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TEAM BASED LEARNING- A NEW APPROACH FOR TEACHING PATHOLOGY TO MEDICAL STUDENTS

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Abstract:

Introduction: The practice of medicine is rapidly changing in a number of ways that have a profound impact of the demands faced by health educators in preparing their graduates for their future professional practice. Graduates now need to be motivated to become life-long learners capable of handling information that is being discovered on an ongoing basis. To respond to these challenges, a team-based learning (TBL) strategy was adopted.

Methods: The total no of participants in the study were 84, which were divided into 2 groups; group I (TBL teaching strategy) and group II (traditional method).Each TBL session consisted of pre-assigned reading (self-directed learning), in-class individual, and group readiness tests (accountability) and faculty-led class discussion (knowledge application). The course was assessed through scores from TBL session activities and course examinations, student satisfaction survey, comparison between the 2 groups and faculty feedback.

Results: Course grades were found to be higher in Group I (86.50) then Group II (78.71). Student evalu¬ation data (74.5% satisfied, 19.4% partially satisfied, and 6.10% dissatisfied) and faculty response indicated strong support for TBL as it was implemented in the course. The faculty noted a higher level of student engagement in Group I then Group II.

Conclusion: TBL is an active-learning instructional strategy for courses with high student-to-faculty ratios. This approach provides regular feedback and the opportunity for students to develop higher reasoning skills.

Keywords: Team based learning, Teaching, Medical Students, Pathology

Introduction

Reforming curriculum in medical schools has focused on reduction in contact hours to decompress crowded programs, an increased emphasis on independent learning, development of interpersonal skills, and problem solving (General Medical Council, 2002; Williams and Lau, 2004). To achieve these objectives it has inevitably meant that time has been reallocated from traditional areas of emphasis to new educational activities deemed to be more important. In some medical schools, this has led to curricula that offer diminished opportunity and little encouragement for students to learn the basic medical sciences (Williams and Lau,

2004). Even in less extreme implementations of reform, teaching of microscopic anatomy and pathology has often suffered disproportionately. In the field of medicine; the Accreditation Council for Graduate Medical Education has endorsed practice-based learning and improvement (PBLI) as a core competence for residents.[1-3] Building this competence requires more emphasis on experiential learning and resident participation in health care improvement projects.[4] To start to gain some of these experiential learning experiences while still in a classroom setting, there has been a shift from pure lecture environments to active learning that requires participation by students as they wrestle with "real-world" scenarios. The goal is to shift to a problem- and case-based learning methodology and student-centered instructional models to achieve the kind of learning that requires the critical thinking and problem-solving skills needed for professional practice.[5,6]

In an attempt to respond to these challenges, a team-based learning (TBL) teaching strategy was adopted. TBL is a relatively new teaching strategy in health education. Developed originally for business schools, which has been proved periodically to be consistent and productive.[4-6] TBL has been increasingly gaining interest in medical and other health professions education because of its potential to promote active learning without requiring a large number of faculty members. It allows a single instructor to manage multiple small groups in one classroom. TBL is learner-centered but instructor-led, uses a very structured individual and group accountability process, and requires small groups to work together to solve problems. Team-based learning strategy consists of three main phases. While a pure application of TBL would include all phases, the method allows flexibility for instructors to use selectively one or more of the phases, depending on the contextual demands of the course or session. The main phases are as follows. In Phase I (self-directed learning), learners read and study independently material defined by the instructor prior to coming to class. In Phase II (accountability and immediate feedback), learners complete an individual readiness assurance test (IRAT) to assess their basic understanding of facts and concepts learned in Phase I. Later, preassigned teams of five to seven learners complete the same test but in groups. Each team forms a consensus about each answer in a group readiness assurance test (GRAT). These consensus answers are scored for immediate feedback though an instructor-led discussion that takes place in class among the teams. Once the instructor feels that the students have mastered the core concepts through Phases I and II, the class moves into Phase III application activities. In Phase III (knowledge application and peer learning), students work in teams on group assignment projects (GAPs) that provide the opportunity to apply concepts learned on real patient cases. All teams work on the same problem at the same time. Teams share their answers to the application problems simultaneously for immediate comparison with other teams' solutions, which promotes total class discussion.

The purpose of this article is to describe how a traditional pathology lecture course was redesigned using a team-based teaching and learning model.

Methods

The teaching material for the pathology (wound healing and repair) module was restructured and transformed into seven lectures and seven TBL sessions. A backward design strategy was used in preparing each TBL session. For backward design the instructor needs to think backward by planning around what he or she wants students to be able to do when they finish the course, rather than what students should know as is done in conventional course design. Only then do instructors think about what students need to know. Our answers to this question guided us in selecting the reading material and the questions for the readiness assurance process, as well as in selection of the group projects scenarios. The total no of participants in the study were 84, which were divided into 2 groups; group I (TBL teaching strategy) and group II (traditional method). Each TBL session consisted of pre-assigned reading (self-directed learning), in-class individual, and group readiness tests (accountability) and faculty-led class discussion (knowledge application). The course was assessed through scores from TBL session activities and course examinations, student satisfaction survey, comparison between the 2 groups and faculty feedback.

Results

Course grades were found to be higher in Group I (86.50) then Group II (78.71). Student evaluation data (74.5% satisfied, 19.4% partially satisfied, and 6.10% dissatisfied) and faculty response indicated strong support for TBL as it was implemented in the course. The faculty noted a higher level of student engagement in Group I then Group II.

Discussion

Knowledge can be categorized into three areas: declarative knowledge, procedural knowledge, and a zone in between that includes the reasoning skills often described as critical thinking and problem-solving.[7-9] In the health professions, critical thinking and problem-solving are often loosely defined as clinical reasoning, diagnostic thinking, or clinical judgment. Critical thinking is the reflective process in which individuals assess a situation or evaluate data by comparing, analyzing, distinguishing, reflecting, and judging. Problem-solving is the "action-end" or implementation component of the overall critical thinking process.[10-14] Best practice strategies for helping students learn the reasoning skills of problem solving and critical thinking remain a source of assumption. A conventional written examination is usually considered a good assessment tool that is able to evaluate students' declarative knowledge but is limited to its ability to assess critical thinking and clinical decision making skills. On the other hand, the OSCE is a type of evaluation with real-world encounters that provides an opportunity for students to demonstrate their knowledge, skills, and strategies for implementing critical thinking and decision making skills. Nevertheless, questions have been raised about the capacity of available critical thinking measurement instruments to assess the type of clinical reasoning required by health care providers.[7,15-17]

Hendricson et al. described seven active learning practices that encourage the development of critical thinking and problem-solving skills. Among those are in-class activities that require students to analyze problem etiology, compare alternative approaches, provide rationales for plans of action, and predict outcomes; frequent in-class quizzing with immediate feedback on response correctness; and retrospective critique of cases in which decisions are reviewed to identify errors as well as exemplary performance.[7] In our study, TBL sessions with their IRATs, GRATs, and GAPs activities provided such an active teaching opportunity. The IRATs and GRATs with their following discussions between teams provided frequent in-class quizzing with immediate feedback on response correctness. Group projects (GAPs) with their following discussions were in-class activities that required students to analyze problem etiology, provide rationales for plans of action, and predict outcomes. Teams were able to compare different approaches taken by other teams to understand the similar aspect of the topic.

In this study, the TBL was introduced into the curriculum to address the shortcomings of conventional lecture-based learning and improve the active learning and critical reasoning experience of the students.Students' reflections on TBL indicated that TBL was a viable alternative to the typical classroom lecturing. TBL helped them understand basic concepts; encouraged clinical problem-solving; encouraged questions, discussions, and interactions; and helped students study consistently. Indeed, discussions with students both during and after the module showed that they felt they had to keep up with the material on a daily basis in contrast to the more usual mode of studying the last week before the exam. They also reported that the sense of competition between teams made learning more enjoyable and motivated them to be more prepared for class. Faculty members also felt that it was a more productive strategy that required less demand on faculty, yet still an effective means to delivering information. They noted that students came prepared; they were alert and engaged during sessions between students, between teams, and with the faculty; and attendance was near perfect.

The structured randomization that was used to group students was in accordance to what has been highlighted in educational research in relation to the positive impact of diverse input in problem-solving discussions on both learning and performance.[7,11,19-21] The collaboration that took place within teams to reacha consensus was powerful to watch.

With this being the first trial of utilizing TBL as a teaching strategy in our curriculum, the combination of conventional lecture-based and TBL teaching strategies gave the instructors the flexibility to cover topics they thought were not fully understood. in the TBL sessions. Lectures worked as a backup especially when outcomes of TBL were yet to be evaluated. Additionally, certain topics were well suited for TBL, while others were more challenging to teach using this teaching strategy. However, after the application of TBL, the instructors felt that the discussions that took place after the GRATs and GAPs were more than adequate to cover any information. As a matter of fact, the contrary happened. The GAP discussions allowed for incorporation of material taught during lectures.

The positive outcomes found in this study encourage broader application of this teaching strategy in other modules in our curriculum. Further studies are required to evaluate the applicability of TBL in other topics and

possibly compare results with previous classes that were taught by conventional methods.

Conclusion

TBL was found in this study to be an effective and flexible teaching strategy for delivering didactic information and improving students' clinical reasoning skills. TBL helped the academically weaker students to succeed and was an effective active-learning instructional strategy for courses with large student-to-faculty ratios. Faculty members felt more engaged with the students than in the conventional lecture-based classroom setting, and students considered working with other students an effective way to learn content and practice their clinical reasoning skills.

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