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Implementation and evaluation of the debate-style tutorial study in a third-year dental curriculum in Japan

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We introduced a debate-style tutorial exercise into the third-year tutorial classes with the purpose of developing the students' logic, broadening their vision and encouraging them to express their opinions in public, before an audience. The issues for debate included medical (dental) and non-medical topics. Two separate debate exercises were performed and each session concluded with an open debate. The groups' performance was evaluated by the audience, which included students and tutors. The groups received high scores; their understanding of the subjects was superior and they provided logical arguments using good presentation skills. The program appeared to have had the desired results. Thus, it was suggested that the introduction of debates into the curriculums of lower classes would be effective in teaching students new ways of thinking about problems. This would prepare them suitably for future education.

Debate, tutorial classes, problem based learning, dental education, decision-making

INTRODUCTION

The improvement of the education system requires continuous efforts by educators. Trials continue to be conducted in various areas for the development of new and effective educational methods. Among these, medical education is likely to be subjected to change. This is primarily due to the innovative nature of the field; it is also due to the strong social demand that future doctors should acquire sufficient interpersonal skills to deal with various patients. The manner of imparting medical education has been changing from a lecture-based, one-way approach to a more self-directed manner of study. As an alternative to passive lectures, 'problem based learning' (PBL) has been incorporated into medical and dental education (Schmidt, 1993; Barrows, 1998; Last, 2001; Pau and Croucher, 2003). PBL education, now widely employed in various areas of education, was initially developed at McMaster University in Canada in 1969 (Neufeld, Woodward and Macleod, 1989). Since then, a number of medical schools in the West have adopted PBL programs into their curriculums in various modified forms and have reported the results (Albanese and Mitchell, 1993). Khoo (2003) evaluated PBL programs in Asian medical schools and reported that Asian students had accepted PBL as well as schools in the West had. In

Japan, PBL was rapidly introduced in the medical curriculum during the past decade (Kozu, 1997). However, alongside the spread of PBL education, there have been conflicting reports regarding its effectiveness and efficiency. One report favoured PBL in comparison to the traditional passive lecture (Norman and Schmidt, 2000); others raised doubts regarding its effectiveness (Colliver, 2000; Albanese, 2000).

Tutorial education was introduced in the Okayama University Dental School in 1999. The curriculum requires the students to attend tutorial classes in their first, third and fifth years of study. The first-year tutorials focus primarily on 'how to learn'. For example, methods of obtaining information and participating in group study on a functional basis are taught (Kuboki et al., 2000). The main purpose of the final, fifth-year tutorial, is to study 'evidence-based medicine' (EBM). The students are presented with diversely designed clinical cases for which they attempt to formulate a treatment regimen or a suitable strategy based on EBM (Miyamoto et al., 2002). In the past years, tutorial study in the third year had been carried out as an intermediate program linking first- and fifth-year exercises. Thus, the style depended on the chief tutor in each year. As part of the exercise, an informal debate was held within the group for the analysis of a given issue. This led us to realise that debates might be beneficial for students, which in turn prompted us to introduce a full debate format into the tutorial classes. In this paper, we report the results of debate-style tutorials that were incorporated into the third-year classes of the Okayama University Dental School in 2003.

METHODS

The first session

Two sets of sessions on debate-style tutorial exercises were conducted during the first and second quarters of the third-year classes. Fifty third-year students and six bachelor graduate entrants were divided into 11 groups. Each group comprised four to six students and was divided into half for the purpose of debating. In the first session, the debate was conducted within the group. The general topic was 'Life' and the students selected the following themes.

a) The government should legalise euthanasia.

b) The government should prohibit smoking and the sale of tobacco.

c) The government should promote the fluoridation of the water supplied to people.

d) The government should increase the promotion of preventive medicine.

e) The government should prohibit the use of IRESSA (a drug for lung cancer in relation to which several fatal side-effects have been reported).

f) Use of disposable products: right or wrong?

g) Production of genetically modified food: right or wrong?

h) The Japanese *yutori kyoiku* (a less intense education system with reduced curriculum): right or wrong?

The second session

The second debate was conducted between groups that took the affirmative stand and groups that took the negative stand on a certain issue. The general topic chosen for the second exercise was 'Insurance' and the students selected the following themes.

a) The government should maintain a public medical care insurance system for all citizens.

b) Insurance should provide cover for health screening.

c) Insurance should provide cover for aesthetic dental treatment.

d) Insurance should provide cover for dental treatments involving implants.

e) Insurance should provide cover for alternative medicine.

Each week, 180 minutes were allocated to the core tutorial classes; the first and second sessions were allocated six and three weeks respectively. The study of the second session concluded with an open, formal debate. The debate format was as follows: constructive speech by the side defending the affirmative position (5 minutes); cross-examination by the side defending the negative position (2 minutes); constructive speech by the side defending the negative position (5 minutes); cross-examination by the side defending the affirmative position (2 minuets); rebuttal by the side defending the negative position (3 minutes) and rebuttal by the side defending the affirmative position (3 minutes).

Evaluation

Each session concluded with a debate-style presentation. Each group and tutor then evaluated the other groups' performance. In the first session, the group presentations were evaluated according to the following five criteria: originality, logical manner of presentation, scientific point of view, appeal and preparation. Each item was graded on a scale of 1–4 (4: excellent; 3: good; 2: average and 1: inferior.) In the second session, the open debate was evaluated according to the following five criteria: problem analysis, argument and evidence, rebuttal, construction of speech, and questions and answers. Each item was graded on a scale of 1–4, as in the first session. For the assessment of individual students in the process of the tutorial study, we adopted the style of the Tokyo Women's Medical University and the tutors evaluated the skills and attitudes of the students in accordance with the university's evaluation sheet (Kozu and Ishii, 1996). Each student was evaluated for the following four items: extraction of learning subjects and recollection of related matters from given problems, selection of the objects of study, planning and implementation of study, and attitudes in the group study. The above four items included five sub-categories which the tutors checked whether the students met the required standards.

RESULTS

The first session

Of the 56 students, only three had had previous debating experience. Therefore, in the first session, the debate was conducted within each group in order to get the students accustomed to it. The students appeared slightly puzzled in the first class, but with the tutor's help, they soon accepted the concept and became interested in the debate format. In addition, they understood its effectiveness as a tool to address problems, and this appeared to be a fresh and joyful experience for them.

Table 1 lists the positions of the 56 students with regard to each proposition. The number of affirmations and negations varied among the propositions; however, one proposition gave rise to 100 per cent affirmation. Although such a proposition might be inappropriate for a formal debate, we adopted it for the first session in order to observe how the students defended its negative position. The proposition was: The government should increase the promotion of preventive medicine, which sounds plausible. However, the students who took a stand against the proposition refuted the others by pointing out the lack of reliable medical tests for gauging the quantifiable efficacy of the medicines as well as the fear that such a policy would interfere with the privacy of individuals. A student who took the affirmative stand described in her 'impressions' that while these refutations did not change her position, the degree of her conviction was substantially altered after the debate. She appeared to feel that blindly accepting what was advocated might

prove dangerous. Each group was allotted 20 minutes for the presentation and the students clearly stated the points under discussion for each issue. Among the various propositions tested, the proposition regarding IRESSA (Gefitinib, a drug for lung cancer) yielded the highest score. The debate was the efficiency of the drug versus its adverse side-effects. The group chose this proposition because it was ideal for the so-called 'merit versus demerit' treatment and developed their arguments using this debate model. As shown in Figure 1, the average score of the student groups for five items was above 3 ('good'); the exercise was very fruitful as the score for 'logic' was the highest of all the scores. Thus, the exercise appeared to have been effective, since one of the reasons for incorporating the debate system was to improve the students' ability to reason logically.

Table 1. The propositions in the first session and the students' positions on them

Propositions	Affirmation	Negation
The government should legalise eutahansia	44	12
The government should prohibit smoking and sale of tabacco	23	33
The government should promote the fluoridation of the water supplied to people	31	25
The government should increase the promotion of preventive medicine	56	0
The government should prohibit the use of IRESSA	22	34
Use of disposable products: right or wrong?	36	20
Production of genetically modified food: right or wrong?	27	29
The Japanese *yutori kyoiku*: right or wrong?	21	35

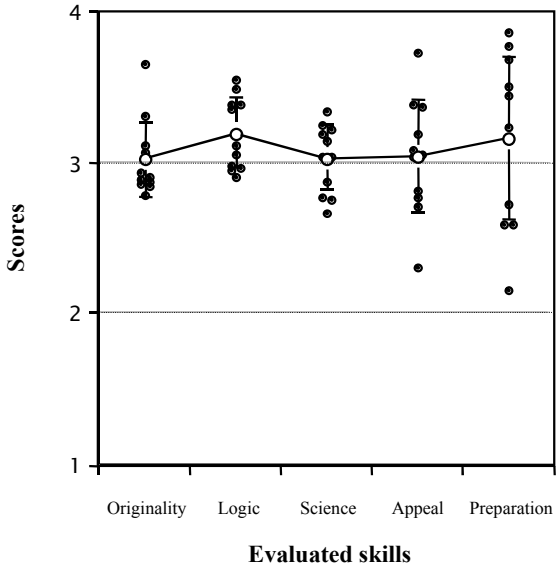

Figure 1. The distribution of the scores for group presentation in the first session

Each group presentation was evaluated according to the following five items: originality, logic, science, appeal and preparation. Each item was graded on a scale of 1–4 as follows: 4: excellent; 3: good; 2: average and 1: inferior. The open circles with error bars represent the mean scores and standard deviations for each item.

The second session

Table 2 lists the students' positions on the propositions before the second session and after the debate. In one case, the students' positions were reversed; in another, the degrees of affirmation and negation changed greatly. Unfortunately, the second session was extremely short and it was not possible to consider the given issues in detail. In addition, this was the first time that the students had performed in an open, formal debate in public before an audience. Consequently, some of the debates had little climax. On the basis of the low scores in the 'rebuttal' and

'questions and answers' sessions (Figure 2), it can be judged that most of the groups spent a considerable amount of time studying the system of insurance and each given issue, both of which were unknown subjects for the third-year students. Under such conditions, the debate on the topic 'Insurance should provide cover for health screening' was a mature one. This was probably because the students had gained some experience while debating a similar proposition, 'the promotion of preventive medicine', in the first session.

Table 2. The propositions in the second session and the students' positions on them

Propositions	Affirmation : Negation before → after
The government should maintain the public medical care insurance system for all citizens	42 : 8 → 42 : 7
Insurance should provide cover for health screening	39 : 11 → 25 : 24
Insurance should provide cover for aesthetic dental treatment	18 : 32 → 15 : 34
Insurance should provide cover for implant dental treatment	38 : 12 → 19 : 30
Insurance should provide cover for alternative medicine	20 : 30 → 23 : 26

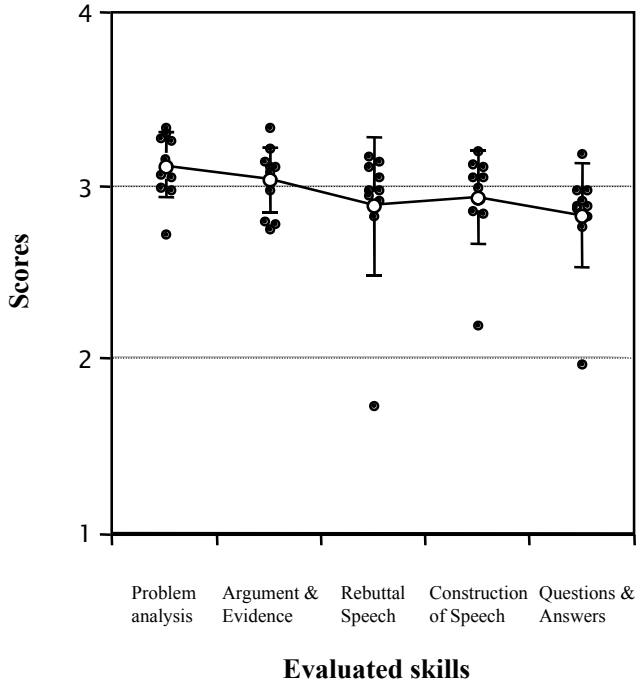

Figure 2. The distributions of the scores for open group debate in the second session

Open debate was evaluated for each group according to the following five criteria: problem analysis, argument and evidence, rebuttal speech, construction of speech and questions and answers. Each item was graded on a scale of 1–4 as follows: 4: excellent; 3: good; 2: average and 1: inferior. The open circles with error bars represent the mean scores and standard deviations for each item.

DISCUSSION

Debate-style tutorials

The incorporation of debates into the education system is more common in the West, where they are considered to play an important role in providing students with various skills, such as how to consider, analyse, state, listen, communicate and make presentations (Huryn, 1986; Green and Hadley, 1990; Crone, 1997). Dundes (2001) has reported a case in which a small group debate was conducted in a criminal justice class. She found that debating was beneficial in helping the

students to think through their problems with maximum involvement. The PBL tutorial study introduced in many medical school curriculums is expected to help students to acquire a self-directed style of study, including ways of learning subjects by themselves along with solving the given problems. Although the goals are not the same, it is thought that the process of a small group debate may cover parts of the educational aims of the tutorial study in lower classes. Therefore, a formal debate was conducted as part of the third-year tutorial exercise.

As an educational tool, the formal debate exceeded our expectations. In the case of certain propositions, this was the first time that the students had been forced to look at an issue from a point of view that was different from their own, which greatly helped them to consider the problems from a variety of perspectives and contributed in the fostering of their objectivity. In addition, they learnt the importance of logical reasoning, collecting materials and using them effectively in order to demonstrate their opinions to a third person. Although it was said that adding a competitive event to the curriculum was undesirable, our observations indicated that the students' desire to win the debate led them to acquire various skills unwittingly.

Another reason for the incorporation of the small group debate was the activation of discussions within the group. The tutors reported that the students showed more engagement and enthusiasm in these discussions than in the former tutorial exercises. Although group work does not always function positively (Hitchcock and Anderson, 1997; Dolman, Wolfhagen, van der Vleuten and Wijnen, 2001), the students learnt much from active debating. Some students appeared not only to learn about cooperative learning, but also to realise their thoughts and personalities and those of the other students. The responses to the question "what did you acquire in this tutorial study," which was asked after the program, included 'realised my potential' or 'realised the potentials and thinking of my classmates', together with gaining a style of debating and knowledge about the given issues.

Students' performance and evaluation

The students exceeded our expectations of the capacity third-year dental students to engage in a problem-solving type of study. Khoo (2003) investigated the incorporation of PBL in Asian medical schools and enthusiastically reported that a similar effect was observed in schools in the West, where students have accepted this mode of study. The effect appeared to be the same in our school, where the students have been adapting to the tutorial classes. The same was also true in the case of the debate method. The students displayed a high talent for considering issues from opposing viewpoints. This demonstrates that the students are sufficiently flexible to respond to a new type of education. As shown in Figures 1 and 2, most of the groups received high scores for their performances in the presentations. In addition, the scores awarded by the tutors and the students were almost the same. The tutor also evaluated the attitudes, activities and understanding of the students in the process of the debate tutorial exercises according to the four criteria, which included a total of 20 sub-categories. The numbers of ticks (which implied that the students met the standard for each sub-category) varied from 2 to 20. Although it was difficult to evaluate each student accurately because they studied, for instance, different subjects in a group, they received evaluations from every tutor. Further, we attempted to correct the biases by discussing them with the tutors. Consequently, we graded approximately 70 per cent of the students as 'A' (Excellent) and the rest as 'B' (Good), which resulted in a high 'A' ratio as compared to that of the other regular subjects that the students attended simultaneously. We believe that this was purely due to their enthusiasm for the tutorial class. In any case, it is extremely important that the students receive precise evaluations for their performances in the educational program. Therefore, we should establish a more sophisticated evaluation system for measuring the understanding and efforts of individual students in the tutorial study and overcome the problems and the biases that might be occurring.

The students' understanding of the debate-style tutorial

As described above, the students soon adapted to the debate-style tutorials and found the debate to be an effective approach to address problems. They appeared to acquire, or realise the necessity of acquiring, several skills from the debate-style tutorial studies. However, a problem was encountered in the further cultivation of these skills. The students collected various materials to support and strengthen their arguments for the debate. These materials were obtained from relevant literature such as academic papers and reference books, and from the Internet. Some groups distributed a questionnaire to the class and obtained results. However, materials were not readily available in the case of propositions that involved very recent issues, and students became confused and worried about researching them. We expected them to discover and develop their own opinions, which is an important factor in determining a person's skills when he or she is faced with unfamiliar issues. However, most of the students were rather anxious about presenting their own views with little supporting material. This could be attributed to the character of the Japanese students. The students should be encouraged to express their opinions in public in addition to thinking critically; they should not rely overly on the opinions in available literature.

On conducting a debate, we discovered that it was difficult to prepare suitable propositions for the third-year dental education program. The propositions were required to be in accordance with the students' level of understanding. In addition, in order to carry out a fair debate, the propositions required nearly an equal number of affirmations and negations. In order to meet these criteria, eight propositions related to 'Life' and five prepositions related to 'Insurance', were prepared as the main topics of the first and second sessions, respectively. One of the purposes of the second session was to study insurance; therefore, we designed propositions that considered whether insurance should provide coverage for medicine without active treatment (preventive medicine), better living (aesthetic treatment), advanced or specialised treatment (implant treatment) and treatment whose results are unproven (alternative medicine). However, the three-week period was extremely short and the students were unable to have in-depth discussions on the morality of the given propositions or to learn about insurance in detail. There were students who desired more intense discussions on the topic. In addition, some wished for a proposition that was more familiar and required less knowledge and study. Such a proposition may be suitable for the introductory tutorials in which the educational aim is merely to activate discussions, draw out more opinions and measure the thinking power of the students. 'Learning how to learn' and 'collecting cognitive facts' are the two goals of PBL tutorial education, the proportion of which differs for the academic years in which it is conducted. Raising good and balanced problems is the key factor for the successful implementation of PBL tutorials (Lohman and Finkelstein, 2002), together with tutor training (Grave, Dolmans and Vleuten, 1999; Gilkison, 2003; Leung, Lue and Lee, 2003) and preparing an effective class schedule (Hoad-Reddick and Theaker, 2003). With the help and support of academic administrators, improvements for future tutorial studies should be made.

After experiencing two sets of debate sessions, the students appeared to feel that making a decision was very difficult. "The more I consider the problem, the harder it is to arrive at a decision" was the impression of one student. In the future, while administering dental treatment, they will probably come across several cases where tough decisions need to be made, for example, whether or not to extract a troublesome tooth. The experience of the debate teaches them to face such situations. Good skills and experiences are required in order to make the appropriate decision in any field. It is our expectation that students who have experienced the

series of tutorial studies, including the debate exercises, are be better equipped to take the right decisions when faced with clinical problems in the future.

CONCLUSIONS

The introduction of the formal debate as a learning tool in tutorials was found to be effective for teaching students new ways of considering problems, as well as developing their logical reasoning skills and objectivity. For students in the lower grades, the experience of debating an issue relevant to any field is training for future education. For students in the higher grades, especially for Japanese students who are not accustomed to expressing their opinions logically or criticising the opinions of others in public, PBL education is assumed to be beneficial.

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