

An Assessment of On-Line Collaboration: A Case Study of an On-Line Graduate Course

Fatma Cemile Serce

Information Systems, Informatics Institute
Middle East Technical University, Ankara, TURKEY
cemile@metu.edu.tr

Soner Yildirim

Computer Education and Instructional Technology
Middle East Technical University
Faculty of Education, Ankara, TURKEY
soner@metu.edu.tr

Abstract: In this study, the effectiveness of a learning management system on on-line collaboration was investigated in a graduate course offered through the means of distance learning. The study explored the nature of collaboration, the perceptions of students on the effectiveness of the tool on on-line collaboration, the factors contributing to the effective peer interaction among students and the role of the instructor as perceived by the students in the on-line course. The study used data from 16 graduate students, the instructor and the assistant. For this research, descriptive study was carried out and both qualitative and quantitative results were given at the end of the study. The findings involve the recommendations for teachers and learners to be successful in on-line collaborative learning environment. The study also provides guidelines for the design, development, improvement, and evaluation of learning management systems by means of on-line collaboration.

1. INTRODUCTION

The advances in technology and changes in the organizational infrastructure put an increased emphasis on teamwork within the workforce. Workers need to be able to think creatively, solve problems, and make decisions as a team. Therefore, the development and enhancement of collaborative skills, and producing graduates who are flexible and have market-related skills and abilities have been among the primary goals of higher education. Online education provides opportunities to both educational institutions and learners on collaboration.

The Informatics Institute at Middle East Technical University developed a web based learning management system, called NET-Class. It has been used for delivering on-line graduate programs and some service courses given at METU. It is also used as a tool to support face-to-face instruction. As a tool used for promoting computer-mediated communication, this study is designed to examine the effectiveness of NET-Class on on-line collaboration for project based learning in a graduate course offered through the means of distance learning. The perceptions of the students about their experiences on on-line collaboration in the course studied are obtained. Moreover, the nature of collaboration of the course is identified from the postings to the forum with respect to the issues: interaction, participation, feedback and the utterances for on-line collaboration.

2. ONLINE COLLABORATION

Collaboration is something that human beings have been experiencing from early times and applying in all their daily life. [1] underlined this when she stated, "the social process of developing shared understanding through interaction is the 'natural' way for people to learn".

Education is based on dialogue instead of monologue. Both in on-line and face-to-face learning environments, there is both information provider and information consumer. The learning occurs in the communication between the information provider and consumer. To increase the quality of instruction, it might be an idea to make this communication more effective and stronger by promoting collaboration among the participants.

Several studies have shown that collaborative learning strategies result in more student involvement with the course and more engagement in the learning process, and collaborative learning methods are more effective than traditional methods in promoting student learning and achievement [1]. [2] argues that if the purpose of instruction is to enhance critical- thinking and problem- solving skills, then collaborative learning will be more beneficial.

Economic, social and technological forces continue to change the global economy, and the way of life in organizations and the world. These factors are crucial to make an ongoing change in teaching and learning organizations. [3] argue that much of the change in academic institutions is because of the economic pressures from mounting costs and demands by the industry for graduates with the ability to function well in a knowledge society. In order to supply the demands, the higher education institutions, with increasing frequency, start to use the Internet to deliver courses to students at a distance, as well as to provide on-line educational programs.

Therefore, online collaboration becomes one of the essentials of distance education of today and future. [2] stresses that "most of the research studies on collaborative learning have been done at the primary and secondary levels". There is a lack of empirical evidence on the effectiveness of collaborative learning in higher education. However, the need for noncompetitive, collaborative group work is emphasized in much of the higher education literature and this yields the need for the research studies on collaborative learning at higher education. This study may contribute to literature by means of an example study on collaborative learning at higher education. The study identifies the factors affecting the collaboration in on-line learning environments and also provides guidelines for the design, development, improvement, and evaluation of learning management systems by means of on-line collaboration.

3. METHODOLOGY

This is an exploratory case study that is based upon descriptive data. The subjects of the study were included instructor, 16 students and teaching assistant enrolled in the course offered in a graduate program at Informatics Institute, enrolled at Middle East Technical University during spring 2002. The course was offered through a learning management system, called NET -Class as a case that grounds the whole research process.

In order to be able to figure out the factors affecting on-line collaboration, all the activities involving collaborative tasks were analyzed. Accordingly, collaborative groups and peers were determined. Collaborative groups were whole class and the discussion groups formed in the forum environment. Moreover, the course was a project-based course and it was allowed to work in peers in project development. Therefore, collaborative peers were taken as the peers working together to develop the project required in the course.

A combination of quantitative and qualitative research methods was employed in the study: a questionnaire survey, observation, interviews and document analysis. Qualitative analysis method was applied to the transcripts of the interviews, the outcomes of the observation reports and the outcomes of the document analysis of posted messages to the forum. The coding schema developed by [4] was used to describe utterances in on-line collaboration in discussion forums. Moreover, the posted messages to the discussion groups were also analyzed according to the 3 important issues, participation, interaction types and feedback.

4. FINDINGS

The findings provide information about peer collaboration, collaboration in discussion groups, collaboration in whole class, effectiveness of LMS on on-line collaboration, the factors affecting on-line collaboration and instructor' role in online collaborative learning environments.

4.1 PEER COLLABORATION

The findings indicate that except from the initial phase, in which learners start to get to know each other, some peers worked individually in most of the phases. They preferred to divide the each task into sub-tasks and distribute them to each other. Their work is a kind of cooperative work rather than a collaborative work. These peers stressed that the time, work overload and knowledge levels make them work individually in most of the phases.

4.2 COLLABORATION IN BOTH DISCUSSION GROUPS & WHOLE CLASS

The findings of both discussion groups and whole class were similar. The on-line interactions in both collaborative groups show that the interactions provide contribution to the participants. According evidences for collaboration in on-line interactions to the findings, it is found out that the *Contributing* behavior category has the highest proportion among the others whole class. *Sharing Knowledge*, and *Exchanging resources and information* are prominent behaviors of this category respectively. On the other hand, *Social Interaction* behavior category accounts no proportion of the coded behaviors in both collaborative groups. This means that the discussions were task focused.

According to the quantitative results, it is found that the average feedback giving time was about 2 day and 3 hours, regarding the type of interactions, 34 % of the messages involved student-student interactions and participation of the students was about 40 % in the whole class. Moreover, disorganized messages and threads in the forum, lack of student-student interaction, the language of the discussions, lack of participation and activities in discussions in the forum were the major problems expressed by the participants of the study.

4.3 EFFECTIVENESS OF LMS

Most of the students feel that NET-Class is effective and sufficient in providing on-line education. They specifically mentioned the goodness of the forum, lecture notes tool of the NET-Class. According to findings, the learners did not complain about or ask for help about any technical problems while using the NET-Class. The reason was found that all of the learners were graduate students in the department of information systems. That means, they have been using the communication technologies effectively.

Regarding peer collaboration, the NET-Class was not used much for the communication. Although, communication platforms were opened for each peer in the forum environment, they did not use these platforms for their communication. They stated the reason for not using the system as not having necessary resources to do the project collaboratively such as server. Since the course was a database course and it is required to develop database projects, there was a need for resources such as computer(s) and software.

4.4 THE FACTORS AFFECTING ON-LINE COLLABORATION

According to the findings obtained, the factors affecting the on-line collaboration in on-line courses are given in Figure 1. Apart from these factors, the participants stated some strategies used in online discussions affective such as discussion circles in which student-student interaction had the highest value. According to the students' feedbacks, it was also found out that it could be an effective strategy for effective peer interaction to provide a platform in which all students or the group members could meet at a particular time and discuss about the projects in each week. The discussion is synchronous in nature; however, the forum tool will be used instead of chat tool as in the traditional synchronous communication. This is something similar to 8:30 classes in traditional learning settings.

4.5 INSTRUCTOR' ROLE

It is found out that, the objectives of the course, the content of the course and the nature and purpose of the task are the factors affecting the role of on-line instructor. Moreover, almost all of the students emphasized giving

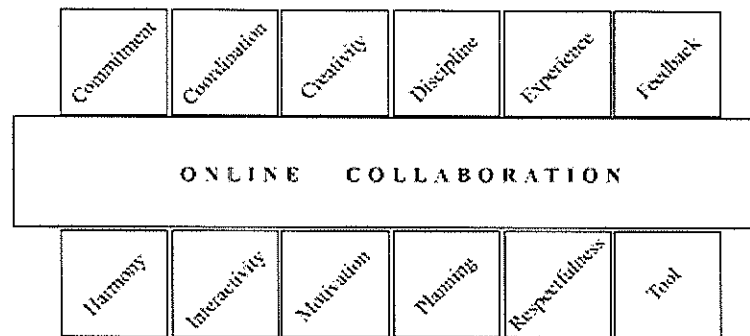


Figure 1 The factors affecting online collaboration

immediate feedback, keeping discussion active, monitoring group works and motivating learners as the major roles of online instructor in online collaborative learning environments.

5. CONCLUSION

This study indicates that collaboration in on-line learning environments depends on both instructional and technical issues. Although technical aspects are important, the spirit of distance education lays on the instructional strategies applied in the learning settings. That means it is possible to fill the lacks in technology with instructional mode, but it is not possible to fill drawback in instruction with technology. Therefore, it is suggested to design and develop new instructional strategies and methods and then to design and develop necessary tools accordingly. The study indicates that the giving immediate feedback, increasing participation, encouraging student-student interaction and social interaction are the three essential tasks of an effective online collaborative learning environment.

Moreover, the findings indicate that it is necessary to provide resources to the students that are needed in development of the projects. Therefore, it will be beneficial to make a requirement analysis of each group or peers at the beginning and to provide necessary guidelines, resources and supports to students. [6] states the conditions for effective collaborative learning as group composition, task features and communication media. It can be understood from the findings that, "resources" provided to the students should also be accepted as a condition for effective collaborative learning.

Although the study is based on one-semester observation rather than a longitudinal, it contributes to understanding of effectiveness of the NET-Class on on-line collaboration, the factors for effective on-line collaboration and the role of the instructor in on-line collaborative learning environment.

6. REFERENCES

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