

A Study on Web Community based Collaborative Learning System for Self Directed Learning

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Abstract: Web community based collaborative learning systems for self-directed learning are generally used to overcome the geographical and time limitations of face-to-face learning. Furthermore, These systems use face-to-face learning methods to enhance learning effects by using blended learning. The system provides shared searched data and analyzed results between different learners in the same learning topics. In this study, students enhanced their creative thinking in searching valuable information and enhanced their self-directed learning abilities. In addition, students improved their problem solving abilities and attitude toward presentations.

1. Introduction

The incredible development of information and communication technology influences people on human life pattern and human thinking ways fast. Recently, ubiquitous computing has become a major issue for twenty-first century society. Most people realize the importance of creative knowledge, and in the field of education, many teachers are interested in teaching methods that enhance creative thinking and self-directed learning to get valuable information for solving given problems. As computer science teachers, we believe that secondary school systems should change to catch up these demands. In order to do this, schools need new paradigms.

Today, in Korea, students learn about ICT (Information and Communication Technology) in their regular curriculum.

In this study, we developed web community based on – off line collaborative learning system and applied this system in regular computer science classrooms to teach the subject of computer science in a way that would enhance students' critical thinking abilities and self-directed learning attitude.

2. Literature

2.1 Blended Learning

A blend is an integrated strategy for delivering on promises about learning and performance. Harvey pointed (2003, p2) that “Blended Learning focuses on optimizing

achievement of learning objectives by applying the “right” learning technologies to match the “right” personal learning style to transfer the “right” skills to the “right” person at the “right” time”.

By applying learning theories of Keller, Gagné, Bloom, Merrill, Clark and Gery, carmen(2002, p2) defined five key ingredients as important elements of a blended learning process

Live Events: Synchronous, instructor-led learning events in which all learners participate at the same time, such as in a live “virtual classroom.”

Self-Paced Learning: Learning experiences that the learner completes individually, at his own speed and on his own time, such as interactive, Internet-based or CD-ROM training.

Collaboration: Environments in which learners communicate with others, for example, e-mail, threaded discussions or online chat.

Assessment: A measure of learners' knowledge. Preassessments can come before live or self-paced events, to determine prior knowledge, and post-assessments can occur following live or self-paced learning events, to measure learning transfer.

Performance Support Materials: On-the-job reference materials that enhance learning retention and transfer, including PDA downloads, and printable references, summaries, and job aids.

2.2 Project based learning

Project-based learning (PBL) is a model that organizes learning around projects. According to the definitions found in PBL handbooks for teachers, projects are complex tasks, based on challenging questions or problems, that involve students in design, problem-solving, decision making, or investigative activities; give students the opportunity to work relatively autonomously over extended periods of time; and culminate in realistic products or presentations (Jones, Rasmussen, & Moffitt, 1997).

According to Lim, the procedure of project based learning depends on the project designer, however, the

procedure of community-based project

2.3 Self directed learning

The learning style or styles of individuals in a training and management education environment should be an important consideration for trainers, not only in the development and design of any program, but also in the subsequent delivery of that program (David Robotham, 1995).

Self-directed learning approaches are becoming increasingly recognized as ways of obtaining necessary information outside formal organizations (Roger Hiemstra, 1997).

Knowles defined self-directed learning as “a process in which individuals take the initiative, with or without the help of others, in diagnosing their learning needs, formulating learning goals, identifying human and material resources for learning, choosing and implementing appropriate learning strategies, and implementing appropriate learning strategies, and evaluating learning outcomes (1978, p. 18).

As the technology of the Internet is spread widely in the world, e-learning environment was appeared as new educational environment in secondary education. Generally, e-learning environment demands individual learning. In individual learning, one of the important students’ features is self-directed learning abilities. Many researches for the self-directed learning have been accomplished. Most of them are focused on adult learning

3. Applying web based on-off line collaborative learning system

3.1 Planning for blended learning

A. Experimental period / participation group

- Participants : Seohai high school students
- Subject : computer
- Experimental period : March, 2007 ~
February, 2008-05-22

B. Procedure

This study has five steps for the experiment.

Step	Name of Activity
1. Planning	Select topic and plan program
	Survey previous study
	Analyze problems
2. Developing	Develop on-off line learning materials and content
3. Lesson	Introduce PBL(Project Based Learning)
	Web based on-off line collaborative learning
	Report learning results and students’ presentation of learning
4. Evaluation	Reflect and evaluate
5. Reporting	Summarize and report

[Table 1] The five steps for the experiment

C. Learning Topics and Project title

- Title of Project : Using Computer technologies and Finding errors in daily lives.
- Topics of learning
 - Topic1 : Computer in home
 - Topic2 : Computer in a school
 - Topic3 : Computer in Societies
 - Topic4 : Computer in industrials

3.2 Develop of prototype

To provide effective on-off line collaborative learning activities, we developed the project community on EduNet, Korea’ portal learning site which is supported by the government. Figure 3 shows the home page of the community.

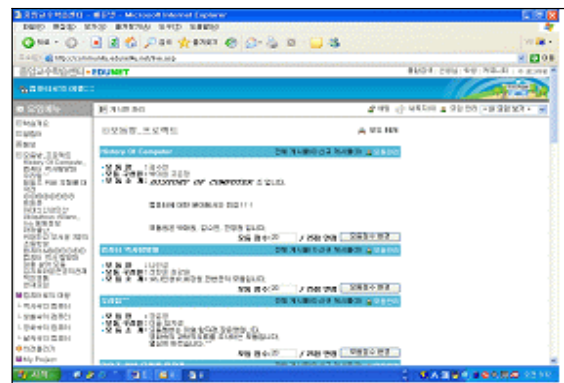


[Figure 1] shows main page of the community (Http://community.edunet4u.net/~Ulearn)

The focus of the developed community was

- Information related to learning topics and data
- Uploading data on the board based on the project type
- Making group rooms for sharing data between students in the same group
- Uploading portfolios

Students could compose their group room environments freely, and each group community to. The environments of the group rooms had the following structure [see Figure 4]. There were one administrator and one sub-administrator to control resources

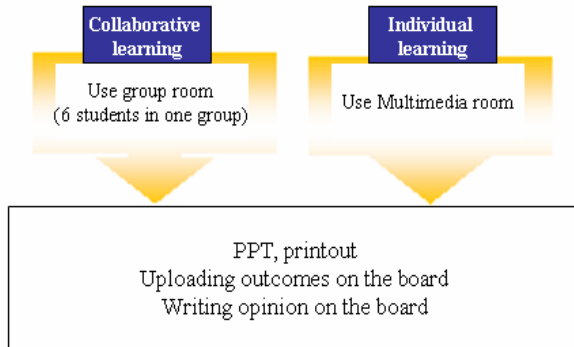


[Figure 2] Group room

3.3 Design and implementation

(1) Group

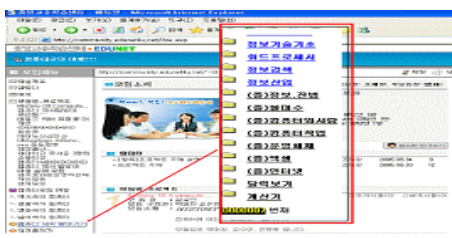
In this study, six students composed one group. The community was developed as the name of “tour toward computer.” The community provided for self-directed learning without limitation of time and space. Figure 5 shows the group structure and each group’s outcomes.



[Figure 3] Group structure and outcomes

(2) E-learning contents for self-directed learning

To learn basic concepts of computing, students accessed the community and logged into “searching the computer” web courseware. In the courseware, students studied individually depending on their current level of academic achievement. In this study, we used open educational software for the learning content as well as flash content and various questions for checking students’ learning achievement.



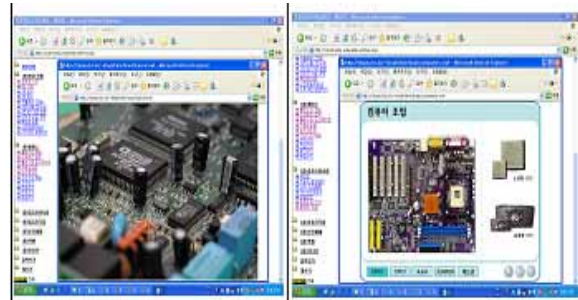
[Figure 4] Web courseware on the community



[Figure 5] Web courseware on the community



[Figure 6] Introduction simulation for solving given project



[Figure 7] Video contents to explain computer assembly

(3) Online evaluation system

After taking the lesson, students took online tests. During the online evaluation, each student evaluated the online evaluation system, and each group was evaluated by other groups.



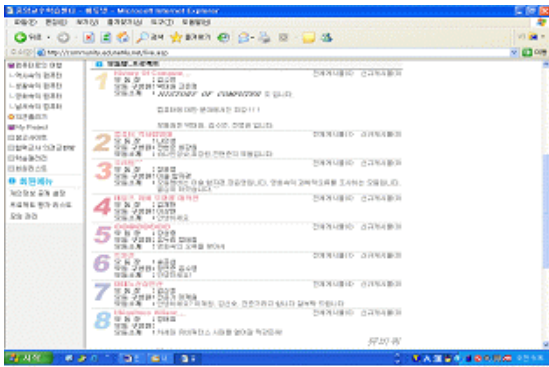
[Figure 8] Online evaluation fram



[Figure 9] Peer group evaluation frame

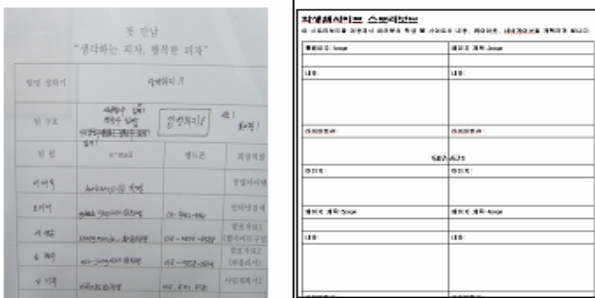
3.4 Project based learning activities

In this study, project-based learning (PBL) was applied to a web community. The project was developed and assigned to students in order to enhance their creative thinking. Each group tried to complete given project by using online searches, asking experts to get valuable information. The outcomes of the project were shared on the board named "Group Data."



[Figure 10] The outcomes of the project on the board

The study also provided learning supporting worksheets that were developed by teachers. However, as they performed the project, they made required data, and worksheets by themselves based on their needs. The worksheets made by teachers were the concept diagram, check list, organizational diagram, and project direction. The worksheets made by students themselves were the plan of presentation, and the presentation storyboard.



[Figure 11] learning supporting worksheets

4. Conclusion

By applying the developed web community based collaborative learning system to students, we found that students could exchange their opinions with each other and find data effectively. Furthermore, students' outputs (the portfolios) were managed systematically. Students realized the importance of continuous and quick feedback.

We also found that communication between group members was an important factor in the success of project-based learning on the web community. Students evaluated themselves that self-directed learning was accomplished

during the study more than before classic classroom and enhanced their presentation skills and problem-solving abilities by finishing the project. Online evaluation results showed every student who took part in the study understood the basic concept of a computer over 80%.

Reference

- [1] Harvey Singh, "Achieving Success with Blended Learning", A White Paper, Instancy, Inc. (www.instancy.com) and Chris Reed, previously at Centra Software., p2, 2003.
- [2] Hiemstra, Roger, "Working with the Self-Directed Learner - A paper delivered at the First World Conference on Self-Directed Learning", 1997.
- [3] Jared M, "Blended Learning Design: Five key ingredients", Product Development KnowledgeNet, 2002.
- [4] Jones, B. F., Rasmussen, C. M., & Moffitt, M. C, "Real-life problem solving.: A collaborative approach to interdisciplinary learning", Washington, DC: American Psychological Association, 1997.
- [5] Knowles, Malcolm S. "self-directed learning, a guide for learners and teachers", Association Press, Follett Publishing Company / Chicago, 1978.
- [6] Robotham, David, "Self-directed learning: the ultimate learning style?" Journal of European Industrial Training, Volume 19, Number 7, pp. 3-7(5), July 1995.