

Development of a Debate Support System for Energy and Environment Education

Hiroshi Shimoda, Mika Terado, Hidekazu Yoshikawa
Graduate School of Energy Science, Kyoto University
Gokasho, Uji, Kyoto 611-0011, Japan

Tel/Fax: +81-774-38-4402/4406, E-mail: shimoda@energy.kyoto-u.ac.jp

1. INTRODUCTION

In order to solve energy and environmental issues, it is necessary to improve technologies and political system, however, the essence of the issues is improvement of our consciousness and knowledge. The energy and environmental issues are complicated related with human, society and technology. It is, therefore, important not only to improve their knowledge but also to gather information, analyze it, discuss it and form their own sense of value.

Taking notice of our education system, since it is difficult to foster such abilities by the conventional lecture-based education, a debate based education has tried to be introduced in high school and university education. It is, however, difficult to introduce it because of the following reasons;

- (1) All the students can not participate in debate within 90 minutes lecture time.
- (2) When plural debates are conducted in parallel, it is impossible to judge them.
- (3) In case of group discussion, the educational effect is dependent on the motivation and contribution of each student.
- (4) It is difficult to form logical discussion when the students are not accustomed to debating.
- (5) In case of oral discussion, they are sometimes emotional and it prevents from logical discussion.

In order to solve there problems and smoothly introduce debate education, an educational debate support system, DEEV system (Debate, Evaluation and Viewing system), has been developed.

2. DEEV SYSTEM

The developed system is web-based server-client system and the student can participate in debate by using PC and Web browser connected to the Internet. The features of the system are as follows;

- (1) The students make text base discussion on a given theme and their standpoints one on one through the Internet.
- (2) They argue one on one against three students of opposite standpoint in parallel.
- (3) Discussion structure based on Toulmin model[1], which consists of claim, data and warrant, is introduced in order to support logical discussion.
- (4) The number of statement is limited as the first argument, question / counterargument, refutation and second argument, in order to

make effective argument against three students within 90 minutes.

- (5) The contents of the argument are recorded in the server computer and the students can review them after the debate.
- (6) The system supports the evaluation of their arguments by the teacher.

By introducing DEEV system into energy and environment education in university, it is expected for the students to foster their abilities such as logical and critical thinking, information literacy, communication and multiple viewpoints.

3. PRACTICE FOR GRADUATE SCHOOL EDUCATION

DEEV system has been introduced in a lecture named "Socio-environmental Science I & II" as an energy and environment education in Graduate School of Energy Science, Kyoto University from 2003 to 2006, and more than 400 students have participated in debate education in total. Through four year practice of DEEV system, the questionnaires evaluation of the system have been conducted, and the system itself and its operation method has been improved according to the results.

4. CONCLUSIONS

Aiming at fostering abilities such as logical and critical thinking, information literacy, communication and multiple viewpoints, an educational debate support system, DEEV system, has been developed, which can be easily introduced to the conventional university education system, and more than 400 students have participated in the debate education from 2003 to 2006. As the results of questionnaires by the students and the teachers, it was found that the system can be easily introduced to university education and it is effective to foster especially their deep and critical thinking, multiple viewpoints to the given theme. It was also found that the discussion time is too short for them to discuss against three students with the opposite standpoint within 90 minutes.

REFERENCES

[1] Toulmin, S. E. The Use of Argument. Cambridge University Press 1958.