" directed at one of the teams.

3. **Cluster team answers when you debrief**. If three teams answer the same way, collect reasons from one of these, then ask the others if they have something to add (Don't proceed one by one). This avoids tedious, repeated explanations.

4. **Vary your order of collecting team answers**. If you always start with the worst one, students will catch on. Sometimes start with the best one. Starting with the minority opinion is often a good strategy, as it ensures that unpopular arguments will be heard.

5. **Close the discussion by pointing to what has been learned**. Make sure to indicate any merit in students' arguments, even if their overall reasoning was flawed.

6. **If a final, correct or best answer needs to be presented, offer it as "this is what the experts would say,"** so you, personally, will not always be identified as the only source of knowledge and authority.

Pillar D: Immediate feedback

Seeing for ourselves the consequences and impact of our own actions is the most powerful teacher that exists. This is the psychology that informs game design. Games, like TBL classrooms, are learning systems, where each action by a player (or team of players) generates consequences that provide the feedback that teaches. A hockey player shoots at the goal and watches to see if the goalie can stop the puck. A poker player makes a bet and watches to see how the other players respond. A video gamer watches how opponents on the screen respond to moves, then alters his strategy or tries a different tool. In any game, a player watches and responds to the effects of his actions—immediate feedback—then takes what he has *learned* into consideration when planning future moves.

> *TBL protocols and practices are specifically designed to create a classroom experience rich with "immediate feedback."*

When the immediate feedback to a team is positive ("We got it right!" "We got more points than the other teams!") it validates team decisions that are sound, and therefore helps the team bond through greater confidence and a stronger sense of identity. When the feedback is negative (for example, when the team misses a question on the tRAT) it can have a useful corrective effect, and help team processes by affecting both the members who might be too assertive or too quiet.

When teams receive feedback that their choice is incorrect, members who may have had good ideas but were reluctant to speak up while the choice was being made realize that they let their team down. Further, even if none of the other team members have any idea about the fact that there was missing input, the quiet members recognize the negative consequences of their inaction, and are motivated to speak up in the future.

Also, during 4-S activity and discussion, when team members are struggling with getting an overly assertive member to listen and have therefore ended up with a problematic "team" answer, the immediate feedback provided by the entire class in the simultaneous report and subsequent discussion helps them make their point.

Here are the 3 primary practices of TBL that are designed to generate immediate feedback:

1. **Immediate feedback will occur for individuals, when transitioning from iRAT to tRAT.** When students finish their iRAT and turn to the tRAT, they are bombarded with immediate feedback, as they begin comparing

their own answers with those of their teammates. Disagreements among team members lead immediately to analytic inquiry (Why did you say A?) and self-assessment (Am I sure of what I read, understood or remember?).

2. **Immediate feedback will occur for teams through the tRAT scratch-off (IF-AT) process.** The tRAT scratch-off form makes the consequences for team decisions immediately visible. This ensures that a team will assess its effectiveness at the end of each negotiation leading to an answer. The immediacy of the feedback allows team members to evaluate the effectiveness of their own decision-making, and to change any behaviours—either collectively or of individuals—required to improve the performance on subsequent items.

3. **Immediate feedback will occur for everyone during team application activities.** The formatting of 4-S team application tasks for "same-problem + simultaneous response" is specifically conceived for generating immediate feedback.

   "Same Problem" ensures that, however the teams respond, their choice will become relevant feedback for the other teams.

   "Simultaneous Response" ensures that each team will see immediately where they stand vis-a-vis *the other teams. No one can hide from his own thinking.*

   The **simultaneous response** reveal is a critical moment of deep self-assessment. When a team is alone in its report of an answer, it immediately feels challenged, and will respond in a variety of ways, all productive. It might argue forcefully and find value in defending itself against the other teams. If the team felt unsure to begin with, the soul searching begins when team members see the responses of all the other teams. Because teams have had to commit to an answer and report it in public, however, they have no choice but to make their case. In some situations they will be vindicated, as the minority position may turn out to be a good one.

Pillar E: Student agency, self-determination and accountability

Students need to be treated like adults, who are free to act on their own judgment, based on knowing what is expected of them to achieve a goal. This means a major shift away from teaching practices characterized by "controlling" students, where the instructor's personal needs, preferences and even worries and fears can inform how the course is experienced by students. A well-managed TBL course ensures that students *own* the course. Students are assumed to be self-motivated (even if they don't appear to be on the surface!), intelligent, capable, responsible individuals, and are, accordingly, objectively accountable at multiple levels. Here are key practices that promote a learning culture for adults.

1. **Course policies are written so as to place students in the role of "agent" acting in his/her own interest.** To achieve this culture means communicating to students the **choices** they are free to make, and the **consequences** that come with those choices, whatever they may be.
   a) Eliminate "attendance requirements," but replace them with "productivity accountability." Students who choose not to attend class are free to do so, knowing that they accept as a consequence loss of the opportunity to receive credit for work done during class. We recommend making sure that something significant gets marked and recorded frequently <u>in class</u>.
   b) Eliminate "make up" assignments. Instead, give students license (and choice!) to drop a small, fixed number of scores in each category of their grade, so that <u>they</u> can be responsible for managing their own options to do or not do an assignment. (You'll need policy language to deal with dire cases of catastrophic illnesses or accidents).
   c) Provide students with assignment deadlines expressed as "choices" tied to "levels of "eligibility" to receive points. For example, assignments submitted by a given date would be eligible for specific point values; assignments submitted on a later date would be welcome, but eligible for fewer points. Avoid the language of "penalties" for late assignments or other infractions. Penalties are perceived by students as the instructor's arbitrary exercise of authority and control. Build your policy structure around the choices students are free to make, knowing that they—and they alone—are accountable for the consequences.
   d) Explain in the course syllabus (and make sure students read it—such as through a first-day "practice RAT" on the syllabus) how your course gives students the tools and responsibility to manage their time as they find necessary.

2. **Students evaluate their teammates' "helping behaviour"** as a part of the course grade. If students are going to become fully responsible and accountable for their team's learning, they will need leverage to motivate their peers to be effective partners.
   a) The Peer Evaluation component of the final course mark should be somewhere around 5-10 % of course total, although there might be circumstances in which more is appropriate. The amount needs to be high enough to potentially influence a student's final grade for the course, but not so high as to directly determine the final grade, by itself.
   b) Spend time on Day One or Day Two of the term working with students to determine the criteria to be used in assessing peer helping behaviour. This works well as a first team activity on day one. See Michaelsen, Knight, and Fink (2004), for a description of the fishbowl exercise often used to establish behaviour criteria for the whole class.
   c) Schedule a first peer feedback and evaluation exercise approximately 1/3 way in the course. Use this activity to allow students to provide feedback to one another, with no points at stake.
   d) For the final peer evaluation, choose a process that requires students to differentiate among individuals in assigning scores to their peers.

3. *The overall grading scheme includes weights or percentages for individual work, team work, and peer evaluation.* The specific weights will vary from course to course and from instructor to instructor, depending upon learning outcomes and the students' frame of reference. The culture of the institution and age or maturity of the students, for example, might affect the grading scheme and weighting strategy you use.
   a) Give student teams the opportunity to determine at least some of the grade weights (within parameters you give them) during the first week of the course. A common, minimal practice is to let students decide the weight of the iRAT vs the tRAT. Let them choose, for example, a 50-50, 60-40 or 75-25 weight split, in either direction. All teams have to agree to the same weighting scheme. See Sibley *et. al.* (2014) for elaboration on this procedure.
   b) As you become comfortable with this process, you can let teams help you determine the value of grade weights for the whole course, within certain parameters. A description of how to do this can be found in Michaelsen, Knight, and Fink (2004).
   c) For the course as a whole, it is recommended for new adopters to start with an overall target weighting scheme of approximately 60-70% for individual work and 30-40% for team-based assignments. As a rule, keep the individual weight aggregate total well above 50%, to ensure individual accountability. As you become more comfortable with the TBL model, you might find reasons to shift the balance of weights in one direction or another.

d) Make sure that some of the daily team application activities result in a score that counts toward the course grade. One way to do this is to have students record in writing and turn in their team response and reasoning, **before the simultaneous response** and subsequent class-wide discussion. The instructor can then evaluate the team's response and enter a value in the grade book.

Here is a sample grading scheme for a TBL course. Note that there are several traditional components. Individual tests and papers, for example, can still be part of a TBL course.

20%	RATs; (Individual vs. Team fraction to be determined in class)
10%	Weekly in-class team "Challenge" activities
20%	Individual in-class Essays/Midterms
25%	Individual Capstone Essay/Memo (or "Final Exam")
20%	Capstone Team Case/Situation Analysis
5%	Team Member Performance (Helping behaviour--peer graded)
100%	Total

This will work!

For many instructors, the first implementation of a TBL course will be an invigorating and satisfying intellectual challenge. Don't worry if you don't hit all the marks perfectly the first time you use TBL. And don't be deterred by the few students who may struggle in response to the new expectations you have communicated. It's perfectly natural for a few students to push back at first—this is a positive sign that you have gotten their attention and are challenging them in a meaningful way. Be prepared to explain to students that your course is designed to teach them how to use their knowledge, which will prepare them for real-world challenges.

This is a learning process for both you and your students. Students in general will be forgiving when they notice (and they will!) that you are trying to create for them an engaging experience, and that they are learning more than they would in a lecture-based course. We hear stories from faculty members who tell of how their students became partners in the process, offering feedback during the course on how to improve RATs as well as the design of 4-S activities that did not work as planned.

Your goal for a first time effort is to put the basic TBL protocol in place, respecting the 5 pillars of practice, and fine tune as you go. It's common, for example, to struggle at first with designing consistently effective team application activities around meaningful choices and decisions that generate lively, relevant

discussion. For some instructors, calibration of RAT difficulty (too easy *vs.* too hard) is also something to be learned through practice. Above all, it's common to struggle in adapting to an outcomes-driven course, where the design of student work in their teams forces you to "think backward" to make sure all the pieces are in real alignment, from the clarity of learning outcomes, to the design of 4-S application activities, to the creation of the RATs, to the selection of content.

There will be genuine joy in the effort, however. We are reminded of a colleague who recently commented to us, during her first semester of TBL, "The discussions in class have been inspiring: this is the first time in my teaching career that I've actually been able to **see and hear** my students learning!"

These students could be yours. Trust the method.