Pros and Cons of Videoconferencing Cyber Course: Learning from a pilot project in Omani University.

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ABSTRACT

The use of the information technology (IT) tools including e-learning systems has become a main imperative in today's knowledge-based economy. Videoconferencing offers a cost-effect way for synchronous distance learning and enriches the learning environment. This study aimed to examine the learners' acceptance of videoconferencing cyber course by measuring their satisfaction and revealing its pros and cons. Data was collected from remote learners of a videoconferencing short-course, which was a collaboration project between a local university in Oman and a remote university in Korea. The remote cyber learners indicated that the course offered them an opportunity to experience videoconferencing in distance learning and acquiring new knowledge through efficient medium. The results demonstrated that the reliability of the videoconferencing technology, the course management, and the course content are major issues related to the deployment of videoconferencing technology in distance learning.

KEYWORDS: Videoconferencing, Cyber course, Distance learning, Videoconferencing Pros, Videoconferencing Cons, Oman.

1. INTRODUCTION

The use of the information technology (IT) tools including e-learning systems has become a main imperative in today's knowledge-based economy. Several international reports from the World Bank [24] and the World Summit on the Information Society (2005) emphasized that the use of information communication technology (ICT), to build human resources is a vital prerequisite for the development of knowledge-based economy especially for developing country. Recently, the adoption of e-learning systems has been growing in the academic world. In 2004, the e-learning market was worth more than US $18 billion worldwide [19].

The advances in technologies are enriching the distance learning process. A number of technologies can be utilized for synchronous distance learning. Videoconferencing, along with audio-conferencing and text messaging, is one of these technologies. The use of video conferencing in the delivery of synchronous learning is the most effective and practical way of delivering courses for distance education and it enriches the learning process because it allows face-to-face interaction. Information is richest when it is delivered face-to-face because you see the speaker's body language, hear the tone of voice and natural language is used [23]. The richer is the technology, the more satisfied the learners. For instance, audio-conferencing learners have a better satisfaction than text-messaging learners in decision-making task [6].

A number of academic institutions are utilizing videoconferencing courses for distance learning around the world. For instance, the Singapore-MIT Alliance distance learning project is utilizing the videoconferencing technology to offer courses between Boston and Singapore(at the National University of Singapore and Nanyang Technological University) [21]. In the Middle East, United Arab Emirates University is one of the pioneers in utilizing videoconferencing for distance learning. In Oman, a number of institutions (such as Petroleum Development of Oman Company, National Bank etc) are utilizing e-learning systems to train their employees. Academic institutions, such as Sultan Qaboos University (SQU), are also utilizing the e-learning systems to supplement their traditional way of teaching. However, very limited institutions if not none are utilizing the use of video conferencing in learning. A recent videoconferencing cyber short course at a local university is considered a foremost attempt by an Omani institution to embrace videoconferencing technology for synchronous distance learning.

Understanding the determinants of individuals' acceptance of this technology is critical for organizations to successfully deploy videoconferencing technology for distance learning. Evaluating individual users' acceptance of the e-learning systems is a "basic marketing element" [13]. Middle Eastern organizations are hesitant to adopt e-learning systems because of the limited Individual users' acceptance [19]. Consequently, the objective of this study is to examine the learners' acceptance of video-conferencing cyber course by measuring their satisfaction and revealing the pros and cons of videoconferencing cyber courses.

2. LITERATURE REVIEW

2.1. Videoconferencing Cyber Courses

E-learning is defined as "instruction delivered through purely digital technology using the Internet or private networks" [14]. It is the use of a web-based communication, collaboration, learning, knowledge transfer and training to add values to the learners and the businesses [13]. Some academic and technical training institutions adopt the e-learning system to support distance learning, while others adopt this technology as a supplementary tool to their traditional way of teaching. For distance learning, E-learning can be used to build a virtual classroom where all coursework is done purely online [17].). What's more, e-learning management system supports the development of virtual universities, where students take classes from home (or off-site location) via the Internet. Examples of these universities are University of Phoenix (www.phonex.edu), and California Virtual Campus (www.cvc.edu).

In videoconferencing, participants in one location can see participants at the other locations; participants can share data, voice, pictures, graphics, and animations electronically; they can also transmit data along with voice and video. This technology allows geographically dispersed groups to work on the same project and communicate simultaneously by video [17]. The interaction between the lecturer and the learners in synchronous videoconferencing mirrors the traditional face-to-face classroom experience. Synchronous learning environment requires participants (instructor and learners) to be in cyber attendance; a technology like videoconferencing for live interaction; high Internet bandwidth or ISDN (Integrated Services Digital Network); and manpower at both ends to ensure smooth operation of the live beaming lecture from remote broadcasting site to the receiving classroom [21]. Also, audio-visual equipment, such as monitors, cameras, microphones, speakers, is a must in videoconferencing environment [20].

User acceptance is a multidimensional attitude affected by various technical and social factors [1, 8]. Technology acceptance has been assessed in the literature based on perceived usefulness, user's satisfaction, intention to use, and actual usage of the technology. Various frameworks in the Information systems literature examined the technology acceptance of users form technical or/and social perspective. Examples of those frameworks are those of [1, 7, 8, 9, 22].

From cognitive perspective, Oblinger indicated that to understand the determinants of "virtual or brick-and-mortar learning environment", cognitive determinants of environmental preference should be considered [16]. These determinants are related to Coherence (the ease with which a setting can be organized cognitively), Complexity (the perceived capacity of the setting to occupy interest and stimulate activity), Legibility (perceived ease of use), and Mystery (the perception that entering the setting would lead to increased learning, interaction, or interest).

There are a number of studies examined the acceptance of e-learning. One of these studies was conducted by Roca and colleagues [18] who found that Information quality ease of use, perceived usefulness, information quality, service quality and system quality determine the students' satisfaction and consequently their e-learning continuous intention. Also, Gotthardt and colleagues [11] indicated the success of e-learning strategy depends on content quality, system and content flexibility, system ease of use and others. Chen and colleagues indicated that the main effects of information richness and task types are independent; and the learners' attitude toward the synchronous learning system significantly affects the satisfaction of synchronous online cooperative learning [6]. In the videoconferencing learning context, Selim found that the student's usefulness and reliability of video conferencing technology are key determinants of a successful utilization of videoconferencing for distance learning in United Arab Emirates University [20]. Campbell and Swift found that Video distance learning meet the cost-effectiveness measure of providing a satisfactory educational experience and remote students are attracted to the video distance learning because it provides an opportunity to take course where no other alternatives are available [4].

2.2. Pros and Cons of cyber courses

The general pros of e-learning systems are cost-effectiveness, consistency, timely content, accessibility and customer value [5, 13]. E-learning management system is not only a promising technology for schools. In corporate training environment, e-learning management system offers several benefits such as flexibility, accessibility and convenience. It allows managers to develop customized online training modules and allows field employees to access those modules 24 hours per day, seven day per week [12].

There are some specific advantages related to the use of videoconferencing as a delivery medium. The videoconferencing cyber course mirrors the traditional face-to-face course, and offers its benefits. The utilization of cyber course for distance learning is also providing an effective and efficient way for education [4]. The use of videoconferencing for distance learning is providing an opportunity for education where there is no other available alternative [4]. It has a major impact on the availability of low-demand courses especially important in rural area [2]. The use of video conferencing technology also enable participants to observe illustrations that would be difficult to present in class such as zooming in and out [2].

There is no technology without challenges. Benbya and colleagues indicated that there are several challenges to the acceptance of an information system [3]. These challenges are related to technical challenges (e.g. system design, effective information, and usability), management challenges (leadership, rewards policy, strategy, and cost.) and social challenges (e.g., organizational culture, trust, commitment and satisfaction)

The use of video conferencing cyber-short course might present some limitations. It is "not uncommon to experience outages in synchronous links" [21]; for instance video frames transmitted through the Internet can freeze up and the audio can break up at times. The reliability of the video-conferencing technology is significant and critical factor on the success of this technology and consequently the distance learning environment [20]. Also the pedagogical quality of the videoconferencing cyber course is a major concern adoption and consideration of the course [4].

3. RESEARCH QUESTIONS

Figure 1. The Study Investigation

The objective of this study is to examine the learners' acceptance of the videoconferencing technology as a delivery medium in a classroom context by looking at their perceived pros and cons of the course. To conduct this investigation, two sets of questions were developed. First set of questions are related to the learners':
1. Satisfaction with the course content
2. Satisfaction with the course delivery medium (video conferencing)
3. Continuous intention

Second set of questions are related to the pros and cons of cyber course and learners' recommendations:
1. What did you like best in this course?
2. What difficulties did you encounter in this course?
3. Any other comments to improve this course?

4. STUDY METHODOLOGY

The study questionnaire was distributed to the learners of the videoconferencing cyber course in the local university in Oman. The topic of the course was on Ubiquitous Network Security and the medium of instruction is English. The cyber videoconferencing short-course was collaboration between a local University in Oman and a remote university in Korea. The instructor of the course was from the remote site, while the learners were from the local site. The course was offered for two days from 8 am to 10:45 am Omani time. Participants are given 15-minutes break in the middle of each session.

The cyber course was offered in a small lab room that fits around 24 individuals; laptops are available for every individual to share and view the lectures' slides and materials. Two big screens are set up in the center of the front side of the lab to show the instructor live video on one screen and the instructor's computer screen (which is showing the slides) on the other screen. Video cameras are also installed to transfer the learners' video images to the instructor. Two technical staff is utilized to ensure smooth operation with the technology and the course.

The course included 21 learners. The attendees of the course were academic staff from computer engineering department, computer science department and information system department, and technical staff from the center for information systems, the center for educational technology and hospital information systems. Most of these learners are Omani (85% of the learners), and Male (90% of the learners).

Data was collected by a questionnaire from the participants (remote learners) of the videoconferencing cyber course. The questionnaire was distributed on the completion of the course. The questionnaire included three open-ended questions related to the pros and cons of the videoconferencing cyber course, and learners' recommendations. Open-ended questions were developed to allow free response in identifying issues that are relevant to these respondents' usage. The questionnaire also includes three 3-points scale(disagree, neutral, agree) questions measuring the learners' satisfaction of the course content, course medium of instruction and the continuous interest in videoconferencing cyber courses.

5. DATA ANALYSIS & RESULTS

Data was analyzed question by question; a frequency-percentage table was developed for each question to produce the study findings. The Results indicated that 70% of the participants were satisfied with the content of the course, 30% were neutral and zero percent was dissatisfied. Because of several communication technical problems, only 40% of the respondents were satisfied with the course delivery methodology (video conferencing), 50% were neutral and only 10% (only one respondent) were unsatisfied. Nevertheless, most of the respondents (about 70%) indicated that they would be interested to take cyber short courses again, 30% were neutral.

Table 1 shows that responded received several benefits of taking this cyber course. Most of the respondents, about 60%, reported that they benefited from the content of the course; 50 % of learners found it was a good opportunity to experience and acquire learning through video conferencing technology; 20 % of learners indicated that video conferencing technology is an efficient mean for short courses; and 20% of learners benefited from the

multimedia supporting materials (such as video clips) of the course. One of the learner cited "It was an interesting course and the use of videoconferencing is an efficient opportunity for distance learners".

However, students encountered some challenges. Table 1 shows that 50% of the learners reported communication problems and delays; 30% of them indicated delays on multimedia (slides, audio, and video) transmission; and 30% of them indicated that they were overloaded with information (too much information). Other difficulties such as a fast class, a lack of supported material, instructor-students interaction difficulty, and the instructor's language were each cited by 10% of the learners independently. One of the learner said "There were some delays on the video transmission during the peak hour", and another one quoted that "I was overloaded with information and it was hard to digest the content".

Table 1: Results of the Survey

PROS	%
The content of the course (lectures)	60%
Opportunity to experience a video conferencing short course	50%
The efficient use of video conferencing for short-courses	20%
The use of multimedia supporting material (videos)	20%
CONS	**%**
Communication delays & problems	50%
Delays on multimedia (audio and video) transmission	30%
Too much information	30%
Class going fast	10%
Lack of supported material	10%
Language of the lecturer	10%
Hard to interact with the instructor	10%
RECOMMENDATIONS	**%**
Provide sufficient bandwidth	30%
Provide supported material a head of time	30%
Provide dedicated lines for such course	20%
Identify the level of the course to participants	20%
Include more time for the course	20%
Improve the content of the slides	10%

Regarding remote learners' recommendations to improve the quality of the delivery method of videoconferencing cyber course, Table 1 shows that 30 % indicated that the university should provide a sufficient internet bandwidth, and 20 % also indicated that the university should establish a dedicated line for cyber (video conferencing) courses applications. Table 1 also shows that to improve the quality of the course: provide the supported material a head of time (30 % of respondents); identify the level of the course to the attendees (20%), include more time for the course (20%), and improve the content of the lecture slides (10%)

6. DISCUSSION & CONCLUSION

The popularity of e-learning systems has been growing in the last few years. Videoconferencing is a promising state of art technology that enriches the synchronous distance learning experience. This study examined the remote learners' acceptance of video-conferencing cyber course by measuring their satisfaction and revealing the pros and cons of a pilot videoconferencing cyber course offered by an Omani university in a collaboration project with a Korean University.

The results revealed that the majority (70%) of the remote learners were satisfied with the course overall and have continuous intention to take it, even though only 40% of the learners were satisfied with the course delivery methodology (video conferencing). The cyber learners indicated that that the course provided them an opportunity to experience videoconferencing in distance learning and acquiring new knowledge through efficient medium. However, students encountered some difficulties most of them are related to the technology such as delays and multimedia transmission speed. Other challenges are related to the course management such as supporting material, information overloaded, class speed and time, and interactivity level. Thus, the results suggest that the reliability of the technology is a major factor on the utilization of videoconferencing in distance learning as indicated by several studies in the literature. This study also showed that course management is also important as well as the technology reliability. The major issue is information overload. This may suggest that cyber learners may be slower on assimilating course content and overloaded faster with information compared to learners in the physical face-to-face class room. Further more the instructor's characteristics (such as language and interactivity style) also have an impact on utilization of videoconferencing in distance learning.

In conclusion, although this study was based on the perceptions of remote learners in a pilot short-course, it revealed some useful insights for practitioners and organizations on the deployment of videoconferencing technology for synchronous distance learning. The utilization of

videoconferencing in learning offers some benefits. The reliability of the videoconferencing technology, the course management, the course content and the instructor's characteristics are major issues on the deployment videoconferencing technology in distance learning. The reliability of the videoconferencing technology might be established by providing sufficient bandwidth and dedicated communication lines for such utilization. Regarding the course management, a good preparation is essential; for instance, providing course material a head of time; expanding the course in several few-hours days rather than squeezing it in few long-hours days might assist remote learners' content-assimilation process. Also running the illustration video clips and the slides at the learners' remote site would reduce the load on the network and alleviate transmission delays issue.

Future research might have a large scale quantitative investigation to examine the acceptance of videoconferencing technology for synchronous distance learning, the effects of the technology reliability, course management and course content on the remote learners' acceptance. Future research might also compare students' assimilation level of the course content in videoconferencing context vs. face-to-face context. Also, most of the learners in this course are IT related personnel; thus their perceptions of videoconferencing experience might be different than non-IT related people. Future studies may carry out such comparison.

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