Supporting Collaborative Learning Environment with Learning Blogs

Chun-Chia Wang[1], Hsuan Pu Chang[2], Shu-Wei Yeh[2], Timothy K. Shih[2], and
Mei-Chung Chen[3]

[1]Department of Information Management

Technology and Science Institute of Northern Taiwan ,China

E-mail: gcwang@tsint.edu.tw

[2]Department of Computer Science and Information Engineering, Tamkang University

[3]Computer Center, Hsiuping Institute of Technology

Abstract

Collaborative learning is a kind of group learning mode where members of group learn any concept or topic through communication and discussions. Current researches on collaborative learning paid little attention to the functionalities of group members. In order to solve this problem, this paper utilizes a Learning Blog (LBlog) to share experience and viewpoints of group members, and achieve learning goals together in the end. The LBlog also integrates Learning Management System (LMS) to manage the group members' profiles to evaluate the learners' learning efficiency. Our initial experiments with the LBlog indicate that it is an useful educational tool to support collaborative learning.

Keywords: Learning Management System, Collaborative Learning, Blog, E-learning

1. Introduction

With the emergence of Internet technologies, web-based learning as an increasing acceptable learning approach makes interesting and possible. The concept of web-based learning totally differs from classroom-based method by online communications and powerful computer technologies. This pedagogical mode offers many possibilities, such as approaching new groups of students [2], the freedom of choosing the time to learn anywhere and the way learners prefer, and collaborative learning environment [1]. Many recent studies show that Computer-Supported Collaborative Learning (CSCL) is a promising paradigm for research in web-based education that focuses on the use of Information and Communications Technology (ICT) as a mediation tool within collaborative methods of learning [9] and provides advanced activities, necessary functionalities and learning resources to all participants to enable the collaborative learning experience in open, dynamic, large-scale and heterogeneous environments. However, one of the main challenges in the development of CSCL systems is to overcome important non-functional requirements arisen in distributed environments such as scalability, flexibility, availability, interoperability, and integration of different, heterogeneous, and legacy Collaborative Learning Systems.

In order to overcome these issues, we propose a LBlog that combines with the Web2.0, weblog, and LMS technologies to improve the quality of collaborative learning and life-long learning. Besides, our proposed LBlog is the first one to extend blog functionalities with LMS based on IMS Tools Interoperability (TI) architecture to manage learning course materials and learners' learning processes. Our experiences indicate that collaborative learning at LBlog mechanism may give as good results as CSCL or even better.

The remaining of the paper is organized as follows. In section 2, the state of the art in this research field is stated. The system design and construction of the LBlog collaborative learning are introduced in section 3. The last section summarizes our work and draws some conclusion.

2. Related Work

Collaborative learning has presented a pedagogical mode around a long time. It is a student-centered approach that interacts with one or more collaborating peers to accomplish a given problem. In [3], authors explore the strengths and weaknesses of CSCL, including the viewpoints of the repositioning of the responsibility of learning in which the lecturer's role has been transferred to that of facilitator and

resource guide as CSCL requires that the student take a more active role in his or her own learning [10]. [11] states vicarious learning that points out the knowledge is formed from others' experience. [12] proposes a concept of distributed constructive learning that explains knowledge comes from "doing", not "receiving." [4] uses Blog as a learning tool to be media for tutor development, auxiliary teaching, and dialogue. The author [1] builds a web-based collaborative learning environment via a web-based course to indicate that collaborative learning at web-based environment may give as good as results as classroom learning.

However, the weblog has been widely accepted in use in e-learning during the past four years, it not only provides the personal web vision, but also facilitates the command post function for learner to provide the opportunity to make a discussion with each other [5]. This rapid growth reflects attempts to circumvent the constraints of centralized authorship [6] and increase needs for instant communication on knowledge-building community [7], as it allows alternative forms of learning, such as self-reflection, student-student and student-tutor different to the conventional ways. Besides, with the concept of Web2.0, the weblog is much easy to develop a suitable personal learning interface for LMS in order to fulfill the construction of the collaborative learning environment. Therefore, we propose a LBlog with the integration of weblog and LMS to illustrate that the LBlog has great potential to become one of the effective groupware in collaborative educations.

3. Constructing a Collaborative Learning Environment with Learning Blogs

According to the features of the weblog, it is easy to provide collaborative workspace, where the learners can exchange information in a synchronous or asynchronous manner and support primitive activities and resources in collaborative learning, such as dialogue channel, shared workspace, technologically mediated remote communication, and personal workspace [8]. In order to emphasize these characteristics, we propose a LBlog integrating with LMS to share knowledge or interaction when a learner faces a problem that he/she cannot solve, he/she can exchange meaningful information.

First of all, in order to process the collaborative learning in the open learning workspace, it is very important to find out the suitable group members. It consists of two ways to manage the searching method.
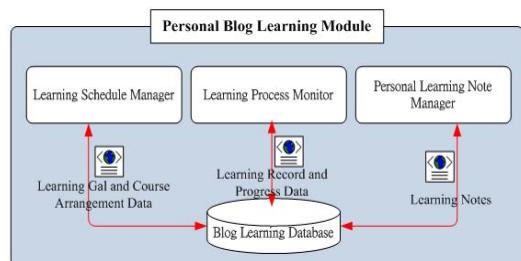
- Searching for mentors
  - Searching for course materials:

browsing members' blogs and realizing their learning statuses and interests.
  - Learning goal: utilizing members' learning goal records and course scheduling strategy to learn the similar knowledge courses.
- Building study forum: The forum is used to construct a more get-together and affinity group such that it is easy to the same learning goal.
  - Grouping members
  - Scheduling the same goal and time
  - Monitoring each other
  - Displaying status
  - Synchronizing multiple discussion
  - Delivering messages

Personal LBlog architecture encompasses two functions-traditional blog function and e-learning function. The former presents the personal operation and interface to exchange and retrieve the learning contents. The latter compliments the features of the pedagogical learning to promote the learners' interests and to motivate their self-learning potentiality. The architecture consists of three managers shown in figure 1.

- Learning Schedule Manager: providing the functions of learners' self-scheduling courses, making the learning goals, and then saving as XML documents in the blog learning database.
- Learning Process Monitor: Monitoring and recording the learners' learning status and behavior, including the beginning time, the reading ID, and time duration.
- Learning Note Manager: Notating the learners' experience and thought and saving the learners' IDs and courses' IDs to database.
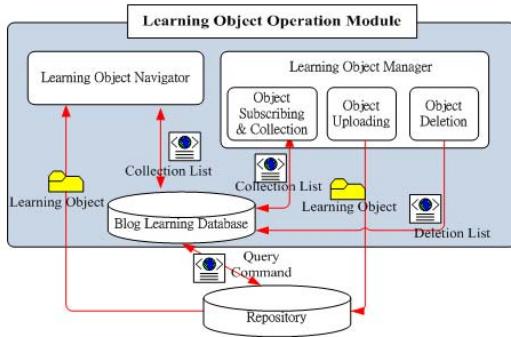

Figure 1. Personal Learning Blog Framework

In the meanwhile, in order to manage the learners' own blogs, this system provides a Learning Object Operation Module to control

the learning resources. It consists of two functions shown in figure 2.

- Learning Object Navigator: Having a responsibility to view all kinds of learning objects. It parses course imsmanifest file, loads and shows the course architecture, retrieves the course metadata, and represents the course contents.
- Learning Object Manager:
    - Learning Object Subscribing and Collection: Assigning the name and ID of the courses which are stored in the repository.
    - Learning Object Uploading: Authoring self course contents and uploading to course repository.
    - Learning Object Deletion: Deleting learners' collecting courses names and IDs.
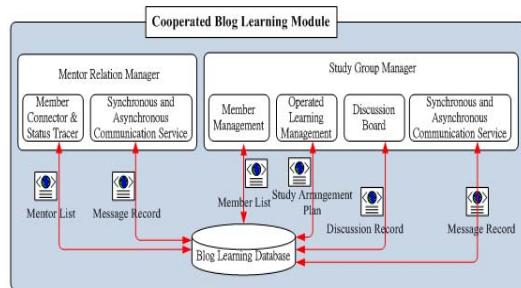

Figure 2. Learning Object Operation Module

The Cooperated Blog Learning Module provides the functions and services of collaborative learning. It divides into two functions shown in figure 3.

- Mentor Relation Manager: Consisting of Member Connector and Status Tracer part and Synchronous and Asynchronous Communication Service part to automatically build the mentors lists. The communication records are saved to database in order to be an important evaluation factor.
- Study Group Manager: Consisting of Member Management, Operated Learning Management, Discussion Board, and Synchronous and Asynchronous Communication Service to deliver a message to willingly organize a member group and call for members publicly. The establisher dispatches the learning goals and jobs such that the group members are able to realize the learning progress and
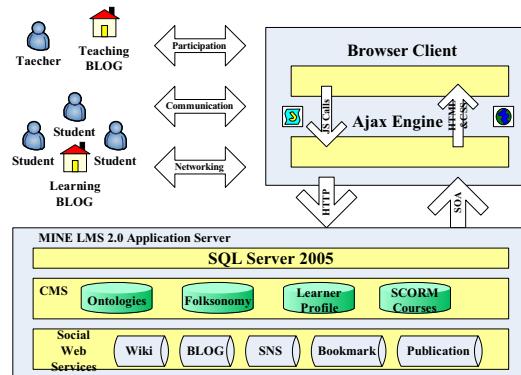
status each other.

Figure 3. Cooperated Blog Learning Module

Figure 4 shows the MINE LMS2.0 system, and it also has the basic functionalities, like the register course, view course and view learning records...etc.

Blog functionalities architecture will be divided into two parts, one is teaching blog which provides the course content, and the other one is LBlog where learners can make the interaction and discussion in this area.
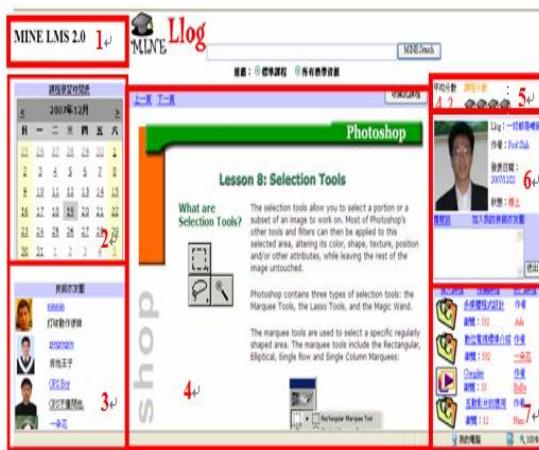

Figure 4. MINE LMS 2.0 based on Blog Functionalities with Tools Interoperability Architecture

- Student (Learning Blog):
    - Each student can be assigned a learning blog.
    - Personal learning blog is similar to the satchel. The student can subscribe the course he wants to learn in a semester.
    - Student can utilize the notebook to connect to the learning blog, than the student will get his/her own learning course.
- Teacher (Teaching Blog):
    - Each teacher will assign a teaching blog.
    - The teacher can issuanced courses to students.
    - The teacher can construct the related course forum, and he can broadcast

course information to the related students.

Learner/Teacher can utilize the JavaScript Call and HTTP method to connect with LMS Server, and utilize the SOA and HTML&CSS to show the result in the user browser.

Figure 5. The View and Implementation of the LBlog

Figure 5 shows the view and implementation of the LBlog. The functionalities of the LBlog will be introduced as follows:

1. LMS: MINE LMS2.0 provides Proxy tool and Tool Interoperability Runtime (TIR) to make communication with exterior tools.
2. Personalized Calendar Functionality: The learner clicks the date of the calendar to realize their own courses when he/she would like to learn. If the learner has arranged the learning courses in advance, system can automatically load the courses.
3. Group mentors: This area shows the name list of the mentors and displays if they are on-line at the same time. Using the hyperlink, the learner is able to visit their learning blogs directly. Also, system keeps track continuously if there are new learning goals or activities, and then notifies to learners.
4. Course representation area: The area shows the webpage learning materials, video, or a picture. If the learners have interest in these courses, they click the button on the right corner to collect the courses.
5. Evaluation area: The learners can browse the courses that peers collect. The learners also can evaluate them.
6. Authors: This area shows all of data that author have. The learners are able to leave messages to authors directly.
7. Collection area: This area shows all of

courses that authors collect. These maybe are IMS Common Cartridge or video courses.

4. Conclusion

In the case this paper shows that the LBlog has been proved to be an efficient environment that enables group members to achieve the learning goal in a collaborative learning. This collaborative learning environment combining with MINE LMS2.0 and Web2.0 functionalities observes as a very important mechanism for motivating students' continuous communication, discussion or participation and sharing their learning experiences in the e-learning field.

References

[1]. Yi Jia, "Building a Web-Based Collaborative Learning Environment", *Proceedings of the 6th Annual International Conference on Information Technology Based Higher Education and Training*, Juan Dolio, Dominican Republic, pp. F2D-7-F2D-9, July 7-9, 2005.

[2]. Rune Pettersson, Gary Svensson, Yvonne Warn, "On Web Based Learning-Experiences from Teaching and Learning Online", *Proceedings of the 34th Annual Conference of the International Visual Literacy Association*, Breckenridge, Coloardo, USA, October 1-5, 2002.

[3]. Sallyanne Williams and Tim. S. Roberts, "Computer Supported Collaborative Learning: Strengths and Weaknesses", *Proceedings of the International Conference on Computers in Education 2002,* Auckland, New Zealand, pp. 328-331, December 3-6, 2002.

[4]. Chewi-Shyong Tsai, http://wiki.mis.nchu.edu.tw/mediawiki/, February, 2005.

[5]. Wei-Jane Lin, Hsiu-Ping Yueh, Yi-Ling Lu, Masayuki Murakami, Koh Kakusho, and Michihiko Minoh, "Blog as a tool to develop e-learning experience in an international distance course", *Proceedings of the 6th International Conference on Advanced Learning Technologies,* Kerkrade, the Netherlands, pp. 290-292, July 5-7, 2006.

[6]. D. Karger and D. Quan, "What would it mean to Blog on the Semantic Web", *Proceedings of International Semantic Web Conference 2004*, pp. 214-228.

[7].   M. Divitini, O. Haugalokken, and E.M. Morken, "Blog to support learning in the field: lessons learned from a fiasco", *Proceedings of the Fifth IEEE International Conference on Advanced Learning Technologies*, pp. 219-221, 2005.

[8].   Toshio Okamote, Muzue Kayama, and Alexandra Cristea, "Proposal of a Collaborative Learning Standardization", pp. 267-268, August 6-8, 2001.

[9].   Zhengyou Wang and Jianhua Ming, "A Web Collaborative Learning System Based on Multi-agent", *Proceedings of the 3rd International Conference on Natural Computation (ICNC 2007)*, pp. 305-309, August 24-27, 2007.

[10].   D.W. McMurray and M.E. Dunlop, "*The collaborative aspects of online learning: A pilot study*", http://ultibase.rmit.edu.au/Articles/online/mcmurry1.htm.

[11].   A. Bandura, *Social learning theory*, Englewood Cliffs, NJ:Prentice Hall, 1997.

[12].   M. Resnick, "Distributed Construction", *Proceedings of the International Conference on the Learning Science,* 1997.