Evaluating the Sense of Community in a Distributed Health Informatics Learning Enviornment

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ABSTRACT

This paper discusses a mixed method study conducted to investigate the experiences and implications of a graduate level course in electronic healthcare and emerging technology in Saudi Arabia. The study focuses on the sense of classroom community when interacting in synchronous (face to face and videoconferencing) and asynchronous (Blackboard) forms of communication. Study results showed that face-to face students expressed positive feelings of classroom community, connectedness and learning compared to off-campus students who expressed more neutral feelings of classroom community.

Keywords

E-learning, health informatics, e-health, emerging technologies, distributed learning.

1. INTRODUCTION

The use of information technology as a tool for learning in higher education has increased dramatically over the years [1,2]. This has taken the form of multimedia e-learning methods including applications such as Web-CT and Blackboard learning management systems [3] as well as the increased use of interactive videoconferencing as a method for distance education and distributed learning [4].

Establishing a sense of classroom community is essential in any learning environment and particularly so in distributed learning where students may be geographically distributed [5]. Previous research has shown that establishing a healthy classroom community is essential in enhancing a students learning experience and important in online class structures where student's sense of connectedness and ability to communicate with each other can influence their learning [6]. Classroom community has been stated to encompass two main components including connectedness and learning where connectedness is composed of "spirit, trust and interactions" and learning is the "feeling of actively working together to construct the course content" [6,7]. The effectiveness of group learning in asynchronous distributed learning groups depends on the social interaction that takes place. This social interaction affects both cognitive and socio-emotional processes that take place during learning, group forming, establishment of group structures, and group dynamics [5].

The purpose of this paper is to investigate experiences, lessons, and implications of a graduate level course in Electronic Healthcare and Emerging Technology within the Kingdom of Saudi Arabia. The specific focus will be on how well the students built a sense of a classroom community when interacting in synchronous (face-to-face and videoconferencing) and asynchronous (Blackboard) forms of communication. To date, no such study has been conducted in the Kingdom of Saudi Arabia, and results from this study will help inform further research in this area.

2. METHODOLOGY

A mixed method design using survey and focus groups methods was used to measure and explore the participants' sense of community, connectedness, and learning within a distributed learning environment within a graduate health informatics course. The study took place over 11 weeks and began March 1, 2010 and ended May 10, 2010. The title of the course was *E-health and Emerging Technology* and is a core requirement for students within the graduate health informatics program at King Saud Bin Abdul Aziz University for Health Sciences, Riyadh, Kingdom of Saudi Arabia.

Thirteen female and three male students were enrolled in the class. Five female students, who were 500kms away, participated via video conferencing because they could not attend face-to-face classes. The remaining eleven students attended class in a face-to-face session with the instructor. Each student in the face-to-face session had access to a computer with secured internet access. Distant students had access to laptops with secure access to an internet connection. There was a video conferencing monitor in the class for the instructor to view distant students, and distant students also had a screen where they could view the instructor. Also, a screen and projector were present in the face-to-face room, as well as the distant room. Both groups of students could see the instructor's power-point slides. Students were also given access to Blackboard, an online course management system, where they could access their grades, links to reading material, and a discussion forum. Figure 1 below shows the classroom setup and a screenshot of the Blackboard course management system.
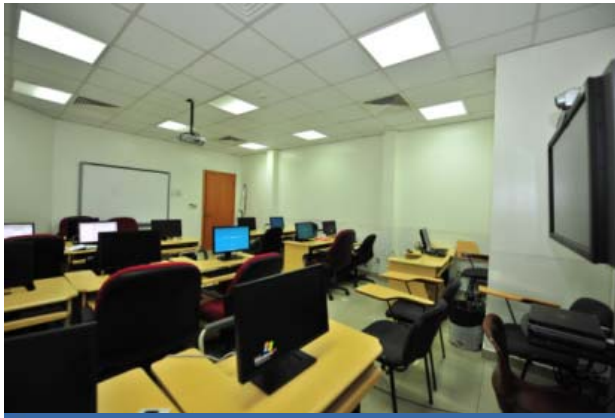
Figure 1: Classroom (Above), Blackboard Content (Below)

The course was designed to be taught in both lectures and in-class group work and discussions. During each class, a lecture would be given around each topic, and sample articles would be discussed within the class.

All sixteen students agreed to participate in the course and signed a confidentiality agreement. No incentives were provided to students to participate in the study. All students were informed that their participation was voluntary and it would not be reflected in their course evaluation. In addition to taking this course, the students were also taking three other courses. Furthermore, ten of the students were working full-time. The class was composed of one physician, two laboratory technologist, two pharmacists, two dentists, and nine students with information technology undergraduate degrees in health information management and computing science.

As for the survey, it was administered bi-weekly for a period of seven weeks. Each student completed one survey every two weeks. The survey was administered at the beginning to the class and was composed of twenty questions.

The survey instrument used in the study was the classroom community scale (CCS) developed by Rovai [7]. The purpose of the scale is to describe the students' perceptions around classroom community. The instrument consists of twenty questions on a five point likert scale that ranges from strongly agree to strongly disagree. The average of the twenty questions provides information on the overall sense of community within the classroom. There are also two subscales within the instrument that measure learning and connectedness. The even numbered questions describe the sense of learning within the classroom. The odd numbered questions describe the sense of connectedness within the classroom.

The focus group session was conducted on May 10, 2010. A trained facilitator facilitated the focus group session. Only one student opted out of participation in the focus group session. The facilitator outlined the purpose of the study and showed the students results of the survey data. Students were asked to respond and interpret the survey findings. Three slides were presented to the students showing the results for the total group, face-to-face, and distant students around sense of community, learning, and connectedness. All students were encouraged to comment on the findings. Students were also encouraged to discuss and elicit their ideas on the course structure, the teaching style and course content while taking into account how these issues influenced their views on classroom community, learning, and connectedness.

3. ANALYSIS

The survey data were analyzed separately from the focus group data. For the survey data, likert scale items were scaled from 0-4, 0 being strongly disagree and 4 being strongly agree. Ten negatively worded question calculations had to be reversed. These questions were: 4,5,8,9,10,12,14,17,18, and 20. For a sense of community, all 20 questions were included in the analysis. For the sense of learning, only the even numbered questions were in the analysis. For the sense of connectedness only the odd number questions were included in the analysis. Survey scores measuring community, connectedness, and learning were calculated separately for the face-to-face and distant participants for each week.

As for the focus group data, the responses were recorded using a digital device and transcribed by an administrative assistant working for the university. The focus group facilitator worked with the assistant to ensure that the transcribing was accurate. A detailed content analysis has not been carried out on the data. Only excerpts from the qualitative data are presented in this paper.

4. RESULTS

For the survey results (see Table 1), generally, the data showed that face-to-face groups reported a stronger sense of community, learning, and connectedness during each single period in time. Furthermore, for each week students in the face-to-face sessions reported a higher sense of community, learning, and connectedness. As an entire group, based on interpretation of the score shown in Table 2, for all weeks, the group as a whole had a somewhat positive sense of community, connectedness, and learning. In general, for the distant group, across all weeks, they felt a more neutral sense of community, learning, and connectedness.

Table 1. CCS Survey Results

Week	All	Distant	Face-to-Face
Community			
1	2.4	2.3	2.5
3	2.6	2.2	2.8
5	2.6	2.3	2.9
7	2.7	2.0	2.7
Connectedness			
1	2.7	2.3	3.0
3	2.4	2.2	2.8
5	2.7	2.1	3.0
7	2.5	2.0	2.6
Learning			
1	2.6	2.2	2.7
3	2.6	2.2	2.8
5	2.6	2.2	3.0
7	2.6	2.2	2.6

Table 2. Interpretation of CCS [Rovai]

Interpretation of Scores Using CCS
0.00−0.49 Strongly negative sense of community, connectedness, or learning
0.50−1.49 Somewhat negative sense of community, connectedness, or learning
1.50−2.49 Neutral sense of community, connectedness, or learning
2.50−3.49 Somewhat positive sense of community, connectedness, or learning
3.50−4.00 Strongly positive sense of community, connectedness, or learning

As for the focus group data, all the students agreed with the results presented from the survey data. When asked to express these further, the majority of the students stated that although they felt an overall positive sense of classroom community, connectedness and learning, they did not feel it was only solely due to the current course, but due to them being enrolled in the program and being together for almost two years:

"….when I was answering the questionnaire, I was thinking about the whole course of the two years, I was not thinking about this semester because we met each other two years ago……"

".....I think the judgment of the community and connectedness between us will have the impact of the two years and not only for one semester….."

Other students stated that they did not feel a sense of community and connectedness which reflected the off-campus student responses.

"……For the course, sometimes we feel connected, but in general we are not much connected. I think the group in Damam [sic. off campus group] are usually, mostly are isolated".

Almost all of the students agreed that the use of technology in the classroom helped enhance classroom community and connectedness as well as improved learning however, technology mishaps were also an issue.

"……it's much better as all the students agree that with blackboard we communicate more and interact with each other more than before".

"Blackboard is good for discussion and is a good interactive [sic: method] with my colleagues for me, however sometimes it is not working probably like the video-conferencing"

5. CONCLUSION

Based on the results of the study, this study supports the validity and usefulness of videoconferencing and asynchronous Blackboard as a distributed model of education. Based on these results, the findings of this study can be used for further studies to validate and/or extend the use of videoconferencing and asynchronous Blackboard technology in various courses.

6. ACKNOWLEDGMENTS

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