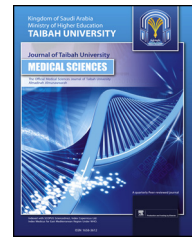




Taibah University
Journal of Taibah University Medical Sciences

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Student Article

Team-based learning in an undergraduate pathology curriculum and its effects on student performance

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Received 8 February 2018; revised 18 March 2018; accepted 20 March 2018; Available online ■ ■ ■

المخلص

أهداف البحث: يمثل 'التعلم المبني على فريق' استراتيجية تعليمية مستحدثة مثيرة للاهتمام. حيث يتم جمع الطلاب المتفوقين مع غيرهم في مجموعات تعليمية مما يساعد على تعزيز الكفاءات المهنية للطلاب، ويعتصم بشكل كبير على قابلية الطلبة للتعلم من بعضهم البعض. الهدف من هذه الدراسة هو تقييم فاعلية 'التعلم المبني على فريق' كاستراتيجية تعليمية، وتأثيره على الدرجة النهائية أيضاً. استكشاف آراء الطلاب عن هذه الاستراتيجية كطريقة تعليم حديثة في العالم العربي.

طرق البحث: أجريت دراسة مقطعية من خلال استبانة ذاتية التصميم. شُيّد الاستبانة لفحص جوانب من 'التعلم المبني على فريق'، بما في ذلك الإدراك، والمهارات الاجتماعية، و نوعية الأسئلة خلال محاضرات التعليم المبني على فريق. تمت دعوة 101 طالباً للمشاركة في الدراسة وأكمل 101 منهم الاستبانة. تم جمع نتائج كل من 'اختبارات ضمان استعداد الفرد' و 'اختبارات ضمان استعداد المجموعة' كما تم تحليل البيانات ومقارنتها بنتائج التقييم النهائي باستخدام البرنامج الإحصائي للعلوم الاجتماعية.

النتائج: درجات الطلاب خلال محاضرات التعليم المبني على فريق كانت دائماً أعلى من درجات التعليم المبني على الفرد. لوحظ وجود علاقة إيجابية بين درجة التعليم المبني على الفرد ودرجة الامتحان النهائي. 57% من الطلاب وافقوا على التعليم المبني على فريق ساعد في فهم المادة المطروحة في المحاضرة. 45% و

جودوا أن التعليم المبني على فريق كان مفيد و 67% من الطلاب و جودوا أن التعليم المبني على فريق ساعد في تحسين مهارات الاتصال والعمل الجماعي.

الاستنتاجات: كان التصور العام وموقف الطلاب تجاه نظام 'التعلم المبني على فريق' إيجابياً وواعداً. ومع ذلك، فإن هناك بعض الملحوظات ومجالات للقلق يجب إعادة النظر فيها ومعالجتها لتحسين 'التعلم المبني على فريق' كأداة تعليمية.

الكلمات المفتاحية: التعلم المبني على فريق؛ التعليم الطبي؛ التعلم المبني على؛ مشكلة؛ اختبارات ضمان استعداد الفرد؛ اختبارات ضمان استعداد المجموعة

Abstract

Objectives: Team-based learning (TBL) is a student-centered learning modality in which high and low achievers are organized in groups where students learn from each other at their own pace. The purpose of this study was to explore the correlations between TBL scores and final examination scores and student perceptions of a TBL system.

Methods: A cross-sectional survey was conducted on a sample obtained using quota sampling of a population of second-year students enrolled in the College of Medicine, University of Sharjah, Sharjah, United Arab Emirates. A self-administered questionnaire was employed to collect data on the students' perceptions and opinions, TBL scores, and final examination scores. The data were processed and analyzed using SPSS Version 22.

Results: A sample of 101 students participated in the study. The Team Readiness Assurance Test scores were consistently higher than the mean Individual Readiness Assurance Test (IRAT) scores. The results found a

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Peer review under responsibility of Taibah University.



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statistically significant correlation between the IRAT and the final examination scores ($r = 0.46$, $p < 0.001$). About 57% of the sample agreed that TBL increased the understanding of course content, 45% reported that TBL was a useful learning activity, and 67% indicated that TBL enhanced interpersonal and communication skills.

Conclusion: The findings imply that TBL is an effective tool to facilitate inter-professional and team-based learning outcomes. Collaborations among TBL group members help learners to develop communication and interpersonal skills and to gain knowledge.

Keywords: Communication skills; Interpersonal skills; Medical students; Student-centered learning; Team-based learning

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Introduction

Parmelee (2012) defined team-based learning (TBL) as a student-centered, subject-specific, directed instructional strategy that promotes active learning in small groups.¹ Larry Michaelsen introduced and integrated TBL into the medical field in 2001.^{2,3} This modality provides students with opportunities to apply their knowledge through a series of activities comprising individual work, teamwork, immediate feedback, and application to problem-solving task-based assignments. TBL has three stages: (1) student preparation based on generated and provided session objectives, (2) assessment of the preparation through the Individual Readiness Assurance Test (IRAT) and the Team Readiness Assurance Test (TRAT) followed by immediate feedback, and (3) problem-solving in groups in the context of a provided clinical scenario.^{2,3}

Many active learning strategies are currently being used, including case-based group discussion, workshop, and audience response. Although these learning techniques are effective for increasing student engagement, they also have been extremely resource intensive. In contrast, TBL strikes a balance among active learning, faculty teaching time, and resources.⁴ Its immediate feedback, self-reflection, meaningful peer evaluations, and peer-assisted learning process are cornerstones of the learner-centered educational strategy.¹

The first application of TBL in professional healthcare education occurred at Baylor College of Medicine in 2001.⁵ Currently, TBL is being implemented at schools of medicine, nursing, dentistry, pharmacy, and in residency programs worldwide, including Japan, Korea, Singapore, and the Middle East.⁶ Apparently, TBL has gained considerable popularity during the past two decades based on its perceived effectiveness. The goal of this study was to empirically determine the effects of TBL on students' independent and team-based learning by statistically

assessing the relationship of this active learning modality to performance on final examinations intended to assess learning outcomes. An alternative way to assess learning would be to compare student perceptions of TBL to their perceptions of problem-based learning (PBL).

Materials and Methods

A single-stage, cross-sectional survey without random sampling was conducted. All of the respondents ($n = 101$) completed a structured self-administered paper questionnaire comprising 24 multiple-choice questions with response options on a Likert-type scale. The questionnaire had five sections: (1) contents of the TBL, (2) opinions of the TBL process, (3) perspectives on the material covered during the TBL sessions, (4) perspectives on the TBL assessments, and (5) the effects of TBL on communication and interpersonal skills. Because instruction at the College of Medicine, University of Sharjah, is in English, the questionnaire, which was administered in academic year 2015–2016, was in English. All of the available respondents were interviewed, the questionnaire was explained to them, and the respondents' anonymity was assured. Before distributing the questionnaire, the administrators explained the study's objectives to the respondents, and they were informed that their participation was voluntary and based on their consent.

This study aimed to determine the effects of TBL for second-year students in an undergraduate pathology curriculum. The undergraduate curriculum at the College of Medicine, University of Sharjah, Sharjah, United Arab Emirates, is a six-year integrated hybrid PBL outcome-oriented curriculum in which the pathology courses that focus on basic medical science are spread throughout the first three years. All of the study's respondents were students in their second year undertaking the cardiology, respiratory, and endocrine blocks offered in the "first semester of the second year." The students were organized into 10 groups of about nine to 11 students per group. The three phases of the TBL process are described in Table 1.

During the study period, there was one TBL session per week, each of which lasted for at least 2 h, comprising of 12 multiple-choice questions (MCQs) and conducted by one faculty member. The objectives of the TBL sessions were posted on Black Board® one week before the TBL sessions. Before the sessions began, the faculty member made certain that the participants were correctly seated in an examination format. Then, the faculty member distributed the Scantron™ form used to complete the IRAT; the Scantron™ used for the TRAT was provided only to the group leader.

During the TBL sessions, the students were given 90 s to attempt each MCQ on the IRAT and TRAT. Topic experts had developed all of the MCQs, each of which included a short clinical vignette, laboratory data, imaging studies, and high-resolution photographs depicting gross and histopathological findings relevant to that week's learning objectives. The MCQs were displayed in timed PowerPoint™ presentations.

The students indicated their answers to the IRAT and TRAT MCQs on individual Scantrons™. The IRAT Scantrons™ were collected at the end of IRAT testing period. During the TRAT, the students worked in predefined

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