Videoconferencing for Segregated University Campuses in Saudi Arabia

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ABSTRACT

Male and female college students in Saudi Arabia study and work in a segregated (gender-based) environment. King Saud University (KSU) has 50,000 students on 3 campuses each of which is 35 kms away (Diri'ya Male-Students, Campus, Olaysha Female-Students Campus and Malaz Female-students Campus). Due to increasing student enrolment, all departments for female students are understaffed. The three campuses (Diri'ya, Olaysha and Malaz) were upgraded and are now connected through fibre optics with a LAN. The Olaysha campus, hosting women's colleges of Education, Arts, Administrative Science, Languages, and Graduate college, has installed a new videoconferencing (distance education) lab and two large-lecture halls (auditoriums). Through these, female students and instructors can attend conferences, classes, meetings, thesis defenses, workshops, and other university live events simultaneously with men. However, the videoconferencing facilities are not optimally used. This article gives a description of the infrastructure of the distance learning lab and videoconferencing halls at KSU, their setup, equipment, applications/software, capacity, hours of use per semester; how graduate and undergraduate lectures, conferences, presentations by invited speakers, graduation ceremonies are broadcast; how workshops and thesis defenses are conducted; and how interaction takes place; limitations of videoconferences; what problems are solved by the videoconferencing technology. The uses, causes of under-use, and male and female students and faculty's views on the benefits and limitations of the videoconferencing technology used, and effect of videoconferencing on student-instructor and student-student interaction are reported.

Keywords: *segregated campuses, gender-based, videoconferences, distance education, male campus, female campus, teleconferencing, videoconferencing equipment.*

1. INTRODUCTION

Videoconferencing is a technology that allows users in different locations, such as remote schools, universities, and companies to hold live meetings without having to leave their location to be together. Videoconferencing is specifically used in business and education. Some businesses that have users in different cities or even different countries use videoconferencing technology for holding routine meetings with their company staff, to confer with shareholders about their latest business activities, to address board members, to negotiate business deals, for job training sessions, to interview job candidates and to help their teams to work more collaboratively. Hotels and conference centers sometimes make videoconferencing services available to guests who need such services. In education, videoconferencing technology connects a traditional classroom on a main location with students studying the same course in remote areas of other schools. It is used as a medium for conducting training, conferences and other events held at institutions with multiple campuses. Luck and Laurence (2005) added that videoconferencing is a cost-effective way for bringing experts from remote areas from around the world to the higher education classroom.

Due to the importance of the videoconferencing technology, a review of the literature has shown some studies that focused on the educational uses of videoconferencing technology. For example, Badenhorst and Axmann (2002) explored some issues related to the use of videoconferencing in South Africa such as scaffolding in the learning process, feedback from learners, assessing the use of videoconferencing, cost issues, and suggestions for using videoconferencing as an educational medium.

In Croatia, Tatkovic and Ruzic (2005) described the use of videoconferences in high school education, the relevant equipment required, types of conferences, samples of educational videoconferences and reported results of a survey administered to students to elicit their views on interactive communication by means of videoconferences.

In the USA, a study by Sedlacek, Young, Acharya, Botta, and Burbacher (2005) described the Youth Network for Healthy Communities (YNHC), in which students researched environmental health issues in their communities through the internet and library and combined original research, interviews, and site visits with their print research, then presented their findings to other students throughout the state via videoconferencing technology. At the end of each presentation, there was a question-and-answer period to offer additional learning opportunities for attendees and student presenters. Through YNHC, the students connected health issues and the environment, discovered how science is an integral part of people's lives, and took action regarding their communities' health.

In Australia, Andrews, and Klease (2002) described a project using videoconferencing for establishing a virtual faculty as an alternative to extending learning opportunities for students in regional universities or universities where specializations of interest may not be offered, and emphasized the importance of collaboration, planning, and strategic priorities.

Few more studies in the literature reported students and instructors' views on the use of videoconferencing technology. DeBourgh (2003) surveyed 43 nursing graduate students to explore the influence of learning attributes and instructional dimensions on satisfaction with the course and interactive videoconferences and Internet. Results showed that only instructor and instruction contributed to the explanation of variance in satisfaction.

Similarly, Passmore, Barneveld, and Laing (2005) surveyed student-teachers' opinions of the use of desktop videoconference technologies to provide teaching experiences that mimic the real-world teaching practicum. Student-teachers reported that the videoconferencing software mimicked direct instruction, questioning, tutoring, and one-on-one scenarios that rely on audio communication. They also reported some limitations of the videoconferencing technology such as slow frame rates, inability to capture students' facial expressions, and inability to simultaneously capture images of students' and written work as it is created.

Kuo (2005) reported graduate students and faculty's experience with videoconferencing on-campus and remote sites in courses delivered using Web-based course management courseware and videoconference-based delivery methods. The researcher compared distance learning and traditional learning environments in terms of student satisfaction, peer relationships, faculty motivation, faculty load, and resource support. Findings showed that student satisfaction and peer relationships were significantly related to the learning environment. Faculty members in different learning environments had different workloads and motivations. However, the

researcher concluded that there is still no standard to evaluate the effectiveness of distance learning educators.

As in other countries, numerous universities in Saudi Arabia are currently using videoconferencing technology to connect various campuses especially because male and female students and faculty in Saudi Arabia study and work in segregated (gender-based) learning and work environments. This means that use of videoconferencing technology at Saudi universities is a necessary for connecting male and female university campuses. For example, King Saud University (KSU) has 50,000 students on 3 campuses (the Men's Campus in Dir'iya, Women's Campus in Olaysa and another women's Campus in Malaz) each of which is 25 kms away. Due to the increasing numbers of student enrollment at the graduate and undergraduate levels, almost all women's departments are understaffed. That is why use of videoconferencing technology is widely used as a means for solving the faculty shortage problem in which case male professors teach both male and female students using videoconferencing technology.

Despite the importance of videoconferencing technology in the Saudi higher education system, there are no research studies in Saudi Arabia that have explored the utilization of videoconferences at Saudi higher educational institutions, what they are used for, equipment used, views of faculties and students using videoconferences, and technical glitches encountered while having videoconferences. Therefore, this study aims to describe how distance education labs and large lecture videoconferencing halls at King Saud University are used to connect three campuses at the university: Dir'iya Male Campus that hosts 32 colleges; Malaz Female Campus that hosts the Colleges of Medicine, Pharmacy, Science, Computer Science and Agriculture; and Olaisha Female Campus that hosts the Colleges of Business, Education, Arts, and Languages and Translation. Due to the large student enrollment, shortage in faculty members, and the distance between the three campuses, videoconferencing is the only way to meet the needs of the students in segregated learning environments. Specifically, the study aims to describe the setup, equipment, software, capacity, how graduate and undergraduate lectures, conferences, presentations by invited speakers, workshops, such as commencements and other live events are broadcast and conducted; hours of use per semester and causes of underuse; how interaction takes place; students and instructors' reflections on their experience with videoconferences, benefits and limitation of videoconferencing technology.

The study will not report the effectiveness of videoconferencing technology in the Saudi setting because, as Kuo (2005) indicated, there is no standard to evaluate the effectiveness of distance learning.

2. DATA COLLECTION AND ANALYSIS

2.1 Subjects

The videoconferencing service at King Saud University is setup, maintained, and times of use are scheduled and coordinated by the Deanship of eLarning and Distance Learning. The Dir'iya Male Campus has 1 administrator, 3 engineers, and 5 technicians; the Malaz Femlae Campus has 2 administrators and 2 engineers; and the Olaysha Female Campus has 2 administrators and 2 engineers.

For purposes of the current study, the following samples were selected:
- A sample of 3 engineers and 2 administrators.

- A sample of 25 male instructors and 25 female instructors from 4 colleges: Education, Arts, Business and Languages and Translation.
- 40 graduate students randomly selected from 4 colleges: Education, Languages and Translation, Arts and Business.

2.2 Instruments

The researchers used face to face interviews with female engineers and phone interviews with male administrators as they are on the men's campus. Similarly, she used face to face interviews with female faculty and students and phone interviews with male faculty and students at the 4 colleges.

The engineers were askes technical questions about the videoconferencing infrastructures such as the equipment used for connecting the 3 campuses, hours of operation and hours of actual use of the distance education lab and videoconferencing lecture halls.

The male and female faculty and students were asked about their experiences with and views on the benefits and problems of using videoconferencing for academic lectures, conferences, and other live events.

Descriptions of the videoconferencing infrastructure are reported exactly as they were described by the engineers and administrators. Male and female students and faculty responses, the benefits, and limitations were grouped separately and are reported qualitatively.

3. RESULTS AND DISCUSSION

3.1 Lab Description

The engineers indicated that each campus has the following videoconferencing equipment: (i) 12 PC's; (ii) an LCD projector (iii) a visualizer; (iv) a server; (v) a network switcher; (vi) a SMART Board; (vii) a wall screen; (viii) directional mics; and (ix) speakers, printers, tables, and chairs. For example, the Olysha campus has 2 large-lecture halls and a teleconferencing (distance education) lab. Each distance learning lab is equipped with: (i) 12 PC's; (ii) a ceiling-mounted LCD projector; (iii) a visualizer; (iv) a server; (v) a 12-port network switcher; (vi) a smart board; (vii) a wall screen, a directionless mic; (viii) speakers and printers; (ix) a conferencing table and chairs; and (x) Dell PC's.

In addition, the engineers pointed out that there are different types of VDC (Virtual Design and Construction) equipment (Polycom, Sony, and Tandberg). But they prefer Polycom due its capacity and capability. It is a PC-based solution. There is a Polycom software to communicate with the UTA data network; iPower 900 series; and 5 ISDN (Integrated Services Digital Network) numbers.

The distance learning lab is connected with the auditoriums (large lecture halls) on the Olaisha Campus through the university LAN, dialup and fiber optics. Thy have the capability of two-way audio and video, two-way audio and one-way video, and three-way audio and one-way video.

The KSU engineers, administrator, and technicians on the 3 campuses are responsible for designing, operating, and maintaining the KSU VDC (Virtual Design and Construction) system.

3.2 How Lectures Are Delivered

The videoconferencing halls (auditoriums) are equipped with the following:
- 2-way audio and two-way video for the presenter and presentation from 2 campuses.
- 2-way audio and one-way video for the presenter and presentation from men's campus.
- 2-way audio and one-way video for the presentation only from women's campus.
- Three-way audio and one-way video from the men's campus only.
- An audio system: Women use a mic and/or headphones to ask questions and discuss topics with male professors and presenters.

When there is a lecture, event or a conference, female attendees and lecturers/presenters are on one campus and male attendees and lecturers/presenters are on another campus. When the presenter is a male, female attendees would see the male presenter and/or the PPT on the screen and hear the presentation through the auditorium audio. But when the presenter is a female, male attendees on the male campus would only see the PPT on the screen and hear the presentation through their auditorium audio system, but they will not see the picture of female presenters or any female on their screen. If they have questions, comments or need to discuss a point, they use a mic connected to their audio system. This means that during live events, female students and faculty receive audio-video transmission, whereas male students and faculty receive audio and PPT video. They do not see female students and female faculty on the their screen at all.

3.3 What Videoconferences are Used for at KSU

The distance learning lab and videoconferencing lecture halls are used in a variety of live events such as:
- delivering graduate classes from the men's campus to female graduate students daily from 8:00 to 2:30 p.m.
- dissertation defenses.
- commencements.
- meetings between vice-presidents, deans and, faculty from different colleges on different campuses. Other examples are the University President's address to students and faculty in all colleges and all campuses.
- for guest speakers. For example, female students and instructors attended a briefing from the British Council.
- For training workshops by guest trainers.
- orientation sessions to new freshman students.
- broadcasting lectures and conference concurrent sessions to women's campuses (2-way and 3-way).
- Some extracurricular activities for students.

The distance learning lab and videoconferencing halls are not used for distance learning or live events outside the university, i.e., they are not used for connecting several universities within Riyadh, across Saudi Arabia, or in several countries.

3.4 Frequency of Using Videoconferences at KSU

Table 1 shows how many hours the distance learning lab was used for conferences, symposia, and commencements; number of meetings per week; number of dissertation defenses; and number of graduate classes delivered over 2 semesters (Fall 2004 and Spring 2005).

Table 1:   Frequency of Use in Fall 2004 & Spring 2005

	In Fall 2004	in Spring 2005
The distance learning lab was used	238 hours (5%)	201 hours (5%)
Conferences, symposia, and commencements	108 hours (2%)	344 hours (8%)
Meetings once a week	2 hours each	2 hours each
2 dissertation defenses per week	4 hours	4 hours
Graduate classes	24 hours a week	24 hours a week

Moreover, Table 1 shows that the distance learning labs are not being optimally used. They are used for 5% of the total hours (capacity). The engineers and administrators indicated that underuse is due to instructors' lack of required technical skills. Faculty are not familiar with teleconferencing and how to operate the distance learning lab equipment. Instructors and students are not used to this mode of learning (distance learning). Department meetings are not being held via videoconferences yet. There are still some technical glitches and internet connectivity issues. Instructors prefer to use of closed-circuit T.V. to deliver lectures to students as they are used to them. There are only 3 female technicians that need to be present to operate and supervise the distance learning lab while it is being used. Finally, the distance learning labs are not being used full time to reduce the cost.

3.5 Benefits of Videoconferencing as Viewed by KSU Students and Faculty

Students and faculty indicated that use of videoconferencing technology saves commuting time between the campuses and from their home to campus where the lectures, conferences or meetings are held. It saves them time, expenses, and hassles associated with travel abroad to attend meetings and conferences. Some female students and faculty indications that having something is better than nothing. At least they have a chance to attend and participate in all live events held on the other university campuses. They also have a chance to experience advanced technology and multimedia.

Male faculty added that enjoying a conference session depends on the female presenter, whether there are handouts, whether she uses a PPT, whether the topic is intriguing and is in an area of interest to male attendees. Male professors who teach both male and female graduate students majoring in education via the distance learning lab) asserted that female students are better, i.e., smarter, and more interactive than male students. Faculty and students in hospital administration reported high interaction between the instructor and the students.

These views are confirmed by Luck and Laurence' (2005) study that found that videoconferencing provides an excellent, cost-effective learning opportunity that benefits students, instructors, and their institutions.

Furthermore, results of a study by Atkinson (1999) revealed some factors that affect interaction in videoconferencing events in higher education such as: instructional strategies, participants' attitudes. Student-instructor and student-student interactions were highest in classes that were

organized as discussion sessions with specific guidelines for the content and the nature of questions on which the discussions would focus. Statements of praise, acceptance of student ideas and use of questions that require the learners to synthesize and draw conclusions rather than simply recall information were found to be effective in soliciting responses. Humanizing the students' learning experiences by using their first names and some of their relevant personal experiences increased students' participation. Use of visual realia and well-designed textual visuals provided a scaffold for connecting the students with course content and facilitated discussion. Moreover, student participation can be increased through modelling and encouragement.

By contrast, Atkinson (1999) identified some strategies that proved to be less effective such as use of peer presentations, expertise of the instructor in presenting the content and in eliciting student participation. Students-instructor interactions were impaired by limitations of the technology used. Students at the remote location felt isolated when they were excluded from informal conversations at the main site. It was difficult to read facial expressions and other physical cues of the students such as gestures and eye contact. This problem can be solved by adjusting the cameras and helping the students to inteface with the technology. This also helped the instructor give more attention to teaching and engaging students with the lecture content.

3.6 Limitations of Videoconferencing as Viewed by KSU Students and Faculty

Male and female faculty and students mentioned some limitations. They referred to some technical glitches that interrupt the transmission of a videoconference such as mic malfunctioning and blurred picture on the wall screen specially in large lecture halls; getting disconnected from the other campus; waiting for a faculty or student to reach for the mic to speak. The engineer has to be present to operate the equipment, and to solve technical problems when they take place.

Some male faculty indicated that sitting in a videoconference is like watching T.V. but in the case of a videoconference, you have one channel only. Some female faculty and students indicated that sometimes they cannot fully concentrate during a conference or symposium because some attendees talk while a speaker is presenting, and they make side comments and discussions, especially when the number of attendees is large and the event is held in a large auditorium.

Male subjects reported that sitting in a videoconferencing even for a long time, especially when it is attended by male and female faculty is boring because they use one sense only, which is listening. They can hear the female speaker and see the PPT on the screen, but they do not see her and cannot see other female colleagues or students. There is no direct interpersonal interaction between male and female faculty attending a symposium except when the floor is open for questions. Even then, some female faculty indicated that females are given fewer chances and less time to ask and respond to questions and comments. Others reported that some female faculty and students are shy to talk over the mic or ask questions in from of a large audience on two or more campuses.

Some female faculty and students added that sometimes they cannot attend some videoconferencing events because they are notified shortly before the start of the live event and they cannot cancel their classes or other academic work.

Some of the technical glitched mentioned by the faculty and student in the present study are similar to those reported by student-teachers in Passmore, Barneveld, and Laing's (2005) study in which student-teachers reported slow frame rates, inability to capture students' facial expressions, and inability to simultaneously capture images of students' and written work as it is created.

4. RECOMMENDATIONS AND CONCLUSION

The present study described the infrastructure of the videoconferencing technology used at King Saud University especially in the distance education lab, the evets it is used for, how many hours it is used per semester and students and faculty reflections on their experiences with videoconferences. The findings revealed many benefits for using videoconferences at KSU but revealed some shortcomings, underuse, misuses, and technical glitches.

To make the best out of videoconferencing technology, this study recommends raising all faculty and graduate students' awareness about distance learning via videoconferencing technology, and training faculty to operate and use the equipment.

It also recommends improving the videoconferencing infrastructure such as using high-grade cameras and screens to ensure the conversation is clear and with limited technical faults.

Finally, it is hoped that in the near future, it is possible for faculty and students to attend university events in their offices and in the convenience of their home using their own PC and relevant videoconferencing software. It is also hoped that students and faculty at KSU can attend live events at other universities in Riyadh, across the Kingdom, and even in other countries via the videoconferencing technology.

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APPENDIX

Photos of Large Lecture Halls, Distance Learning Lab and Classrooms Using Videoconferencing Technology