

**IMPLEMENTING TEAM BASED LEARNING IN  
POSTGRADUATE MEDICAL EDUCATION**

by

Christina Graves

A Portfolio submitted in partial fulfillment of the  
requirements for the Degree of Master of Education

Faculty of Education

Lakehead University

Thunder Bay, Ontario

April 2019

## ACKNOWLEDGEMENTS

I would like to express my sincere gratitude to my adviser, Dr. Angela van Barneveld, for her unwavering support, wisdom, patience, and incredible guidance. Thank you for challenging my thinking, sharing your knowledge, and mentoring me. You kept me inspired and motivated throughout the process which was key to my success. I would like to express my heartfelt appreciation to my committee member, Dr. Graham Passmore, for his time, invaluable feedback, and guidance. Finally, I would like to thank my family and friends for their encouragement and support.

## Table of Contents

Chapter 1 – Proposal.....	1
Introduction.....	1
Tasks .....	2
Literature Review.....	2
Presentation.....	3
TBL Orientation Session and Faculty Guide .....	3
Chapter 2 – Literature Review .....	5
Introduction.....	5
Methods.....	6
History of TBL.....	7
Classic and Modified Implementations of TBL.....	9
Classic TBL Implementation. ....	10
Modified TBL – Number of Sessions.....	11
Modified TBL – Session Durations. ....	13
Modified TBL – Testing Strategies. ....	14
Summary .....	14
Faculty Development .....	15
Faculty Development: Individual Approach.....	15
Faculty Development: Team Approach .....	16
Summary .....	17
Learner Orientation.....	18
Content of Orientation Session .....	18
Delivery of Orientation Session.....	19
Summary .....	20
Challenges Encountered When Implementing TBL.....	20
Challenges Encountered by Faculty.....	21
Challenges Encountered by Learners.....	22
Challenges Associated with Scheduling.....	23
Summary.....	23

Discussion and Conclusion .....	24
Limitations of this Literature Review .....	26
Future Research .....	27
References .....	28
Chapter 3 –Faculty of Education Graduate Student Conference Presentation .....	33
Conference Abstract.....	33
PowerPoint Presentation .....	34
Reflection on Presentation .....	45
Description of Presentation.....	45
Critical Reflection.....	45
Chapter 4 – Team Based Learning Faculty Guide.....	48
Using this Guide .....	51
Purpose.....	51
Content.....	51
Access to Appendices: .....	51
Preparing to Facilitate a Program Designed by Someone Else.....	51
Introduction to TBL .....	52
What is TBL? .....	52
Paradigm Shifts:.....	52
Why TBL Works: .....	52
Module 1: Resident Orientation to TBL.....	54
Session Outline .....	54
Purpose and Learning Objectives .....	54
Evaluation of Knowledge Gained:.....	54
Timing:.....	54
Before the Session.....	55
1. Organize Learners into Teams .....	55
2. Review Resident Preparation Materials.....	55
3. Familiarize Yourself with the Readiness Assurance Test.....	55
4. Finalize the Application Activity for the Session .....	56
5. Review the Session PowerPoint Presentation.....	56

6. Connect with your Program Coordinator.....	56
During the Session .....	57
1. Room Set-Up: .....	57
2. Welcome and Intro:.....	57
3. Readiness Assurance Process .....	57
4. Application Activity: .....	58
Appendix 1: Faculty Toolbox .....	59
Appendix 2: Resident Pre-Work TBL Handout.....	60
Appendix 3: Pre-Work TBL Video.....	64
Appendix 4: Readiness Assurance Test.....	65
Appendix 5: Application Activity.....	67
Appendix 6: Application Activity.....	68
Appendix 7: Session PowerPoint.....	69
Appendix 8: Administrative Documents .....	73
Appendix 9: LMS Screenshot.....	74
Appendix 10: Administrative Checklist.....	75
Appendix 11: Simultaneous Reporting Cards.....	76

## Chapter 1 – Proposal

### Introduction

My portfolio is focused on team-based learning (TBL) in the area of health sciences education. My interest in this topic stems from my work in the Postgraduate Medical Education (PGME) setting where I work as an instructional designer. I believe that TBL is a teaching methodology that, when implemented with proper support and guidance, can enhance learning by providing a structure around a flipped classroom model while providing active learning opportunities.

In PGME, residents have completed multiple levels of schooling, including their medical degree, in order to enter their final years of training to become a licensed physician. Learners spend the bulk of their time completing clinical rotations and only attend in class academic sessions for a small amount of time. Academic sessions vary by program, but time spent in academics is usually about one half-day/week with the rest of a learner's time being spent on rotation at clinics, hospitals, health units, etc. Academics are normally delivered by different presenters each week and topics vary from week to week. Further to that, residents are not assessed or graded on their performance in academic sessions. Due to the way that academic sessions are organized for PGME programs, there are distinct differences from traditional higher education programs that need to be thought about when designing curriculum delivery. There are many promising strategies used within the TBL method and some challenges to overcome specific to PGME implementation.

This portfolio aims to provide a current state view of the integration of TBL into higher education, with a focus on health sciences education. In doing so, this portfolio will share best

practices strategies for implementing TBL from an instructional design perspective while adhering to defined TBL principles.

### **Tasks**

The tasks to be completed for this portfolio include:

- (1) A literature review to determine what the current state of integrating TBL into higher education is, with a specific focus on health sciences education
- (2) A presentation on TBL to disseminate information on what TBL is and how it has been implemented into health sciences education
- (3) A TBL orientation session and associated faculty guide

### **Literature Review**

The literature review aimed to determine the current state of TBL implementations into health sciences education and to identify best practices. I completed this literature review by searching for literature related to the use of TBL in health sciences education to determine how TBL is used to engage learners and foster higher-order thinking skills as well as to determine what the best practices to follow are when implementing TBL in health sciences education.

A thorough understanding of the current literature is necessary in order to disseminate information about what TBL is, how it is being implemented, and what the outcomes of some of the implementations are. It is also necessary to conduct this literature review in order to inform the faculty guide that will be completed as the third task in the portfolio. The literature review is the first task so that it can enrich the following two tasks.

## **Presentation**

I wrote and submitted a proposal to present at the 2018 Graduate Student Education Conference held by the Faculty of Education at Lakehead University in March 2018. The purpose of my presentation was to disseminate knowledge about TBL and to share information on the work I am doing as a graduate student in the Faculty of Education at Lakehead University. I prepared and delivered a 10-minute oral presentation based on my work for the literature review I had completed to this point. My presentation focused on providing a current state view of the integration of TBL into medical education and shared strategies for implementing TBL from an instructional design perspective while adhering to defined TBL principles.

This task was important so that I could develop and practice the skill of writing a proposal to present at a conference, develop a presentation that is clear and focused, and deliver the presentation in an engaging way while ensuring the proper message was getting across in ten minutes. It is also important to share learning as a graduate student so that those interested can attend and learn more about my project. Perhaps more important, was the opportunity this presentation gave me to receive feedback from those who attended as well as to reflect on the questions I was asked. This allowed me to reflect on what else people are interested in knowing about in terms of TBL implementation into health sciences education and to identify what information I delivered that was not clear in my presentation. As part of this task, I also completed a reflection on my presentation.

## **TBL Orientation Session and Faculty Guide**

A learner orientation to TBL was found to be an important step when implementing TBL in the literature review. Therefore, creation of a learner orientation session and an associated faculty guide was decided upon as the final task for this portfolio. The learner orientation session



is designed to be 90-minutes in length and to be applicable across disciplines. The faculty guide is important to include with the session so that it can be used by multiple facilitators across disciplines. Further to that, in order to reap the full benefits of TBL, it is important to follow the principles and steps of running a TBL session. The guide is a tool that is to be used as just-in-time faculty development so that faculty instructors can review the guide and understand how the TBL session is to be run.

## Chapter 2 – Literature Review

### Introduction

Medical Education is changing from a traditional teaching approach to encourage active learning through engagement and interactivity with learners to enhance knowledge retention and skills acquisition. In order to prepare learners to become competent healthcare practitioners, it is crucial that their education focus on the development of critical thinking and reasoning, high level of communication, and effective team work (Morris, 2016). Thus, new teaching methods are emerging that are learner-centred and allow for more interaction and active learning. Team-based learning (TBL) is one of these teaching methods and it has been found to be a promising alternative to traditional teaching methods common to medical education, such as didactic lectures (Parmelee & Michaelsen, 2010). TBL exposes learners to challenging problems and provides them an opportunity to apply their knowledge while working with their peers to solve the problems, allowing for meaningful application of knowledge in real-world scenarios (Michaelsen, Watson, Cragin, & Dee Fink, 1982).

This literature review focused on the current state of TBL implementations in higher education with a specific emphasis on health sciences education. The questions addressed in this literature review include:

1) How is TBL being implemented into higher education, specifically in health sciences education?

(2) What are the best practices to follow when implementing TBL in health sciences education?

A thorough review of literature will help inform instructional designers and faculty interested in implementing TBL into a higher education program in the health sciences education field by

- highlighting the current state of practice,
- identifying key factors to consider when implementing TBL, and
- describing challenges encountered by others when implementing TBL.

This is important to look at because it provides guidance for the implementation of TBL while being aware of challenges and how those challenges may be mitigated.

### **Methods**

Databases searched for this literature review included Education Source and PubMed in September 2017. The search focused on articles related to the use of TBL, as described by Larry Michaelsen, in health sciences education and only included peer-reviewed journals with full text access. Search terms included Team Based Learning (6,377), Team Based Learning + medical education + implementation (275) and Team Based Learning + medical education + best practices (76). The majority of the articles (over 70%) focused on interprofessional education and learning how to work with a team of health care providers. This is different than the focus of this literature review which is implementation and best practices of TBL. Thus, title and abstracts were reviewed for the following inclusion criteria to keep articles that (1) described or focused on a TBL implementation or TBL best practices, (2) were published between 2007 - September 2017 (with the exception of Michaelsen's 1982 landmark article), and (3) reported on primary research. Articles were excluded if they were written in any other language than English. Ultimately, this resulted in 24 articles that were included in the literature review.

Table 1

*Literature on TBL Implementation and Best Practices*

First Author (year)	Implementation	Best Practices	Both
Alimoglu et al. (2017)	•		
Altintas et al. (2014)	•		
Anwar et al. (2015)	•		
Behling et al. (2017)	•		
Brandler et al. (2014)	•		
Brich (2013)		•	
Chen et al. (2016)	•		
Ismail (2016)		•	
Juncà et al. (2017)	•		
Orr et al. (2015)	•		
McMullen et al. (2014)			•
Michaelsen et al. (1982)		•	
Middleton-Green et al. (2013)	•		
Mody et al. (2013)	•		
Morris (2016)	•		
Nelson, et al. (2013)			•
Obad et al. (2016)	•		
Ozgonul et al. (2017)		•	
Sutherland et al. (2013)			•
Thompson et al. (2007)			•
Wamsley et al. (2013)		•	
Warrier et al. (2013)			•
Wiley et al. (2017)	•		
Zeng et al. (2017)		•	

**History of TBL**

TBL has been in existence for over 35 years, originally gaining popularity at the University of Oklahoma in business education. Larry Michaelsen developed TBL when he was teaching for the Faculty of Business in the 1970s (Michaelsen et al., 1982). Michaelsen was driven to create TBL because of increasing class sizes and decreasing teaching resources, which

led to concerns about instructional strategies, learner engagement, and learning. He wanted to continue to teach using a case-based method he had used in previous years when he had smaller class sizes. Thus, he implemented TBL with the goal of engaging a large class in effective problem solving while keeping his learners accountable for preparing before each class. TBL is defined as “an active learning and small group instructional strategy that provides students with opportunities to apply conceptual knowledge through a sequence of activities that includes individual work, team work, and immediate feedback” (Parmelee, Michaelsen, Cook, & Hudes, 2012, p. e275).

TBL slowly gained popularity in the early 1990s as the demand for active learning in professional education classrooms rose. Educators at professional schools found TBL to be an effective teaching method that introduced active learning into their classrooms (Parmelee & Hudes, 2012). TBL literature exploded in the early 2000s partly due to a large uptake of health sciences using the teaching method. Parmelee and Hudes (2012) noted that in 1998 there were no medical schools using TBL and by 2013, over 100 medical schools were using the TBL teaching method. This explosion in the health sciences was largely due to an education grant received in 2001 by the Baylor Medical College in Texas which supported the promotion of TBL in health sciences education (Parmelee & Hudes, 2012). The grant also supported the creation of the TBL Collaborative, which is described on their website as “an organization of educators from around the world who encourage and support the use of Team-Based Learning in all levels of education” (“Team-Based Learning Collaborative,” n.d.). TBL has been implemented across the world in many disciplines including medicine, nursing, the social sciences, pharmacology, toxicology, and business education (Parmelee & Hudes, 2012). Michaelson developed TBL (described in the

next section) that is widely accepted as the process to follow when implementing this teaching model (Parmelee & Michaelsen, 2010).

TBL has been shown to be an effective teaching model that produces equivalent or improved learning outcomes when compared to more traditional teaching models such as lecture-based formats (Parmelee et al., 2012). Although it is a team-based approach, the high performers are not left to complete the group work for their peers which is a common complaint among learners. The process of TBL is purposeful in the way it is carried out to keep all learners accountable to complete their individual work and to contribute to their team. In fact, TBL enhances mastery of course content and students in the lowest academic quartile have been shown to benefit more than the highest quartile students when the TBL method is employed (Koles, Stolfi, Borges, Nelson, & Parmelee, 2010; Reimschisel, Herring, Huang, & Minor, 2017). By providing immediate feedback throughout the course, TBL provides feedback on individual weaknesses so that learners who are struggling are caught earlier on. This allows learners to self-evaluate their own understanding of content and permits team members and faculty to provide help long before a summative exam (Parmelee et al., 2012).

### **Classic and Modified Implementations of TBL**

Parmelee and Michaelsen (2010) emphasized that it is important to follow the TBL method closely in order to implement it successfully. However, within the literature there were differences in implementation regarding the number and duration of TBL sessions, and there are some examples of the TBL process being modified. An implementation was considered to be modified if it was significantly different from the classic implementation approach described by Parmelee and Michaelsen (2010) or if one or more of the phases was missing. These differences

across implementations were reviewed to determine what aspects of TBL are being changed across settings and how this could inform those looking to implement TBL into their own setting.

**Classic TBL implementation.** More than 80% of studies in this review implemented classic TBL, meaning that the implementations followed the TBL process as described by Parmelee and Michaelsen (2010). Phase 1 involves out-of-class preparation with clear learning objectives where learners study assigned materials to prepare for each session. Phase 2 is referred to as the readiness assurance process (RAP). The RAP involves an in-class individual readiness assurance test (IRAT) and team readiness assurance test (TRAT). Both tests are made up of the same multiple-choice questions which are focused on content from Phase 1. Learners are provided with immediate feedback on their answers to check on knowledge gained from the pre-class materials. The RAP has two purposes: (1) to keep learners accountable for completing Phase 1 and (2) to determine what concepts learners did not fully understand. This information allows the facilitator to clarify misunderstandings through discussion or a short, pointed ‘mini-lecture’ to ensure learners are ready for Phase 3. Phase 3 takes up the bulk of the class time and involves application exercises that provide teams with the opportunity to apply their knowledge to real-life, challenging problems while working together in their teams (Parmelee & Michaelson, 2010). Further, Parmelee and Michaelson (2010) noted that the TBL process is normally repeated over 5-7 sessions to cover the material of one course. Figure 1 shows the instructional activity sequence for a TBL session. This sequence creates the TBL teaching method, which is grounded in the constructivist education theory (Hrynchak & Batty, 2012). Constructivist education theory stipulates that an active learning environment should use authentic and relevant problems and group interaction to communicate with peers and the

facilitator to exchange ideas. The teacher's role is that of a facilitator to guide learning (Hrynchak & Batty, 2012).

Figure 1. TBL Activity Sequence

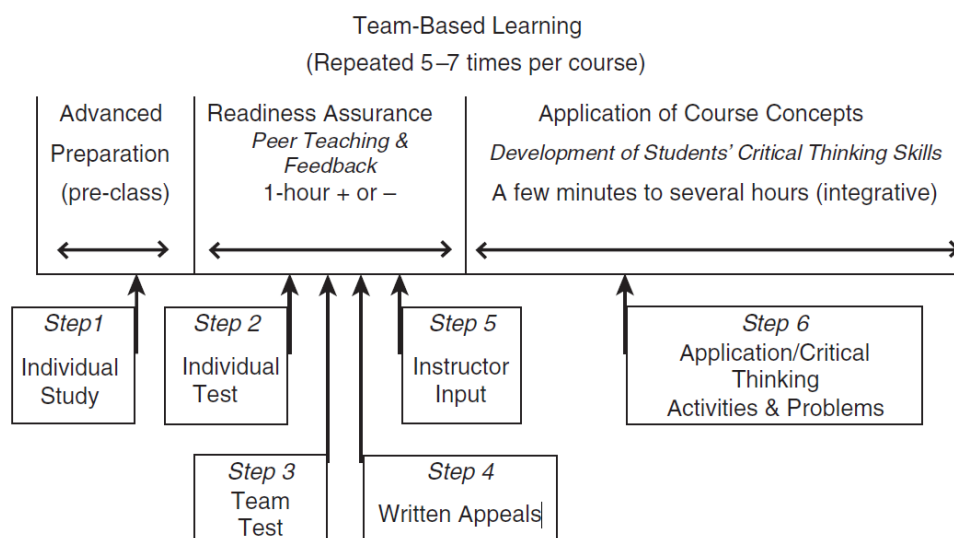


Figure 1. Instructional activity sequence for a TBL content unit. Reprinted from “Twelve tips for doing effective Team-Based Learning (TBL),” by D. X. Parmelee and L. K. Michaelsen, 2010, *Medical Teacher*, 32, p. 119. Copyright 2010 by Taylor & Francis (<http://www.tandfonline.com>).

### Modified TBL – number of sessions.

Parmelee and Michaelsen (2010) stated that when TBL is implemented, the course is normally organized into five to seven sessions. However, when looking at the implementations of TBL within this review, there was variance in the number of TBL sessions implemented. For those who implemented multiple TBL sessions, the most common number of sessions ranged from four (Behling, Kim, Gentile, & Lopez, 2017; Brandler, Laser, Williamson, Louie, & Esposito, 2014), to six (Brich, 2013; Warriar, Schiller, Frei, Haftel, & Christner, 2013), to eight sessions (Anwar et al., 2015; McMullen, Cartledge, Finch, Levine, & Iversen, 2014) which is



close to the recommendation made by Parmelee and Michaelsen (2010). However, there were examples where more sessions were implemented including Middleton-Green and Ashelford (2013) who implemented 13 sessions, Sutherland, Bahramifarid, and Jalali (2013) who implemented 19 sessions, and Nelson et al. (2013) who implemented TBL across their curriculum with TBL replacing lecture for 71 out of 102 credit hours. There were three authors who indicated that they implemented multiple TBL sessions but did not clarify how many (Chen, McCollum, Bradley, & Chen, 2016; Morris, 2016; Obad et al., 2016). Thus, it was common to see either 4-8 sessions or 13 or more sessions being implemented. On the other hand, some of the authors implemented one TBL session. The authors who implemented one session had implemented TBL into a UME clerkship which means that learners were on a clinical rotation for a set number of weeks and were only present and available to participate for a short period of time. Ozgonul and Alimoglu (2017) implemented TBL into a two-week clerkship, Alimoglu, Yardim, and Uysal (2017) into a three-week clerkship, and Mody, Kiley, Gawron, Garcia, and Hammond (2013) into a 6-week clerkship. Other authors who implemented one TBL session did so to teach a topic that requires knowledge and skills in clinical practice (Juncà, Belli, & Bajwa, 2017; Wamsley et al., 2013; Wiley et al., 2017; Zeng, Xiang, Zeng, & Zuo, 2017), because the topic was complex and learners had struggled with the content in the past (Ismail, 2016), or because they only converted one of 13 lectures as a pilot (Altintas, Altintas, & Caglar, 2014). The variance among the number of sessions that these implementations demonstrated that a small-scale or large-scale implementation can be done dependent on the reason for implementation and the resources available to implement TBL. For example, if time and resources do not allow for a large-scale change to implement multiple TBL sessions, it can still be beneficial to implement one TBL session. This allows for flexibility within educational

programs interested in implementing TBL to try it out in a lower stakes environment by implementing a small number of sessions prior to replacing a larger amount of curriculum all at once.

**Modified TBL – session durations.** The implementations of TBL also varied in the amount of time that was dedicated to each session from being 50-minutes in length to holding full day sessions. The most common duration of time allotted for TBL sessions was 90-minutes to two hours (Anwar et al., 2015; Brandler et al., 2014; McMullen et al., 2014; Obad et al., 2016; Warriar et al., 2013; Zeng et al., 2017). In their implementations, McMullen et al. (2014) and Zeng et al. (2017) dedicated two-hours for their TBL sessions and Warriar et al. (2013) dedicated 90-minutes. Although these implementations varied in duration, they all dedicated at least 50% of their session to complete the application activity. This is in line with Parmelee and Michaelsen (2010), who emphasized that the majority of class time should be spent on the application activity so that learners can apply their knowledge to real-life problems. Orr et al. (2015), on the other hand, only had 50-minutes at a time available to them in the schedule. Acknowledging that this was too short of a time frame to complete the TBL process, they decided to break up one TBL session over 2-3 50-minute time slots in order to complete the TBL process. Orr et al. (2015) acknowledged that this was not ideal because the time in between sessions led to a disconnect from the readiness assurance process to the application activity. Similarly, Ismail (2016) who ran a TBL session that was one-hour in length stated that the timeframe was too short and that two-hours for a TBL session would be preferred. Based on the review of this literature, 90 minutes to two-hours seems to be an ideal time to allocate towards a TBL session. In fact, in studies where one-hour or less was dedicated to a TBL session, authors noted that this

was not enough time. Further to that, at least 50% of the session should be dedicated towards completion of phase 3 – the application activity.

**Modified TBL – testing strategies.** In this review, two articles explained a modified implementation of their testing strategies in TBL when implementing the individual and team readiness assurance tests (Altintas et al., 2014; Ismail, 2016). Both studies were from Asia and the implementations were in UME. These studies did implement three phases of TBL, however, the readiness assurance phase and the application activity phase were altered. These implementations did not include the individual test and the team test during the readiness assurance process as a classic implementation would. Instead, both implementations had learners complete the individual test during the readiness assurance process and then used the team test as the application activity. Altintas et al. (2014) re-used the same questions with the team test as the TBL method intends but Ismail (2016) changed the questions on the team test slightly. Both studies allowed learners to use materials such as readings, notes, the internet, etc. while completing the team test. The authors of these studies do not comment on the reason for modifying their TBL implementations. Although these studies modified their implementation of TBL, they still provided an opportunity for learners to complete pre-work, conducted the individual test, and had teams work together to solve problems using knowledge they had learned.

## **Summary**

The variety of implementations described in this section shows the potential that TBL has in terms of being successfully implemented across different settings. There are some factors to consider when implementing TBL such as how many sessions will be implemented to start, how long each session will be, and what the design of each phase will look like including timing and

process. The studies reviewed followed the TBL method by providing pre-work to learners, completing the readiness assurance process to encourage learner accountability being driven through readiness assurance tests, as well as providing an application exercise to allow learners to apply and discuss their learning. Therefore, these implementations show that adjusting the implementation of TBL to ensure it works for the setting it is being implemented in is possible while still ensuring that all three phases are utilized. Once the logistics and planning of the TBL format is determined, there are other steps in the implementation described in the literature including preparing faculty and learners at the school for a smooth transition which will be discussed further in the following sections.

### **Faculty Development**

When implementing a change that will rely on faculty to develop curriculum and teach following a certain process, it is important to ensure they are aware of the process. Thus, faculty development is an important step in a change such as implementation of TBL. With the studies that discuss delivery of faculty development, several disciplines are represented including UME (Sutherland et al., 2013; Warriar et al., 2013), nursing (Morris, 2016), pharmacy (Nelson et al., 2013), and PGME (Brandler et al., 2014; McMullen et al., 2014). Upon reviewing the faculty development provided within these studies, approaches taken can be grouped into two: (1) one or a small number of faculty become local champions of TBL and teach the other faculty that are involved in the TBL implementation at their organization and (2) the faculty at an organization learn about TBL together prior to the implementation by doing a group faculty development activity.

#### **Faculty Development: Individual Approach**

One faculty development approach was to identify one or a small number of faculty to act as the local TBL champion(s) and use their knowledge to prepare the other faculty members involved in the TBL implementation (McMullen et al., 2014; Morris, 2016). Prior to their implementation, McMullen et al. (2014) had two faculty members and Morris (2016) had one faculty member who acted as the TBL champion for their implementation. The champions role was to become the expert on TBL which was done by reading about and attending workshops and/or conferences on this topic. The local champions would then provide faculty development to the rest of their implementation team. The local champions in these studies also created the session materials and then invited review and input from the larger implementation team. Further to that, McMullen et al. (2014) created facilitator guides and attended the first session taught by the teaching faculty to act as the TBL expert and assist as needed. These two implementations provide one approach to the delivery of faculty development and how local champions can lessen the work on the faculty group. This allows for less resources to be spent overall because not all faculty were required to seek out information to learn about TBL, travel to workshops and conferences, or create session materials. On the other hand, other researchers described implementations where the local faculty learned about and developed TBL sessions together, sharing the work-load.

### **Faculty Development: Team Approach**

The other model of faculty development was to have the faculty who were involved in the implementation of TBL all be included to learn about TBL instead of a select few as was the case in the individual approach. When Brandler et al. (2014) and Warriar et al. (2013) implemented TBL, all the faculty involved attended a workshop and learned about TBL together in preparation for their implementation. The faculty groups were then all involved in the creation

and implementation of TBL meaning that the workload was spread across the team instead of having the bulk of the work on one or two people. In these examples, the team faculty development explained was completed in preparation for implementation. On the other hand, Nelson et al. (2013) implemented brown-bag sessions for their faculty once they had already implemented TBL. These sessions were held to provide a forum for faculty to discuss TBL implementation after the sessions had been executed to help support faculty with ongoing challenges such as facilitation issues and to discuss successful practices. In fact, Sutherland et al. (2013) conducted focus groups with their faculty after their TBL implementation and they determined that limited faculty development was seen as a challenge in their TBL implementation. In order to improve this, their faculty suggested that ongoing faculty development sessions should be implemented. This is important to note because the other faculty development approaches were completed prior to implementation to prepare faculty for the creation of session materials and to understand the TBL process prior to running their first session. However, this points to the need of providing ongoing faculty development to support faculty after the initial implementation as well.

## **Summary**

These faculty development approaches provide different options to prepare faculty for a TBL implementation by taking the individual or team approach. Morris (2016) did comment that the professional development undertaken by the lead was very important because it allowed her to develop TBL sessions appropriately. Providing faculty development is an important step in the process but the way in which it is carried out can be done to suit the local needs and resources available. For example, if there are limited resources the individual approach can be taken whereas if resources allow, or if one or two faculty members are not able to take on the bulk of

the workload, the team approach can be taken. What does not appear in any of the studies is the impact of each of these different approaches on faculty and whether the faculty found the faculty development provided effective or useful in their implementation of TBL. Another very important stakeholder in the implementation are the learners. Thus, similar to providing faculty with education on TBL, preparing learners to engage in TBL is an important step in the implementation process.

### **Learner Orientation**

Learners are central to the implementation of TBL and many of them will have experienced traditional, lecture style courses and may not be familiar with TBL (McMullen et al., 2014; Parmelee & Michaelsen, 2010). The provision of learner orientation to the TBL approach appears to be a standard across disciplines such as UME (Alimoglu et al., 2017; Altintas et al., 2014; Brich, 2013; Ozgonul & Alimoglu, 2017; Warriar et al., 2013; Zeng et al., 2017), PGME (McMullen et al., 2014), and nursing (Middleton-Green & Ashelford, 2013; Morris, 2016). Just as there were different approaches to prepare faculty for TBL, there were various methods used to prepare learners for TBL.

### **Content of Orientation Session**

There was a variety of content included in the learner orientation to TBL. The most common pieces of information included in the orientation sessions were to (1) provide learners with an overview of the TBL sequence (Alimoglu et al., 2017; Altintas et al., 2014; McMullen et al., 2014; Middleton-Green & Ashelford, 2013; Morris, 2016; Ozgonul & Alimoglu, 2017; Warriar et al., 2013; Zeng et al., 2017), (2) give an explanation of the assessment strategy for the course (Altintas et al., 2014; Brich, 2013; McMullen et al., 2014; Zeng et al., 2017), and (3) explain the rationale for using TBL (McMullen et al., 2014; Middleton-Green & Ashelford,

2013; & Morris, 2016). These topics for orientation follow the advice provided by Michaelsen and Sweet (2008) who noted that it is imperative to prepare learners for TBL in order to successfully implement this teaching method. They explained that learners should understand why TBL was chosen as an instructional method and what TBL entails, including expectations of learners and the grading system for the course. Providing learners with an orientation that covers these topics helps with obtaining buy-in from the learners, understanding of the TBL process and setting expectations for learners, as well as showing the connections between the pre-work they will complete, and the activities done in class (Michaelsen & Sweet, 2008).

### **Delivery of Orientation Session**

Delivery of orientation is expected, but how it occurs across implementations is less standard. For example, McMullen et al. (2014) and Morris (2016) delivered their orientation in the form of a mock TBL module. Morris (2016) used their first session as a TBL practice run but they did not state the time allotted for the orientation. During their orientation, Morris (2016) organized their learners into teams and went through the process of a TBL session. Similarly, McMullen et al. (2014) ran their learner orientation in the form of a TBL session in which they dedicated one-hour for the session. The authors noted that an application activity was planned, however, they ran out of time and were only able to explain the activity as an example instead of having the learners complete it which indicates that one-hour was not long enough for their mock TBL session. This is in line with what was found in terms of creating TBL sessions that are at least 90-minutes. Brich (2013) and Middleton-Green and Ashelford (2013) indicated that they prepared learners for TBL during their first session, however, they do not provide details on how long they spent preparing learners or what format was followed. Thus, it is unclear whether this was done in a mock TBL format or not. Finally, Zeng et al. (2017) also mentioned that they



prepared their learners by distributing documents about TBL electronically for the learners to review on their own time one-week prior to the session.

## **Summary**

The commonalities among studies provide information on what type of content is being included in implementations as well as the different approaches to deliver a learner orientation. This review provides an example of what type of information is being introduced to learners during their orientation including an explanation of the TBL teaching method and an establishment of expectations of learners within this teaching method. Similar to faculty development strategies, the impact of providing an orientation to learners was not captured in any of the literature reviewed. Thus, it cannot be determined within this literature what aspects regarding content are important to include or how best to deliver the learner orientation because the literature reviewed did not report on an evaluation or impact of the learner orientation that was implemented. While faculty development and learner orientation to TBL are recommended ways to start a TBL learning experience, there are challenges that must be considered during the implementation phase. These challenges will be discussed in the next section.

## **Challenges Encountered when Implementing TBL**

When implementing a new teaching and learning process it is common to encounter challenges due to the significant change impacting faculty and learners. The literature identified challenges experienced at different stages of the implementations that are important to look at in order to understand where they may arise and how they can be planned for or prevented. The challenges can be separated into three groupings which are (1) challenges encountered by faculty including faculty time required to create a TBL session (Alimoglu et al., 2017; Brandler et al.,

2014; Brich, 2013; McMullen et al., 2014; Middleton-Green & Ashelford, 2013; Morris, 2016; Zeng et al., 2017), (2) challenges encountered by learners including time required to complete pre-work associated with Phase 1 (Altintas et al., 2014; McMullen et al., 2014; Nelson et al., 2013), and (3) challenges associated with the organization such as scheduling (Ismail, 2016; McMullen et al., 2014) and physical space (McMullen et al., 2014). These challenges are reviewed in further detail below.

### **Challenges Encountered by Faculty**

The most common challenge encountered by faculty while implementing TBL was the amount of time that faculty needed to dedicate towards creating TBL sessions including creation of the preparation material, individual and team tests, and the application exercises (Brich, 2013; Middleton-Green & Ashelford, 2013; Morris, 2016; Zeng et al., 2017). In order to estimate the time required by faculty to implement TBL, Morris (2016) measured the amount of time that it took to restructure an existing course into a TBL delivery method and estimated that it took five-days per session. However, during the second implementation this amount of time dropped to only one-day per session. Further to this, Middleton-Green and Ashelford (2013) had faculty report that it took time to learn how to create ‘just right’ multiple choice questions for the individual and team tests, noting that this got easier over time once they had gained experience and learned what types of questions created lively discussion and debate among learners without being too hard. Similarly, Brich (2013) and Zeng et al. (2017) commented that the time and effort spent at the outset is greatly reduced in future deliveries of the session because materials can be tweaked without having to re-create the full sessions again. In the end, faculty involved in the implementation found that implementing TBL was worth the initial effort because of the active learning environment it created, however they found it important to note so that others

looking to implement TBL do not underestimate the time it takes (Middleton-Green & Ashelford, 2013).

### **Challenges Encountered by Learners**

A common challenge from the learners perspective was completing pre-work for Phase 1 of the TBL process (Altintas et al., 2014; McMullen et al., 2014; Mody et al., 2013; Nelson et al., 2013). Studies within UME (Altintas et al., 2014; Mody et al., 2013) and PGME (McMullen et al., 2014) indicated that learners found it hard to prepare for class due to the time commitment it took on their part within their busy schedules. Given that TBL is a flipped classroom model where preparation work is completed outside of class time there needs to be consideration to how much preparation time is needed (McMullen et al., 2014). In a pharmacy education setting, Nelson et al. (2013) noted that, during the beginning of their implementation, learners commented that they were not given enough time to complete the pre-work. Thus, they established a minimum deadline for all instructors that the TBL materials had to be available to the learners on the learning management system and this resolved the issue, though they do not identify what the minimum timeline was. However, other authors do offer more information on time given. These vary from one-week to one-month. Obad et al. (2016) stated that they provided learners with the preparatory materials one-week in advance to ensure adequate time to prepare for class whereas Mody et al. (2013) provided preparation materials to their learners one-month in advance. Other than providing materials well in advance of each session, the studies do not indicate possible solutions for the challenge faced by learners to complete the pre-work. However, Altintas et al. (2014) hypothesize that this complaint may be more common among learners who are not used to the active learning method or having more responsibility for their learning which speaks to the importance of learner preparation.

### **Challenges Associated with Scheduling**

When implementing TBL, Ismail (2016) and McMullen et al. (2014) noted that scheduling the TBL sessions into the program timetable was a challenge. Both Ismail (2016) and McMullen et al. (2014) were provided with one-hour chunks of time to deliver their topics, however, they wanted a larger chunk of time to deliver the session because, as previously noted, 90-minutes to two-hours is the ideal duration to implement TBL. In order to overcome this challenge, Ismail (2016) and McMullen et al. (2014) both came up with the same solution which was to work with their administration to combine one-hour chunks into longer chunks of time. To make this work and cover their curriculum, they combined two to three topics that were all allocated one-hour each in the schedule and so designed their TBL sessions to cover all topics in one session. This allowed them to work with their administration to alter the schedule so that they were given the same amount of time overall but in longer blocks of time in the schedule, allowing them to complete all three phases of TBL in each session. In order to optimally implement TBL, it was found that having a flexible schedule was helpful so that instructors were allocated the proper amount of time to run TBL sessions.

### **Summary**

There were common challenges encountered across the literature that affected faculty, learners, and require flexibility from the organization. The challenges encountered by faculty regarding time required for implementation can be planned for by allocating faculty time to create sessions (Morris, 2016). The other important group going through a change is the learners as they experience the flipped classroom model and they are expected to take on a more active role in their learning (Altintas et al., 2014). Learners having a hard time completing their pre-work was a challenge and a potential solution to this was to ensure the amount of work assigned

during the pre-work phase was reasonable to expect from learners (Mody et al., 2013; Obad et al., 2016). Finally, at the organization level, it is ideal if there is co-operation with scheduling the TBL sessions to allow for enough time for the session(s) (Ismail, 2016; McMullen et al., 2014). Reviewing the challenges associated with implementing TBL can assist in planning ahead to mitigate challenges.

### **Discussion and Conclusion**

It is evident that TBL is being implemented across a wide range of Health Professional disciplines including UME, PGME, Nursing, and Pharmacy. To address the first research question of how TBL is being implemented, there were many commonalities among studies. First, implementations followed the three phases of TBL in order to see the intended benefits of the teaching method. However, it became apparent that implementations have been flexible with how the three phases are implemented. The implementations varied in terms of how many TBL sessions were implemented from holding one session, four-eight sessions, or holding 13 or more sessions. Further to that, the duration of sessions ranged from 50-minutes to full day sessions. This flexibility was important in the implementations due to scheduling and time constraints for some organizations, however, the studies all still included all three phases of TBL apart from Altintas et al. (2014) and Ismail (2016) who changed the testing strategy in their implementations. Challenges encountered during implementation included the time and effort required from faculty in order to gain knowledge and experience with TBL to create sessions, learners had issues finding time to complete Phase 1 of TBL, and scheduling TBL sessions into set-timetables can be an issue if there is no flexibility to allow for longer sessions. Some solutions to these challenges were presented such as acknowledging and preparing for the amount of time needed to implement TBL (McMullen et al., 2014; Morris, 2016), providing

enough time for learners to receive and complete the pre-work associated with Phase 1 of TBL (Mody et al., 2013; Obad et al., 2016), and working with the organization to cover the intended curriculum within larger chunks of time opposed to broken up, short blocks of time (Ismail, 2016; McMullen et al., 2014). It is important to be aware of and plan preventive solutions for these challenges to assist with a smooth implementation for TBL.

To answer the second research question, best practices for implementing TBL were established from the literature. First, the implementations were flexible with how long the sessions were and how much time each phase was allocated. The predominant length of time for the session was 90-minutes to two-hours in length with at least 50% of session time dedicated to the application activity (McMullen et al., 2014; Warriar et al., 2013; Zeng et al., 2017). Second, there is evidence in the literature that providing faculty development and learner orientation is important in order to prepare those involved in the implementation for the changes that come with implementation of a new teaching method. Faculty development approaches included an individual approach (McMullen et al., 2014; Morris, 2016) or a team approach (Brandler et al., 2014; Warriar et al., 2013) where faculty preparation was completed prior to the creation and facilitation of TBL (Brandler et al., 2014; McMullen et al., 2014; Morris, 2016; Warriar et al., 2013). Additionally, ongoing faculty development was provided after the initial implementation had occurred (Nelson et al., 2013; Sutherland et al., 2013). Similar to providing faculty with development on the new teaching method, learners were also provided with an introduction to TBL through learner orientations. The learner orientations provided learners with an overview of the TBL sequence (Alimoglu et al., 2017; Altintas et al., 2014; McMullen et al., 2014; Middleton-Green & Ashelford, 2013; Morris, 2016; Ozgonul & Alimoglu, 2017; Warriar et al., 2013; Zeng et al., 2017), gave an explanation of the assessment strategy for the course (Altintas

et al., 2014; Brich, 2013; McMullen et al., 2014; Zeng et al., 2017), and explained the rationale for using TBL (McMullen et al., 2014; Middleton-Green & Ashelford, 2013; & Morris, 2016). Finally, it is important to anticipate challenges that may be encountered and to find ways to prepare for and overcome them.

In conclusion, TBL has become a popular teaching methodology in the health sciences education due to the emphasis of moving towards active learning teaching methodologies within health sciences education and the importance of teaching skills such as critical thinking and collaboration. Hrynchak and Batty (2012) explained that TBL is solidly grounded in constructivist theory and agree that TBL is a relevant teaching methodology to implement into health sciences education. TBL includes three phases in order to prepare learners for each class by (1) assigning pre-work, (2) holding learners accountable to complete pre-class preparation through the readiness assurance process and (3) providing learners with the opportunity to apply their knowledge and critically thinking about challenging, real-life problems that they are likely to deal with once they enter practice on their own. When TBL is designed and implemented by following these three phases, it provides learners with complex, real world scenarios that learners must think critically about, not simply regurgitate facts they have learned. In order to prepare health sciences learners for practice, TBL is a promising teaching method to teach learners the ability to work independently, as a team, and to engage in a deep understanding of the content they are learning.

### **Limitations of this Literature Review**

One limitation in this literature review is that the articles did not evaluate the effectiveness of the faculty development or learner orientation done within their implementations. Evaluating the effect of providing faculty development and learner orientation

would help identify best practices in the delivery of these preparation sessions for faculty and learners. Further limitations of this of this review include that it was limited to a review to articles published in English. It is acknowledged that a better understanding of TBL may be developed by reviewing articles published in languages other than English.

### **Future Research**

Future research can be done in the area of faculty development and learner orientation to determine the effectiveness of such programs and the appropriate content to prepare faculty and learners for the change. Also, further research into the replacement of the application activity with the team readiness assurance test could be done. This would help determine whether this modified version of TBL is as effective as the classic TBL method.



## References

- Alimoglu, M. K., Yardım, S., & Uysal, H. (2017). The effectiveness of TBL with real patients in neurology education in terms of knowledge retention, in-class engagement, and learner reactions. *Advances in Physiology Education*, *41*(1), 38–43.  
<https://doi.org/10.1152/advan.00130.2016>
- Altintas, L., Altintas, O., & Caglar, Y. (2014). Modified use of team-based learning in an ophthalmology course for fifth-year medical students. *Advances in Physiology Education*, *38*(1), 46–48. <https://doi.org/10.1152/advan.00129.2013>
- Anwar, K., Shaikh, A. A., Sajid, M. R., Cahusac, P., Alarifi, N. A., & Al Shedoukhy, A. (2015). Tackling student neurophobia in neurosciences block with team-based learning. *Medical Education Online*, *20*(1), 28461. <https://doi.org/10.3402/meo.v20.28461>
- Behling, K. C., Kim, R., Gentile, M., & Lopez, O. (2017). Does team-based learning improve performance in an infectious diseases course in a preclinical curriculum? *International Journal of Medical Education*, *8*, 39–44. <https://doi.org/10.5116/ijme.5895.0eea>
- Brandler, T. C., Laser, J., Williamson, A. K., Louie, J., & Esposito, M. J. (2014). Team-based learning in a pathology residency training program. *American Journal of Clinical Pathology*, *142*(1), 23–28. <https://doi.org/10.1309/AJCPB8T1DZKCMWUT>
- Brich, J. (2013). Feasibility, acceptance and impact of team-based learning in neurology: A pilot study. *GMS Zeitschrift Für Medizinische Ausbildung*, *30*(2).  
<https://doi.org/10.3205/zma000863>

- Chen, W., McCollum, M., Bradley, E., & Chen, D. T. (2016). Shared team leadership training through pre-clerkship team-based learning. *Medical Education, 50*(11), 1148–1149. <https://doi.org/10.1111/medu.13170>
- Hrynchak, P., & Batty, H. (2012). The educational theory basis of team-based learning. *Medical Teacher, 34*(10), 796–801. <https://doi.org/10.3109/0142159X.2012.687120>
- Ismail, N. A. S. (2016). Effectiveness of team-based learning in teaching medical genetics to medical undergraduates. *The Malaysian Journal of Medical Sciences: MJMS, 23*(2), 73–77.
- Juncà, G. P., Belli, D., & Bajwa, N. M. (2017). Team-based learning to contextualise evidence-based practice for residents. *Medical Education, 51*(5), 542–543. <https://doi.org/10.1111/medu.13297>
- Koles, P. G., Stolfi, A., Borges, N. J., Nelson, S., & Parmelee, D. X. (2010). The impact of team-based learning on medical students' academic performance: *Academic Medicine, 85*(11), 1739–1745. <https://doi.org/10.1097/ACM.0b013e3181f52bed>
- McMullen, I., Cartledge, J., Finch, E., Levine, R., & Iversen, A. (2014). How we implemented team-based learning for postgraduate doctors. *Medical Teacher, 36*(3), 191–195. <https://doi.org/10.3109/0142159X.2014.875617>
- Michaelsen, L. K., Watson, W., Cragin, J. P., & Dee Fink, L. (1982). Team learning: A potential solution to the problems of large classes. *Exchange: The Organizational Behavior Teaching Journal, 7*(1), 13–22. <https://doi.org/10.1177/105256298200700103>

- Michaelsen, L. K., & Sweet, M. (2008). The essential elements of team-based learning. *New Directions for Teaching and Learning*, 2008(116), 7–27. <https://doi.org/10.1002/tl.330>
- Middleton-Green, L., & Ashelford, S. (2013). Using team-based learning in teaching undergraduate pathophysiology for nurses. *Health and Social Care Education*, 2(2), 53–58. <https://doi.org/10.11120/hsce.2013.00031>
- Mody, S. K., Kiley, J., Gawron, L., Garcia, P., & Hammond, C. (2013). Team-based learning: A novel approach to medical student education in family planning. *Contraception*, 88(2), 239–242. <https://doi.org/10.1016/j.contraception.2012.07.012>
- Morris, J. (2016). Implementation of a team-based learning course: Work required and perceptions of the teaching team. *Nurse Education Today*, 46, 146–150. <https://doi.org/10.1016/j.nedt.2016.09.002>
- Nelson, M., Allison, S. D., McCollum, M., Luckey, S. W., Clark, D. R., Paulsen, S. M., ... Brunner, L. J. (2013). The Regis Model for pharmacy education: A highly integrated curriculum delivered by team-based learning (TBL). *Currents in Pharmacy Teaching and Learning*, 5(6), 555–563. <https://doi.org/10.1016/j.cptl.2013.07.002>
- Obad, A. S., Peeran, A. A., Shareef, M. A., Alsheikh, W. J., Kalagi, D. A., AlAmodi, A. A., Khan, T. A., ... Yaqinuddin, A. (2016). Assessment of first-year medical students' perceptions of teaching and learning through team-based learning sessions. *Advances in Physiology Education*, 40(4), 536–542. <https://doi.org/10.1152/advan.00001.2016>
- Orr, K., Feret, B. M., Lemay, V. A., Cohen, L. B., Mac Donnell, C. P., Seeram, N., & Hume, A. L. (2015). Assessment of a hybrid team-based learning (TBL) format in a required self-

care course. *Currents in Pharmacy Teaching and Learning*, 7(4), 470–475.

<https://doi.org/10.1016/j.cptl.2015.04.016>

Ozgonul, L., & Alimoglu, M. K. (2017). Comparison of lecture and team-based learning in medical ethics education. *Nursing Ethics*. <https://doi.org/10.1177/0969733017731916>

Parmelee, D. X., & Michaelsen, L. K. (2010). Twelve tips for doing effective team-based learning (TBL). *Medical Teacher*, 32(2), 118–122.

<https://doi.org/10.3109/01421590903548562>

Parmelee, D. X., & Hudes, P. D. (2012). Team-based learning: A relevant strategy in health professionals' education. *Medical Teacher*, 34(5), 411–413.

<https://doi.org/10.3109/0142159X.2012.643267>

Parmelee, D. X., Michaelsen, L. K., Cook, S., & Hudes, P. D. (2012). AMEE guide no. 65.

Team-based learning: A practical guide. *Medical Teacher*, 34(5), e275–e287.

<https://doi.org/10.3109/0142159X.2012.651179>

Reimschisel, T., Herring, A. L., Huang, J., & Minor, T. J. (2017). A systematic review of the published literature on team-based learning in health professions education. *Medical Teacher*, 39(12), 1227–1237. <https://doi.org/10.1080/0142159X.2017.1340636>

Sutherland, S., Bahramifarid, N., & Jalali, A. (2013). Team-based learning from theory to practice: Faculty reactions to the innovation. *Teaching and Learning in Medicine*, 25(3), 231–236. <https://doi.org/10.1080/10401334.2013.797343>

Team-Based Learning Collaborative. (n.d.). Retrieved from <http://www.teambasedlearning.org/>

- Wamsley, M. A., Julian, K. A., O'Sullivan, P., McCance-Katz, E. F., Batki, S. L., Satre, D. D., & Satterfield, J. (2013). Team-based learning exercise efficiently teaches brief intervention skills to medicine residents. *Substance Abuse, 34*(4), 344–349.  
<https://doi.org/10.1080/08897077.2013.787958>
- Warrier, K. S., Schiller, J. H., Frei, N. R., Haftel, H. M., & Christner, J. G. (2013). Long-term gain after team-based learning experience in a pediatric clerkship. *Teaching and Learning in Medicine, 25*(4), 300–305. <https://doi.org/10.1080/10401334.2013.827975>
- Wiley, R., Shelal, Z., Bernard, C., Urbauer, D., Toy, E., & Ramondetta, L. (2017). Team-based learning module for undergraduate medical education: A module focused on the human papilloma virus to increase willingness to vaccinate. *Journal of Cancer Education*.  
<https://doi.org/10.1007/s13187-017-1311-7>
- Zeng, R., Xiang, L., Zeng, J., & Zuo, C. (2017). Applying team-based learning of diagnostics for undergraduate students: Assessing teaching effectiveness by a randomized controlled trial study. *Advances in Medical Education and Practice, 8*, 211–218.  
<https://doi.org/10.2147/AMEP.S127626>

### **Chapter 3 –Faculty of Education Graduate Student Conference Presentation**

#### **Conference Abstract**

Medical Education is changing to encourage active engagement and interactivity with learners to enhance knowledge retention and skills acquisition. Traditional didactic lectures have shown to be inadequate in teaching because this teaching method is not engaging to learners and learners remain passive in the learning experience. Thus, new teaching methods are emerging to allow for more interaction and active learning. Team based learning (TBL) is a teaching method developed to help faculty run sessions that allow for active participation and minimize didactic lectures. TBL has been found to be a promising alternative to other teaching methods common to medical education such as didactic lectures and problem based learning (PBL). TBL has the advantage of allowing small group learning to take place while not being as resource intensive as PBL. This poster presentation will present portfolio work that is in progress. More specifically, the goal of this poster will be to provide a current state view of the integration of TBL into medical education and share best practices strategies for implementing TBL from an instructional design perspective while adhering to defined TBL principles.

PowerPoint Presentation



**Christina Graves**  
Graduate Student Conference  
March 2, 2018

# Team-Based Learning

# TOPICS

- Purpose of presentation
- Team-based learning (TBL) description
- Process of TBL
- TBL implementations – benefits and challenges
- TBL in postgraduate medical education (PGME)



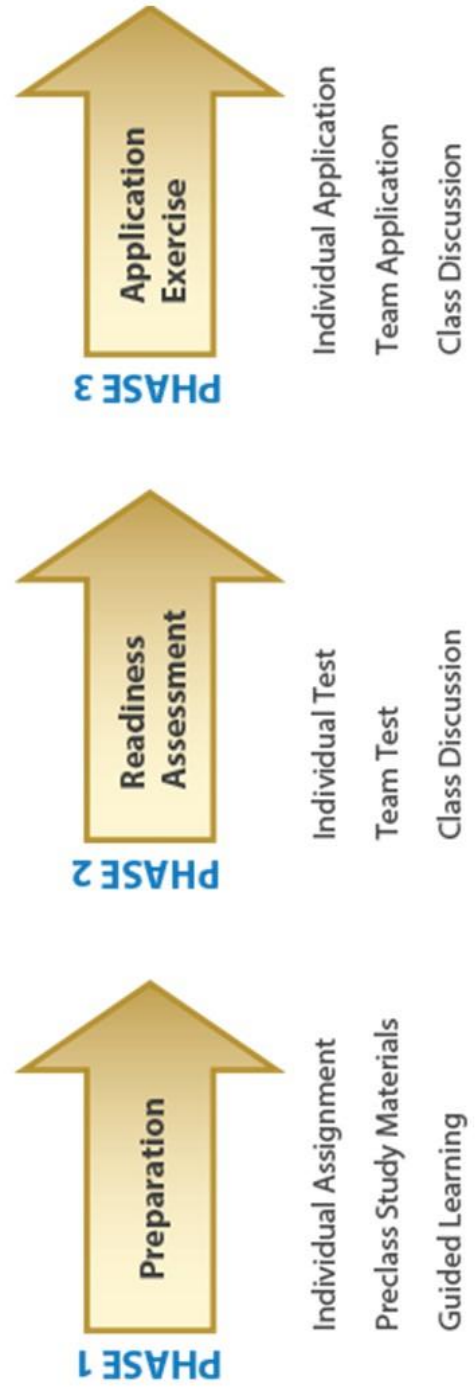
# PURPOSE OF PRESENTATION

- Share information about my portfolio project to date
- Its integration with my work at NOSM



# TEAM-BASED LEARNING

- What is it? (Michaelson, Watson, Cragin, Fink, 1982)
- Why is it?
- What's the process? (Parmelee, Michaelsen, Cook, Hudes, 2012)



## **IMPLEMENTATIONS OF TBL**

- (Nursing) Small scale implementation in 1 course focused on time/ effort to implement TBL found it took 60d for first iteration and 12d subsequently—elements were familiarization with TBL, course redesign for TBL; Faculty felt positive and well prepared, and students were more enthusiastic and engaged in the learning (Morris, 2016)
- (Pharmacy) Large scale implementation across 5 courses identified lessons learned related to institutional barriers, instructor and student transition to TBL, and course administration; Learning gains were better for application versus recall questions (Remington, Hershock, Klein, Niemer, & Bleske, 2015)
- Systematic Review of implementation across health professions education found that teacher and learner attitudes is the highest area studied with the next highest being learning outcomes (Reimschisel, Herring, Huang, & Minor, 2017)

# TBL BENEFITS AND CHALLENGES

## Benefits

- Student knowledge outcomes increase
- Students learn effective teamwork skills
- Student and faculty report satisfaction with TBL

## Challenges

- Time intensive to create TBL modules and train faculty
- Lack of compliance with prework completion

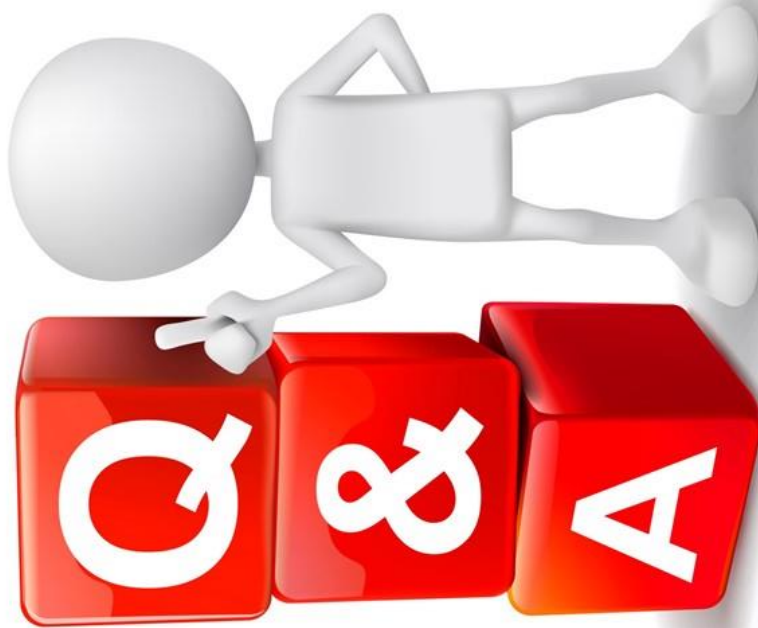
(Poepelman et al., 2016; Reimschisel et al., 2017; Remington et al., 2015)

# TBL IN POSTGRADUATE MEDICAL EDUCATION

- The gaps or needs that TBL can address in PGME:
  - Provides more active learning and less didactic lectures (Reimschisel, et al., 2017)
  - Provides opportunity to mimic clinical practice where there is often no single right answer (Poepelman, et al., 2016)
- Implementations in PGME
  - Internal Medicine Residency Program (UCalifornia) found that residents skills and confidence were increased (Wamsley, et al., 2013)

## **NEXT STEPS**

- TBL implemented in Family Medicine Evidence Based Medicine Course
- Conducting program evaluation on implementation and creating faculty guide for TBL



**Christina Graves**  
([cgraves@lakeheadu.ca](mailto:cgraves@lakeheadu.ca))



## REFERENCES

- Michaelsen, L.K., Watson, W.E., Cragin, J.P., and Fink, L.D. (1982) Team-based learning: A potential solution to the problems of large classes. *The Organizational Behavior Teaching Journal* 7(4): 18-33.
- Morris, J. (2016). Implementation of a team-based learning course: Work required and perceptions of the teaching team. *Nurse Education Today*, 46, 146–150.
- Parmelee, D., Michaelsen, L. K., Cook, S., & Hudes, P. D. (2012). AMEE guide no. 65. Team-based learning: a practical guide. *Medical Teacher*, 34(5), e275–e287. <https://doi.org/10.3109/0142159X.2012.651179>
- Poepelman, R. S., Liebert, C. A., Vegas, D. B., Germann, C. A., & Volerman, A. (2016). A narrative review and novel framework for application of team-based learning in graduate medical education. *Journal of Graduate Medical Education*, 8(4), 510-517.



## REFERENCES CONT'D

- Reimschisel, T., Herring, A. L., Huang, J., & Minor, T. J. (2017). A systematic review of the published literature on team-based learning in health professions education. *Medical Teacher*, 39(12), 1227-1237. <https://doi.org/10.1080/0142159X.2017.1340636>
- Remington, T. L., Hershock, C., Klein, K. C., Niemer, R. K., & Bleske, B. E. (2015). Lessons from the trenches: Implementing team-based learning across several courses. *Currents in Pharmacy Teaching and Learning*, 7(1), 121-130. <https://doi.org/10.1016/j.cptl.2014.09.008>
- Wamsley, M. A., Julian, K. A., O'Sullivan, P., McCance-Katz, E. F., Batki, S. L., Satre, D. D., & Satterfield, J. (2013). Team-based learning exercise efficiently teaches brief intervention skills to medicine residents. *Substance abuse*, 34(4), 344-349. <https://doi.org/10.1080/08897077.2013.787958>

## **Reflection on Presentation**

### **Description of Presentation**

My presentation was on Team-Based Learning and focused on providing a description of what TBL is and how it is being used in higher education health sciences education. It was a 10-minute presentation delivered at the Lakehead University Education Graduate Student Conference. To deliver my presentation, I used PowerPoint (PPT) as a visual aid. My plan for the PPT design was meant to be simple and neat so I left the background white and used images throughout the presentation to avoid having too much text on the slides and relied on verbal explanation to illuminate the pictures and explain my points. The visuals used were purposeful and related back to the content being discussed.

### **Critical Reflection**

I think overall my presentation went well, however, I have some lessons learned for what I would do the same and what I would try to improve the next time I do a presentation. First, practicing is hard but essential and helps to prepare you for the presentation. Second being open to feedback and reflecting on it is essential, and third, I would like to try another medium for delivery of a presentation other than PowerPoint to be more engaging for my audience. These will be discussed in further detail below.

First, I know I have always been told to practice, practice, practice for any kind of presentation I am preparing for, but I do not think I have done well at this in the past. For this presentation, I was forced to practice much more than I normally would (which was definitely a good thing!). First, I created the PPT and practiced my session while recording my voice to send a practice presentation to my supervisor. This gave me a lot of practice because I could listen and then when I knew I had not been clear I could go back and re-record myself which provided me

with a lot of practice about what I wanted to say and then memorizing it so that it came out the way I intended. Further to that, the conference organizer set-up a practice session where I was given the opportunity to deliver my presentation to a faculty member one-week prior to the conference. This put pressure on me to ensure my presentation was complete and practiced prior to delivering it at the practice session. It also provided an opportunity for me to practice in front of an audience and receive feedback prior to the delivery at the conference. Drawing information from the feedback given, one primary thing that emerged was that length was an issue and so I was able to cut-down my presentation prior to delivering it at the conference.

Second, once my presentation was over, I was given some feedback and reflected on my own thoughts as well in terms of how I felt giving the presentation. The feedback I received was that the presentation was interesting and had a good flow but near the end of my presentation there was a point that I got a bit scattered which I felt happened as well. Near the end of my presentation there was content that I had added a few days before the presentation for which I was not as well practiced. I faltered when I got to this point but then got back on track. When receiving feedback like this it was hard not to get defensive, but I know it is hard to give someone honest, constructive feedback like this, so I took time to appreciate it and then reflect on it. On top of practicing new content I decided that I needed to practice oral speaking overall because it does make me very nervous. In order to gain opportunity to do so I have joined Toast Masters which provides guidance and opportunity to improve oral speaking and this is helping.

Overall, I am pleased with the way the task went and really enjoyed assembling the information in what was hopefully an interesting way. It has given me experience with developing and delivering an oral presentation which I hope to do more of in the future. It has also shown me the importance of practicing and how much practice is needed in order to feel

more confident with the delivery of a presentation. Answering unseen questions at the end was something I was nervous about, but that provided fantastic practice at responding on the spot and organising thoughts in a coherent way. I feel that preparing and delivering the presentation has developed my confidence and I will look back on it as a very positive experience.

## **Chapter 4 – Team Based Learning Faculty Guide**

# **TEAM-BASED LEARNING**

**RESIDENT ORIENTATION**

**FACILITATOR GUIDE**

## Table of Contents

Using this Guide .....	51
Purpose .....	51
Content .....	51
Access to Appendices: .....	51
Preparing to Facilitate a Program Designed by Someone Else .....	51
Introduction to TBL.....	52
What is TBL? .....	52
Paradigm Shifts: .....	52
Why TBL Works:.....	52
Module 1: Resident Orientation to TBL.....	54
Session Outline.....	54
Purpose and Learning Objectives.....	54
Evaluation of Knowledge Gained:.....	54
Timing: .....	54
Before the Session .....	55
1. Organize Learners into Teams .....	55
2. Review Resident Preparation Materials.....	55
3. Familiarize Yourself with the Readiness Assurance Test .....	55
4. Finalize the Application Activity for the Session.....	56
5. Review the Session PowerPoint Presentation .....	56
6. Connect with your Program Coordinator .....	56
During the Session .....	57
1. Room Set-Up: .....	57
2. Welcome and Intro: .....	57
3. Readiness Assurance Process .....	57
4. Application Activity:.....	58
Appendix 1: Faculty Toolbox.....	59
Appendix 2: Resident Pre-Work TBL Handout .....	60
Appendix 3: Pre-Work TBL Video.....	64
Appendix 4: Readiness Assurance Test .....	65
Appendix 5: Application Activity .....	67
Appendix 6: Application Activity.....	68
Appendix 7: Session PowerPoint .....	69
Appendix 8: Administrative Documents .....	73
Appendix 9: LMS Screenshot .....	74
Appendix 10: Administrative Checklist .....	75
Appendix 11: Simultaneous Reporting Cards .....	76

# USING THIS GUIDE

---

## PURPOSE

This guide is intended to prepare and assist facilitators who are orienting residents to Team-Based Learning (TBL).

## CONTENT

This guide provides options, outlines, tips, slides and examples that will help you:

- Familiarize yourself with TBL
- Prepare to facilitate the TBL orientation module

## ACCESS TO APPENDICES:

The documents for this session, which are reference throughout this guide, are attached as appendices. To access the electronic copies, visit the following link: <http://bit.ly/tblappendices>

## PREPARING TO FACILITATE A PROGRAM DESIGNED BY SOMEONE ELSE

It can be challenging to present a session design by someone else. Some common challenges that may be encountered include:

1. Learning the content and activity flow well enough to present it effectively
2. Developing a sense of ownership and confidence with the material and feeling comfortable enough to change materials so that the session is more personal to you

The following are general suggestions to help you prepare:

- Read the facilitator guide and complete the prep material, assignments, handouts, etc.
  - This will allow you to become familiar with the content for the session and provide you with an opportunity to change things if you would like to.
- Set personal goals that will help you succeed. Identify the goals you would like to achieve as a facilitator. Some examples are:
  - Mastery of the TBL process
  - Closer working relationships with the participants
  - Achievement of personal goals or advancement of skills

(Reynolds, 2003)



# INTRODUCTION TO TBL

---

## WHAT IS TBL?

Michaelsen (as cited in Sibley and Ostafichuk, 2014) defines TBL as a “special form of small group learning using a specific sequence of individual work, group work, and immediate feedback to create a motivational framework in which students increasingly hold each other accountable for coming to class prepared and contributing to discussion.”

TBL shifts the focus of classroom time from lectures where the instructor conveys course concepts to the application of course concepts by student teams. This is achieved by exposing students to course content through pre-work, such as reading materials, prior to class and holding students accountable for preparation using a Readiness Assurance Process (RAP). Following the RAP, students use the remainder of class time to practice applying course content through team application exercises.

This video, *Team-Based Learning: Group Work that Works*, provides an overview of TBL and the process followed: <https://bit.ly/2OoK9tC>

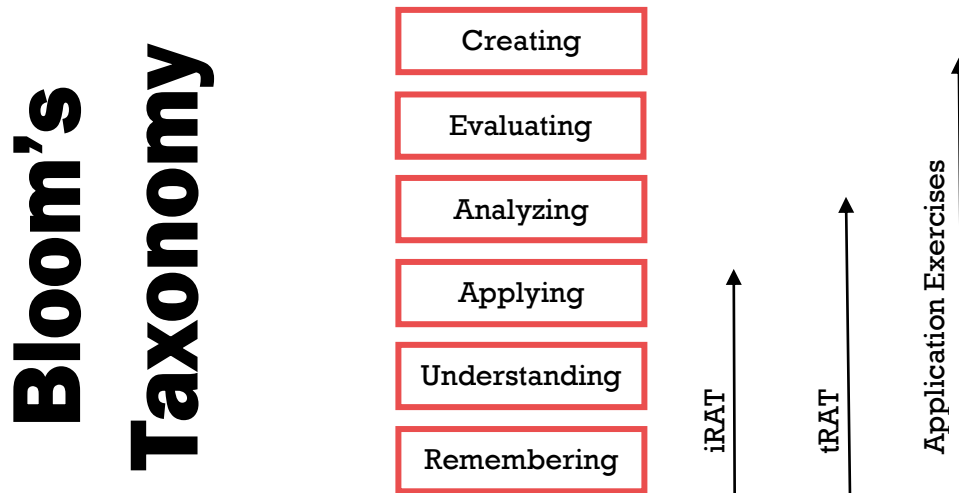
## PARADIGM SHIFTS:

- ❖ Course goals shift from knowing to applying
- ❖ Teacher shifts from “sage on stage” to “guide at side”
- ❖ Students shift from passive to active
- ❖ Responsibility for learning shifts from instructor to student

## WHY TBL WORKS:

Teams focus on making decisions collaboratively opposed to many other assignments where group members tend to ‘divide and conquer.’ Additionally, teams only work together during class and thus do not need to find time in their schedules to meet outside of class.

Activities progress through Bloom's Taxonomy levels from initial acquisition of content to higher order thinking. Important foundational knowledge occurs during the RAP which has students' progress through remembering, understanding, and applying and the higher order thinking skills are reached during application activities where students must apply, analyze, and evaluate the content they have learned (Sibley & Ostafichik, 2014).



Faculty Toolbox

There are many resources available to faculty who are preparing to facilitate a TBL module. There are different levels of resources identified depending on your current comfort level with TBL. See [Appendix 1: Faculty Toolbox](#) for a list of available resources in the following areas:

- ♦ Introduction to TBL
- ♦ Tips for facilitating TBL
- ♦ Creating and using teams effectively
- ♦ Creating and facilitating application activities

# MODULE 1: RESIDENT ORIENTATION TO TBL

---

## SESSION OUTLINE



### PURPOSE AND LEARNING OBJECTIVES

The purpose of the team-based learning (TBL) orientation session is to introduce students to the TBL teaching method and have learners understand why this teaching method was chosen to teach the evidence-based medicine (EBM) curriculum.

*After this module, residents will be able to:*

1. Identify individual and team responsibilities associated with TBL
2. Identify the benefits of TBL as a learning strategy for PGME
3. Identify challenges of TBL
4. Generate solutions to address or mitigate these challenges.



### EVALUATION OF KNOWLEDGE GAINED:

#### 1. Individual and Group Readiness Assurance Test

The individual and group readiness assurance test will test residents on their understanding of TBL including individual and team responsibilities, the learning sequence, and benefits of using TBL. The test will be based on the pre-work completed by residents prior to the session.

#### 2. Application Activity

Residents will be asked to work with their team to develop a 3-minute presentation which will identify one benefit and one challenge they foresee with using TBL for this course. It will also ask residents to identify a solution for the challenge they present. Once the presentations are complete, the facilitator will lead a debrief with the class to identify similarities among groups, and to open up discussion across teams.



### TIMING:

This session is designed to be **two-hours**. A breakdown of the timing can be found in the facilitator guidelines under the 'During the Session' section on page 9.

# BEFORE THE SESSION

## PREPARE FOR YOUR FIRST CLASS, THE RESIDENT ORIENTATION:



Create Teams

---

### 1. ORGANIZE LEARNERS INTO TEAMS

- ♦ Teams should have 5-7 students, be diverse, and will be permanent for the duration of the course.
- ♦ The facilitator should decide on a way to assign teams. It is not advisable to allow students to self-select teams because learning results are improved among diverse teams. According to Jim Sibley (2014), diverse teams lead to team discussions with a wider range of skills, opinions, and personal experiences. On the other hand, when students choose their own teams, the individuals who choose to be on a team are normally like-minded people and this can lead to 'group-think' not allowing for the diversity in group discussions.
- ♦ Depending on your program, you may be able to sort residents by their postgrad year level so that there is a mixture of learner levels across teams or mix them up depending on other criteria. Assigning residents randomly is an appropriate way to create teams as well, as long as you ensure transparency with residents about the process.
- ♦ To learn more about forming teams, visit <https://learntbl.ca/team/>



Review Materials

---

### 2. REVIEW RESIDENT PREPARATION MATERIALS

- ♦ The preparation materials for this session focus on introducing TBL to the residents. The following handout and video are resources you can assign to your residents as preparation materials (**Appendix 2: Pre-Work – TBL Handout** and **Appendix 3: Pre-Work – TBL Video**)
- ♦ You are welcome to change the materials that you assign to your residents but keep in mind that the readiness assurance process is built upon these resources. Thus, if you change the resources you may also need to change the readiness assurance test questions, depending on what your materials cover.

### 3. FAMILIARIZE YOURSELF WITH THE READINESS ASSURANCE TEST

- ♦ The readiness assurance process consists of having the residents take the same test twice – once individually and then again with their team.

- ♦ The readiness assurance test includes a facilitator copy (**Appendix 4: Readiness Assurance Test**) which identifies the correct answer for each question with an arrow pointing at the correct answer. Ensure you are comfortable with the questions and answers in order to explain the correct answer to the class.

#### 4. FINALIZE THE APPLICATION ACTIVITY FOR THE SESSION

- ♦ The application activity takes up the bulk of your session time (50% or more of your class time should be spent on this step). This is because the application activity allows residents to apply their knowledge gained from the pre-work to real-world scenarios that challenge their thinking and show you (the facilitator) that they are understanding and meeting the learning goals of your session.
- ♦ An application activity for this orientation session has been created: Residents will be asked to work within their teams to create a 3-minute presentation that identifies one challenge with using TBL for this course and a solution to overcome or mitigate the challenge identified. See **Appendix 5: Application Activity** for the activity instructions and **Appendix 6: Application Activity Notes** that identify common challenges that *may* come up during the presentations.
- ♦ To learn more about the purpose and design of an application activity, visit <https://learntbl.ca/4s/>.

#### 5. REVIEW THE SESSION POWERPOINT PRESENTATION

- ♦ There is a very short PowerPoint presentation attached as **Appendix 7: Session PowerPoint** to go along with the TBL session.

#### 6. CONNECT WITH YOUR PROGRAM COORDINATOR

To prepare for the session, your program coordinator will need to know:

- ♦ The teams you have created
- ♦ If you have made any changes to the materials provided

The following appendices provide administrative documents that can be used to ensure everything is prepared for your session. These include: **Appendix 8: Email Template** that can be used to draft an email to your residents, **Appendix 9: Learning Management (LMS) Screenshot** that visualizes what the residents will see when they log in to their LMS to complete the pre-work, and **Appendix 10: Administrative Checklist** that can be used to organize materials for the session.



Communicate Your Needs

---

## DURING THE SESSION

### SUGGESTED PROCESS FOR FACILITATING THE SESSION

1. **ROOM SET-UP:** Approximately 10-minutes prior to the session, ensure you have your facilitator folder and that the resident nametags are visible on a front table or somewhere that makes sense for residents to easily find their nametag. There should be numbers on the tables so residents can find their table, and the team folders should be available to be handed out when appropriate.

Load the PowerPoint on the screen in your room and leave it on **slide one** so residents can organize themselves into their teams as they arrive in the room. See [Appendix 7: Session PowerPoint](#) for slide examples.

2. **WELCOME & INTRO:** Once residents have had a chance to come in the room and introduce themselves to their team members, advance to **slide two** and introduce yourself and the topic for today's session, the Resident Orientation to TBL.

3. **READINESS ASSURANCE PROCESS:** Advance to **slide three** and handout the team folders. Explain that each resident must take an *individual readiness assurance test* from the folder and complete it individually. Explain that there should be no talking, no cell phones, etc. and emphasize that the purpose of the individual test is to allow residents to check their understanding of pre-work content so the test will not be graded. Once folders are handed out and everyone has a test, give residents 5-minutes to complete the test.

After five minutes is up, have resident hold on to their own test to use as they go through the team test. Advance to **slide four**. Have each group take out their team test and go through it together, emphasizing that all team members **must** agree on one answer for each question and all members should be prepared to defend the answer, because you will call on random individuals to rationalize the answer while you take up the quiz. This encourages all members to remain active in answering the questions. Provide teams 10-minutes to complete the test, the extra time this time around allows for discussion among team members.

### SUGGESTED TIMING



**10 Mins.**

**10 Mins.**

**10 Mins.**

Once teams are done answering the team test, or 10-minutes is up, it is time to take up the test. Advance to **slide five**. Have each team find the simultaneous reporting cards (**Appendix 11: Simultaneous Reporting Cards**) in their folders and explain that all teams will hold up the card that aligns with their answer as you go through the questions.

**10 Mins.**

The reason for simultaneous reporting of answers is so that all teams provide their true answer without being swayed by other team answers. For example, if one team answered 'A' for a question but all other teams answered 'B' we don't want the team who answered 'A' to change their report back to answer 'B'. When teams have varying answers, it means there is an opportunity for you, as the facilitator, to clarify why teams chose a certain answer to see where they were coming from and to discuss any misunderstandings with the content.

After the questions have been taken-up, use **slide 6** to go over the TBL Process, focusing on areas where residents got questions wrong.

**10 Mins.**

- 4. APPLICATION ACTIVITY:** This is the 'meat' of the session where residents have the opportunity to work within their teams to apply the knowledge they have learned through the pre-work and readiness assurance stages.

Advance to **slide 7** and explain the application activity to the residents. Provide them with 15-minutes to complete their presentation. They can use any materials they like including the flip charts available, cell-phones, pre-work materials, etc. to develop their presentations.

**20 Mins.**

Allow teams to present. Depending on how many teams you have, the overall timing will vary. The suggested timing for the session assumes that there will be 4-5 teams presenting. If you have more than this, it is suggested that you re-work the suggested timing, so the additional teams are allotted time to present. While teams are presenting, keep track of the challenges and solutions presented.

**15 Mins.**

Once all teams have presented, debrief with the whole class. What were common and distinct findings between the teams? What other benefits, challenges, solutions can the residents come up with now that they have heard all teams present?

**30 Mins.**



## FACULTY TOOLBOX



### Articles and Books

Hrynchak, P., & Batty, H. (2012). The educational theory basis of team-based learning. *Medical Teacher*, 34(10), 796–801.

<https://doi.org/10.3109/0142159X.2012.687120>

Parmelee, D. X., Michaelsen, L. K., Cook, S., & Hudes, P. D. (2012). AMEE guide no. 65. Team-based learning: A practical guide. *Medical Teacher*, 34(5), e275–e287.

<https://doi.org/10.3109/0142159X.2012.651179>

Sibley, J. & Ostafichuk, P. (2014). *Getting Started with Team-based Learning*. Sterling, VA: Stylus.



### Online Resources

Sibley, J. (n.d.). Team-Based Learning with Jim Sibley. Retrieved from <https://learntbl.ca/>

Team-Based Learning (TBL) Collaborative. (n.d.). Retrieved from <http://www.teambasedlearning.org>



## RESIDENT PRE-WORK: TBL HANDOUT

## APPENDIX 2: RESIDENT PRE-WORK TBL HANDOUT

### Introduction to Team-Based Learning

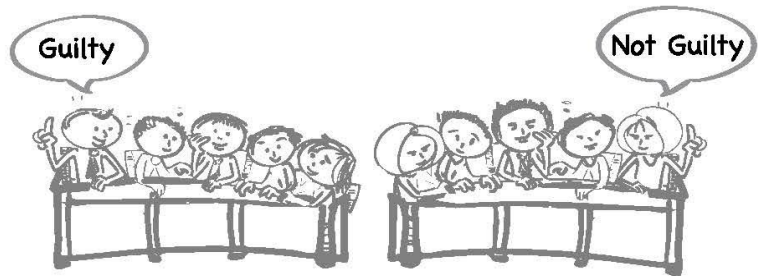
TBL is a uniquely powerful form of small group learning. It provides a complete coherent framework for building a flipped course experience.

#### TBL lets you achieve two important things:

1. Students come to class prepared by using TBL's ingenious Readiness Assurance Process.
2. Students learn how to apply the course concepts to solve interesting, authentic, real-world problems using TBL's 4 S framework.

#### It's like a courtroom jury ...

Think of a courtroom jury that sifts through large amounts of evidence, statements, and transcripts to come up with a simple decision: guilty or not guilty. Imagine your work on a jury; you rise to state the jury's verdict, but another person rises from a different jury team in the same courtroom and states a different verdict. You naturally want to talk to them; you naturally want to ask "why?" This simple comparability between decisions, and the natural tendency to ask the question "why" is at the heart of TBL. This "why" motivation provides the instructional fuel to power insightful debates between student teams.



### The rhythm of TBL

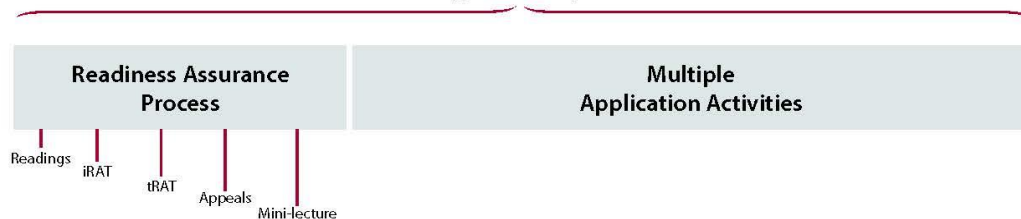
TBL courses have a recurring pattern of instruction that is typical of many flipped classrooms. Students prepare before class and then students spend the bulk of class time solving problems together. TBL gives you a straightforward whole course framework to design and implement your flipped classroom.

A typical TBL course is divided into five to seven modules. Each module has a similar rhythm, opening with the Readiness Assurance Process that prepares the

students for the activities that follow, and then moving to Application Activities that often grow in complexity and length as the module progresses. As the module is ending, you provide some closure and reinforcement. Module length varies in different contexts. In some courses an entire cycle is completed in one long session and in other courses the cycle may be spread across multiple class meetings.

As the next module begins, the familiar TBL rhythm starts to build: out-of-class preparation, the Readiness Assurance Process, followed by Application Activities.

#### Typical TBL Cycle



a place of mind

THE UNIVERSITY OF BRITISH COLUMBIA  
FACULTY OF APPLIED SCIENCE

CENTRE FOR INSTRUCTIONAL SUPPORT  
by Jim Sibley and Sophie Spiridonoff  
[www.teambasedlearning.org](http://www.teambasedlearning.org)

## APPENDIX 2: RESIDENT PRE-WORK TBL HANDOUT

### How TBL Works

## Readiness Assurance

### Getting Your Students Ready

During this 5 stage process at the beginning of each module, students progress from initial preparation to true readiness to begin problem-solving.

Following the Readiness Assurance Process, the bulk of class time is spent with students applying course concepts and solving problems.

#### 1 Pre-Class Preparation

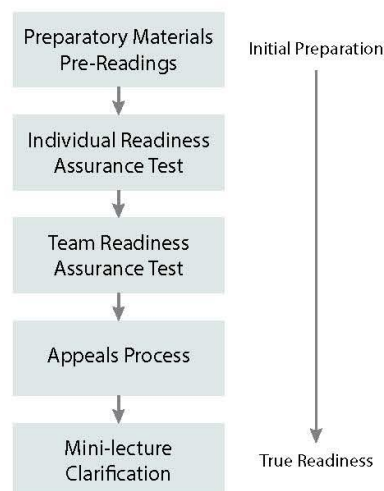
Students are assigned preparatory materials to review before start of each module. The preparatory materials can be textbook chapters, articles, videos, or PowerPoint slides. The preparatory materials should highlight foundational vocabulary and the most important concepts the students need to begin problem solving, but not everything they need to know by module end.

#### 2 Individual Readiness Assurance Test

To begin the classroom portion of the RAP process, students complete a 15-20 multiple-choice question test. They first complete the test individually (iRAT), and then repeat the same exact test with their team (tRAT). The iRAT holds students accountable for acquiring important foundational knowledge from the preparatory materials that will prepare them to begin problem-solving. The questions are typically written at Bloom's levels: remembering, understanding and simple applying.

#### 3 Team Readiness Assurance Test

The Team Readiness Assurance Process Test (tRAT) is the exact same test as the iRAT. A special type of scoring card known as an IF-AT should be used (scratch and win style testing). With IF-AT's, the teams must negotiate which answer to choose, they then scratch off an opaque coating over their answer choice, hoping to find a star that indicates a correct answer. If the team does not discover a star, they continue to discuss the question and sequentially select other choices. The tRATs are high energy learning events.



#### 4 Appeals

During the closing of the team test, the instructor circulates around the room and encourages teams to consider creating a written appeal for questions they got incorrect. This forces students back into the reading material exactly where they are still having difficulty. The team then researches the "right" answer and may choose to complete the appeals form with their rationale and defense for their alternate answer. The appeal must consist of (a) a clear statement of argument, and (b) evidence cited from the preparation materials. The instructor collects these forms and considers them after class.

#### 5 Mini-lecture

To conclude the Readiness Assurance Process, the instructor focuses a short mini-lecture only on the concepts that are still problematic for the students.

In the words of Bob Philpot at South University, "TBL helps me understand the 10-15% of the course material I really need to talk to the students about."

## APPENDIX 2: RESIDENT PRE-WORK TBL HANDOUT

### In Class Activities

#### 4S Problem-Solving Framework

- **Significant Problems**
- **Same Problem**
- **Specific Choice**
- **Simultaneous Report**

In the TBL classroom, the bulk of class time is spent having student teams solve, report, and discuss solutions to relevant, significant problems. Structuring the problems using TBL's 4S Framework lets you leverage the power of team processing without many of the problems that are inherent in other forms of small-group learning. The structure of the TBL activities gives individuals, and teams, many opportunities to make decisions and get timely feedback on the quality of their thinking and their process for arriving at their answer.

#### 1 Significant Problem

##### *Examples of Significant Problem*

- A historian reconciles conflicting sources.
- A doctor decides the best course of action.
- A businessperson picks the best location for a business.
- A writer identifies the most powerful passage or best example.

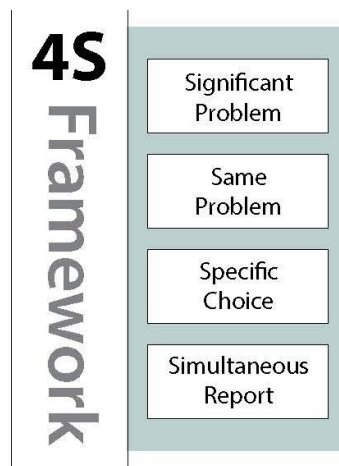
You must use a significant, relevant problem that captures the interest of students. The quality of the problem ultimately controls the effectiveness of an application activity. Problems must require students to use course concepts to solve them.

#### 2 Same Problem

Teams work on the same problem. This ensures the comparability of team solutions and this naturally acts as a potent discussion starter. Having students work on the same problem lets you create reporting opportunities for teams to defend, challenge, discuss, and examine each other's thinking and problem-solving process. Working on the same problem, ensures that students are interested in what other teams decided.

#### 3 Specific Choice

Teams select the best choice from a limited list of options. This ensures that teams can easily compare their final decisions to the decisions of other teams. It is this comparability that drives the rich reporting discussion as



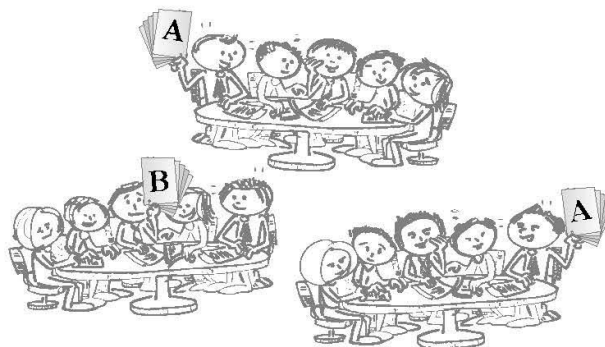
teams examine and critique other teams decisions and defend their own.

##### *Examples of Specific Choice*

- Which of these is the **best** example of X?
- **Most** important piece of evidence in support of Y?
- Which statement would the author **most** agree with?

#### 4 Simultaneously Report

Simultaneous reporting is most simply accomplished with holding up of a coloured card indicating a particular choice. When a team sees that another team has made a different decision, they naturally want to challenge the other teams' decision. In the ensuing conversation, the teams challenge each other and defend their own thinking. The reporting requires teams to articulate their thinking to other teams – putting their thoughts into words. This helps cognitively with the process of creating enduring, deep understanding. The feedback from their peers is immediate and focused on "how did you arrive at your decision" and not "which is the right answer."



## APPENDIX 2: RESIDENT PRE-WORK TBL HANDOUT

### 4 Essential Elements of TBL

<p><b>Teams must be properly formed and managed</b></p> <p>TBL works best with large, diverse teams. TBL teams should have 5-7 students. Teams should be created by instructor and uniformly distribute the student assets you feel are important for team success. Teams need to be permanent so team cohesion has time to build.</p>	<p><b>Getting Students Ready</b></p> <p>The magic of the Readiness Assurance Process is that it builds on the initial preparation, changing it into true readiness to begin problem-solving. At the simplest level, the RAP is a series of multiple-choice tests. First the test is taken individually, and then the same test is immediately retaken in teams.</p>	<p>For more information on how to get started.</p> <p>Visit <a href="http://www.teambasedlearning.org">www.teambasedlearning.org</a></p> <p>Classroom materials, books, videos, workshop schedules and more!</p>
<p><b>Teachers Say It Works!</b></p> <p>The enthusiasm and energy of students. It's just so much fun!</p> <p style="text-align: right;"><i>Larry Michaelsen</i> <i>University of Central Missouri</i></p> <p>Students excited about learning and faculty falling in love with teaching. The way learning should be.</p> <p style="text-align: right;"><i>Holly Bender</i> <i>Iowa State University</i></p> <p>Students are so engaged in conversation with each other and the task that, literally, they don't know I am there. My favorite days are when I have to tell them to leave.</p> <p style="text-align: right;"><i>Laura Madson</i> <i>New Mexico State University</i></p> <p>I think the genius of TBL is that it maximizes the advantages of group learning while minimizing the disadvantages.</p> <p style="text-align: right;"><i>Brent MacLaine</i> <i>University of Prince Edward Island</i></p>	<p><b>Applying course concepts</b></p> <p>Use the 4 S problem-solving framework to have students make complex decisions and then get rich, immediate, and specific feedback on the quality of their decisions. The give-and-take discussions that follows after teams publically report their decisions is a powerful opportunity deepen students understanding.</p>	<p><b>Making students accountable</b></p> <p>Making students truly accountable is key. There is individual accountability from the iRAT, but what is most motivating is the accountability to teammates during the tRAT's and Application Activities. Peer evaluation is key to giving the grading scheme enough teeth to motivate students.</p>
	<p><b>The Literature Says It Works!</b></p> <p><b>Students are more engaged</b></p> <p>Students reported higher level of engagement in TBL courses (Chung et al., 2009; Clark et al., 2008; Kelly et al., 2005; Levine et al., 2004).</p> <p><b>Increased excitement in the TBL classroom</b></p> <p>Teachers report increased excitement and engagement in their classrooms (Andersen et al., 2011; Dana, 2007; Jacobson, 2011; Letassy et al.; 2008; Nicol-Senft, 2009).</p> <p><b>Teams outperform best members</b></p> <p>The worst team typically outperforms the best student. In 20 years of results Michaelsen (1989) found that 99.95% of teams outperformed their best member by an average of 14%.</p> <p><b>Students perform better on final and standardized exams</b></p> <p>TBL students outperform non-TBL students on examinations (Grady, 2011; Letassy et al., 2008; Persky, 2012, Zingone et al.; 2011, Koles et al., 2005; Koles et al., 2010; Thomas &amp; Bowen, 2011).</p> <p><b>A large class can be an asset</b></p> <p>Michaelsen, Knight, Fink (2002) found that students actually perceived a larger class size as beneficial to their learning with TBL.</p>	



a place of mind

THE UNIVERSITY OF BRITISH COLUMBIA  
FACULTY OF APPLIED SCIENCE

CENTRE FOR INSTRUCTIONAL SUPPORT  
by Jim Sibley and Sophie Spiridonoff  
[www.teambasedlearning.org](http://www.teambasedlearning.org)

**APPENDIX 3: PRE-WORK TBL VIDEO****TBL Video Link for Resident Pre-work:**


This video can be assigned to residents as the second step in their pre-work to complete prior to class. The video is available from the University of Texas Faculty Innovation Center and is 12-minutes long. It provides an overview of what TBL is, how it is designed and the sequence of TBL. The video link is available for review below:



<https://bit.ly/2OoK9tC>


**APPENDIX 4: READINESS ASSURANCE TEST****Readiness Assurance Test for Student Orientation to TBL****\*Facilitator Copy with Answers\*****Q1. How is a TBL course different from most other courses?**

The primary course objective shifts to:

-  A. Learning how to use and apply course concepts
- B. Learning teacher-specified knowledge
- C. Reviewing and learning course concepts
- D. Learning about teams and team development


**Q2. How will we spend class time?**

The bulk of class time in a TBL course will be spent:

- A. Reviewing important course content
- B. Working on team writing assignments and reports
- C. Listening to lectures, interspersed with activities
-  D. Using course content to solve problems and make decisions


**Q3. Individual Expectations.**

In a TBL course, individuals are expected to:

- A. Attend a series of introductory lectures
- B. Complete a homework assignment
-  C. Complete assigned preparation materials and be prepared to engage with their team in class
- D. Engage in problem solving with their team during class time


**APPENDIX 4: READINESS ASSURANCE TEST****Q4. Purpose of the Readiness Assurance Process**

**An effective Readiness Assurance Process, achieves which of the following?**

- A. Provides you with feedback on your individual preparation
- B. Prepares you for Problem-Solving and Application Activities that follow
- C. Lets instructor know what topics student are having difficulty with
-  D. All of the above

**Q5. Purpose of the team portion of TBL**

**What are teams responsible for in a TBL course?**

-  A. Teams work together to apply and deepen their understanding of course concepts during the group readiness assurance test and the application activity
- B. Working in a team encourages the development of team leadership and for a team leader to “step forward”
- C. Working in a team gives prompt feedback, so teams know which team member is least prepared
- D. Team work gives the instructor prompt and unambiguous feedback, so they know quickly which teams are dysfunctional

## APPENDIX 5: APPLICATION ACTIVITY

### **Application Activity**

The application activity for this session will be to have residents develop a 3-minute presentation in which they will identify one challenge of using TBL for this course and a potential solution to mitigate the challenge identified.

#### **Instructions for Developing a Presentation:**

Within their teams, residents are to develop a 4-minute presentation that:

1. Identifies one benefit and one challenge their team foresees with using TBL for this course; and
2. Describes at least one solution for the challenge identified.

Give the teams 15-minutes to develop their presentation. In order to ensure all team members are actively involved, explain that once it is time to present you will pick someone from the group at random, thus, all group members should agree on the challenge and solution and be ready to speak to it.

#### **Resources:**

There will be flip charts and/or notepads and paper available in the room. Residents are welcome to make use of these materials to keep track of their thoughts and organize their presentation.

#### **During the Presentations:**

1. Allow teams to present. Depending on how many teams you have, the overall timing will vary. The suggested timing for the session assumes that there will be 4-5 teams presenting. If you have more than this, it is suggested that you re-work the suggested timing, so the additional teams are allotted time to present. While teams are presenting, keep track of the challenges and solutions presented.
2. Once all teams have presented, debrief with the whole class. What were common and distinct findings between the teams? What other benefits, challenges, solutions can the residents come up with now that they have heard all teams present?



## APPENDIX 6: APPLICATION ACTIVITY NOTES

### **Notes for facilitator: Common TBL challenges associated with learners**

In order to offer solutions to challenges that may be raised from the residents, see a list below which identifies common challenges associated with learners and some potential solutions you can discuss with the class.

#### **Anticipated challenges with group work**

**Learners become concerned that they will end up in a group where team members don't 'pull their weight'**

**Possible solution:** For a variety of reasons, this is virtually never a problem with team-based learning. One reason is that the readiness assurance tests illustrate the value of give-and-take discussion in tackling intellectual problems. The most important reason, however, is that application-focused assignments provide both incentives and opportunities for face-to-face interaction because they are designed around reaching decisions (not producing a lengthy document or assignment) and are conducted during class time.

#### **Time to prepare ahead of class**

**Learners raise concerns over completing preparation work prior to each class**

**Possible solution:** Reassure learners that the preparation work will not be lengthy and that the flipped classroom model allows for a more active learning environment opposed to didactic lectures. Also, this may be a good time to establish time-lines with the residents, asking how you can assist them with this step as the facilitator by ensuring there is a minimum amount of time provided for completing preparation work (i.e. that it will always be posted 2-weeks prior to each session).

#### **The teacher is not teaching them**

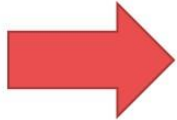
**Some learners will feel like they are doing all the work in a TBL setting and the teacher isn't teaching them**

**Possible solution:** Explain to the residents that the facilitator's role is to guide the resident's learning. Instead of standing at the front and doing a lecture for two-hours, you instead facilitate the session and deliver direct teaching when a knowledge gap has been identified, allowing for a more active learning environment. You can explain that this teaching method has shown to be effective and more engaging for learners.

Slide 1

# Welcome!

---



Please find your nametag on the front table of the room and find your table printed on your nametag

While you wait for class to begin, introduce yourself to your teammates! 😊

Slide 2

# Team-Based Learning

---

RESIDENT ORIENTATION

Slide 3

## Readiness Assurance Process

---

**01****Step One:**

- Each person complete the 'Individual Readiness Assurance Test'

**02****Step Two:**

- As a group, complete the "Group Readiness Assurance Test" (be prepared to defend your answer to other teams)

**03****Step Three**

- Take up test

Slide 4

## Readiness Assurance Process

---

**01****Step One:**

- Each person complete the 'Individual Readiness Assurance Test'

**02****Step Two:**

- As a group, complete the "Group Readiness Assurance Test" (be prepared to defend your answers to other teams)

**03****Step Three**

- Take up test

## Readiness Assurance Process

# 01

### Step One:

- Each person complete the 'Individual Readiness Assurance Test'

# 02

### Step Two:

- As a group, complete the "Group Readiness Assurance Test" (be prepared to defend your answer to other teams)

# 03

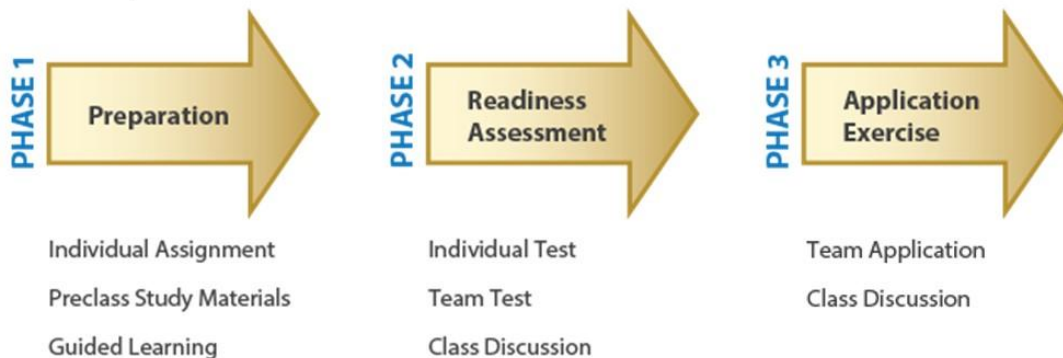


### Step Three

- Take up test as a class, using the simultaneous reporting cards from your team folder

## Team-Based Learning

- What is it?
- Why is it?
- What's the process?



Slide 7

# Application Activity

**Within your team, develop a 3-minute presentation that:**

1. Identifies one challenge your team foresees with using TBL for this course; and
2. Describes at least one solution for the challenge identified.

*You have 15-minutes to develop your presentation.*



## APPENDIX 8: EMAIL TEMPLATE

### **Resident Introduction and Instructions Email**

Below is a draft email that you may wish to send out to your residents prior to your first class. It is suggested that residents are given ~3 weeks to complete preparation work so that they can schedule it in to their busy schedules.

**Subject:** Learner Preparation Instructions: Team-Based Learning Orientation

#### **Body of email:**

Hello and welcome to your Evidence Based Medicine (EBM) Course!

I am the facilitator for your EBM course, [enter your name]. The EBM course will be taught using a teaching method called Team-Based Learning (TBL).

**Expectations of Residents:** Prior to each class there will be some preparation work for you to complete. You will be expected to come to class prepared to answer questions and discuss the prep materials. In recognition that you all have very busy schedules, the mandatory preparation materials will be very focused on relevant content and be limited to require no more than 60 minutes of your time.

In preparation for our first class on [enter date], please complete the following:

1. Review the TBL handout which provides you with an overview of this teaching method
2. Watch a 12-minute video on TBL

To access these documents, log in to your program's MyCurriculum page at [learn.nosm.ca](http://learn.nosm.ca) and navigate to the EBM Course.

Please contact your program coordinator if you have access issues with MyCurriculum.

I look forward to meeting you all at our first class.

## APPENDIX 9: LMS SCREENSHOT

This is a screenshot of the instructions residents will see on their Learning Management System (MyCurriculum). They can open the handout from this screen and watch the video.

### Team-Based Learning Orientation Session Prep

*Prior to the session, residents are expected to:*

1. Review the handout titled 'Introduction to Team-Based Learning' created by Jim Sibley and Sophie Spiridonoff:



[Introduction to Team-Based Learning](#)

2. Watch the following 12-minute video on TBL:



Team-Based Learning from Faculty Innovation Center on Vimeo.

## APPENDIX 10: ADMINISTRATIVE CHECKLIST

### **TBL Orientation – Admin Session Material Preparation Checklist**

#### **Materials required:**

- Facilitator Guide
  - One printout per facilitator (usually one)
- Readiness Assurance Test with Answers
  - One printout per facilitator (usually one)
- Individual Readiness Assurance Test
  - Enough printed so that each resident has one copy
- Group Readiness Assurance Test
  - Enough so that each group has one
- Simultaneous Reporting Cards
  - Each group needs one set of cards (A-D)
- Flipchart and markers
  - One flipchart per group with markers (if flipcharts aren't available, provide notepads and pens)

#### **Prepare a folder for the facilitator**

- In the facilitator folder, provide the:
  - Facilitator guide
  - List of residents broken into teams
  - Readiness assurance test with the answers indicated on it.

#### **Prepare one folder for each group of residents**

- In each folder, provide:
  - Individual readiness assurance test (1 per resident)
  - Group readiness assurance test (1)
  - Simultaneous reporting cards (1 set, A-D)

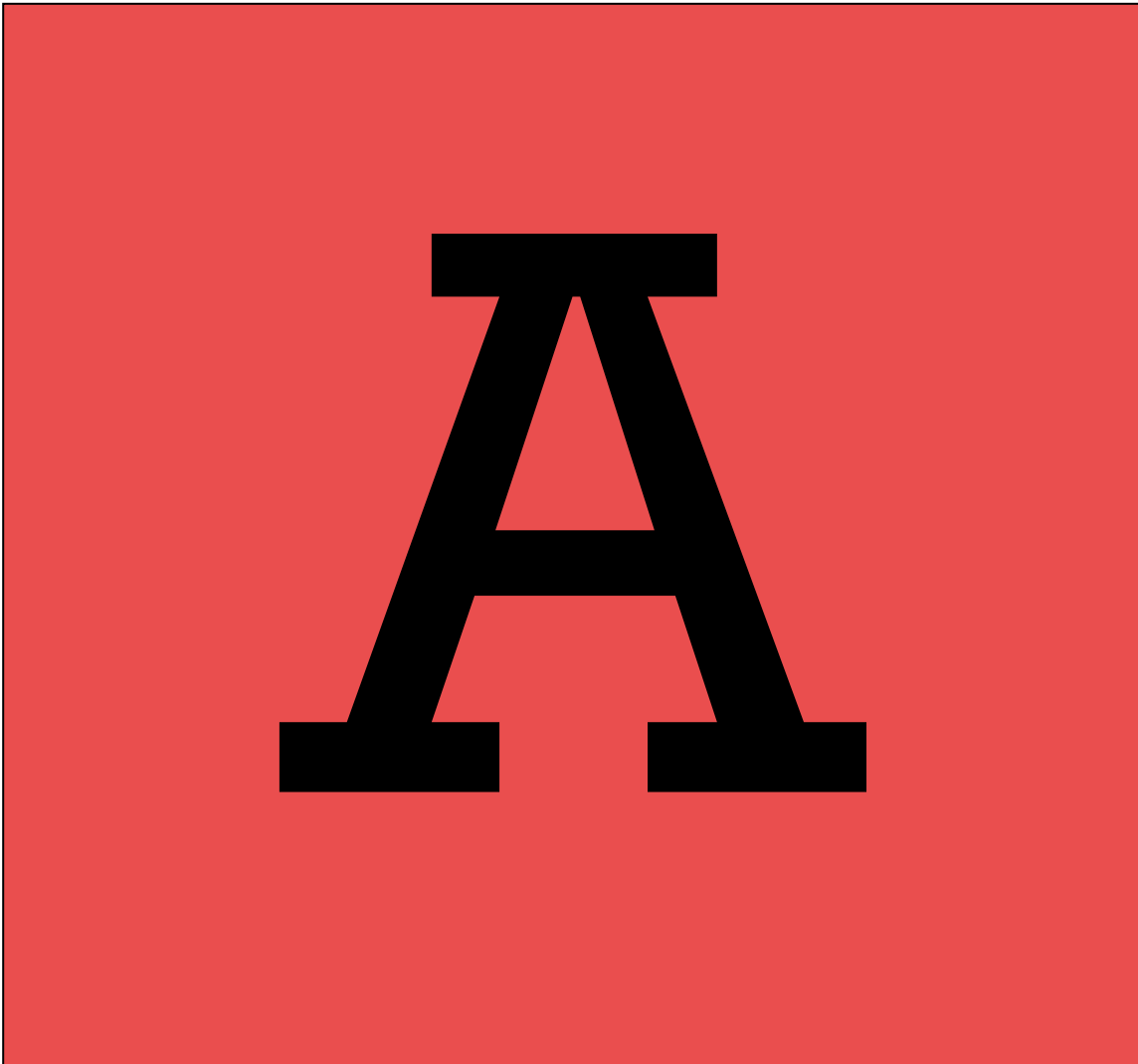


**APPENDIX 11: SIMULTANEOUS REPORTING CARDS**

# Simultaneous Reporting Cards

---

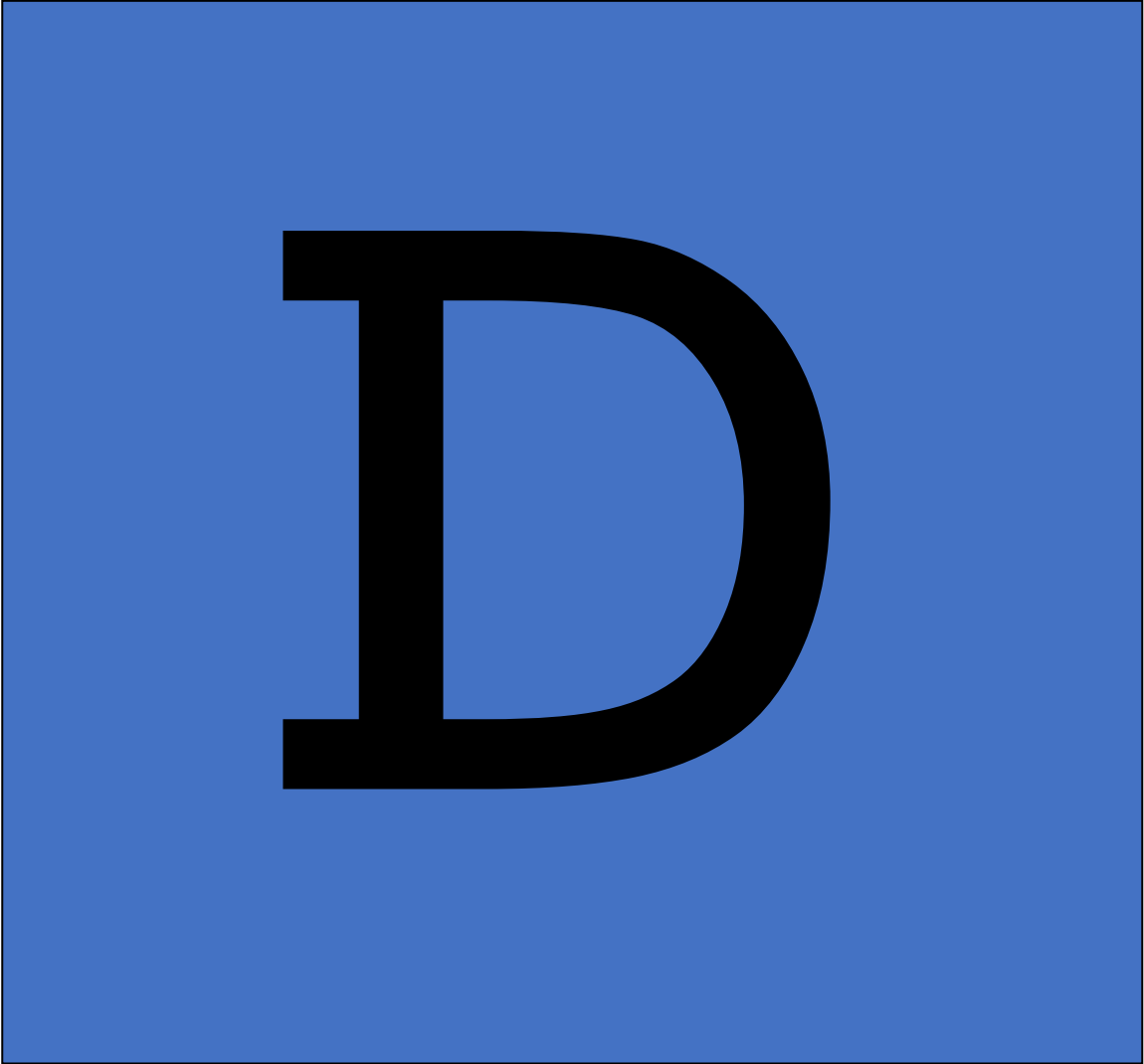
Provide one set of the simultaneous reporting cards to each team.





**B**





## References

A. B. Reynolds. (2003). Strategic marketing for academic and research libraries:

Facilitator Guide. Retrieved from:

<http://www.ala.org/acrl/sites/ala.org.acrl/files/content/issues/marketing/FacilitatorGuide.pdf>

Sibley, J. (2018). *Learn TBL*. Retrieved from <https://learntbl.ca/>

Sibley, J. & Ostafichuk, P. (2014). *Getting Started with Team-based Learning*.

Sterling, VA: Stylus.