

Correlation between group discussion and examination result in Problem Based Learning

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Abstract

Background: Problem-based Learning (PBL) is one method used in conducting a competence-based curriculum. Group discussion plays an important role in PBL, and students have the opportunity of obtaining more information to meet their learning objectives and improve their knowledge. The aim of this research was to study the correlation between group discussion results and the final score of the theoretical examination.

Method: Second-year medical students Faculty of Medicine, University of Indonesia (n=214, 85 males and 127 females), who took the Cardiovascular module completely were included in this study. Group discussion and summative test scores were collected and analyzed using SPSS program version 10.

Results and Discussion: The correlation between scores obtained in the group discussion and theoretical test was significant, with Pearson Correlation = 0.218, significant at 0.01 level (2-tailed).

Conclusion: There was a significant correlation between group discussion scores and theoretical test scores.

Background

Problem-based Learning

The first problem-based learning (PBL) curriculum was introduced by McMaster Medical School in Hamilton, Ontario in 1969. In Europe, PBL was first introduced by the University of Maastricht medical school (1974). Problem-based learning has been primarily applied in pre-clinical years; however the University of Manchester has used it during the clinical clerkship. This method has also been used by other disciplines, such as Health Sciences, Law, Business Studies and Economics (David *et al.*, 2003).

The principle of PBL is group discussion. The students are given a trigger, after which they analyze the problem, determine their learning objectives and search for information in order to meet the learning objectives (David *et al.*, 2003; Branda, 1990; Maudsley, 1999). They share the knowledge obtained and may develop further questions. Students not only acquire knowledge, but also learn how to communicate and argue constructively with others, working in groups, developing initiative, sharing information, and respecting other opinions. In addition, they learn how to develop contextual learning, relate the trigger with clinical problems or situations (David *et al.*, 2003; Branda, 1990). On the other hand, the tutor/facilitator plays an important role in directing the students and stimulating group interaction; guiding and motivating students to learn what should be learned (David *et al.*, 2003). *Effective tutors are those who encourage active learning, tolerate silence and only make appropriate interruptions* (Maudsley, 1999).

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In PBL, self-directed learning (SDL) is an important part; PBL cannot be effective without SDL. Self-directed learning is a major requirement for maintaining standards of competence in professional practice (Branda, 1990).

Assessment in PBL

Student assessment in PBL must be aligned with the learning objectives (David *et al.*, 2003; Amin & Hoon, 2003; and Savin-Baden & Major, 2004). According to Amin and Hoon (2003), student assessment in PBL should consider the following matters:

1. Not merely test the factual knowledge
2. Should provide feedback not only to students, but also to teachers
3. Should assess process skills: problem identification, problem-solving, and application of knowledge in practice

Therefore knowledge, behaviour and skills should be assessed. Student assessment can be done informally or formally in order to get more opportunities for achievement (David *et al.*, 2003; Amin & Hoon, 2003; Savin-Baden & Major, 2004). Content knowledge can further be assessed by using MCQ, MEQ, essays etc. (Amin & Hoon, 2003).

New Curriculum in the Faculty of Medicine, University of Indonesia

Before 1995, the Faculty of Medicine, University of Indonesia (FMUI) applied traditional teaching methods mainly consisting of lectures and practical laboratory activities. In 1995, FMUI developed a curriculum using the PBL approach. Unfortunately it was not implemented well due to a lack of staff understanding and support. In addition, the facilities were also not ideal.

In the year 2005, the Ministry of Education declared that all medical schools should conform to a new competency based curriculum. The curriculum comprised of self directed learning and active learning. To implement the curricular reforms, FMUI developed the Faculty Curriculum 2005. This new curriculum was prepared within 6 months by the Medical Education Unit with support from other academic staff members who were concerned about medical education. Supporting facilities were completed including rooms for

discussion, audio visual aids, books, 24-hour library facilities, computer lab, skills lab and other laboratory facilities. The five-year curriculum uses PBL as one method of choice, mainly in medical sciences. During the last year of study, the 6th year, students will have their internship programme which is conducted by the collegiums of professional groups.

Other methods used in this curriculum are lectures, basic clinical skill practices, laboratory activities, plenary discussions and other modules on research and empathy. In addition, in the cardiovascular module the students visit the Cardiac Center Hospital in order to improve their knowledge and understanding of the cardiovascular system.

To evaluate the cardiovascular module, a study was conducted to determine the correlation between group discussion results and the final score at the theoretical test.

Method

Second-year medical students, Faculty of Medicine, University of Indonesia (n=212; 85 males and 127 females) who had taken the Cardiovascular module completely were included in this study. Only 2 students who had not completely attended the activities were excluded. The module was conducted during 6 weeks and consisted of 5 triggers (problems), 23 hours of lectures from several disciplines, 25 hours of group discussion, 46 hours of self study, 16 hours of training in basic clinical skills, 24 hours of laboratory work and 20 hours of plenary discussion.

The group discussion

Group discussions were held twice a week for periods of 2-3 hours, supervised by a trained facilitator. The students were divided into 21 groups, each evaluated by one facilitator for five weeks; 21 evaluators were involved in this study. Each group consisted of 10-12 students, selected considering their GPA, so that students were evenly distributed. The facilitators completed a student evaluation form consisting of items on sharing, knowledge, argumentation, activities, dominancy, disciplines, and attitude. Figure 1 demonstrates the student evaluation form.

Questionnaires distributed to the students collected information on the learning facilities, the Students' Guide, lecturers, cases, facilitator performance and assessment. How well the facilitator helped the students during group discussions was graded as strongly agree, agree, not agree, and strongly not agree. The alignment of the tests with the learning objectives was also graded as mentioned above. Assessments were graded as very difficult, difficult, easy, and very easy.

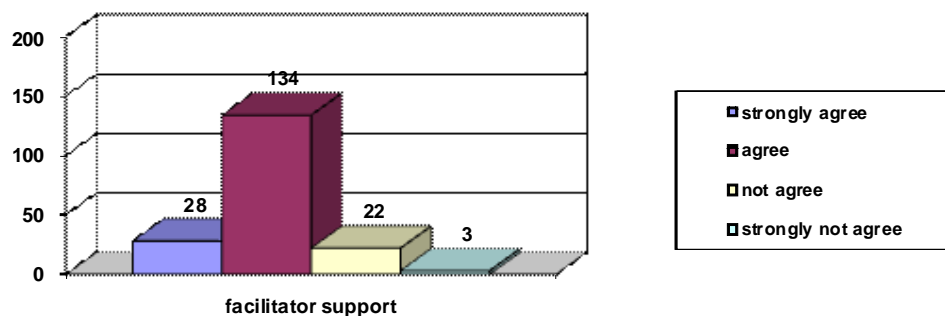
Results and Discussion

Correlation between scores obtained during the group discussion and the theoretical test was significant, with Pearson Correlation Sig. (2-tailed) = 0.218. The correlation was significant at the 0.01 level (2-tailed). In fact, the mean of theoretical score (66.26) was lower than the mean of group discussion score (86.55). Nieminen *et al.* (2006) found that group functioning and case quality correlated with students' course grades. Of the 212 questionnaires distributed, only 187 completed questionnaires were handed over. Learning facilities such as

discussion rooms, practical lab, reference facilities etc. were found to be satisfactory. Most of the students had understood the Students' Guide (72.9%) and the objectives of the module (79.8%). They also agreed that almost all of the lecturers explain the learning material clearly. The cases were reported to have helped students in understanding the learning objectives.

Twenty eight students (14.97%) strongly agreed and one hundred and the thirty four students (71.66%) agreed that the facilitator helped and directed them during group discussion (figure 2). Only 13.3% students were unsatisfied with their facilitator performance. As the facilitator performance was high, it may also have supported students in obtaining high scores in group discussion. This study is similar to one by Dolmans *et al.* (1999) that showed the average tutorial group productivity score was higher if the tutor performance was higher. Group productivity and tutor's performance have an impact on the effectiveness of PBL modules (Dolmans *et al.*, 1999; Dolmans & Wolfhagen, 2005).

Figure 2 : The role of facilitator in helping and directing students



As demonstrated in figure 3 the 1st summative test was rated as very difficult by 68.6% students and as difficult by 30.3%. They stated that the test materials were not aligned well with the learning objectives. Of the students, 61.2% stated that the 2nd summative was very difficult

and 23.9% stated that it was difficult. However, the 2nd summative material test was reported to be appropriate with the learning objectives. This can be demonstrated by a low mean value from score obtained in the summative tests (66.26).

Figure 3: Students' perception about the difficulty level of the exam

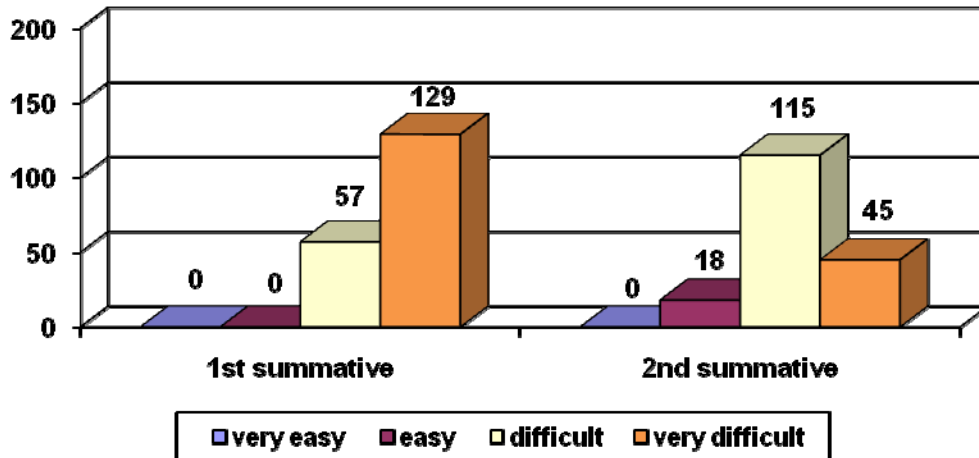
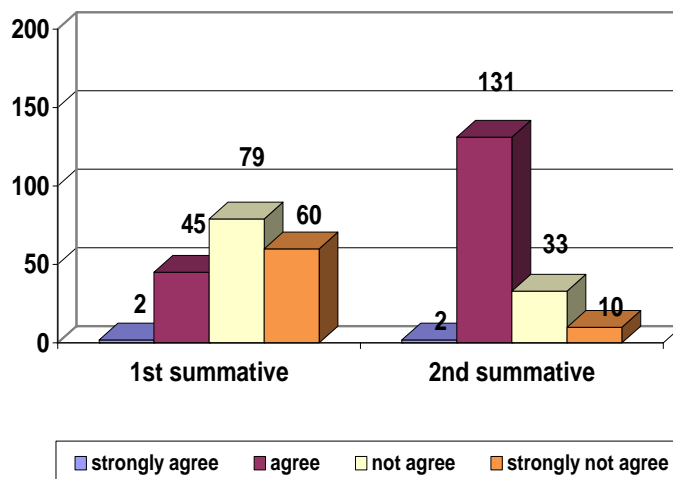


Figure 4: Student perception on the alignment of exam material with the learning objectives



Therefore, there are two possibilities that support the low correlation between the summative test and group discussion score. First, that the examination was too difficult for the students and less aligned with the learning objectives. Second, even though the facilitator performance was high, they may have been too generous in marking the students during the group discussion or may have a little knowledge in giving appropriate scores. Therefore, student evaluation should be changed, after careful review and exclusion of test material that is too difficult. Academic staff should be trained, especially in student

assessment in order to sufficient knowledge about construction of good questions, how to mark the students etc. In addition, the evaluation form can be revised to include the score range, so that the total score would be more reliable. To decrease the bias one of a single facilitator marking group discussions, the facilitators can be rotated weekly so that each group is scored by more than one.

As a final result, only 3 students failed in the module. These students were found to have had problems in several other modules as well.

Conclusion

There was a significant correlation between the group discussion score and theoretical test score, even though the correlation was low. Further studies should be conducted to study the impact of Problem Based Learning on students' learning abilities.

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