Team-Based Learning in a Physiology Course To Prepare for The International Inter-Medical School Physiology Written Quiz in Kunming Medical University

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Abstract

Background

International Inter-medical School Physiology Quiz (IMSPQ) is a global event that purportedly engages students in team work, critical thinking and active learning of physiology. Team-based learning (TBL) is an interactive analytic teaching approach and has been used extensively in medical education. However, there is little evidence of its use in preparing for IMSPQ. The purpose of the present study was to investigate whether a TBL approach is effective to prepare for the written section of IMSPQ.

Methods

Five students from Grade 2014 majoring in Clinical Medicine, were selected, based on academic performance in physiology and English, to be taught in a TBL physiology course to prepare for the written section of 14th IMSPQ.

Results

In 2016, this TBL teaching method worked well and for the first time the team from Kunming Medical University entered the top forty teams at the written competition of 14th IMSPQ in Yogyakarta.

Conclusion

TBL method was effective to prepare for the IMSPQ in Kunming Medical University and provided an improved team performance in the written section of 14th IMSPQ.

Background

The annual International Inter-medical School Physiology Quiz (IMSPQ) was initiated in 2003 at the University of Malaya, Kuala Lumpur, Malaysia [1, 2]. In July 2016 nearly 350 students and 100 accompanying lecturers representing 81 medical schools from 23 countries gathered at the Universitas Gadjah Mada in Yogyakarta, Indonesia to take part in the 14th IMSPQ [3]. A growing number of participating international teams has become a regular feature of the IMSPQ [2]. IMSPQ stimulates interest of the medical students from all over the world by encouraging team work, active learning and critical thinking. Now, the IMSPQ has become a useful platform for international students and accompanying lecturers to share their interest in the learning and teaching of physiology [4]. The Physiology Department of the Basic Medical Science School at Kunming Medical University has been sending teams for IMSPQ every year since 2013. In the first three years, our students took part in the written test, but never entered the top forty, so we were not qualified for the stage of oral competition.

Team-based learning (TBL) in medical education has emerged over the past few years as an effective strategy for enhancing active learning and critical thinking [5]. TBL and IMSPQ have the same goal of promoting education; therefore, we hoped that TBL could be an appropriate modality to help prepare our students to be more successful in the written test of IMSPQ.

Although many studies have reported positive outcomes for TBL courses, there has been little evidence of its benefits in preparing for IMSPQ. The purpose of present study was to determine whether this teaching approach was effective in preparing for the written section of IMSPQ in Kunming Medical University.

Methods

The present study was conducted by the School of Basic Medical Science at Kunming Medical University in a five-year undergraduate program for students majoring in Clinical Medicine. The “Miracle Team” in our school for 14th IMSPQ was composed of four female students and one male student. This small group was selected based on both their academic performance in physiology and their proficiency in English, representing the most competitive Grade 2014 undergraduates majoring in Clinical Medicine in our school.

In the middle of the third semester, we arranged a special written test followed by interviews to choose a team of five. The top five students were selected from five different classes in Grade 2014, Department of Clinical Medicine. During the fourth semester, there was a 20 week long physiology course with a total of 80 class hour. This course was taught in English using a TBL approach to a small group of five students to prepare for the written section of 14th IMSPQ.

The TBL was conducted in three phases. Phase one was a preparatory phase, one week before this session, the students were directed to study materials through a variety of ways, including textbooks, library and internet. Phase two was a readiness assurance test. In the individual readiness assurance test, a 10-question, closed book, multiple-choice quiz was completed by each student individually within 20 min. The questions were focused on fundamental concepts. Immediately after the individual readiness assurance test, a group readiness assessment test was performed. The same 10 questions used in individual readiness assurance test were administered to the team with a 30 min time limit and the group was required to select the answers after team discussion. This process provided opportunities for collaborative problem solving and peer teaching. Phase three was the application of course concepts. The exercises used in this session required the students to summarize and analyze content based on the knowledge they had learned [6]. We chose Professor Cheng’s book “Physiology Question-Based Learning” for the application exercises [7]. During the entire TBL, the instructor would provide help when needed. At the end of each TBL, the instructor and students completed an evaluation of this class in oral form.

Results

In 2016, we used a TBL approach to prepare for the written quiz and the five students' team did extremely well. At the 14th IMSPQ in Yogyakarta, for the first time, the team from Kunming Medical University entered the top 40 teams and got 20th among 81 teams in written test.

Discussion

The goal of our research was to determine whether TBL is effective in preparing for the written section of IMSPQ. In 2016, we used a TBL to prepare for the written section of IMSPQ. At the 14th IMSPQ in Yogyakarta, the performance of the team from our school was markedly improved, placing 20th among 81 international teams in written test.

Considering TBL was a new teaching strategy in our physiology course, the first important thing for the teacher to do at the beginning of the preparation process was to create an inclusive student-centered learning environment and to maintain an open mind and a willingness to accept new ideas. In an atmosphere of genuine mutual respect, the students felt safety and quickly became active participants, and then developed a positive attitude toward the team work [8]. For example, the name and slogan of our team was a result of cooperation between teacher and students. The students hoped to create a "miracle" in the written test of IMSPQ and our team was named "Miracle Team". The teacher encouraged the five students to work together and our slogan was "Never abandon, never give up!"

The second most important thing was to guide the selected five students to work effectively as a team. To achieve this, instructor should have skills to facilitate group discussion and activate students to promote thinking and problem solving [9]. In the Grade 2014, Department of Clinical Medicine, physiology course was completed in the third semester, but the medium of instruction is not in English. Although these five students had passed College English Test Band Six, the English curriculum was still difficult for them. In our actual situation, we chose "Broad Review Series-Physiology (fifth edition)" as the first textbook and believed that this book was appropriate to the education level of our students. In order to foster effective teamwork, the five students were encouraged to rotate as team captain. During this exercise, the student would responsible for making a study plan as well as evaluation. TBL was conducted once a week, and then the students would receive immediate feedback from the instructor. During this TBL process, team members learned that they were not on their own and established mutual credibility. After several weeks of TBL, the five students were not only more willing to participate but also more committed to and excited about TBL.

Creating a group application exercise is also very important for effective TBL. These problems required students to use all their previous knowledge and their team brainpower to analyze, interpret and then commit to a choice or a decision. By using well designed questions, students not only learned from each other but also developed a great deal of confidence in the value of working in a team [5]. In 2015, Quiz Master Professor Cheng published a book which included a collection of IMSPQ related questions, and these questions mainly tested key concepts or fundamental understanding of physiology rather than

mere recall [1, 3]. Therefore this book acted as the source of application exercises in our preparation process.

This was an unusual semester, in which we witnessed something like a miracle. In the entire preparation process for the written section of IMSPQ, the students and instructor were clearly accountable for behaving in ways that promote learning. The teacher enjoyed a sense of renewed energy and satisfaction when teaching in this way; it is very different from traditional didactic lectures. This study has given an example of how to implement a TBL to prepare for the written section of IMSPQ and how it can be of value to both learners and teachers. We would like to introduce this strategy to more teams, and we believed that it will provide not only an enjoyable experience, but will also improve outcomes even if you are not from a top university.

Limitations

There are several limitations for this research. First, medical schools across the globe are eligible to send a team of 3–5 students to participate in the IMSPQ. In 2016, Kunming Medical University sent one team to take part in the 14th IMSPQ and only five selected students experienced TBL lessons. Second, since there was only one team, the study design did not compare the 5 selected students' performance among different teaching methods. Finally, it is important to note that this study was a small pilot project, and in actual situation, our students did not qualify for the stage of oral competition in the first three years. So the aim of “Miracle Team” for 14th IMSPQ was try to enter the top forty in the written test and we did not prepare for the oral part of the quiz. Further study can explore the effects of TBL in preparing for the oral section of IMSPQ.

Conclusion

Taken together, using TBL method to prepare physiology team for the written section of IMSPQ was not only an enjoyable experience it also provided a markedly improved performance in the quiz.

Abbreviations

IMSPQ

International Inter-medical School Physiology Quiz; TBL:Team-based learning

Declarations

Acknowledgments

Not applicable.

Author's contributions

HB designed the study. HB wrote the main manuscript. HB and YB edited and revised the manuscript. All authors approved the final version of the manuscript.

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Availability of data and materials

Not applicable.

Ethics approval and consent to participate

The study was approved by the Institutional Review Board and the Ethics Committee at Kunming Medical University. The informed consent was obtained from the students participated in the study.

Consent for publication

Not applicable.

Competing interests

The authors declare that they have no competing interests.

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