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KEYWORD: Online Learning

Perceptions on Problem-Based Online Learning

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Abstract

This study investigates the students' perceptions of problem-based online learning in regard to computer mediated communication, benefits for learning, online support, motivation, and online collaboration. A case study design was used in this study. The participants consisted of 87 students. The study lasted for 14 weeks. Quantitative and qualitative research strategies to investigate students' opinions about the problem-based online learning environment were used. The results indicated that students were satisfied with the problem-based online learning experience.

Introduction

Among others, there are two critical challenges for the students who enroll in distance education courses face: lack of communication and adequate guidance. Since the instructor is not present in the classroom, and the students are away from each other most of the time, the communication and guidance have to be provided through the Internet by means of computers. If communication tools and facilities are established well and proper, and guidance is provided when needed, then learning can be enhanced. Through computer-mediated communication, all types of interactions namely student-content interaction, student-teacher interaction, and student-student interaction (Moore & Kearsley, 1996) and learner and interface interaction (Vrasidas, 2000) are available for the students and the instructor.

Bolliger (2004) identified the contributing factors to online learners' satisfaction as availability and feedback time of the instructor, social interaction and collaboration among peers, and between student and instructor, accessing to technology, support and meaningfulness of the course website. To help learners connected emotionally and socially, peer and student-instructor interaction can be facilitated through synchronous communication (McInnerney & Roberts, 2004) and asynchronous communication tools (Taylor, 2001). Interaction can be facilitated best when learners collaborate with peers on projects and assignments related to the course. (Vrasidas, 2000).

The online instructor has an important role in keeping learners on track of the course requirements, and in facilitating student participation (Moore, 2001). He/she should hold social, pedagogical, managerial and technical skills to plan the instructional tasks, and to provide students with timely feedback (Bonk, Wisner & Lee, 2004)

To create a sense of community, situated, learner-centered, integrated, collaborative and project-based online learning environment should be established. Thomas, Mergendoller & Michaleson (1999) indicated that project-based learning involves authentic tasks, authentic assessment, and appropriate facilitation by the instructor. Projects are created by a problem or

a driving question (Blumenfeld et al., 1991). According to Nelson (1999), in problem-based learning, learners in groups work on a carefully designed problem scenario with the assistance of the instructor. Discourse among students and instructor is essential to problem-based learning process (Zumbach, Hillers & Reinmann, 2004). In this process, students elucidate the problem, determine learning needs, examine the resources and apply newly obtained understanding to solve the problem (Pearson, 2006).

Despite the widespread implementation of online learning in the field of education, and a rich research basis investigating the effectiveness and efficiency of online courses/programs, the literature falls short in providing guidelines for effective and efficient implementation of online learning. Therefore, there is a need to examine experiences of students engaged in problem-based online learning. Accordingly, the purpose of this study is to find out how online learners perceive online collaboration, computer-mediated communication, motivation, online support, and the benefits of collaborative problem-based online learning environment.

Method

A case study design integrating qualitative and quantitative research strategies was used in this study, and it lasted 14 weeks. One classroom was studied through survey and interview techniques to understand students' perceptions of collaborative problem-based online learning environment.

The participants consisted of 87 (46 male and 41 female) volunteer Computer Studies and Information Technology Vocational School second year students who enrolled in "Web Design" online course at Eastern Mediterranean University in Magusa, Northern Cyprus. In the study, there were four online groups each consisting of 20-25 students. At the end of the semester 35 volunteer students (20 male and 15 female) were interviewed to get deeper understanding of their perceptions of problem-based online learning experience.

For the purpose of this study, an online questionnaire was developed through the examination of the related literature in the field. Two experts from the instructional technology field examined it, and based on the feedback, the questionnaire was revised. The questionnaire consisted of 28 five-point Likert type items. The internal consistency of the questionnaire (Cronbach alpha coefficient score) was found to be .90. The themes in the questionnaire included online collaboration, computer mediated communication, motivation, online support and benefits of problem-based online learning environment. The frequencies, means, standard deviations and percentages of the data gathered from the online questionnaire were calculated.

The purpose of the interview was to follow up the findings of the questionnaire, and to gather in-depth data. An interview guide consisting of six questions in line with the themes covered in the questionnaire was developed. A total of 35 volunteer students were interviewed individually at the end of the study, and the interviews were tape recorded with their permission. The interview results were subjected to content analysis in which the data were coded first, and then the categories were established to bring together the codes produced.

The Online Course

The study was carried out in a "Web Design" online course aiming to help students develop the student skills in HTML, ASP and Web design.

To engage students in the course, an online collaborative problem-based and constructivist learning environment was designed by Ozden (2002) who is an expert on online course

design, at the Middle East Technical University in Ankara, Turkey. According to Gold (2001), “constructivism is less content-oriented and more learner-centered; the designer goal is to create an information-object rich, and socially meaningful (i.e. communication and collaboration filled) learning environment”(p. 36). The constructivist model proposed by Ewing (2000) was used in the course design. Ewing (2000) highlighted that opportunities should be available for peer interaction and collaboration, and there should be significant autonomy in assessing and using learning materials. Nelson’s (1999) collaborative problem-based learning guidelines such as creating situated, integrated, collaborative and learner-centered learning environment were also considered in designing the course. To construct their own knowledge, the students worked on authentic problems collaboratively, were involved with real life problems, and tried to solve the problems through the group projects by using forums chats and e-mail.

The instructor as a facilitator provided feedback by answering the messages on time and guiding the weekly forum discussions (in 20-25 students groups) to eliminate students’ confusions and misunderstandings about the subject. He monitored each group’s progress by examining their projects at every level and by providing feedback. To understand the group members' contribution to the projects, and to keep each member on track, records of chats and forums, and the workload of group members were examined closely by the instructor.

The forum was organized based on the subtopics. It contained links to the objectives, syllabus, lecture notes and resources. The project groups had their own forum and chat. Additionally, net meeting, desktop sharing, whiteboard, and e-mail facilities were used in the course. Through desktop sharing, the students were able to see the instructor's computer; the instructor was able to show applications about web design; and the students could ask questions through chat synchronously. The interaction among students, group members and instructor were done through the forum, e-mail and chats. The instructor was supposed to answer all questions in 12 hours so that the students would not be confused. While providing feedback, the instructor did not provide the answer directly most of the time but tried to lead the students through clues to allow them to find the answers themselves.

As McLoughlin (2002) mentioned, the learner support was facilitated through supervising group process associated with effective teamwork, scaffolding for collaborative communication, and providing resources that the learner would access in order to perform the required task.

Results

In order to find out the participants’ perceptions of online collaboration, the students were asked 14 questions about online collaboration. Close to three-fourths (74.2%) of the students agreed or strongly agreed with the statements (Mean=4.1) on the usefulness of online collaboration. Even though the majority of the students agreed with the statement that “we could not achieve the project unless we worked together,” 53% of the students stated that they would rather work alone for this project in relation to another item in the collaboration part of the survey. This shows that even though they collaborated online, half still prefer working individually.

It is understood from the interview results that heterogeneity of the group was quite important for the group work, and was a contributing factor to accomplish the group task. While working together, the students learned how to view things from their group members’

perspectives. This supports the results of questionnaire that majority of the students indicated learning together was very beneficial to them. A few students stated that, “if it was something that can be done in a short time, they would prefer working alone.” Although it may not be true for all cases, one student from one group commented that he would “rather work alone” since he dealt with much of the work. It can be concluded from the results that majority of the students found online collaboration effective in this course, even though a considerable portion of students also preferred individual work.

Students were asked 14 questions to investigate their perceptions of computer-mediated communication (communication patterns of online course, and their advantages and disadvantages) in relation to problem-based online learning experiences. The results indicated that the majority (74.9%) agreed or strongly agreed with the statements (Mean=4.1). Among these items “flexibility in time made me work effectively” and “I was able to receive immediate feedback through chats and forums” received higher agreement levels (Mean=4.4 and 4.3 respectively). Even though chat was found to be convenient in terms of receiving immediate feedback, the item “I used chat very frequently to communicate with other group members” has the lowest mean (Mean=3.7).

The interview results were in line with the questionnaire results in respect to computer-mediated communication. Majority of the students who were interviewed indicated that through chat and forums they were able to communicate with and receive feedback from the instructor individually and as a group. They were able to communicate with their classmates as a whole, with their group members and with other individuals in class. The majority indicated that even though they used computer-mediated communication facilities to communicate with the instructor and their classmates, they would communicate better with their group members in face-to-face learning environment.

In the motivation part, there were 4 items to understand the students’ perceptions. 82.2% of the students agreed or strongly agreed with the statements in this part indicating that the majority of the students found problem-based online learning motivating. The overall mean score for this part was 4.2.

The interview findings were consistent with this result. The majority of the students stated that they tried to finish their project on time, and they were involved deeply in their project in this process.

Related with the support they received in problem-based online learning environment, more than four-fifths of the students (82.4%) agreed or strongly agreed with the related statements. This shows that the resources provided in the course, the access to the website, and the feedback through the chats and forums were adequate, and the students did not have much difficulty in receiving support from the instructor and their teammates. The overall mean score in this theme was 4.2. The highest mean (4.5) was related with the statement “the resources in order to search for my answers were adequate.”

During the interview, most students stated that the messages sent by the instructor and the students to the forum, to their own groups or the entire class kept them aware of the events and help them progress in their projects. They indicated that this was better than sending e-mails for communication because all the messages according to the subjects covered in the course were kept in the Web site, and all of the students who were registered in the forum could see them anytime they wanted. They stated that the feedback they received from the

instructor was timely, and the course Web site was informative in regard to resources, and about students' progress. Students were able to understand where they were in regard to their group progress and individual progress. Also they were highly satisfied about the role of the online instructor as a facilitator.

In this study, students were asked if they benefited from problem-based online learning. Overall mean for this part was 4.2, and the majority of the students agreed or strongly agreed with all statements in this part. They indicated during the interview that the teamwork helped them understand concepts and processes from different perspectives; they improved their interpersonal skills; the forum improved their understanding of the topic; the overall experience helped their professional growth; and online communication socialized them. Students mentioned that the learning strategies used in the course and the Web site's organization were highly beneficial to them. One of the students stated "I believe I improved myself about HTML and other things." Another one indicated, "I can say I learned a lot. I had no idea of HTML commands. In that respect the course gave me a lot. We learned how a web site is constructed, and we learned ASP."

Curtis and Lawson (2001) stated that pedagogical and technical supports, and integration of various online tools are essential for collaboration in online learning environments. Both questionnaire and interview findings were in line with their statements that students were satisfied with the course, and computer-mediated communication and online support were found to be effective in this course.

Conclusion

Curtis and Lawson (2001) stated that good real time interactions are needed for successful online courses, and interaction support tools have to displace face-to-face communication. For online collaboration, there are certain patterns to be considered by the instructor. According to McCormack & Jones (1998), the web provides a rich environment for learners to have enough sensory experience to learn the necessary skills. Constructivist learning employs cognitive apprenticeship and it relies on feedback and mentoring. Constructivism accepts that through interaction with the environment and with meaningful information, the students can construct knowledge. The findings of this study foster these statements that online collaborative problem-based learning in a constructivist setting can be helpful for students in benefiting from the learning/instruction process better. Also having no drop-out in the online course was another indication of satisfaction.

Even though the findings of the study were in favor of problem-based online learning, one needs to be cautious in generalizing the results of this study to similar other contexts. Because, this study was limited to the number of students who enrolled in the "Web Design" online course at Computer Studies and Information Technology Vocational School. Since the department trains computer specialist for the business and industry, the participants had to gain confidence in Web site development, and they had some background skills and knowledge in computer field. So, the participants of this case were members of a specific group. Therefore similar studies with different learners from different fields need to be conducted.

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