

THE APPLICATION AND ENHANCEMENT OF WEB BASED COURSES

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ABSTRACT

This paper presents the methodology, the results and the difficulties found in the development and delivery of a course through the Internet. The course is about the application of information technology to education and is being delivered using the AulaNet environment, which is a groupware for the creation, participation and maintenance of Web-based courses. This paper also shows how this kind of environment can be used to provide support, facilitate and manage cooperative learning.

KEY WORDS: distance learning, Internet-based educational systems, cooperative learning, groupware.

1. INTRODUCTION

Society is changing and professionals dedicated to intellectualized work are in ever-greater demand [1]. Besides possessing the knowledge necessary to do their jobs, workers must also have other, perhaps even more important skills. They must learn how to learn so that they are continuously able to adapt to the constant evolution within the work environment and to the tools of their trade, and must learn to work within a group. These changes in work patterns are also noticeable within the field of teaching. The use of the Internet makes cooperative learning possible [2], allowing for a rich exchange of information between members of a knowledge community.

Despite the fact that the Internet brings us innumerable possibilities and facilities for teaching/learning, there are also many difficulties associated with it. Upon developing a course the teacher normally have to understand technologies that are not part of his field of study. In order to get around this problem, they can use environments like AulaNet [3], that facilitates the creation, delivery and administration of Web-based courses and separate the educational content from navigation. This permits teachers to concern themselves with the production of

educational content, using everyday tools such as a word processor, while letting the environment worry about learner management and navigation. Moreover, the AulaNet environment offers integrated communication, coordination and cooperation services that can be added to the course as it proceeds, in order to supplement it.

It was with this scenario in mind that the Information Technologies Applied to Education (ITAE) course was designed and is being delivered. Its purpose is to get students to learn to work with information technology as a group, turning them into Web-based educators [4]. The class has been conducted since 1998 as a regular course and currently is wholly taught on the Internet through the AulaNet environment.

In this paper we will report on the methodology that was used, the results that have been obtained and the difficulties that have been encountered in the development, delivery and integration of the course with the environment.

2. THE ITAE DYNAMICS ON THE AULANET

In order to smooth the adaptation of learners to the environment via the Internet, the AulaNet services are added to the ITAE course as it progresses. At the beginning a minimum set of available resources are used, and as necessary, new services are added to the course and their use is explained to the learners. Now we will analyze the use that has been adopted by each AulaNet service in the course.

Since it is a course that is based mainly on participant interaction [5], the ITAE course uses all of the communication services that are available within the environment. The Contact with the Teachers is a channel for contacting members of the course's teaching staff. The Group Discussion channel is used to communicate with the entire class. When a message is posted on this service, besides being filed within the environment it is sent to the electronic post office box of all members of the group. As a result, everybody is aware of the activities of the Group Discussion, even if they do not enter the environment. In this service, the messages are shown as a list sorted chronologically and they can be consulted at any time.

This service was used for the discussion of the course content and for coordination messages from the instructors.

The Interest Group operates like a conferencing system where it is possible to answer a message and the answers are nested below it, forming a threaded discussion. This structure allows the organization of a discussion by topics, with related messages remaining compartmentalized below the original topic message. This is different from the Group Discussion service where messages about different topics are mixed together, often making it hard to reconstruct the linkages. The Interest Group does not send electronic mail messages and the learners must get into the environment to consult the service and participate in the discussion. In the ITAE the Interest Group service is used to develop in depth course themes and topics selected by the learners.

The Debate service is a real-time conversation through text chat. In the ITAE, the topics are divided into lessons and the Debate is used for weekly discussions. Since it is a synchronous communication service [6], before beginning the course the learners are informed about the time slot that should be reserved for the debate.

Finally, the Participant Contact service is the only tool that is used by the ITAE without having a specific purpose. It lets members of a group who are simultaneously connected to the environment to contact each other through messages that open up in new browser windows.

The course uses the following coordination services: Tasks, Lesson Plan and Participation Follow-up. At the end of the course, the Tasks service is used to assign the writing of a paper about a particular topic to learners. The environment permits configuring if a learner's task resolution is visible to the others. This is permitted in the ITAE since monograph themes are all different and having access to papers produced by colleagues motivates those who are developing their own topics and enriches the cooperative learning process [7].

In the Lesson Plan the teacher structures the course's educational contents, separating them into lessons. These lessons follow an order that is suggested, but not imposed upon the learners. This order just indicates a basic flow for the course. The lesson content is made up basically of videos, slide presentations and supplementary texts that learners may consult at any time and choose the format that most pleases them [8]. The environment allows learners to take private notes on a lesson for their personal viewing. The Participation Follow-up allows quantifying and qualifying learner participation and it makes participation reports available to everyone involved in the course.

The cooperation services: Bibliography, Webliography and Documentation services are other means through which educational content may be presented and the Learner Co-authorship service is used to let learners supply new content to the course. This new content needs to be checked up by the teacher in order to be incorporated to the course.

3. THE COURSE METHODOLOGY EVOLUTION

The ITAE course syllabus covers the following topics: groupware concepts, digital communication, Web-based instruction (WBI), learningware, multimedia, Web-based course projects, learning environments, education on the Internet 2 project, implementation of WBI and knowledge communities. The objective of the course is to capacitate educators to use the new technologies for teaching/learning and to develop a community of persons who are interested in the subject. Despite the non-mandatory nature of being a totally distance learning experience via the Internet, this mode of teaching was chosen because it is related to the subject of the course and in order to create an environment for experimenting with distance learning methodologies and technologies.

The course was taught for the first time during the first semester of 1998 and its structure has been evolving ever since. Initially the course structure included a weekly live class and a debate via the Internet, using the AulaNet Debate service. This embryonic version of the ITAE served to generate educational content for the course. Final evaluation of the learners was based upon the amount of participation and the quality of their contribution [9].

Held during the second semester of 1998, the second edition of the course was entirely delivered through the Internet. In order to help the course contents generation, the final task of the learners enrolled in this edition was to prepare a new lesson about a theme discussed in one of the Interest Groups using the necessary resources (slides, text, images, video, HTML pages, etc.) Besides the regularly enrolled students at the university, this time the course was also attended by outside individuals, adding up to 100 learners. The excessive number of participants made it difficult to prepare a cooperative learning process that could count upon everyone's participation [10].

In the third edition of the course, held during the first semester of 1999, the content from the first two editions was taken advantage of once again, demonstrating the evolutionary aspect of the generation of a community. To solve the communication overload problem [11], the learners were divided into smaller subgroups, each with its own instructor. It was also decided that at this edition of the course each group should have between 10 to 25 participants. Despite the changes made, one of the groups comprised of students who were not regularly enrolled and would not be graded did not live up to expectations, with some activities left unfinished and some debates cancelled for lack of quorum.

Attempts were made to stimulate learners to participate more in this edition. For each one of the topics divided into weekly lessons, one of the learners was designated as a seminar leader. This person was responsible for carrying out research about the current topic and preparing the seminar, which consisted of a text substantiating his or her point(s) of view about the topic. Each of the other

learners prepared their own contributions to the seminar, delving into greater depth about some aspect of the topic. Another duty of the seminar leader was to coordinate the debate together with the instructor, encouraging learner participation, proposing topics and maintaining the focus of the discussion. During the first week the learners were also asked to present themselves to break the inertia and their initial fear.

In the fifth edition conducted during the first semester of 2000, the AulaNet incorporated a feature in the Participation Follow-up service for assessing messages and making qualitative and quantitative reports. Knowing and seeing that they were now being evaluated, learners worked hard to get good marks on their messages and seminars. The message evaluation feature also generated a major positive discussion within the group. Another feature incorporated into the environment was the categorization of messages. Looking for a better organization of the large volume of messages, at the outset the coordinator defined desired course categories and, upon sending a message, the participants were to select among them the one that most reflected their intention. The use of categories coupled with proper subjects improved the participants' ability of identifying the content of the messages.

It was noted that in the Discussion Groups half of the messages were about the course itself and half were about content. Since these two types of messages were sent to the same list, the messages were intermingled, making the list look disorganized. The messages about the course were messages with suggestions, doubts or questionings on the methodology, selection of topics for discussion and other messages about the conduction of the course that were really not related to course content.

In the sixth edition of the course conducted during the second semester of 2000, as an effort to solve the problem about lack of structure and organization of the Group Discussion messages, the discussions about course content were transferred to the Interest Group. A new interest group was created for each lesson/seminar and the messages were organized and compartmentalized there. After that the Group Discussion service basically was used for group coordination. This change made it possible to increase the quality and the quantity of the messages, raising the average number of messages per seminar from 7 to 24. This semester in order to supply an initial example about the seminars, the first seminar leader was an instructor and the topic was about the change of attitude expected from the participants in their transition from the classroom to the Internet.

4. CONSIDERATIONS REGARDING THE ITAE COURSE

Now let's look at some of the observations and conclusions that were obtained from the six editions of the course and that can be useful in order to prepare and improve distance learning courses on the Internet.

4.1. COST OF DEVELOPMENT, UPDATING AND DELIVERY

In principle, the time and effort needed to develop good educational content are substantial and possibly prohibitive. In order to develop attractive content, besides good understanding about the subject, other skills such as knowledge of graphic design techniques are required. The ideal situation is that for the teacher to have the support of a team of experts that has such skills. Since the ITAE does not have such resources, the course was developed through the six editions and a large portion of its educational content was re-used and improved with the help of the learners.

Regarding the updating of the content, the major obstacle found was the difficulty in editing videos. External Internet page references also generated problems, because links change frequently forcing the instructors to constantly check these references. The cost of monitoring the learning process, moreover, uses up a lot of the time of the course instructors.

4.2. LEARNER PARTICIPATION

With a few exceptions the participation of the learners during the course has been satisfactory giving their intense participation. But there are times when the level of interaction begins to decline, requiring the intervention of the instructor who needs to send out motivational messages to individuals and to the group.

4.3. EVALUATION OF THE LEARNING PROCESS

Evaluation of learners in the ITAE is based on their participation and on the quality of their contribution during the run of the course [12]. Although AulaNet contains evaluation mechanisms in the form of questionnaires, in order to evaluate learners based upon cooperative rather than individual tasks, the ITAE did not make use of this service [13].

4.4. EVALUATION OF THE COURSE BY THE LEARNERS

For the majority of the learners it was their first experience with Internet-delivered education. The learners reported that they had some initial difficulty in getting accustomed to the methodology adopted, i.e., being active learners, having responsibility for the success of the course and generating group knowledge instead of receiving everything ready from the instructor. Although they liked the content, the learners affirmed that the learning process occurred mainly during the exchange of views and experiences with other learners. They also stated that the heterogeneous set of activities (seminars, contributions, debates, interest groups, papers, etc.) permitted a major involvement on their part and allowed

them to assimilate content in a more constructive manner [14]. It also was reported that the obligation of preparing a seminar and posting contributions to it contributed to both individual and group learning. They complained that the instructors should participate more actively in orientation of the discussions regarding the content of the course instead of merely observing and evaluating. The learners thought that this posture, instead of working as an incentive inhibited the participants.

The communication service that was most cited (66% of the learners) was the Debate. They said that the weekly debate generated a sensation of proximity between colleagues and instructors and the discussion of the topics took unexpected directions that were only possible to attain through the collaboration of the group, thus generating new questions, ideas and views. However they also pointed the difficulty of accompanying a discussion when many individuals were writing at the same time, making it difficult to know which question to answer when there were several at once.

5. CONCLUSIONS

Environments such as AulaNet can provide the means for structuring the learning process. The ITAE course is a project developed by the AulaNet team to discuss how to apply information technologies in education. ITAE acts as an environment for testing and generating ideas and it was developed specially for web delivering.

In ITAE, the cost of preparing educational contents was significant in the beginning, but diminished in time as a result of their re-use. The interaction among the participants of the course raised issues about communication overload. These issues showed, for example, the need to keep the number of learners in a group under 25 participants in order to create a sense of community, thus making the accompanying of their participation feasible.

As ITAE has never been delivered in a traditional way, it was not possible to verify whether the use of the Web for delivering the course increased the results obtained in the learning process.

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