

# Strategy of selecting topics for debate teaching in engineering education

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**Abstract** — *Debating in education refers to an instructional method that students, from two perspectives of pros and cons, express their opinion and contradict each others' arguments. This study attempts to offer practical guidelines of how to select topics in using classroom debate in the field of engineering education. The study expects that classroom debate in the field of engineering education may be utilized in a simple and clear manner.*

**Index Terms** — *Engineering education, Debate, Debating topic, Active Learning Activities*

## INTRODUCTION

Debating in education refers to an instructional method that students, from two perspectives of pros and cons, express their opinion and contradict each others' arguments, whereas classroom discussion facilitates group interactions, exchanging and reviewing each member's opinions in order to solve problems involved in, enhancing understanding knowledge, and decision-making skills. The educational effectiveness that debate and discussion concerned are i) acquiring knowledge those curriculum cover, ii) developing logical thinking and presentation skills, iii) improving self-directed learning, and iv) improving leadership.

In spite of its effectiveness as an instructional method, debating has been less popular than discussion in Korea in particular. This has been resulted, [presumably](#), from the cultural tendency of being reluctant to speak in public, lack of experience in education compared to [that](#) in abroad, and accordingly unfamiliarity for both instructors and students in use. Furthermore, [there is](#) misunderstanding of the effectiveness of debate teaching [in](#) some areas of law, humane and social studies.

As a matter of fact, experts and professionals acquired their degree [in](#) engineering education are expected to have a solid and logical stance [as well as contradicting abilities](#) in the course of design processes such as analysis, design, development, implementation, and evaluation. Therefore, debating should be utilized as a popular instructional method in engineering education for developing students' [debate](#) skills, and teaching faculty [might](#) as well [acquire](#) how to design and implement debating into their classroom. The existing research revealed that teaching faculty [has](#) more difficulties in choosing or selecting a debate topic than in managing debating, since there have been some materials on its uses available.

This study attempts to offer practical guidelines [of](#) how to select topics in using classroom debate in the field of engineering education. The study expects that classroom debate in the field of engineering education may be utilized in a simple and clear manner.

## DEBATES AS AN INSTRUCTIONAL TOOL

Debate is a formal [competition](#) of argumentation between two [groups](#) or individuals and can be used as an good [teaching](#) method. They can [give](#) students the [chance](#) to synthesize course information, [carry out](#) related outside research, [enhance](#) critical thinking, and develop verbal communication [abilities](#). Debaters [lead to](#) the sense that something has been logically [illustrated](#) by [the](#) following systematic reasoning processes or patterns. In each [occasion](#), these logical patterns answer the three key questions [raised](#) by the Toulmin Model: (1) Claim: What are you trying to get me to believe? (2) Data: What have you got to go on? (3) Warrant: How does the data lead to the claim? Each pattern, however, answers the questions in somewhat different ways [2].

Debate has been [highlighted](#) as an important teaching-learning method. The reasons are as follows; first, students can create knowledge in debate class, who can be [an essential](#) human resource in the future. Second, students [could](#) get a mature philosophy of life beyond personal opinion or prejudice through debate. Third, debate is a good training program for leadership [growth](#). Fourth, debate is a good alternative teaching method against lecture in the college class. Finally, [companies and corporations want](#) professionals that have creativity and self-regulated learning [capabilities which](#) can be [prepared](#) in the debate (Ha, 2009). In the past Greek and Roman era, 'technique of good speak' [was](#) a critical component for social and political [achievement](#). Today, this technique is also a [key](#) to be a [successful](#) person.

Generally, we can obtain the following advantages in class debate.

- Engage students in the subject matter
- Operationalize the issues of the subject matter
- Create advocacy-oriented education
- Teach persuasion skills
- Teach critical thinking
- Create positive classroom atmosphere
- Create new patterns of knowledge
- Have fun

## DEBATE TOPICS

The beginning of debate preparation is to fix a good debate topic. Good debate topics should be broad and controversial, and **reveal** the various issues related to this. Non-controversial issues are not suitable for debate. Debate is for argumentation. Debate is a speaking for **persuading** another person based on logical evidences. Debate is different from proof. In argument, there can be two conflicting opinions focused on a constant argument. **Thus**, there are pros and cons **in** debate. Some topics **are** regarded as a non-good topic because it becomes taken for granted. However, that is not important to decide winner and loser in debate.

In class debate topics should be controversial, if possible, to persuade students to evaluate not only their own **point of view**, but other possible viewpoints as well. Especially, a good debate topic is any topic that **improves** student knowledge, causes **students** to think, and helps them learn. In addition to increasing subject matter expertise, a thoughtful debate topic can also help students **develop** their critical thinking, organizational, and verbal skills. A successful debate topic has numerous clear and compelling arguments available for both sides to present. **Also**, there must be sufficient information available through research to support both opposing viewpoints [1].

Alford & Surdu(2002) also suggest “The selection of a debate topic is also partially dependent upon the timing of the debate itself. Debates scheduled near the beginning of the course should be less technically oriented than debates near the end of the semester. It is generally recommended to hold debates near the end of the semester so that students can call upon all of the information they have learned throughout the semester. When measured against course syllabus and student knowledge, possible debate topics fall into three broad categories: (1) topic discusses in depth during the course of the semester, (2) topics discussed briefly during the semester, and (3) relevant topics not taught or discussed during the semester [1].

## RESEARCH METHOD

This study tried to guide how to select debate topics when the instructor **implements** debate as a teaching & learning method. For this purpose, we collected and analyzed data by interviewing and surveying **five experienced instructors in debate class**. The engineering professors were not included in **this study as** participants because they **had not debated** in class in Korea.

The characteristics of **the participants were** as follows; their majors **were** political science, law, philosophy, and education. They **taught** politics, presentations and discussions, writing and reading skills, curriculum and assessment, educational technology, ethics, mythology and religion, criminal law, legal practice, **and** legal writing. These subjects can be divided as subject with specific contents and subjects with non-specific information. They utilized different selecting processes of debate topics depending on the nature of their **teaching** subjects.

Professor	Major	Courses		Utilization rates (debate in class)	Another teaching method	Debate topic sample
		Majors	Liberal Arts			
A	Political science	Politics	Presentation and discussion Dialogue and Negotiation Writing and Reading skills Leadership	90% (She used 10% time for presenting strategies for searching data, NIE, utilizing media, etc.)	Lecture, discussion	Free lunch policy
B	Law	Criminal law Legal practice	Legal writing	20%	Lecture, discussion,	Euthanasia, Abortion
C	Philosophy	Ethics Philosophy	Mythology and Religion	30%-50%	Lecture, discussion, role	The existence of God, Romantic

			Presentation and Discussion Reading and Debate		play, etc.	love
D	Education	Curriculum and Assessment Educational Technology		30%	Problem based learning, lecture, discussion	Current education curriculum, constructivism & objectivism
E	Law	American law American criminal law American civil law	Speech and Debate	50%	Lecture, discussion, presentation, etc.	Proximate cause and reasonable foresee ability in torts law

TABLE 1  
Information of Participants

## DECIDING DEBATE TOPICS

The process of selecting debate topics was divided into two main types. In particular, in-class debate is classified into two types: one is the major course with specific contents and the other is the course without specific contents. These processes were presented in Figure 1.

In the former case, the debate topic selection process is as follows. The first step is setting the educational objectives. If educational objectives included cultivate discussion skill, problem solving skill, logic thinking, and researching ability, debate could be a good teaching strategy. The second step is analyzing characteristics of students. Characteristics of students involve their interests, current knowledge level, grade, gender, and all information about them. The interest of students was considered because their engagement is very important. The third step is searching controversial topics based on students' interest. Debatable topics can easily be found in books about debate, newspapers, articles, etc.. Fourth, instructors have to listen to opinions of students about topics you suggested. You'd better choose topics students want to deal with. Fifth, the teachers should modify the discussion topics. The sixth step is to select and use debate topics in the class.

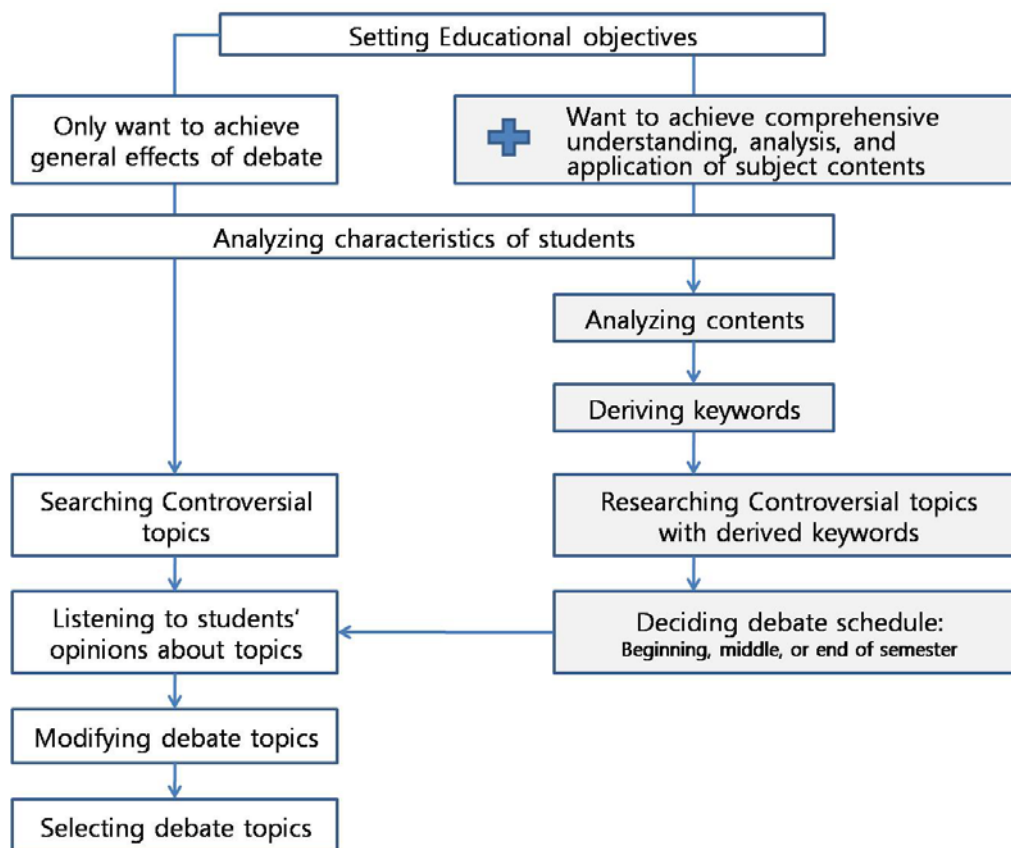


FIGURE 1  
Process of selecting debate topics

In the latter case, the debate topic selection process is as follows. The first step is setting the educational objectives. This is the same as the previous case. The second step is analyzing characteristics of students, especially prior knowledge level. The third step is a content analysis. In this case, instructors use debate as a teaching tool. So it is important to check critical concepts, process, and principles. The fourth step is deriving major keywords based on the output of the content analysis. Keywords are important sources to make debate topics. The fifth step is to search debate topics related to the keywords. The sixth step is to decide debate schedules after reviewing the debate topics. There is proper time to debate according to nature of the subject. Next steps are equal to the former case. The seventh, instructors have to listen to opinions of students about topics you suggested. Eighth, the teachers should modify the discussion topics. The ninth step is to select and use debate topics in the class.

## CONCLUSION

Debate is an effective teaching method that can train students' capacities of problem solving, logic, presentation, etc. However, debate is not always the best solution because it is just one of teaching methods. The best way to teaching students is depending on characteristics of students, subject contents, educational environment, and so on. Findings of this study show these characteristics. Experienced instructors first considered students' interests and characteristics, and the purpose of education through several steps.

Faculties in engineering college often think that debate is an inadequate teaching method in engineering areas. However, students learn during preparing for and participating in debate. Research of Alford&Surdu(2002) showed how to implement in the example of the AI course in engineering class. Their students were forced to support their chosen definitions of intelligence, thinking, and learning. Throughout the semester, the students had been exposed to many disparate concepts. In order to design this active course, instructor should pay attention to debate and try to make good debate topics appropriate to the characteristics of class.

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