AN EDUCATIONAL PROGRAM USING A DEBATE SUPPORT SYSTEM FOR CULTIVATING CRITICAL THINKING DISPOSITION

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Introduction

- **Critical thinking**
  - One of the most important educational goals in high school education.
  - “Reasonable, reflective thinking that is focused on deciding what to believe or do” (Eniss 1987)

- **Disposition of critical thinking**
  - Necessary for spontaneous critical thinking

- **Debate learning**
  - Effective program for cultivating critical thinking ability

- **Problem**
  1) Debate learning needs much time for all the students to participate
  2) Some Japanese students have difficulty in criticizing other side’s position in the front of other side students
Purpose

Proposal of an educational program using an internet-based debate support system for cultivating critical thinking disposition

In order to solve existing problems of debate learning
1) Debate learning needs much time for all the students to participate
2) Some Japanese students have difficulty in criticizing other side’s position in the front of other side students

Application of the proposed program to the actual high school education

Evaluate cultivation of critical thinking disposition
Proposal of a program

- **Direct experience** of critical thinking will cultivate strong critical thinking disposition *(Ruggiero 1988, Fazio and Zanna 1987)*

- First, knowledge and skill have to be learned.

  1. **Reading textbook** (four hours) to obtain basic knowledge
  2. **Critical thinking exercise** (one hour) to get technique of critical thinking
  3. **Research and presentation** (four hours) pre-training of argument and assertion in debate learning
  4. **Debate learning** (four hours) to cultivate critical thinking disposition

**Use the debate support system!**

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Debate support system

- Japanese, English, and Chinese language are supported
Debate support system
Function and characteristic

- Many groups of students can participate at the same time
- 2 pros and 2 cons (or 3 pros and 3 cons) in one group
Debate support system
Function and characteristic

- Discussion based on Toulmin model
- Non-face-to-face, anonymous and text-based debate learning
  - to remove difficulty in criticizing other side’s position in the front of other side students
Debate support system
Function and characteristic

- Four steps formal description of discussion
- One-to-one discussion
  - Every participants are required to think by themselves

<table>
<thead>
<tr>
<th>The pros side</th>
<th>The cons side</th>
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</thead>
<tbody>
<tr>
<td>1st argument</td>
<td>1st argument</td>
</tr>
<tr>
<td>Counter argument</td>
<td>Counter argument</td>
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<tr>
<td>Rebuttal</td>
<td>Rebuttal</td>
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<tr>
<td>2nd counter argument</td>
<td>2nd counter argument</td>
</tr>
</tbody>
</table>

The pros side

The cons side
Application in high school education

- The first semester of 2008

Participant
- 438 Japanese high school students of 11 classes (3rd grade, 17-18 years old)

Evaluation of the proposed program

Three factors of critical thinking disposition

- **Objectivity**: objective and logical thinking
  “Following a line of reasoning consistently to a particular conclusion”

- **Good-faith**: faithful attitude and respect for others thought
  “The acceptance of statements as being true, when there is sufficient evidence, even though it negates some of our cherished beliefs.”

- **Inquiring mind**: inquiring and pursuing thinking
  “To persist in seeking ways of resolving disputes”
Procedure and questionnaire timing

1: Pre-presentation questionnaire

2: Pre-debate questionnaire
   • Introduction
   • Inputting pre-opinion

3: Post-debate questionnaire
   • Counter argument, Rebuttal, and 2nd counter argument

4: Debate learning
   • Reading textbook (4 hours)
   • Critical reading exercise (1 hour)
   • Research and presentation (4 hours)

Total 13 hours

Critical thinking disposition questionnaire

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Themes of debate learning

1. Japan has to introduce a deposit system of beverage containers.
2. Japanese government has to introduce an environment tax.
3. Japan has to introduce daylight saving time.
4. Japanese government has to prohibit installation of automatic vending machine, and remove existing automatic vending machine.
5. Use of plastic bottles has to be prohibited in Japan.
6. Japan has to promote introduce of cars which use gasoline bleded with bioethanol.
7. Japan has to prohibit convenience stores from staying open until late at night.
8. Collection and recycling of plastic bottles have to be stopped in Japan.
A picture of class room
Result

- 287 valid responses
  - Some students were absent from some hours

ANOVA and Scheffe's pair comparison
- Objectivity and good-faith: Significantly improved
- Inquiring mind: Relatively not improved

*: p<0.05, **: p<0.01

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Debating needs logical persuasion and faithfully listening to others' proposition and these characteristics may cultivate objectivity and good-faith.

Debating with a given theme and a given position doesn’t essentially stimulate students’ creativity and curiosity, which are related to inquiring mind.
Conclusion

Summary

- An educational program using the debate support system for cultivating critical thinking disposition has been proposed
  - Solve problems of debate learning
    1) Debate learning needs much time for all the students to participate
    2) Some Japanese students have difficulty in criticizing other side’s position in the front of other side students
- The proposed program was applied into Japanese high school and evaluated

Conclusion

- The effectiveness of the proposed program to cultivate critical thinking disposition was confirmed especially for the factors of objectivity and good-faith.

In the future

- A new educational program which can improve the critical thinking disposition, not only objectivity and good-faith but also inquiring mind.
Thank you
Problems in application

- Talking outside of the debate support system
  - Lack of concentration?
  - Talking about the theme of debate can activate debate?
- Breaking of anonymousness
  - Students want to know who is other side students
- Typing skills
  - Few students has this problem
  - Almost all students has no problem
    - Japanese high school has some classes using PCs
Other application of the debate support system

- Application in Graduate school
  - Education for energy problems
  - Since 2006

- Application in high school
  - 1st, 2nd, 3rd grade students in 2009
  - It was suggested that it is too difficult for 1st grade students
  - It may be too difficult for Junior high school or elementary school students
Face to Face Debate Versus Debate support system

Face to Face

- Resembles real situation
  - Business, conference...
- Team discussion

Debate support system

- Artificial environment
- One to one discussion
- Easy to check statement of others and themselves
If you want to use debate support system

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