

Collaborative Learning in Internet-Based Distance Education

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Abstract

Collaborative learning is for people to learn together in a collaborative manner. Through collaborative learning, not only can learning become more efficient and effective, learners can acquire and improve their team-work skills as well. In this paper, we will discuss how collaborative learning can be done in Internet-based distance education (IBDE). We will first present some background of the research, and then present the tools and systems that can be used for collaborative learning in IBDE. We will then share with you some strategies and techniques we used to implement collaborative learning in teaching a graduate course in an IBDE setting.

Keywords: collaborative learning, e-learning, Web-based distance education

Introduction

Education is for learners to acquire knowledge and skills. The success of education depends on what sets of knowledge and skills designed for the learners to acquire, and how efficiently and effectively these knowledge and skills are acquired by the learners, and such success can only be proved with the success of the learners in their future careers. Among the knowledge and skills learners should acquire, team-work skills are essential for almost all learners to possess for their future [12]. In traditional

education, team-work skills can be more easily acquired through collaborative learning amongst learners in classrooms, labs and within small groups formed for specific learning tasks. In distance education, however, such close interactions needed for collaborative learning was much less and even impossible.

Fortunately, since today's distance education has advanced to Internet-based, the impossible has now become not only possible, but more convenient as well [1] [2] [3]. If effectively utilized, many Internet technologies and systems available today can be used to support collaboration among learners [11], and hence, to help them developing team-work skills.

In this paper, we will discuss about some Internet technologies and systems that can be used to support collaborative learning in today's Web-based distance education, and present some strategies and practice in teaching a course on information security to a group of graduate students over the Internet. The paper will then be concluded with some lessons we learned from experiences about collaborative learning in Internet-based distance education.

Tools and systems for collaborative learning in IBDE

In the old days when distance education was done through paper-based correspondence and telephone, collaborative learning was hard to

implement among students who were geographically separated. With the drastic expansion of the Internet and the development and deployment Internet technologies and Internet-based systems, today's distance education has moved to Internet-based, and a variety of Internet technologies and systems available for instructors and learners in distance education have made collaborative learning not only possible, but also convenient, even compared to collaborative learning in traditional universities and colleges. In this section, we will present an overview of available Internet and Internet technologies and systems, and discuss how they can be used to support collaborative learning.

Electronic Mail (Email)

Email is almost the first communication system on the Internet. Started as a text-only communication service on ARPANET, the first portion/generation of the Internet, email has been extended to be able to carry multi-media content within the message body or as attachment. Because of its capability of carrying different types of contents, because of its support to communicate in an asynchronous manner, because many people especially those who are not so young are so used to using emails, email is still a good Internet/Web system to use to support collaborative learning in today's distance education.

When using email for collaborative learning, it is important to ask all participating learners to use carefully chosen subjects for all messages related to the collaborative learning session, so that email filters can identify all the messages and put them into different folders or subfolders.

Threaded Discussion forum

Threaded discussion forums may be the second most popular communication system used in today's distance education. Because postings to

the forum are threaded and because communication in a forum can be asynchronous, discussions within a forum can be easily organized and followed. We have been using threaded discussion forum in our online course delivery since later 90s, and we are still using it as a main channel for communication with and between students. Compared with email, threaded discussion forum presents everybody in a course, or a collaboration group with a consistent body of knowledge generated during the course or collaboration.

Blogs

Originally coined by Jorn Barger in late 1997 [6], Blog has evolved to be a popular and very powerful media for the general public to publish all types of information on the popular Internet: small or big articles, short commentaries, photos, audio and video clips. Compared to traditional media such as newspapers, magazines and even formal Web pages, publications on a blog site are more casual, but provide the general public world-wide with almost instant access to news and new ideas; compared with email and threaded discussion forum, however, postings to blog sites are a bit more formal.

In some cases, a blogging site may provide a mechanism for interactions between original author and the readers, by allowing the readers to leave comments [10]. This feature of blogging is especially favorable in collaborative learning: imagine that each participant in a collaboration group posts an answer to a question or topic to a blogging site as a blog, and then all others in the group can comment on the answer using this feature of blogging.

Wikis

Wiki is a Web technology developed for the easy creation and editing of Web content through a Web browser using a simplified markup language or a WYSIWYG editor [7]. In

fact, Wiki was developed for collaborative authoring. In that sense, it is a favorite Web technology and system for collaborative learning in today's distance education. A well-known example of collaborative Web content authoring may be Wikipedia (<http://www.wikipedia.org>).

A wiki system can be best used in report or paper development in a collaborative learning session. For example, a report/paper can be initially divided into several sections, including abstract, introduction, and a few sections for the body, a section of discussion/conclusion, and references, and assign each section to a different member in the collaborative group as a chief author to draft the section, and all others may be allowed to edit, or comment. Such collaboration will significantly speed up the authoring of the report or paper.

Instant Messenger

Instant messengers are systems that provide users with instant communication services using the Internet. Initially only plain text is supported, today's instant messengers support audio and video calls as well. Using an instant messenger, people can also share documents [9].

Currently, there are many Internet-based systems that provide instant messaging services. Good examples of such systems are Windows Live Messenger (<http://explore.live.com/home>), formerly called MSN Messenger, and Skype (<http://www.skype.com/>). Although not initially designed for instant messaging, Skype can now be used as an instant messenger for convenience, because other services such as audio calls to other Skype users and landline phones, as well video conferencing are all built in. All these communication services are useful in collaborative learning.

Compared to other Internet technologies and systems we have previously discussed about, systems such as Microsoft Live Messenger and

Skype can be best used for meeting and conferencing in collaborative learning. One must remember that text messages, audio and video calls generated in such systems are not automatically archived for future uses. Also, in terms of conferencing, only limited number of people can be supported in such systems. Currently, Skype voice conference supports up to 25 people at a time.

Strategies for collaborative learning in IBDE

A good collaborative learning session must begin with a good plan. So, the first step toward a successful collaborative learning is planning. Such planning can be done by the instructor, or jointly by group members, lead by the instructor or group leader. In any case, the purpose of the planning phase is to develop clear instructions for participating learners and make everybody know what are to be achieved through the collaborative learning session, and what each participating learner should be doing for the group. According to (Kollar, Fischer & Hesse, 2006), such instructions must clarify the following for each and every learner in the group:

- ✓ ***Set up the objectives:*** it has to be made clear to every learner about the learning objectives the group and each learner need to achieve, though the collaborative learning process.
- ✓ ***Define the activities:*** learning activities must be clearly defined to support the learning objectives, and every learner in the group must know clearly what he or she is expected to do as a collaborator in the group. These activities may include searching for articles, books or other references for the group, providing summaries of those articles, books and references, generating questions for

others to think and answer the questions others have asked.

- ✓ ***Put the learning activities in the right order:*** it is also necessary to let everyone in the group know in what order the activities specified above should be taken. Some activities may depend on others so that they have to be taken before others. The sequencing process will also set deadlines for activities.
- ✓ ***Distribute roles within the group:*** the nature of collaborative learning is that different learners may play different roles by carrying out different learning activities for the group. So, it is important to clarify the roles each individual will play throughout the collaboration, or during different stages.
- ✓ ***Make clear about the outcomes and the way(s) they are presented:*** the outcomes of collaborative learning of the group essentially depend on the outcomes of each individual, which shall be, and must be presented to the group in some form. So, it is very important to make every learner in the group know how his/her outcomes should be presented and in what format, where and when.

After a good plan has been made, the next step is to kick-start the collaborative learning session. This step is important but simple, after the activities have been clearly defined in the plan.

Once the collaborative learning session is started, the next big step for the learners is to carry out the learning activities according to the plan; for the instructor or group leader at this step, it is important to monitor the activities of all participating learners to ensure that the activities are completed on time and done correctly, and

the objectives have been achieved. During the collaborative learning session, there may be need for changes to the activities. For example, some of the planned activities may not be well planned after all, hence need to be revised or adjusted; another situation where changes may need to be made is that for some reasons, a participant in the group may not be able to meet a deadline.

The last step of a collaborative learning session is for the group to summarize the learning outcomes, and to ensure that everybody in the group has acquired the knowledge and skills he/she is supposed to get from the learning session, although different learner in the group may have carried out different learning activities during the session.

Our Experience - The Need for System Integration

We utilized collaborative learning when teaching a graduate course on information security in the fall session of 2010. The systems we used in the collaborative learning session include email, Skype, Wiki, discussion forum and peer-to-peer messaging built into Moodle, an open source LMS system adopted by the university. In the plan, we give a list of topics covered in each unit of study and assign the topics to students in each collaboration group, and then ask each student to post his/her findings about the topic assigned to the threaded discussion forum in Moodle, while ask others to read, comment and add further findings. One each topic, a report is generated collaboratively using Wiki. To assess the learning outcomes of each collaborative group, some information security problems related to the topic are given to each student, and then students in the same collaboration group, working on the same topic, exchange answers to mark and discuss through audio conferencing on Skype.

From this experience, we feel there is a need for system integration to support collaborative learning [4]. Using several systems makes information generated during the collaboration hard to track. We cannot ask students to use only the threaded discussion forum built in Moodle, because it doesn't provide other services needed to support collaboration, such as audio and video conferencing; most of our graduate students in the course are full-time employed in the IT industry, often in senior positions, and they want to use their Blackberries or iPhones to email or message others to collaborate. It would be more effective if all the data generated through these communications can be archived and accessible within an integrated system. Note that integration of certain systems previously discussed will form a new Web technology called social network, which has been tried for collaborative learning as well [8].

Discussions

We presented in this paper how collaborative learning can be implemented in today's Internet-based distance education. We argued that collaborative learning is necessary for students in distance education to develop their team-work skills, and to make learning more effective and efficient. We discussed several Internet technologies and systems that can be used to support collaborative learning in today's IBDE. We further presented some strategies for collaborative learning in IBDE we developed when implementing collaborative learning during a fall session of teaching a graduate course on information security.

There are two lessons we learned from our experience in implementing collaborative learning in IBDE. First of all, the collaborative learning must be well planned, and everybody in the collaboration group must be made clear about the objectives of the learning session and activities/tasks he/she must carry out; Secondly,

good monitoring and necessary adjustment during the collaboration are important, and the instructor or team leader must be prepared to do that, to ensure everyone in the group will meet the deadlines, while leaving some rooms for changes due to unforeseen circumstances.

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