



Research

Student perspectives and learning outcomes with implementation of team-based learning into a videoconferenced elective

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Abstract

Objectives: The primary objective was to evaluate the learning outcomes following implementation of team-based learning (TBL) into a videoconferenced elective. The secondary objective was to compare student perceptions of TBL to a mixed methods model in the course.

Methods: For two course offerings, group presentations for eight topics were converted to TBL or were taught using a traditional discussion method. Students were surveyed after the TBL weeks and after the discussion weeks and perspectives were compared. Students' readiness assurance tests (RAT) and quiz scores were also evaluated. The majority of coursework was facilitated by faculty via videoconference from regional clinical sites, thus the faculty member was not on-site in the classroom with the students at the main or satellite campuses.

Results: All students ($n = 35$) completed both surveys. Team RAT scores were significantly higher than the individual RAT scores, $p < 0.001$. Quiz grades after TBL were significantly higher than quiz grades after discussions (89.3 versus 80.9), $p < 0.001$. Comparing the teaching methods, students (89%) preferred TBL versus traditional discussions.

Conclusion: Student feedback and outcomes were positive regarding the incorporation of TBL into a videoconferenced elective with faculty at off-site locations from students. TBL methods replaced discussions in subsequent course offerings.

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Introduction

Team-based learning (TBL) has become a popular method of teaching in the health sciences today. The development of small, self-managed learning teams in a classroom is one way to prepare students to work in professional teams and emphasizes application of material to real-world

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situations. Michaelson and Sweet¹ described the core principles of TBL to include (1) group formation, (2) student assurance of readiness (via independent and team readiness assurance tests), (3) student feedback and (4) application assignments. As educators became familiar with this method, published reports of TBL implementation in the classroom increased. Haidet et al.² recommended guidelines for publishing reports on TBL to include seven components, adding: (5) the four S principle for group assignments: significant problem, same problem, specific choice, simultaneous reporting, (6) incentive structure, and (7) peer evaluation, but note that not all elements are appropriate for every TBL experience.

In the 2016 Standards, the Accreditation Council for Pharmacy Education encourages admission of students who have “the ability to practice in a team-centered... environment” and states that graduates shall be “team ready.”³ TBL affords students one way to learn of working in a team. Reports exist of the incorporation of TBL into various pathophysiology, therapeutic, pharmacokinetic, and elective courses of pharmacy curriculums.^{4–12} There have been three published studies that specifically assess student perspectives and learning outcomes in courses conducting TBL via videoconference in pharmacy curriculums.^{10–12} Videoconferencing, in this course, is defined as a live, synchronous, and interactive distance classroom involving multiple sites. As health professional schools open multiple campuses, the use of videoconferencing for teaching increases. In the medical education literature, one study found no difference in students’ academic preparedness or achievement between students at the site-of-origin and receiving sites of videoconferencing and another determined videoconferencing to multiple sites of medical students was effective.^{13,14} Since the TBL method can be applied in many contexts, it is important to share the implementation strategies and outcomes of learners from courses in which it is used.

This study describes outcomes of a multi-year experience implementing TBL into an elective course within the Auburn University Harrison School of Pharmacy curriculum delivered via videoconferencing to multiple campuses. One aspect that makes this TBL model unique is that the majority of coursework is facilitated by faculty via videoconference from regional clinical sites and the faculty member is not on-site in the classroom with the students at the main or satellite campuses. The primary objective was to evaluate the learning outcomes following implementation of TBL into a Drugs in Pregnancy videoconferenced elective. The secondary objective was to assess student perceptions of the mixed methods model [problem-based learning (PBL), TBL, and discussions] in the course. This project was approved by the university’s institutional review board.

Materials and methods

This Drugs in Pregnancy elective course has been taught for 12 years in the school’s curriculum by the same course

coordinator, a full-time faculty member. The course coordinator has taught the course via videoconference to the main campus from a regional clinical site. During this time frame, a satellite campus opened and the course became available for students at both campuses via distance videoconferencing. Currently, the elective is a semester length course, meeting two hours once a week, with a maximum enrollment of 24 third-year professional pharmacy students. The initial format of the course encompassed case-based student group presentations on various topics. The course morphed into primarily a PBL format with two student group presentations each week (one topic per presentation) and an additional one or two faculty lectures each semester. The PBL format included one student group presenting a case and background on a disease state, options for pharmacotherapy management of the disease state in a pregnant patient, and then an assessment and plan for the case scenario based upon the week’s topic (e.g., hypertension). Students also were expected to incorporate answers to six to seven pre-assigned questions based on disease state objectives. The group presentation was followed by questions from the faculty and peers. No additional discussion or in-class activities occurred with this format. In 2012, the course was modified to a mixed method model, incorporating TBL and traditional discussions. Four full-time pharmacy practice faculty, including the course coordinator, taught in the elective and no faculty had prior experience with the TBL method. The students had not been exposed to TBL in other courses in the curriculum, thus exposing them to a new teaching method. Course topics remained the same as previous years.

For the 2012 and 2013 fall semesters, a primarily PBL-structured course with 22 topics was converted to mixed method teaching style including PBL, TBL, and traditional topic discussions. Specifically, eight PBL topics were converted to TBL or discussion (four each). The selection of these topics to a particular format (TBL or discussion) was based upon timing in the course and not on difficulty or class performance from prior years. Two faculty changed their PBL sessions to be in the TBL format using the Michaelson core components and two faculty changed their PBL sessions to be in a traditional verbal discussion format. Of note, the two faculty members who changed to TBL and one who changed to traditional discussion reside at regional clinical sites and taught via videoconference to the main and satellite campuses. The other faculty member who changed the format to a traditional discussion resides on the main campus and sessions were videoconferenced to the satellite campus.

In all, 16 and 19 students were enrolled in the course in 2012 and 2013, respectively. Of these, four students in 2012 and three students in 2013 were based on the satellite campus. Due to the size of the class and continuation of student-led PBL group presentations, students were allowed to self-select TBL teams with three to four students in each team creating five or six teams in the class. For both years,

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