INSTRUCTIONAL DESIGN AND ASSESSMENT

Using Team-based Learning to Teach a Hybrid Pharmacokinetics Course Online and in Class

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Objective. To compare the effectiveness of face-to-face and online team-based learning (TBL) to teach phenytoin pharmacokinetics.

Design. A TBL format was used to teach an online cohort of 222 pharmacy students and two face-to-face cohorts (Tampa and Las Vegas) of pharmacy students. Students in all cohorts completed individual and team readiness tests (iRATs and tRATs), and a self-assessment survey to determine teamwork and content understanding. Knowledge retention questions also were added to the final examination.

Assessment. Mean scores on iRATs were: 54% for the Tampa group; 72% for the Las Vegas group; and 58% for the online. Mean tRAT scores were 78.5% for the Tampa cohort and 82.2% for the Las Vegas cohort, compared to 89.5% for the online cohort. The mean tRAT scores for the online cohorts were significantly higher than those of the face-to-face cohorts. Data from the teamwork survey provided evidence of positive interactions among teams for all cohorts.

Conclusion. Team-based learning can be an effective method for teaching applied pharmacokinetics in both face-to-face and online classes.

Keywords: pharmacokinetics, team-based learning, pharmacy education, health care, online

INTRODUCTION

There is a call in pharmacy education for active-learning activities to foster learners who are “practice and team ready.”^{1,2} Recent teaching innovations in pharmacy and other health professions have focused on transitioning to a learning environment that is more engaging and interactive and that improves performance during clinical courses and clerkships.³⁻⁸ Active-teaching methods can be broadly defined as instructional strategies that are student-centered and involve student interaction with course materials through one or more of the following: reading, writing, discussion, or reflection.^{9,10} Active learning is different from more passive methods of learning such as when instructors lecture to a live and/or virtual audience while students merely watch and listen.

Active-learning strategies such as the “flipped classroom” used in problem-based learning (PBL) and team-based

learning (TBL) are becoming more prevalent in higher education to improve traditional lectures. In addition, the incorporation of trends such as the use of Web-based learning modules prior to class show particular promise for improving student readiness for skill-based learning.¹¹ Yet, even with the positive outcomes on learning associated with active-learning methods, many faculty members are reluctant to adapt their courses, wary of student evaluations and the time and effort required to reengineer a course.¹² A review by Howard and Persky reminds us that the process of implementing active-learning in a course, particularly the first implementation, is frequently imperfect but the results often improve with each attempt.¹³

Team-based learning is a prescriptive method, which incorporates four components: permanent teams, readiness assurance, application activities, and peer evaluation.¹⁴ As at Duke University School of Medicine, different universities across different health professions have used large, theater-style classrooms with fixed seats for TBL activities. Instructors who have used TBL in traditional classroom settings report high levels of student attendance, preparation, participation, and critical thinking.¹⁵ Ofstad and Brunner reviewed the application of

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TBL in health care education and concluded that the use of TBL improves students' engagement, communication, team-building, and knowledge retention.³ Persky developed five TBL modules to use in a semester-long foundational pharmacokinetic course. He concluded that a mathematically based course such as pharmacokinetics with a large enrollment and students on multiple campuses taught synchronously via video conferencing could successfully implement the TBL format.¹⁶ Student performance on course examinations provided evidence of the efficacy of using TBL, and students' responses on pre- and post-course surveys showed evidence of improvement in attitudes toward professionalism and teamwork.¹⁶ To date, there are no published studies evaluating online TBL as a facilitation method.

We decided to implement TBL within the University of Florida (UF) nontraditional doctor of pharmacy (PharmD) program. This nontraditional Working Professional PharmD (WPPD) program is designed to be equivalent to the UF entry-level PharmD program. The WPPD program is taught using a blended online and onsite curricular delivery model. In order to teach a pilot phenytoin pharmacokinetics module using TBL, we needed an online format that would facilitate the process. We looked for a TBL model that would allow us to conduct a standardized pharmacokinetic workshop, moderated by an expert, for a large class (292 nontraditional student learners). Our goal was to maintain the small-group learning opportunities that TBL provides without significantly expanding resources. This manuscript describes the results of transitioning a large-enrollment course to one that delivered both face-to-face and live online TBL depending on learners' geographical location. The objectives of this study were to determine whether face-to-face or online TBL better improved learner's understanding and application of phenytoin pharmacokinetics, and if TBL administered online using collaborative communication software and a learning management system (LMS) could achieve comparable results to classroom instruction for learning content and making team decisions.

DESIGN

The team-based learning experience described in this paper was designed and implemented as a component of the curriculum in a large academic health science center with a geographically diverse, multi-site WPPD program. The WPPD program is a three-year program for licensed pharmacists to obtain a PharmD degree. The students learn additional clinical knowledge while maintaining their professional careers. The learners are diverse in terms of their age, knowledge and skill, practice settings,

and location within North America including recent Canadian pharmacy graduates seeking additional training for their practice in Canada.

The WPPD program followed a cohort-based hybrid or blended-learning model, that incorporated both an online learning system and face-to-face instruction to meet the needs of all learners.¹⁷ The blended distance-learning model offered considerable flexibility for learners, who could participate in cohorts that met monthly or over a 3-day weekend each semester. The university's institutional review board classified this study as exempt from review.

In our unique situation, 292 geographically challenged learners were brought together for either face-to-face or online TBL as described in the facilitation guide published in the MedEdPORTAL.¹⁸ Prior to the study the learners were in smaller groups of four to 15. We combined and mixed the very small learning communities to form larger groups to increase engagement and collaboration among the learners. Four learning communities that met for a three-day weekend every semester merged with the face-to-face team-based pharmacokinetics group (70 learners). The learning communities that were not able to meet in a central location (222 learners) signed up for the live online TBL sessions. The online TBL groups had 11 live session times to choose from over two weeks. Adobe Connect was used as the online learning system platform. Figure 1 depicts the learners.

Four small groups in Las Vegas and three small groups in Tampa used the face-to face class sessions for the two-hour long TBL activity. The groups in Las Vegas and Tampa gathered together in one large room at each location for an average total of 35 learners at each site. Group members at each site were randomized in Excel.

Thirty regional model groups located across the United States were considered to have too few learners to conduct effective TBL sessions (in some cases only three to six learners per group). Therefore, the decision was made to combine regional models online to conduct the TBL sessions. The resulting 222 learners in the online group were registered via Doodle schedule survey. There were 11 session options made available to these learners over a 10-day period. Dates and times were created based on estimated learner time availability for different time zones.

For faculty members a facilitation guide was created, which describes the TBL activity for the pharmacokinetic module and timeline in detail, can be found in MedEdPORTAL.¹⁸ The faculty members completed an hour of training two months prior to implementing the TBL active-learning sessions. The hour-long training session

Figure 1. Total number of learners and individual groups for face-2-face and online.

for faculty members consisted of the iRAT (10 min), tRAT (10 min), and 30 minutes for the application exercise with 20 minutes remaining to discuss activity design, objectives, and case questions.

The content of the facilitation guide describes the design of the TBL activity for both the online and in class activities. In both these learner groups the patient case activity followed the iRAT and tRAT using a traditional TBL format. For the in class groups two colored folders, red and blue, were placed on each table. The first folder included the iRAT and tRAT and the second folder contained the practice case, three rounds of questions, and a set of laminated letters (A, B, C, D, and E) for the table to hold up when teams were asked to reveal what they believed was the best answer to a question. Following the readiness tests, the learners were introduced to the application exercise. Teams worked on each of the application exercises independently, then discussed their perspectives and collaborated with other teams in a facilitated TBL format with faculty.

Adobe Connect was used for the virtual TBL session where face-to-face interaction in a traditional classroom was not possible for learners. Within the virtual class platform there is 1) a main meeting room used for the large room facilitations and 2) breakout rooms used for the team discussions. The lead facilitator selected a

randomize breakout room feature to place the learners in a defined number of teams. The breakout room feature was used for the tRAT and patient case team-discussions.

Learners were invited to participate in a practice session the day before the first TBL activity so they could practice using the technology. Learner Instruction and correspondence for Adobe Connect and Sakai LMS Online sessions were sent out one week prior to class and the day before class. Sign up and scheduling occurred a minimum of two weeks prior to the online session with the available dates and times for the learning activity. Both the iRAT and tRAT were created in Test & Quizzes, an e-learning system's (Sakai) quiz tool. As with standard TBL methodology, learners participated in an iRAT and tRAT, with team assignments made a-priori. These same team assignments were used to create breakout groups for the application activity, which followed the tRAT. The application exercise was facilitated via Adobe Connect sessions. Each team was assigned a breakout room; the lead facilitator then introduced the application exercise. The facilitators were able to visit each virtual breakout room to identify discussion themes, which were then used to promote discussion among breakout groups.

Ten questions were used to assess the learners' perceptions of their teamwork competencies, team

interdependence, and perceived understanding of phenytoin pharmacokinetics. The teamwork ratings consisted of six, five-point Likert style questions, which included three questions that queried participants on their perceptions about team competencies and interdependence. These six evaluation questions were adapted from a University of Florida Interprofessional course.¹⁹ The team competency questions were designed to assess the following concepts: team contribution, communication, and attitude. To assist learners in answering the first 3 team competency questions definitions for contribute, maintain and display were provided in the self-assessment evaluation. This in addition to the 5-point scale used can be found in appendix 1. The remaining four questions assessed perceived understanding of the material covered (foundational concepts of ADME). Outside of the team competency questions strongly agree to strongly disagree was used for all other questions. The same questions were administered to both the face-to-face and online groups.

EVALUATION AND ASSESSMENT

Learners' scores from the performance tests were evaluated relative to the content and team assessment scores. The readiness test scores (iRAT and tRAT) are shown in Table 1. The logistical analysis of learners' readiness scores is detailed in Table 2. Descriptive statistics were used to discern differences between groups based on assessment variables (standardized test scores) and the perceived content and team evaluations. The iRAT and tRAT performance scores were evaluated relative to the end of semester knowledge retention questions on the final examination.

The learners were divided into three different non-randomized cohorts. Two cohorts were taught face-to-face while the third cohort participated in an online team-based learning experience, using the same curriculum as the other two cohorts, just adapted for synchronous online instruction, facilitated through the Sakai LMS and Adobe Connect.

The data input for the one-way analysis of variance (ANOVA) did not use any filter, weight, or split files. It was defined as a one-way iRAT or tRAT. Statistics for each analysis are based on cases, with no missing data for

Table 2. IRAT and TRAT Scores: Online vs. Face-to-Face Descriptive

		N	Mean (SD)
iRAT	Online ^b	222	58.0 (30.0)
	Tampa ^{a, c}	34	54.3 (27.7)
	Las Vegas ^{a, b, c}	36	72.2 (24.6)
	Total	292	59.3 (29.4)
tRAT	Online ^b	222	89.5 (7.8)
	Tampa ^{a, b}	34	78.5 (6.0)
	Las Vegas ^{a, b}	36	82.2 (15.0)
	Total	292	87.3 (9.6)

^aFace to face sessions were held in Las Vegas and Tampa

^b $p < .01$

^c $p < .05$

any variable in the analysis. All of the questions have a positive point-biserial, which indicated that learners who answered correctly on a question had higher overall quiz scores than those who answered incorrectly. The reliability (Cronbach's alpha) for the seven readiness assessment questions was 0.68.

Cronbach's alpha reliability for each of the three evaluative components was calculated. Reliability for the teamwork competencies was .97, team interdependence was .98, and perceived content understanding was .97. As shown in Table 3, teamwork competency data provided evidence of positive interactions within each of the three cohorts. Nevertheless, learners in the online cohort perceived lower levels of teamwork. Similarly, in Table 3 all three cohorts perceived high levels of interdependence during the activity. The online cohort perceived lower levels of interdependence than the face-to-face cohorts despite scoring highest on the tRAT. The Tampa and Las Vegas cohorts reported very similar teamwork experiences. Learners in the online cohort had a slightly less positive perception of the team experience than did learners in the face-to-face cohorts ($p < .01$). Perceived understanding was not significant across the cohorts.

For the 16-week course, the adjusted total course score accounted for 5% of the total course grade. Also, up to 1.6 bonus points were added to the final course grade based on learners' answers to eight TBL knowledge-retention questions on the final examination. Regression analysis of the retention points as a dependent variable and the iRAT and tRAT as independent variables showed the iRAT was related to the retention score ($B = .27$). In this manner, a one point increase in iRAT score translated to a .27 increase in the retention score ($p < .01$). The regression analysis of the retention points did not show an effect on knowledge retention related to the tRAT scores.

Table 1. Individual and Team Readiness Test (iRAT and tRAT) Scores per Cohort Summary

	Tampa ^a	Las Vegas ^a	Online	Mean Scores
iRAT	54.3	72.2	58.0	59.3
tRAT	78.5	82.2	89.5	87.3

^aFace to face sessions were held in Las Vegas and Tampa

Table 3. Teamwork Evaluation Instrument Results

Question	Tampa, N=34, Mean (SD)	Las Vegas, N=36, Mean (SD)	Online, N=222, Mean (SD)
Teamwork Competencies			
My team contributes to the team meeting to achieve group tasks	5.0 (.2)	4.9 (.3)	4.4 (.8) ^a
My team maintains positive group communication	4.9 (.3)	4.8 (.4)	4.4 (.7) ^a
My team displays a positive attitude	4.9 (.3)	4.8 (.4)	4.6 (.7) ^a
Team Interdependence			
The team worked best when we coordinated our work closely	4.7 (.5)	4.8 (.5)	4.4 (.8) ^a
Team members had to work together to complete group tasks	4.8 (.4)	4.9 (.4)	4.4 (.8) ^a
The way individual members performed their jobs had a significant impact on the others in the team	4.7 (.6)	4.8 (.4)	4.2 (.8) ^a
Perceived Understanding			
My ability to apply pharmacokinetic concepts in establishing a therapeutic regimen for phenytoin has improved	4.3 (.7)	4.0 (1.0)	4.0 (.9)
My understanding of medications that are highly protein bound has improved	4.3 (.6)	4.0 (.9)	4.1 (.9)
My understanding of absorption of IV, IM and PO phenytoin products has improved	4.3 (.7)	4.0 (.9)	4.1 (.9)
My understanding of non-linear pharmacokinetics has improved	4.3 (.6)	4.1 (.9)	4.1 (.9)

^aThere was a significant difference ($p < .01$) between the online cohort and cohorts in Tampa and Las Vegas

The breakdown for estimated facilitation time for both the face-to-face and online models is listed in Table 4. The lead facilitator designed and created the facilitation guide. A technology instructional designer trained the lead facilitator on Adobe Connect, including on how to use the breakout rooms and the document-sharing features for class moderation. A brief online tutorial was provided to both faculty instructors and learners who had never used Adobe Connect. Three planning sessions for the TBL activity were held with the lead facilitator, course coordinator, and technical instructional designer

using Sakai LMS and Adobe Connect. This time was used for planning how to conduct the iRAT, the tRAT, and the case application exercise.

DISCUSSION

Face-to-face learning is the conventional strategy for conducting TBL. In this instructional design study, we used TBL to teach online and face-to-face learners the relevant clinical principles of phenytoin pharmacokinetics prior to their experiential training. The online groups achieved results that were comparable to those of the

Table 4. Facilitator Time Comparison

Estimated Facilitator Time per Online Versus Face-to-Face Session	Online	Face-to-Face
Total Training Time per Facilitator	1 hours	1 hours
Content Preparation Time per Lead Facilitator ^a	0.5 hours	0.5 hours
Adobe Connect Training for Lead Facilitator ^a	1 hour	0
Logistical Pre-Planning with Technical Instructional Designer, Course Coordinator and Lead Facilitator ^b	2.5 hours	0
Time per Session for each Facilitator Member	2.5 hours	2.5 hours
Technical Student Training per Session ^c	0.5-1 hours	0
Number of Sessions	11	2
Number of Lead Facilitators per Session	1	1
Mean Total Number of Co-facilitators per Session	2.6 (2-3)	2.5 (2-3)
Mean Number of Students per Session	21	35
Mean Number of Students per Co-facilitator (per session)	8.0	14.5

^aOne lead facilitator per session

^bIncludes online tutorial completed before online training with instructional designer

^cOnline students were not experienced in using Adobe Connect and were given a tutorial to complete independently and up to one hour of pre-class support before each session to help students set up audio, microphone, and chat functions

face-to-face groups in readiness performance scores, team perceptions, and perceived understanding of content. This is a new area of research and practice that is still emerging.

The iRAT and tRAT scores reflect the learners need to study the 2 articles provided to them prior to their TBL session. The face-to-face group that had additional instructions and a night to read the articles (Las Vegas group) performed best on the iRAT (72.2; $p < .01$). The mean iRAT score for the Tampa learners (54.3) was similar to that of the online groups (58). The online cohort performed significantly better ($p < .05$) on the tRAT (89.5) than did the Las Vegas group (82.2), and the Tampa group (78.5). This could be explained by the smaller faculty-to-learner ratio in the face-to-face groups, which was intended to facilitate peer-to-peer collaboration. Even though the learners' tRAT scores were higher than their iRAT scores, the bonus points on the final examination imply iRAT scores were more predictive of knowledge retention than were the tRAT scores. The tRAT is a method for listening to team members and receiving immediate feedback, while the iRAT emphasizes individual learning.

The application case in TBL should stimulate inter- and intra-personal communication among the learners at different tables to foster teamwork and practice readiness. Application of cases emphasizes that in practice there can be multiple answers to explore; learners must collaborate to determine the best answer or solution. Selecting a practice case that highlighted the importance and complexity of the medication use system illustrated challenges in the clinical setting that learners must be able to consider in order to prevent medication administration and communication errors. The majority of learners are community-based pharmacists. Learners with experience in hospital medication use systems were helpful for group discussions during the application exercise.

The team competencies and interdependence questions showed most learners strongly agreed the team was necessary and felt their team members were always contributing, maintaining positive group communication with a positive attitude for both face-to-face and live online. As shown in Tables 3 there was some evidence that learners perceived some differences in the ability to function as a team while interacting online ($p < .01$). One of the two faculty facilitators strategically placed stronger learners in each group at the Tampa site based on their past experience with those learners. However, the Tampa group had the lowest tRAT scores. Nevertheless, their perceived ability to apply and understand pharmacokinetic principles was the highest of the three cohorts. This attempt may not be seen in the data since students in the Las Vegas class were overall stronger learners.

The design of the TBL sessions was similar to Persky at UNC during a foundational pharmacokinetic course.¹⁶ However; we only had one TBL session instead of five during the course. The TBL session was accomplished during one two-hour session instead of two 90-minute sessions. Online TBL may be associated with increased faculty resources. We used three facilitators (1 lead, 2 co-facilitators) for 34-36 learners. For the online group, the faculty-to-learner ratio was three faculty members for every 22-30 learners. In the breakout rooms representing tables there was possibly more faculty time per table. However, groups up to 85 for two faculty facilitators have been used in other TBL courses.¹⁹ Persky reported having one faculty expert for 154 learners.¹⁶ With the online version, this would likely require being more strict regarding the requirements for Internet bandwidth and headsets. Based on our experience, more than 56 online participants (seven participants in eight breakout rooms) would be a challenge for two TBL-experienced faculty facilitators. As shown in Table 4, greater facilitator time was needed for the online versus face-to-face model to adapt TBL to the online model, especially for successful implementation of the class breakout rooms and document-sharing features.

Online TBL is a valuable alternative. Initially, it may be resource and time-intensive to implement. Additional time for faculty to learn the software and gain experience with virtual TBL was necessary. Comfort with technology and TBL helped to ensure optimal learner engagement to stimulate team interaction in the main classroom and the breakout rooms. The lead virtual TBL faculty member had previous experience in TBL and worked with an instructional designer to discover how to lead in a virtual environment. The basic tips for TBL when using Adobe Connect provided by the instructional designer can be found in Appendix 2. The main reason learners needed additional time was dependent on the prior use of Adobe Connect. For learners not familiar with Adobe Connect, it was necessary to provide online tutorials and pre-class technical support.

As we sought to use the TBL approach online, we realized considerable barriers needed to be addressed. Successful adoption of online learning methods in health care education requires appropriate institutional characteristics such as a supportive culture, educational technology opportunities, and organizational readiness. Educators will benefit from positive attitudes and self-initiative toward adopting new technologies. They also need to obtain a level of competency for the educational technology tool(s) selected for learning. Motivation is needed to become digitally competent learners.²⁰

Online TBL does promote a level of digital literacy, which may be needed in providing different health care

models; especially telemedicine or eHealth.²¹ Online TBL might have application for educational areas involving large number of learners with a limited number of available faculty members and logistical challenges. This might have application for online continuing education or interprofessional learning activities that inherently include physical location barriers to having all learners and facilitators available at one location. Based on our initial experience, it is possible to conduct online TBL with two or three instructors and four breakout rooms with approximately five or seven learners per room. However, once the initial barriers are overcome, we believe that two instructors could manage 42 learners using four breakout rooms at one time by navigating back and forth during the session.

Team readiness is a critical outcome. Though teamwork performance data was captured, conducting multiple sessions to improve team cohesion would have enhanced our ability to assess whether teamwork performance can improve knowledge retention. A 2003 meta analysis suggested Festinger's original components of cohesion of interpersonal attraction, task commitment, and group pride each bear independent relationships to performance across many criterion categories.²⁰ Further Bell reported the deep-level team composition variables (i.e., personality factors, values, abilities) and performance varied depending on whether it was in practice or in a laboratory setting.²² Thus, learners may not have been significantly motivated to exhibit exceptional behaviors as one may see on team sports. For this reason, it may be necessary for teams to start at the beginning of a curriculum in teams and continue over two to four years in order to have the repetition necessary to develop and measure team cohesion and performance.

The same questions were used for each cohort; however, learner groups did not take the tests at the same time. Performance in the TBL activity only counted 5% of the total course grade, providing a low risk for dishonesty. The overall iRAT scores showed a normal distribution and were associated with the ability to answer knowledge retention scores at the end of the course. There may have been a power bias resulting from the limited number of face-to-face participants, which was 70, compared to the 221 online participants. Learner demographic data were not collected.

CONCLUSION

Team-based learning can be an effective method for teaching applied pharmacokinetics in both face-to-face and online classes. Facilitating high-quality online team experience at a distance is possible; however, greater facilitator resources may be needed. The clear, organized, and instructional learning format of TBL helped

to facilitate learner engagement in different class environments including both online and face-to-face models. This learning activity supports efforts when controlling for site and preceptor variance, but more importantly has the potential to prepare learners for practice and team readiness. The live online TBL session format could be used for cocurricular activities in instances where physical classrooms and meeting spaces are not available.

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Appendix 1. Teamwork Evaluation Instrument

Instructions: This evaluation instrument is to assess the frequency the team applied teamwork competencies to make a positive impact on the team process. Answer the questions for your team by filling in the bubble to indicate how frequently you think your team demonstrated the competency.

Teamwork Competencies

Contributes to team meetings to achieve group tasks: initiates, seeks and gives information clarifies, summarizes, takes consensus, and is accountable

Maintains positive group communication: serves as a gatekeeper, encourages, resolves conflict, acknowledges feelings, set standards, and is open

Displays a positive attitude: values team decisions, has positive regards and respect for all members, fosters mutual trust, open to feedback, shares team vision

My team. . .

	Consistently	Regularly	Occasionally	Rarely	Never
Contributes	☐	☐	☐	☐	☐
Maintains	☐	☐	☐	☐	☐
Displays	☐	☐	☐	☐	☐

Appendix 2. Faculty Tips for Using Adobe Connect for Team-based Learning

When first introducing the equipment and use of Adobe Connect, one should ensure the learners speak using their USB connector headset, have the appropriate Internet bandwidth, and adjust to an appropriate volume. It is important to provide the following detailed instructions to ensure the success of the TBL activity and time.

During the microphone set up and microphone check please instruct the learners to:

- Set up audio wizard when entering the room; otherwise no one will hear you.
- Click on the microphone icon and connect audio, then mute your microphone until asked to speak.
- Do not leave the Adobe Connect room. If you do exit you have to repeat the setup process to speak. For some Adobe Connect versions you must use Internet Explorer or Firefox browser (avoid Chrome).
- Check technology by saying, "This is [name]" instead of "Hello," so we know who is speaking.
- Mute your microphone when not speaking, especially in large groups with varying Internet bandwidth to minimize interferences during the entire live session.
- Use a headset or an appropriate Internet bandwidth otherwise you may need to reschedule if your technology is not working.

Once the orientation began, a strict no access into the virtual classroom policy should be enforced.

The following are the iRAT and tRAT instructions to provide to learners during TBL to ensure students can follow the virtual classroom activity.

- The location of Tests and Quizzes is in Sakai. This requires detailed instructions prior to taking the iRAT.
- Refresh Sakai before taking quizzes if the quiz is not visible.
- Check the iRAT completions before moving on to the tRAT as a group. If someone does not complete the iRAT they need to reschedule. If a learner does not complete the iRAT, but completes the rest of the TBL activity a make-up exam will need to be created.

(Continued)

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- When learners first enter the breakout rooms for the tRAT, ensure learners start speaking one by one to identify a leader and someone to enter quiz scores. This may require facilitations to ensure learners are on task and have adequate time.
 - If learners are experiencing interferences during the breakout groups mute microphones except for the team leader who is facilitating a group consensus of the answers to the questions.
 - The team recorder shall record each students name in the comment box at then end of the Sakai quiz for the first TRAT submission. This helps to electronically ensure the student names are in the groups for grading.
 - The private chat function should be turned off for this activity to minimize distractions. Otherwise, the other learners will not able to speak due to multiple Internet bandwidths and headset connectivity issues.

Note:

It is helpful to use live Adobe Connect screenshots at the start of the groups in case they start moving around as well as screenshots for the IRAT and TRAT for analyzing results.

At the end of each night, ensure the block guest access setting under “Meetings” is not active. If the block guest access is selected the next group cannot enter Adobe Connect as a guest.