Web-based Cooperative Learning System

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Abstract. Cooperative learning practice offline is limited in terms of time, space and information usage, taking longer time to produce a result. Web-based cooperative learning was developed to address such problems. This research seeks to overcome the limitations of the extant web-based cooperative learning by introducing a wireless network environment. Accordingly, new cooperative learning strategies were designed herein. The proposed strategies are consisted of three steps of problem situation recognition and goal setting, problem solving and evaluation and reflection. As a result, wireless network environment helped ease the limitations in students’ learning environment by reflecting their demand in real time so that the students could work as a main player of learning with full interest and proactive participation.

Keywords: Cooperative Learning, Web-based Strategy

1 Introduction

Cooperative learning practice offline is limited in terms of time, space and information usage, taking longer time to produce a result. For these reasons, offline cooperative learning can be only limitedly utilized in actual classes. Web-based cooperative learning[1,2,3] was developed to address such problems. Through web-based cooperative learning practices, learning environment was expanded.

Web-based cooperative learning, still, could be limited if performed only within classrooms or computer rooms because problem-solving ability is acquired in the process of resolving diverse daily issues[4,5]. Thus, in order to maximize the educational effectiveness of the web paradigm, wireless network environment is all the more necessary. Classroom boundaries are blurred. Learners come to practice in diverse time and space. They should be allowed to collect, process, share information

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collected from corners of their school or during their days and then re-process and re-produce such data in real time.

In this understanding, the study seeks to examine strategies for the web-based cooperative learning in wireless network environment and compare its effectiveness with those of the extant cooperative learning method. Units and materials appropriate for cooperative learning are selected from each subject. The selected materials are taught in three different ways - offline cooperative learning method, web-based cooperative learning and wireless network web-based cooperative learning. Then the students’ interest, satisfaction and achievement are evaluated.

2 WLS (Web based Learning System) composition and design

This research seeks to overcome the limitations of the extant web-based cooperative learning by introducing a wireless network environment. Accordingly, new cooperative learning strategies were designed herein. The proposed strategies are consisted of three steps of problem situation recognition and goal setting, problem solving and evaluation and reflection.

WLS is a system to assist the web-based cooperative learning online. It monitors the progress of students during the cooperative learning process in real time to provide mentoring about study goal setting, problem solving and study achievement. The figure 1 below shows the overall structure of the WLS system.

The system is operated through the google document tool and naver blog and supports the following functions; first, it produces statistics based on the level test results and final test results to assess the levels of student performance and provides proper feedback. Students send their pre/post-intervention tests to teachers and teachers refer to student-specific and test question-specific statistics to identify those with poor performance and let them receive teachers’ and colleagues’ mentoring. Second, in the problem-solving stage, teachers monitor information production process and advice about the produced information to lead students’ problem-solving
efforts in the right direction. Students, in the information production process, receive real-time feedback from teachers through the ‘sharing’ function and ‘share view’ function in the google document tool.

3 Experimental results

The themes selected above are separated by different units but, for this research experiment, they were performed in similar period. Each was taught in the form of class then the students were surveyed for their interest in and satisfaction with the class. Their final test results were referred to view their study achievement. The following figure is the graph of the students’ class interest, satisfaction and subject-specific achievement.

![Figure 3. Students’ interest according to class types](image)

The students in this research were found to have 13.6% interest level in offline class; 40.4%, web-based class; and 46%, wireless web. This finding implies the effect of learning environment. The fact that they use a computer seems to work as a study motivation to show no big difference between web-based and wireless web activities. But as the wireless web was based on personal notebooks and reflected own thoughts or opinions in real time, it gained a higher score from the students.

4 Conclusion

In this research, web-based cooperative learning strategies were designed and applied in a wireless network environment with a view to address the shortfalls of the existing web-based cooperative learning practice. As a result, the following conclusions are made; first, wireless network environment helped ease the limitations in students’ learning environment by reflecting their demand in real time so that the students could work as a main player of learning with full interest and proactive participation. Second, the introduction of web could address the problem of inefficient interaction
among participants under the previous web-based cooperative learning because web enabled the students to share, process and re-produce their data. Third, as existing education curriculum was presented in relation to everyday issues, the suggested method could help improve the students’ problem-solving ability as aimed by the cooperative learning practice.

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