Improvement of debate competence: an outcome of an introductory course for medical humanities

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Purpose: Academic debate is an effective method to enhance the competences of critical thinking, problem solving, communication skills and cooperation skills. The present study examined the improvement of debate competence which is an outcome of debate-based flipped learning.
Methods: A questionnaire was administrated to second-year premedical school students at Yeungnam University. In total 45 students participated in the survey. The survey questionnaire was composed of 60 items of eight subfactors on debate competence. To investigate the homogeneous of low and high achievement groups, 18 items on empathy and 75 items on critical thinking scales were used. To compare the pretest with posttest scores, data was analyzed using paired sample t-test.
Results: There were no significant differences between low and high achievement groups by average grade at the beginning of the semester. There was a significant improvement in high achievers on the logical argumentation ($p<0.001$), proficiency in inquiry ($p<0.01$), active participation ($p<0.001$), ability to investigate and analyze ($p<0.001$), observance of debate rules ($p<0.05$), and acceptability ($p<0.05$). Even in low achievers, active participation ($p<0.05$) and ability to investigate and analyze ($p<0.01$) were significantly improved.
Conclusion: Results showed that students could improve their debate competence by the debate-based flipped learning. A prospective and comparative study on the communication and teamwork competences needs to be conducted in the future. It is suggested that in-depth discussion for the curriculum design and teaching will be needed in terms of the effectiveness and the outcomes of the medical humanities.

Key Words: Debate competence, Debate-based flipped learning, Improvement of competence

Introduction

Medical schools are institutions of higher education. The purpose of higher education is not to make students acquire the only knowledge, but to coach students to be effective problem solvers and good communicators in real world as well as prominent and productive citizens and members of future society. One of the methods of enhancing the competences of problem solving and communication with teamwork and professionalism is academic debate. Debate is the process of inquiry and advocacy, a way of arriving at a reasoned judgment on a proposition [1]. Critical thinking and listening as well as the acceptance of leadership roles can be developed as consequences of practicing [2,3].

During debate activities, students could improve the abilities of democratic decision making to resolve the conflictual and irreconcilable situation between the two opposing positions on an issue [4]. This method allows

students to choose pros or cons with one topic and to make students to learn not only the ability to speak, listen and persuade but also to acquire the competence of critical thinking, plentiful knowledge of real world and mutual cooperation skills to be better performers. Freeley & Steinberg [1] told that debating leads to the ability to analyze, criticize, and advocate ideas, to make reasoning inductively or deductively, and to reach factual or judgmental conclusions based on sound inferences drawn from unambiguous statements of knowledge or belief.

In 2010, Yeungnam University College of Medicine adopted debate-based introduction curriculum on medical humanities and since 2012, debate-based flipped learning was introduced as a new concept of teaching method for medical humanities. During the 18 weeks, students who belong to one of the eight teams should take part in eight debates and four general discussion activities. For the debate, students who are in the debate teams should be allocated to the pros or cons of an issue and should develop a strategy to win the debate engaging in activities which are making arguments, taking positions, supporting those positions and reaching an agreement. There were five steps of learning activities for the students who were audiences of debate. First, students should prestudy the contents uploaded by debaters or professors on the leaning assistant system. Second, in the beginning of class, mobile quiz is conducted to check the degree of preparation. Third, students should evaluate the quality of debate and ask questions about the issues during the class. Forth, students should make out the self-report, which sums up the ideas and describes their own opinions about the issues. Fifth, post mobile quiz with feedback answers are conducted for formative evaluation.

It is supposed that through all these activities, students could learn the psychosocial and cultural implications of diverse medical issues and reflect their critical thinking

and decision making problems on the patients and medical care with their colleagues. In the concrete, it is expected that students could enhance their debate competences which were logical argumentation, proficiency in inquiry, open-minded listening, ability to investigate and analyze, prompt response, acceptability, active participation and observance of debate rule during the debate procedures. Therefore the present study examined the outcomes of the debate-based flipped learning, especially the growth of debate competence and any differences in the pattern of progress between low and high performers.

This study endeavors to research and consider the following issues: (1) Are there any differences in debate competence and subfactors' scores between the pretest and posttest? (2) Are there any differences in debate competence and subfactors' scores between low and high performers?

Subjects and methods

A questionnaire was administrated to second year premedical school students at Yeungnam University in 2014. In total 45 students participated in the survey comprising 30 male students (76.92%) and 15 female students (23.07%) who took part in "An Introduction to Medicine" course which was composed of 12 structured academic debates. The debate topics represented controversies about medicine; doctor's role and limitation, public healthcare and management, responsibility for health, patient and doctor relationship, medical ethics of research, euthanasia, abortion and end-of-life care, legal limits of invasive procedures, therapeutic coverage of severely disabled child, telemedicine system, and human embryo research.

Students were assigned to eight teams and two of the eight teams participated in a structured academic debate. Each team was assigned to present the pro or con, researched

background information about issues, identified the main ideas, analyzed and developed arguments on the issues and persuaded or maintained their opinions. When not presenting, students had to be peer reviewers and make self-reports of the issues every week. With the pre- and post-quiz sessions and feedback lecture, it took about 120 minutes. The whole process is configured as follows: a 10-minute presentation for the background and arguments of the issues; a 10-minute rebuttal segment with a 5-minute first operations meeting; a 20-minute question and answer session; a 10-minute second operation meeting; and a 5-minute final presentation.

The survey questionnaire was composed of the Debate Competence Scale (DCS), the Korean translation of the Jefferson Scale of Empathy-S version (K-JSPE-S) [5] and California Critical Thinking Disposition Inventory (CCTDI) [6]. K-JSPE-S and CCTDI were used to investigate the homogeneous of the high and low achiever groups. Kang & Jang [7] developed the DCS which was comprised of 60 items of eight subfactors on debate competence; logical argumentation, proficiency in inquiry, open-minded listening, ability to investigate and analyze, prompt response, acceptability, active participation and observance of debate rules. Cronbach

α was 0.94. K-JSPE-S was comprised of 18 items and Cronbach α was 0.92. CCTDI was comprised of 75 items of seven subfactors on critical thinking and Cronbach α was 0.89. Scales of 1 (not appropriate at all) to 5 (very appropriate) were used to rate all items.

The operated definition of the achievement was the final achievement of second year in the premedical school as students were divided into two groups by average grade: low (n=22) and high achievers (n=23). The effectiveness of the debate-based flipped learning was evaluated by the improvement of debate competence which was defined as the positive gap of the scores on DCS.

To compare the pretest scores with posttest scores of debate competence, data was analyzed using paired sample t-test by high and low achievement groups and pretest to posttest scores of DCS. All significance was evaluated at a confidence level of 95% and SAS 9.2 version (SAS Institute, Cary, USA) used for statistical analysis of data.

Results

To investigate the similarity between the low and high achievers' groups, descriptive analysis and t-test for

Table 1. Comparisons of Empathy and Critical Thinking Scores in Low and High Achievement Groups

Instrument and test	Low		High		t	p-value
	Mean	SD	Mean	SD		
K-JSPE-S scores	5.78	0.64	5.47	0.65	1.74	0.088
Emotional factor	5.86	0.68	5.55	0.66	1.63	0.109
Cognitive factor	5.41	0.59	5.05	0.81	1.83	0.074
CCTDI scores	4.12	0.29	4.04	0.39	0.82	0.417
Trust-seeking	3.56	0.25	3.44	0.35	1.39	0.172
Open-mindedness	4.57	0.48	4.46	0.56	0.73	0.468
Analyticity	4.28	0.42	4.13	0.55	1.08	0.284
Systematicity	4.00	0.41	4.00	0.56	-0.03	0.979
Self-confidence	4.00	0.68	4.02	0.63	-0.11	0.911
Inquisitiveness	4.50	0.44	4.40	0.60	0.65	0.517
Maturity	3.90	0.44	3.79	0.41	0.91	0.369

K-JSPE-S: The Korean translation of the Jefferson Scale of Empathy-S version [5], CCTDI: California Critical Thinking Disposition Inventory [6], SD: Standard deviation.

empathy and critical thinking disposition were conducted. Mean scores and results of t-test are indicated in Table 1. There were no significant differences in K-JSPE-S scores as well as in CCTDI scores between low and high achievement groups. Two groups of students were not significantly different in empathy and critical thinking disposition and there was no significantly different in debate competence between low and high achievement groups (Table 2).

In the result of a paired sample t-test of pretest to posttest scores on debate competence and subfactors (Table 3), the mean scores on the debate competence were 3.33 ± 0.53 at the beginning of semester and 3.55 ± 0.51 at the end of semester. There was a significant difference between the pretest and posttest scores, and the improvement of debate competence was identified (t=4.14, p<0.001).

Within the subfactors of debate competence, logical

Table 2. Comparisons Debate Competence Scores in Low and High Achievement Groups

Instrument and test	Low		High		t	p-value
	Mean	SD	Mean	SD		
Debate competence	3.26	0.43	3.39	0.38	-1.12	0.267
Logical argumentation	3.36	0.53	3.36	0.61	0.00	0.996
Open-minded listening	3.90	0.38	3.90	0.38	-0.02	0.986
Proficiency in inquiry	3.44	0.44	3.65	0.39	-1.76	0.084
Active participation	2.81	0.77	2.91	0.75	-0.50	0.616
Prompt response	2.67	0.64	2.74	0.65	-0.37	0.709
Ability to investigate and analyze	3.13	0.59	3.33	0.43	-1.35	0.182
Observance of debate rules	3.40	0.59	3.62	0.51	-1.42	0.163
Acceptability	3.40	0.61	3.63	0.51	-1.46	0.151

SD: Standard deviation.

Table 3. Comparisons of Debate Competence Scores in Pretest and Posttests (n=45)

Instrument	Group	Pretest scores		Posttest scores		t
		Mean	SD	Mean	SD	
Debate competence	Low	3.26	0.43	3.44	0.53	2.04
	High	3.39	0.38	3.65	0.49	4.09***
	Total	3.33	0.41	3.55	0.51	4.14***
Logical argumentation	Low	3.36	0.53	3.42	0.73	0.58
	High	3.36	0.61	3.57	0.77	3.06**
	Total	3.36	0.57	3.49	0.75	2.29*
Open-minded listening	Low	3.90	0.38	3.86	0.61	-0.35
	High	3.90	0.38	4.00	0.44	1.62
	Total	3.90	0.38	3.94	0.53	0.65
Proficiency in inquiry	Low	3.44	0.44	3.61	0.56	1.54
	High	3.65	0.39	3.88	0.44	3.13**
	Total	3.55	0.42	3.75	0.51	3.09**
Active participation	Low	2.81	0.77	3.09	0.77	2.43*
	High	2.91	0.75	3.31	0.80	4.51***
	Total	2.86	0.75	3.20	0.79	4.75***

Table 3. (Continued)

| Instrument | Group | Pretest scores | | Posttest scores | | t |
		Mean	SD	Mean	SD	
Prompt response	Low	2.67	0.64	2.75	0.70	0.64
	High	2.74	0.65	2.94	0.73	1.72
	Total	2.71	0.64	2.85	0.71	1.68
Ability to investigate and analyze	Low	3.13	0.59	3.51	0.53	3.22**
	High	3.33	0.43	3.76	0.53	4.27***
	Total	3.23	0.52	3.64	0.54	5.32***
Observance to debate rules	Low	3.40	0.59	3.68	0.71	1.78
	High	3.62	0.51	3.83	0.63	2.15*
	Total	3.51	0.55	3.76	0.67	2.70**
Acceptability	Low	3.40	0.61	3.61	0.68	1.60
	High	3.63	0.51	3.93	0.52	2.45*
	Total	3.52	0.57	3.78	0.62	2.88**

SD: Standard deviation.
*p<0.5, **p<0.01, ***p<0.001.

argumentation (t=2.29, p<0.05), proficiency in inquiry (t=3.09, p<0.01), active participation (t=4.75, p<0.001), ability to investigate and analyze (t=5.32, p<0.001), observance of debate rules (t=2.70, p<0.01), and acceptability (t=2.88, p<0.01) were significantly improved. There were no significant differences in open-minded listening and prompt response factors.

With reference to the achievement level of the students, there was a significant improvement in high achievers, especially on the logical argumentation (t=3.06, p<0.01), proficiency in inquiry (t=3.13, p<0.01), active participation (t=4.51, p<0.001), ability to investigate and analyze (t=4.27, p<0.001), observance of debate rules (t=2.15, p<0.05), and acceptability (t=2.45, p<0.05). Even in low achievers, active participation (t=2.43, p<0.05) and ability to investigate and analyze (t=3.22, p<0.01) were significantly improved.

Discussion

Diverse teaching methods have been implemented to improve students' competences despite the ambiguity and difficulty of defining the learning outcomes and evaluating the outcomes of the course or curriculum on medical humanities. This study investigated the improvement of the students' outcome, especially their debate competence. It is comprised of eight subfactors: logical argumentation, open-minded listening, proficiency in inquiry, active participation, prompt response, ability to investigate and analyze, observance of debate rules and acceptability.

The present study shows that students could be improved by the debate-based flipped learning. Nonetheless, the weakness of the retrospective nature of the student survey in which students rated both pretest and posttest [8], students showed the progress in competence. In the six factors except of in open-minded listening and prompt response, there were significant improvements in competence at the end of the semester. This is in line with other previous studies about debate based learning. Debate is an effective method for training the ability of discussion in short terms and useful method of cultivating the abilities of inquiry, decision-making and

critical thinking [7,9,10,11,12].

With burden of proof or rebuttal, students could learn how to prove the problems of the status quo and how to design the debate strategies focusing on the main issues [13]. During the debate, students should consider significance, harm or advantage of the arguments, highlight the solvency or inherency of the issues and clarify the positions and argument against the other team. To show the warrant and evidence in the cross type investigation debate, students in an affirmative or negative team should cooperate with colleagues. All of these activities could cultivate students' competences on logical arguments, proficiency in inquiry, and ability to investigate and analyze.

In this study, high performer who have had a high achievement in the second year of premedical course improved six factors of debate competence even if they showed homogeneous properties in the empathy, critical thinking and debate competence at the beginning of the semester. As debate goes on, students become skillful at participating in the debate-based flipped learning. Observance of debate rules and acceptability could be developed and even the lower performers who were in the low achievement group improved the ability to investigate and analyze as well as to participate actively. It can be fruitful and effective for debate-based flipped learning.

In the open-minded listening and prompt response factors, there were no significant differences between the pretest and posttest scores of low and high performers. The implication of open-minded listening is to listen to others attentively and flexibly with self-regulation even in the crisis of debate [7]. It is associated with other-directed communication skill, objective thinking on the divergent issues and acceptability of the criticism and opposite perspectives of the argumentation. It might be reasonable to assume that the open-minded listening was higher than other subfactors of debate competence

without any consideration of differences between low and high achievement in the present study. Otherwise, prompt response was lower than any other subfactors of the debate competence in the present study. Prompt response is one of the core competence in terms of the ability to adapt to academic debate. Students who have the prompt response competence could show the proficient presentation with humor and wit and the leadership with confidence on the debate [7,14]. The students who were participants in the survey had weakness in the prompt response competence.

Lee [12] suggested a general evaluation form to assess the policy debate performance. It was proposed to assess the seven domains of the debate performance: analysis, organization, reasoning, evidence, refutation, delivery, and teamwork. In the present study, DCS which was conducted to assess the students' competence could not get any information of the delivery and teamwork among the students. A prospective study on the communication and teamwork competences needs to be conducted in the future with objective evaluations of instructors and peers. Another limitation of the present study is the small sample size. A comparative study across the students who possess various levels of the competences and different grades of the medical students needs to be encompassed for the study.

In conclusion, the effectiveness of the debate-based flipped learning was clarified by the present study. From the results of the present study, it is suggested that in-depth discussion for the curriculum design and teaching methods will be needed in terms of the effectiveness and the outcomes of the medical humanities.

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