Faculty Peer Review as a Strategy to Assure Quality in a New Team-Based Learning Curriculum—a Single Institution Experience

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Faculty Peer Review as a Strategy to Assure Quality in a New Team-Based Learning Curriculum—a Single Institution Experience

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Abstract

Team-Based Learning (TBL) has focused largely on teaching faculty to develop lessons and help learners apply content. TBL literature has overlooked providing guidance or training in quality assurance. In this study, we describe a single institution’s experience with successfully shifting to the TBL model from a traditionally didactic curriculum. A faculty peer review program (FPRP) was instituted to assure that faculty developed quality TBLs and facilitated them according to their training. The transition from didactics to TBL was facilitated by (1) TBL faculty training, (2) development of a peer review committee, and (3) implementation of the FPRP. Following the implementation of the FPRP, students combined mean scores on major shelf exams in Biochemistry increased from 76.9 to 84.1%; Cell Biology, from 77.5 to 82.5%. Their National Board of Medical Examiners Biochemistry shelf exam mean scores increased from 52.4 to 60.8%; overall percentile ranking increased from the 59th to the 85th percentile. The FPRP proved to be integral to TBL faculty development and curricular change efforts. In a survey issued only to faculty who used the TBL model, they expressed appreciation for the FPRP and identified it as a contributing factor in the successful transition to the new TBL curriculum.

Keywords Faculty peer review · Team-Based Learning · Curriculum design · Faculty development · TBL · Undergraduate medical education

Introduction

Numerous studies have focused on student satisfaction with Team-Based Learning (TBL), yet only a few have addressed faculty satisfaction with TBL as a teaching and learning strategy for medical student instruction in the preclinical years [1]. Previous TBL research has explored (1) student satisfaction [2–6], (2) changes in students’ exam scores [2, 4, 7, 8], (3) students’ motivation [6, 9], and (4) comparisons of TBL to didactic lectures [2, 4, 5, 7, 10]. Similarly, only a small number of studies have addressed faculty perceptions of TBL as an active learning and instructional method and even fewer have addressed faculty development efforts to facilitate the success of TBL implementation. Our investigation explored the latter where TBL was implemented throughout the preclinical years of medical doctor training.

In efforts to achieve Standard ED-5-A of the Liaison Committee for Medical Education (LCME) accreditation guidelines, which states “A medical education program must include instructional opportunities for active learning and independent study to foster the skills necessary for lifelong learning” [11]. Active learning has been described as the active processing of information whereby students develop their own understanding of concepts, relationships, and procedures to facilitate their learning [12, 13]. Team-Based Learning (TBL) is one active learning teaching pedagogy that focuses on the development of heterogeneous teams and utilizes those teams as an instructional strategy [14]. Each learning activity and assignment is linked for the explicit purposes of (1) promoting deeper levels of learning for each student and (2) developing high-performing teams [14]. TBLs are developed using a “backwards design” where specific learning objectives are created first, formative and summative assignments are designed second, in-class learning activities are prepared.

Electronic supplementary material

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third, and pre-class or outside-of-class activities are identified last [14, 15]. Four phases comprise the TBL: (a) pre-class assignments, (b) iRAT, (c) gRAT, and (d) application exercises. Each of these four phases is identified by specific student and facilitator activities and serves a specific function within the TBL pedagogy [15]. TBL benefits both the faculty member and the students in that it improves the learner outcomes for both academically weak as well as academically strong students [14, 15].

The University of Arkansas for Medical Sciences (UAMS) Undergraduate Medical Education (UME) program adopted TBL as the learning transmission method to achieve LCME Standard ED-5-A to increase the active learning within its medical student training. In 2011, UAMS began to introduce Team-Based Learning (TBL) into its curriculum as the primary method of student instruction in its UME curriculum. Prior to this, the curriculum was predominately reliant on didactic educational activities, which required realignment to better comply with the accrediting standards of the LCME. The change to a more active learning curriculum was necessitated by the impending LCME review of the UAMS College of Medicine for reaccreditation in 2014. To ensure compliance with LCME standards, UAMS’ College of Medicine endeavored to increase active learning within the curriculum and reduce didactic educational activities to less than 50%. The faculty were asked to change their normal content delivery methods and reimagine their educational practices to fit a new and more interactive TBL-heavy format. This shift brought with it a need for changes to the curriculum, its management and content transmission methods, and importantly, more focused efforts in faculty development.

Historically, a peer review consisted of one faculty observing another for the better part of an hour resulting in a letter evaluating the faculty member’s teaching and serving as a formal summative review of their abilities [16]. Our efforts were intended to be more formative and proactive as opposed to the historically summative and reactionary nature of peer review. Inclusive of the faculty development efforts that were employed to facilitate the transition to the newly adopted TBL pedagogy was the creation of a faculty peer review program (FPRP). We hypothesized that the structure of our FPRP would aid in optimizing overall TBL quality. In concert with several other initiatives to aid the curricular change, the FPRP proved integral to the implementation and success of the newly adopted TBL curriculum. The FPRP provided feedback from faculty versed in TBL development and delivery, before deployment of the newly developed TBL module. In addition, the TBL was observed and evaluated, allowing the faculty to receive feedback immediately following their TBL in a debrief session conducted by a FPRP representative. The summative model proposed here, although not for reappointment or hiring purposes, is similar in scope to Golparian, Chan, and Cassidy’s [17] summative model, with the caveat that the pre-observation meeting is replaced with the PRC’s review of faculty TBL submitted materials. The FPRP aimed to provide feedback and guidance strictly for the purposes of assuring the quality of TBLs and facilitate the implementation of the new active learning curriculum.

Prior to the formation of the FPRP, no formal review of faculty teaching was performed without cause—cause being teacher/course evaluations or some other form of reporting on faculty that identified areas of weakness in their teaching and classroom behaviors. No formal review of faculty course content development had ever been implemented in the UME curriculum that provided feedback prior to the course content being delivered and certainly no observation was performed that concluded with a debrief session intended to provide useful feedback for faculty to employ in future iterations of their didactic or learning transmission activity. The purpose of this manuscript is to inform on how the implementation of the FPRP was revolutionary in that it provided faculty with guidance before and after TBL delivery, resulting in a greatly improved experience for both facilitators and students.

Methods

The UME program incorporated TBL as its primary teaching and learning pedagogy in both the first (M1) and second (M2) years of medical student training. To ensure the success of this considerable undertaking, UME leadership hosted two leaders in the field of TBL to provide multi-day trainings during three separate events that were open to all COM faculty. Faculty who taught in the UME curriculum were encouraged to attend. Although training was not made mandatory for any UME faculty, a policy was developed that required faculty to attend at least one TBL training session before they would be able to facilitate a TBL event. However, the policy did allow for faculty to participate in a TBL event without having attended any training session, but only as a content expert and not as the facilitator of the event. Several UME faculty volunteered to provide training sessions in-house as faculty development activities for faculty who may not have attended the TBL leaders’ sessions or who wanted more training in the TBL pedagogy. The College’s UME faculty who delivered the trainings were course directors, deans, and education faculty who had attended multiple iterations of the TBL leaders’ in-house trainings that were provided. Faculty TBL trainings were scheduled several times before the implementation of the new curriculum and twice a year, in the fall and spring of each year for 3 years, post TBL implementation. All peer reviewers in the FPRP also served as in-house experts for training sessions for other faculty.
Faculty Peer Review Program

The FPRP served as a formative quality enhancement and faculty development mechanism intended to (1) facilitate faculty transition to the new TBL curriculum and (2) proactively ensure the success of faculty with development and delivery of the new TBL pedagogy. To achieve its intended goals, the FPRP endeavored to accomplish three tasks. First, the FPRP convened to review the structure and appropriateness of newly developed TBLs within the guidelines of the TBL instructional model as outlined by Levine et al. [14, 18]. Second, it confirmed that all new TBLs were facilitated by a TBL-trained faculty. Lastly, it evaluated the TBL during its first run and provided immediate feedback to the facilitators. It is important to note that the FPRP was not created to engage in content review or make recommendations to faculty with regard to their specific content areas. Content review was considered outside of the scope of the FPRP’s responsibilities and is strongly discouraged.

The FPRP was impelled towards its goals by its peer review committee (PRC). The PRC was composed of five senior faculty (two basic scientists, three medical doctors) and a faculty education expert, all trained in TBL pedagogy. The primary responsibility of the PRC was to review the initial TBL faculty submissions before they were facilitated and to provide feedback for enhancement and improvement. The PRC created an evaluation tool (Online Resource 1) that was utilized to objectively assess each TBL submission against nine specific items. The nine items were assessed on each TBL submission as either “Approved” or “Consider Revising.” Specific actions suggested to the submitting faculty by the PRC were listed on the assessment form in a “Comments” box for adoption into the TBL, prior to facilitation.

Although the PRC was the driving force for the FPRP, the FPRP consisted of six phases [19] (Fig. 1) whereby (1) *faculty developed TBL*, (2) *PRC reviewed TBL*, (3) *PRC provided feedback*, (4) *faculty implemented feedback*, (5) *faculty facilitated TBL* (peer observation occurred), and an (6) *After Event Review (AER)* was conducted (peer consultation occurred).

**Phase 1: Faculty Develops TBL**

In the initial phase of the FPRP, faculty developed their new TBL module, either alone or in conjunction with one or more faculty members. Once their TBL was finalized, faculty submitted it for review to the Peer Review Committee (PRC). The PRC created a policy that required all new TBLs to be submitted at least 7 days prior to the scheduled facilitation of the event. Implementation of the submission schedule created ample time for the PRC to convene and review submissions and provided faculty enough time to make the suggested revisions before they facilitated the TBL event. The PRC convened and reviewed TBLs via email when submissions infringed on the policy, whereby coordination of PRC members’ schedules was difficult and a face-to-face meeting would have hindered delivery of the TBL to students.

**Phase 2: PRC Reviews TBL**

Once a submission was received by the PRC coordinator, all members were notified and the PRC was convened to review the TBLs against the nine criteria included in the TBL Evaluation Form (Online Resource 1): (1) number of objectives, (2) objectives’ format, (3) pre-class assignments link to objectives, (4) Readiness Assurance Tests (RAT) link to objectives, (5) application exercises link to objectives, (6) time commitment for pre-class assignments, (7) number of RAT questions, (8) number of application exercises, and (9) complexity of application exercises. The language “Approved” or “Consider Revising” was used in assessment of the nine reviewed items to preserve faculty autonomy in the development of their teaching and learning materials. The PRC provided more detail in narrative suggestions to faculty in the comments section of the form, with the intent to aid faculty in improving the TBL and readying it for facilitation.

**Phase 3: PRC Provides Feedback**

Following PRC review, the coordinator compiled the report and emailed it to each faculty involved in the module’s development. Faculty were invited to ask questions of the PRC for clarification of any unclear suggestions via email. All PRC members were carbon-copied on the communications. Standard practice was to send the written review report to faculty within 24 h of the completed review by the PRC.

**Phase 4: Faculty Implements Feedback**

Upon receipt of feedback from the PRC, faculty included the suggested revisions into their TBL module. No follow-up review of the TBL materials was conducted prior to facilitation of the event. Faculty adoption of suggested revisions was revealed during observation of the TBL event.

**Phase 5: Faculty Facilitates TBL**

Faculty facilitated their revised TBL module. During their facilitation, a designated PRC member observed the faculty member’s TBL event. The focus of the observation was on faculty facilitation skills, implementation of TBL pedagogy, flow, timing, and resources utilized. Careful consideration was taken to omit focusing on content. A more detailed description of the items observed during this phase can be found in Team-Based Learning Event Observation/Recommendation Form (Online Resource 2).
Phase 6: After Event Review

Immediately following the TBL event, the PRC observer conducted an After Event Review (AER) with the faculty member to discuss: “What went well?”, “What could have improved this event?”, “Plans for revision?”. The discussion primarily focused on the faculty member’s self-evaluation. A minor focus was placed on suggestions that could have been made by the observer. The AER was often postponed, usually from 1 to 5 days, due to students vying for faculty time at the conclusion of the TBL event. Once an AER was conducted, the observer (usually the PRC coordinator) compiled a written report on the TBL After Event Review form (Online Resource 3). The report highlighted the discussion that occurred between the faculty observer and the faculty facilitator during the AER. Content experts often participated in the AER as well. The report, which contained nearly verbatim responses from the debrief session, were then emailed to the faculty facilitator and any content experts who participated.

Results

During the 2011–2012 academic year, there were 1051 basic science and clinical faculty on staff in the College of Medicine. Approximately 200 of those were involved in delivering the preclinical curriculum. TBL training sign-in sheets revealed that of the approximately 200 faculty with preclinical curriculum delivery responsibilities, only 35% (n = 70) attended the training sessions. Some faculty participants were unable to participate for the duration of the training sessions (i.e., on-call doctors, administrative meetings, etc.), which could have been a contributing factor to the lower attendance.

The UME students experienced immediate improvements in several areas of their academic performance, specifically in Biochemistry and Cell Biology. An assessment of students combined mean scores in Biochemistry on major shelf exams realized an increase from 76.9 to 84.1% and in Cell Biology shelf exams, from 77.5 to 82.5%. National Board of Medical Examiners (NBME) Biochemistry shelf exam mean scores increased from 52.4 to 60.8%. The overall percentile ranking of students increased from the 59th to the 85th percentile.

Our efforts were intended to deliver faculty feedback on their teaching using TBL pedagogy and not to offer any evidentiary measures for promotion and tenure consideration. As a by-product of the FPRP, faculty satisfaction with TBL following first-year implementation was high (Table 1). The majority of faculty found TBL to be a more effective learning modality than traditional lectures (Table 1).
Due to changes in the curriculum during the year following TBL implementation and data collection, the results of this study were based on a single year of data. The overall curriculum structure was revised to an organ-based system. Both the biochemistry and cell biology courses were dissolved and new organ-based modules were developed to fit with the curricular change. Thus, any comparison of outcome data from the first year of TBL and the FPRP implementation could not be compared due to a lack of equivalence in the curricular offerings.

**Discussion**

It has been stated that peer review serves two important functions. First, peer review aims to provide teachers with feedback on their teaching behaviors and foster personal growth and professional development. Second, peer review provides evidence that would aid in faculty promotion, tenure and compensation decisions [20]. Our peer review program existed to serve the former and thus improve the learning outcomes of our students. However, we endeavored greatly to avoid any association with the latter.

In our attempts to facilitate faculty transition to the new TBL active learning curriculum, we found several similarities between our process and the process undertaken by Levine et al. [18]. For instance, each PRC member served as a clerkship director or in another leadership capacity within the UME curriculum. Four of the six members of the PRC facilitated the “TBL 101,” “Writing an Effective TBL Module,” and “Facilitation Skills for TBL” for the medical school faculty. Each participant had experience with TBL that was more than 1 year.

Our process included monthly student and faculty evaluations of the new curriculum to assess satisfaction of both groups with the new pedagogy. With regard to the peer review, ours differed from Levine et al. [18] in that we focused on the enhancement of TBL through faculty teaching/facilitation observations, debrief following TBL delivery, and recommendations for future iterations to include any additional training that faculty may desire or the observer may have suggested. It is equally important to note that PRC members also submitted new modules to the PRC in their roles as teaching faculty. It was practiced in such occurrences that a PRC member who submitted a new module would recuse him or herself from the review of that module.

<table>
<thead>
<tr>
<th>Table 1 Faculty Team-Based Learning evaluation results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly disagree</td>
</tr>
<tr>
<td>At the beginning of the school year, my general attitude towards Team-Based Learning was positive</td>
</tr>
<tr>
<td>I was active in the development of Team-Based Learning sessions</td>
</tr>
<tr>
<td>Team-Based Learning sessions are a more effective student learning modality than traditional, stand-alone lectures</td>
</tr>
<tr>
<td>The students were well prepared for the Team-Based Learning sessions as a result of the pre-class assignments</td>
</tr>
<tr>
<td>I value Team-Based Learning sessions as an effective instructional method to facilitate student learning</td>
</tr>
<tr>
<td>My general attitude towards Team-Based Learning at the end of the school year was positive</td>
</tr>
</tbody>
</table>

**Conclusion**

One component of the faculty peer review process that we did not find in Levine’s structure was the AER or debrief session. However, our first-year experience resulted in a significant attitudinal shift towards TBL as an effective instructional method. Faculty identified the FPRP as a major contributing factor in the successful transition to the new TBL curriculum and to achieving less than 50% lectures. The AER feedback sessions were given special appreciation in the FPRP and sought after by faculty after the observations were no longer included as a formal activity in the process.

Faculty identified several strategies that contributed to their level of satisfaction with the newly implemented TBL pedagogy (1. Peer Review Committee, 2. TBL Faculty Development Workshops, 3. After Event Reviews, and 4. Peer Review Process). The goal was to serve as colleagues who observed the teaching of peer faculty and to foster improvement while supporting their teaching [21]. Careful creation and deployment of a mechanism by which faculty are supported throughout the process of TBL development and delivery can lead to a positive environment and increase the learning benefit for all involved.
Compliance with Ethical Standards

Conflict of Interest The authors declare that they have no conflict of interest.

Ethical Approval N/A

Informed Consent N/A

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