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TEAM BASED LEARNING - ORIENTATION OF TEACHING FACULTY TO TBL IN THE TBL MODE, IN A CARIBBEAN MEDICAL SCHOOL.

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ABSTRACT

Aim: The present paper is a report on how the teaching faculty at a Caribbean medical school in Aruba was oriented to the TBL strategy before implementation to students. **Method:** Sixteen teaching faculty, most of whom were active PBL facilitators, took part in the TBL orientation. The orientation session was conducted in the TBL mode with three steps - Individual advance student preparation (ASP), In-class readiness assurance programme (RAP) and In-class application focused exercise (AFE). The RAP step had three sub-steps - individual and team readiness assurance tests (IRAT and TRAT), Appeals round and Instructor feedback round. Based on the IRAT scores, the sixteen faculty were divided into four groups of four each to proceed to the TRAT. Correct answers were notified to the groups to activate the appealing round followed by the instructor feedback round. In the AFE, teams were asked to discuss on how the TBL process could be implemented at XUSOM. **Results and discussion:** The orientation session concluded successfully with faculty gaining an in-depth understanding of how TBL is to be conducted. In conclusion, appropriate orientation of teaching faculty to TBL enables its successful implementation. The orientation is best achieved by delivering it in the TBL-mode.

KEYWORDS: Team based learning, TBL, IRAT, TRAT, AFE.

INTRODUCTION

The implementation of Team-based learning (TBL) as a student-centered learning model, has spread across universities in the globe in lightning speed over the past few years. It is used with large classes or smaller ones, incorporating multiple small groups of 5–7 students each, in a single classroom. TBL is specifically characterized by three key components - Individual advance student preparation (ASP), In-class readiness assurance programme (RAP) and In-class application focused exercise (AFE). Step 2 (RAP) is further divided into four sub-steps - individual and team readiness assurance tests (IRAT and TRAT), Appeals round and Instructor feedback round. During the ASP, students are given a topic in advance, to study on their own, understand and apply at the In-class RAP. At the IRAT, students who have come prepared for the topic answer a test of 5-20 MCQs. Based on the IRAT score, students are teamed into groups and each group answers the same test a second time, but as a group that collectively discusses each question before they select the right answer. Grouping is very crucial for the success of a TBL and each group ought to have a balanced knowledge resource as compared to every other group. In other words, every group should be a fair admixture of the low performers, average performers and high performers of the IRAT. Following the TRAT, students are allowed to appeal for a wrong answer, a wrongly worded question or what they feel is a better answer than the one marked right by the facilitator. In the instructor feedback round, the facilitator discusses those areas of the given topic that the students found difficult to comprehend on their own. In the AFE, groups answer a second set of MCQs that test their ability to extend their knowledge to higher levels of learning. A more detailed account of the steps can be found in earlier papers (Parmelee et al. 2012; TBL collaborative 2017).

Faculty has been listed as one of the four major factors (the other three being administration/curriculum, students and characteristics of specific courses) that influence the ongoing utilization of TBL (Thompson et al. 2007). From this perspective, it becomes imperative that the teaching faculty be appropriately oriented for the proper implementation of TBL as a new teaching-learning strategy. A couple of Caribbean medical schools have already adopted the TBL model as part of their curricula. Zhong (2017) has reported how TBL was used

as one of the different combination of teaching strategies to help learning of Pharmacology, which according to him is a difficult subject to learn in the Caribbean medical schools. One Caribbean medical school has reported a survey study on the opinions of students and faculty about 8 different teaching-learning modalities (including TBL) in the first two years of medical school (Shah and Meisenberg 2012), two others have reported the implementation of TBL in teaching Anatomy (Mavrych et al. 2012) and Pathology. However, to the best of our knowledge, there are hardly any reports on efforts made by institutes to orient faculty towards this new teaching-learning modality.

At Xavier University School of Medicine (XUSOM), Aruba, Dutch Caribbean, although didactic interactive lectures form the major teaching-learning strategy, a significant contribution to learning also comes from other strategies like Problem based learning (PBL), Clinical case presentation (CCP) and Objective structured clinical examination (OSCE) sessions. We have recently launched the TBL as a new teaching-learning strategy as a part of our multi-teaching-modality-curriculum. We thought it necessary to first orient our teaching faculty to the new strategy. The present paper is a report on how the teaching faculty at XUSOM, Aruba was oriented to the TBL strategy in the TBL-mode.

METHOD

Sixteen teaching faculty, most of whom were active PBL facilitators to medical students, took part in the TBL orientation. A week before the orientation session, resource material covering the details of TBL proceedings was given to the faculty in the form of power point handouts **(Fig 1)**. In a TBL step equivalent to the ASP, the teaching faculty was asked to come prepared for a written MCQ test and was informed that when they go through the study material they would automatically know the idea behind this exercise. On the scheduled date and time of the orientation session, as a TBL step equivalent to the IRAT, the teachers were individually given a question paper of 5 MCQs **(Fig. 2)** to answer. Each of the faculty entered their answers in their individual laptops in a pre-formulated excel sheet that was given to them just before the test. By virtue of the pre-programmed formula, the excel software immediately returned the scores of each faculty in a sheet and a destination cell that was known only to the resource persons of the orientation session. Based on the IRAT scores, the sixteen faculty were divided into four groups of four each. In a step equivalent to TRAT, each group was administered the MCQ question paper (the same one used in IRAT) to answer collectively as a team. The correct answers were notified to the groups to activate the appealing round which was followed by the instructor feedback round. In the AFE, teams were asked to discuss on how the TBL process could be implemented at XUSOM. The consensus arrived at by the faculty at the AFE is presented as snappy bullet points in **Fig 3**.

RESULTS AND DISCUSSION

Benefits of the TBL strategy are multiple, not only for students but also for teachers and administration. A recent systematic review of 118 published articles on TBL in health professions education has shown triple increase in the numbers between 2011 and 2016. Most studies took place in the US (72; 6%) and involved undergraduate medical students (55; 5%). The major framework component was Teacher and Learner Attitudes (97; 8%), followed by Learning Outcomes (85; 7%) and Team Characteristics (25; 2%) respectively (Reimschisel et al. 2017). There is also evidence of improved shared leadership capacity through reflection and feedback (Alizadeh et al. 2017). In addition, there was statistically significant increase in the student's critical thinking skills in the TBL group (Loftin and West 2017). However, it is to be kept in mind that the role played by faculty is one of the four major factors (the other three being administration/curriculum, students and characteristics of specific courses) that influence the ongoing utilization of TBL (Thompson et al. 2007). As already explained in the 'Introduction' section, TBL is specifically characterized by three key components - Individual advance student preparation (ASP), In-class readiness assurance programme (RAP) and In-class application focused exercise (AFE). Step 2 (RAP) is further divided into four sub-steps - individual and team readiness assurance tests (IRAT and TRAT), Appeals round and Instructor feedback round. A brief explanation of the rounds has already been described in our 'Introduction' section in this paper. Also, a more detailed account of the steps can be found in earlier papers (Parmelee et al. 2012; TBL collaborative 2017).

The competency of the teaching faculty lies in their ability to foster the acquisition of not only factual knowledge by their students but also the higher order skills that would promote their workforce. In an 'institutional milleu' that is constantly influenced by the lightning speed at which teaching innovations are emerging in medical education, teaching faculty is often dissuaded from addressing higher order skills and tends to focus more on transmission of factual information. An orientation session that makes them go through the actual novel process gives them an insight into the pros and cons of introducing a new instructional strategy in the course of their teaching. It also stimulates their critical thinking during the hands-on-experience and this is an essential component to stimulate the critical thinking of their own students. This article reports an effort made to that effect in a Caribbean medical school, Xavier university school of medicine (XUSOM), Aruba.

The orientation session concluded successfully with the faculty gaining an in-depth understanding of how the TBL process is to be conducted. Based on their own hands-on-experience with ASP, IRAT and TRAT, the

teaching faculty could understand which topics and how much content should be included in general for ASP of a TBL exercise. At the AFE, there was active interaction and discussion among and between the groups to discuss the best method of implementation of the TBL process at XUSOM. The AFE step of the TBL orientation enabled the faculty to understand the anticipated problems in implementing TBL for students. For instance, the teachers understood the need to not declare the IRAT scores before administering TRAT to students as they saw for themselves that once they knew the IRAT scores, a faculty who had got 5 on 5 told the rest of his group what the right answers were and the essence of group learning through discussion was lost. Likewise, a first-hand experience of the process enabled an active discussion to reach a consensus that TBL could be implemented for all batches with huge batch size because the teachers saw for themselves that a singleTBL facilitator could practically manage a huge batch in the TBL mode. This, as they had noted by their own earlier experience with PBL sessions, was not possible in a PBL.

Following this orientation session, we implemented TBL to our newest batch for a couple of high-yield topics, adhering to the points that we had discussed in the AFE during the orientation. It has been four months now since we implemented the TBL strategy for our students and the process is proceeding smoothly so far.

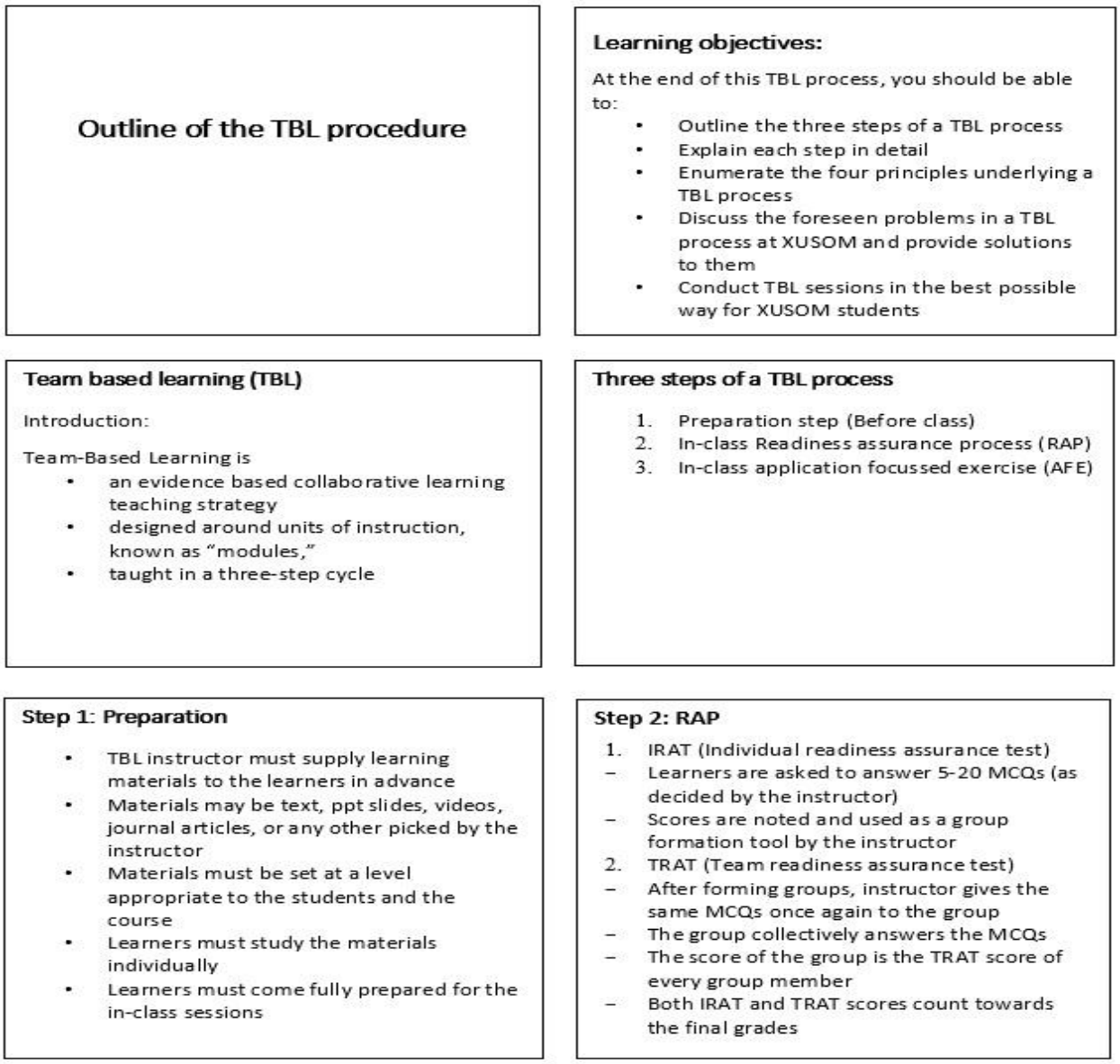

Figure 1: A sample page of learning material given to the teaching faculty for 'Individual advance student preparation' step (ASP) at the TBL orientation session in the TBL mode.

Read the given scenario and answer the questions that follow. Your answers should be based on the notes given to you for pre-learning and not on your individual opinions

Scenario

A medical school introduced a TBL process for the first time on a batch of 12 students. A set of 10 MCQs worth 1 mark each, was given to students as part of the IRAT session.

- Following were the IRAT scores of the 12 students:

Adam	6
Aviva	5
Ellora	9
Farhan	10
Greg	9
Haroon	3
Hema	7
Jessica	4
Kevin	6
Leena	8
Norman	7
Shivam	3

- Based on the above IRAT scores, three groups of four members were formed. When the same set of MCQs as in the IRAT was given to the groups, each group scored 9 at TRAT
- In the following semester, the admissions committee recruited 25 students for the new batch
- The school replaced some of its PBL sessions with the new TBL process

Questions

1. According to the four principles underlying the TBL process, which of the following instructor has the best formed groups?

	Group 1	Group 2	Group 3
Instructor 1	Adam, Aviva, Ellora, Farhan	Greg, Haroon, Hema, Jessica	Kevin, Leena, Norman, Shivam
Instructor 2	Adam, Ellora, Haroon, Hema	Aviva, Farhan, Jessica, Leena	Greg, Kevin, Norman, Shivam
Instructor 3	Adam, Ellora, Greg, Hema	Aviva, Farhan, Haroon, Jessica	Kevin, Leena, Norman, Shivam
Instructor 4	Adam, Aviva, Norman, Shivam	Ellora, Farhan, Kevin, Leena	Greg, Haroon, Hema, Jessica

A. Instructor 1
B. Instructor 2
C. Instructor 3
D. Instructor 4

2. Which of the following expected benefits of the TBL process is obvious from the TRAT scores?
A. Three 'at risk' students have the benefit of staying on track
B. TRAT scores of all students are better than the IRAT scores
C. All students have achieved a greater depth of understanding through team formation
D. Students have understood their strengths and weaknesses as learners

3. Which of the following statements fits into the administrative requirements/benefits of a TBL?
A. The Dean had to recruit more faculty to conduct TBL for 25 students in the following semester
B. The TBL process could be conducted for the 25 students with the existing faculty and infrastructure
C. The Dean did not recruit new faculty but should have recruited more faculty if the student intake was 40
D. The Dean did not recruit new faculty but the existing faculty had to arrange for extra classrooms to conduct TBL for 25 students

4. An active involvement of students in which of the steps of TBL directly reflects their IRAT scores?
A. Preparation step
B. Group discussion
C. Appealing session
D. Application focussed exercise

5. Which of the steps of the TBL session would be most useful in deciding the best possible method of implementation of TBL for XUSOM students?
A. Preparation step
B. Group discussion
C. Appealing session
D. Application focussed exercise

Figure 2: MCQ questions administered to the teaching faculty at the IRAT & TRAT steps of TBL-orientation conducted in the TBL mode.

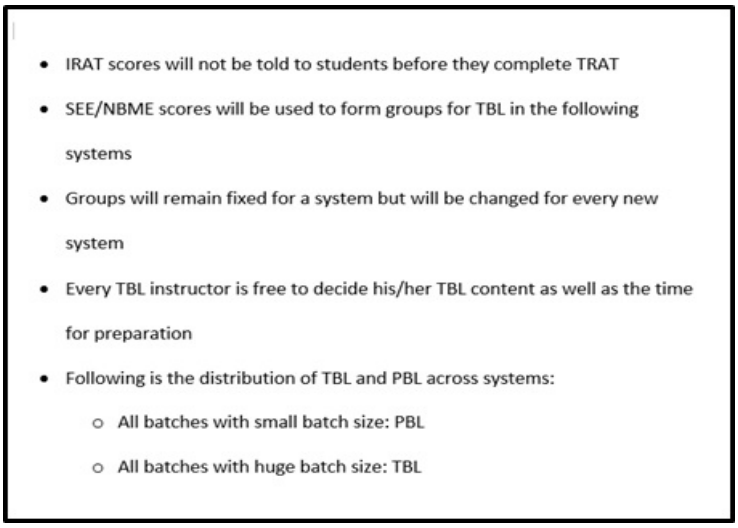

Figure 3: Snappy bullet points of the consensus reached at AFE in the TBL orientation for teaching faculty, regarding implementation of TBL at XUSOM.

CONCLUSION

In conclusion, while the goal of a change in instructional strategy is to prepare students for future learning, the means to achieve this goal successfully is the appropriate orientation of the teaching faculty to the proposed change in the strategy. The best way to achieve a faculty orientation is to give a hands-on-experience of the new strategy to the teaching faculty. Thus a TBL orientation is best achieved by delivering the orientation session in the TBL-mode.

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