Students' Perceived Barriers to In-Class Participation in a Distributed and Gender-Segregated Educational Environment

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ABSTRACT

Education in Saudi Arabia has always been segregated based on gender as a result of the close governmental and societal adherence to Islamic traditions. This segregation causes a problem at the level of higher education due to the shortage of female faculty throughout the country. This problem has lead to the adaptation of several techniques by which higher-level education is delivered to female students by male faculty. This paper presents a modern approach for course delivery adopted by a new Saudi University that combines old techniques with modern telecommunications technologies. This approach makes use of smart classrooms in delivering courses by male instructors to both male and female students in separate but adjacent lecture halls. One of the main goals for conducting this study was the author's perceived low-level in-class participation by female students in one of the courses of the Masters of Health Informatics program offered by the new University. This paper aims to present the perceptions of students regarding this modern approach of education. It also seeks to determine whether the listening-in of students of the opposite gender plays a major role in limiting students' level of in-class participation. Findings of this study show that students in general are favorable of the modern course delivery approach, and that the greater barrier to participation had more to do with the technology rather than the presence of members of the opposite sex.

Keywords: IS education, gender issues, segregation, distributed learning environment, smart classrooms, in-class participation, Saudi Arabia, health informatics.

1. INTRODUCTION

In Saudi Arabia, a developing country where more and more efforts are being made towards the transformation of the society into an information society (CITC, 2005), old traditions remain the same. The issue of segregation between the sexes when it comes to education is one of strong religious beliefs and traditional values. While most other countries in the Middle East allow the integration of genders at college level education, certain countries like Kuwait have more recently reversed their position in favor of the segregated model (Del Castillo, 2003a).

While female school teachers at the elementary and secondary levels are in abundance, the same is not true when it comes to female resources at higher-level education. This occurred mostly as a result of old Saudi cultural values where men are considered the main breadwinners, which in turn resulted in fewer women pursuing higher education. This situation however is not restricted to Saudi Arabia, developing countries in general, in Asia and Africa, suffer from social and organizational "localism" where women are less likely to go abroad to seek more advanced degrees, and are less likely to travel outside their localities for attending work-related meetings or any other activities (Miller et. al., 2006). For Saudis,

this localism has created a shortage in qualified female faculty members and a big challenge in the delivery of higher education to female students, both at the undergraduate and graduate college levels.

King Saud University (KSU), established in 1956, is the oldest and largest university in the Kingdom. It currently has a total population of 70,000 students, 40% of whom are female students (Alsalman, 2007). On the other hand, based on 2-year old statistics regarding the number of educators at the same university, including demonstrators, lecturers, and faculty members, the number of educators was stated at 3009. Females account for only around 26% of this number. Percentage of female students two years ago was also indicated at slightly less than 40% of the total student population of 67,280.

Colleges having higher than the university overall percentage of female instructors (Table 1) include the College of Arts with 32%, College of Education with 38%, College of Pharmacy at 41%, College of Dentistry at 35%, College of Sciences at 34%, College of Applied Medical Sciences at 39%, the College of Languages and Translation with 29%, and the College of Nursing with a 100% female workforce.

Colleges with lower than the overall university percentage of female instructors (Table 2) include the College of Food Sciences and Agriculture with only 10% of the total college body of instructors, College of Medicine at 19%, College of Administrative Sciences at 25%, and the College of Computer and Information Sciences at 22%. Both the College of Engineering and the College of Architecture and Planning do not accept female students and likewise have a zero percentage of female instructors (http://www.ksu.edu.sa/english/ statics.php).

Based on recent statistics from the Spring of 2007, the number of female students at KSU's College of Computer and Information Sciences is 1,234. All of them belonging to the female only Information Technology Department. Male students are distributed among three different departments, Computer Engineering, Computer Science, and Information Systems, and account for a combined total of 1,322 students. Hence, the number of female students in the College of Computer and Information Sciences accounts for 48% of the total college student body, compared with an instructional workforce of only 22%.

This situation of non-equal distribution between the number of female instructors and female students is easily replicated in other universities and select colleges across the nation.

Table 1. KSU Colleges having more than the overall percentage of female faculty at the University of around 26%.

College Name	Percent of female instructors
Applied Medical Sciences	39
Arts	32
Dentistry	35
Education	38
Languages and Translation	29
Nursing	100
Pharmacy	41
Science	34

Table 2. KSU Colleges having less than the overall percentage of female faculty at the University of around 26%.

College Name	Percent of female instructors
Administrative Sciences	25
Computer and Information Sciences	22
Food Sciences and Agriculture	10
Medicine	19

The high percentage of female students in IT in Saudi Arabia represents a major break from the typically low enrollment experienced by IT programs in the Netherlands, USA, Australia, and the UK (Borghans & Groot, 1999; and Moffatt, 1997). This in part may have to do with the fact that for women in Saudi Arabia, IT provides an excellent job prospective in a society where not all types

of roles in the labor market are available to them. Additionally, the IT profession allows women the chance to work independently from home or the ability to establish or work in an all women establishment. Finally, cost of education is not an issue for Saudi college students as public universities and colleges are free to Saudi citizens. On top of free tuition, the government also pays college students a monthly stipend slightly above the equivalent of US $200.

This research paper will initially present a brief overview of female education in Saudi Arabia. It then presents a newly established University that concentrates its efforts on health studies. This new University is the setting where this research study is conducted. A modern approach for education delivery within Saudi Arabia will then be presented where male and female students are both signed up for the same section of a graduate level course in a distributed learning environment.

A distributed learning environment according to Dede (1996) is one where there is an integration between face-to-face instruction and online communication between faculty and students. For this study, males students benefit from direct face-to-face instruction, while female students only interact face-to-face with the instructor on a very limited basis.

Both male and female students have direct access to the benefits of modern telecommunications and distance learning technologies. Concerns with regard to the suitability of this course delivery approach to graduate students in a segregated educational environment will then be addressed along with a view of the students' perceived barriers to effective participation within the classroom.

The paper ends with a conclusion and a look at future studies.

2. FEMALE EDUCATION DELIVERY

Boys and girls in Saudi Arabia are segregated in educational settings from the first grade of elementary school. Coed learning is only allowed for the pre-school age children. Women in the Saudi society have for a long time assumed the role of the housewife. Taking care of the home and raising children properly was considered to be the most important job of a woman. Men were considered the breadwinners and hence, were more likely to seek higher education and to get government scholarships for completing master's and doctoral degrees overseas. This situation has created a greater availability of male faculty members than female ones, and hence the problem of not being able to fully meet today's greatly expanding female college student body through female instructors alone.

Saudi Arabia applies strict educational regulations based on an interpretation of Islamic teachings where females may not be seen by strange males without their veils. A woman may be seen without her veil by her father, children, brothers, uncles, nephews, father-in-law, and son-in-law; basically, men she cannot get married to. All other men are considered strangers to her. General interaction between unrelated men and women, is typically regulated by certain protocols involving modest dress which may include the covering of the face, polite speech, and the non-exclusive interaction between a male and a female in a private closed setting without the presence of a close male relative of the woman. Women typically interact with men in the considered open shops and shopping centers. This is considered a necessity since only men are allowed to work in stores, even those selling strictly female products. Exceptions can be found in women's only shopping malls, a new slowly growing trend within the country.

Other places of interaction between the two genders include hospitals, where male physicians may treat female patients or female physicians may treat male patients, and where both male and female staff of the hospital closely work together. Hospitals and Health Centers are the main places where men and women working together in the same place is accepted by society, to some extent, based on necessity. Even so, unmarried women working in hospitals may have a more difficult chance in getting married as some men in society may not be interested in getting married to a woman that interacts with "stranger" men on a daily basis as part of her job!

As far as education goes, there are enough female instructors to teach female students up to secondary level in completely segregated schools. However, at the college level, a shortage in the number of available female

faculty leads to the need of utilizing male faculty members in teaching certain female courses. This is especially needed at the master's level since according to Saudi Arabian higher education regulations these courses may not be taught by less than a Ph.D. degree holder.

Interestingly enough, prior to 1990 male professors used to teach female students face-to-face. However, since that time, new methods for interaction were created to replace the face-to-face interaction method. One new method involved the use of closed-circuit television (CCTV) for transmitting a faculty's lecture given specifically to female students while in a specially setup studio at the female student campus (Del Castillo, 2003b). In other cases, a lecture being offered by a male faculty to his male students is transmitted via CCTV to female students. Yet, one more method, experienced by the author of this paper while teaching master's level IS female students, involved teaching in a special lecture room divided by a dark one-way see-through glass, where students may view the professor, but not the other way around. The glass barrier did not reach the top of the ceiling allowing voices to go back and forth. Generally speaking, there is no well established rule for which method is used to conduct male lead courses for female students. It mostly depends on the university, college offering the course, the campus on which the course is taught, and the available facilities or lack of within that campus.

When it comes to healthcare college education, male and female students complete the majority of their studies in segregated programs. However, face-to-face instruction between male instructors and female students is much more acceptable. Additionally, during their internship programs, students are finally exposed to training which involves a great level of interaction with other interns and physicians of the opposite sex on a daily basis.

3. PROGRAM UNDER STUDY

The Master of Health Informatics initially started offering courses in the Fall of 2005 as one of the programs offered by the College of Public Health and Health Informatics of the King Saud bin Abdulaziz University of Health Sciences (KSAU-HS). The program admits new students on a yearly basis during the Fall semester. Other programs offered by the college include the Master of System Management and Health Quality, the Master of Epidemiology and Health Statistics, and the Master of Public Health. KSAU-HS is considered to be a first of its kind within the Arab world and is part of the King Abdulaziz Medical City in the country's capital, Riyadh. Other colleges of the university include the College of Medicine and the College of Nursing (KSAU-HS, 2007). Students admitted to the Master of Health Informatics must have a Bachelor's degree from an accredited university in medicine, dentistry, nursing, pharmacy, radiography, laboratories, medical engineering, management of health information, or information technology, in addition to two years of experience in health-related organizations.

4. USED TECHNOLOGY

In this study we shall report on a more modern and recent distributed learning approach. Kitsantas & Chow (2007), describe distributed learning as an approach that combines both face-to-face interaction with telecommunications technology. It utilizes the concept of "smart classroom" (Guthrie & Navarrete, 2002) in the delivery of instruction where computer technology is explicitly used to deliver educational content to students. Computer technology in this instance is represented by an instructor workstation, and a personal computer dedicated to each student. Students' PCs are connected through a local area network to each other and to the instructor's workstation for direct access to any material provided by the instructor.

Male and female students are separated into two adjacent lecture halls. Each room includes a smart board and a multimedia projector that reflects the instructor's workstation screen image onto the smart board. The instructor enjoys direct manipulation capabilities of the system through the smart board itself. Digital markers are also provided that allow the writing and drawing on the smart board, with a duplicate copy simultaneously generated in the adjacent classroom. When needed, in case of female student's presentations of projects, control is easily switched over with a single click of a button to the other lecture hall. Females may then use the instructor's PC in their

classroom for giving their presentations that in turn are displayed on the smart board of the male student classroom.

Student PC's are also augmented with special software programs for conducting tutorials and quizzes. Files can be disseminated to each student selected by the faculty or to the entire group of students and then collected back, once students have finished their in-class quizzes or assignments. One important ingredient that is missing from the current distributed learning solution is a web-based course management tool such as blackboard or WebCT. The university administration recognizes the value of such tools and is still evaluating several tools in the hope of reaching a decision with regard to which tool to adapt in the near future.

At the interaction level, while male students benefit from full face-to-face interaction, both male and female students benefit from telecommunications technologies including two-way audio-conferencing and one-way videoconferencing. Brief face-to-face interaction with female students was needed only a few times in the Semester. The initial meeting was at the beginning of the semester for the purpose of learning about their backgrounds. This event was first initiated by the instructor of the course through the audio system, however, female students immediately requested that this task be conducted in person, and hence invited the male instructor to enter their classroom. A few other occasions of direct face-to-face were required when the female students wanted to extensively discuss the requirements of the main course project.

Of additional interest in this paper is the author's perceived low-level of in-class participation by female students in comparison with an IS Project Management course given several years earlier to an all-girl section which was part of a Master's of Information Systems program. Type of interaction for the IS project management course involved neither telecommunications technologies nor any aspects of a smart classroom. Course material was presented using an overhead projector in a classroom divided by a dark one-way see through glass.

According to relevant research, the typical level of students' participation in in-class discussions is reported to be low. Crombie, et al. (2003) reports of generally very low in-class participation levels, where 64% of the students rarely, or only occasionally, asked questions or answered questions during the class. Women in general rated less than their male counterparts in in-class discussions (Crombie, et. al., 2003; Younger, et. al., 1999; and, Canada & Pringle, 1995). Caspi, et al. (2006) conducted a study comparing the level of participation between male and female students in a face-to-face educational setting and in an online web-based instructional environment. Their results showed that men typically over-proportionally spoke at face-to-face classes while females were more comfortable than males in posting messages through the web-based learning environment.

Even though the situation in our distributed learning environment is somewhat different since both male and female students are physically segregated, it is thought that the male factor might still have a hand in the decreased level of participation by female students in our study. This is based on the fact that male students can still hear female students speak, and female students are aware of it. This assumption can be further strengthened based on the conservative Saudi culture where women are thought of being more generally shy than males, especially when it comes to situations where males are present in the company of females.

5. STUDY INSTRUMENT

The study was conducted at the end of the Semester during the students' enrollment in the Web technologies course which is offered during the second Semester of study. The course introduced main concepts of e-business and e-commerce. Such concepts included e-business models, Internet technologies, e-business systems development, security and encryption, e-commerce payment systems, e-business marketing concepts and marketing communications, and, e-business ethical and social issues. The course also briefly covered the subjects of e-health, e-government, and e-education.

A study instrument (Appendix B) consisting of 55 questions was developed and divided into different sections. The goal of most sections in general was to determine different aspects with regard to the students' previous or current inter-gender educational or work

interactions. Of great importance to this paper were a couple of sections that sought the effect of the presence of members of the opposite sex on students' level of in-class participation. Another section of the survey was concerned with gathering students' level of interest in web-based distance learning tools. It is hoped that a great level of comfort by the students towards the adaptation of such tools can be used as a catalyst for pushing the college administration in the quick adoption of such tools.

6. STUDY SAMPLE

The first group of students to be admitted into the Health Informatics Master's program consisted of n = 25 students, 16 female and 9 male students. Eighteen of the twenty five students held health-related degrees; five students, all female, held computing degrees, while two claimed to have other types of degrees. Tables 3 and 4 respectively show the number of male and female students, and the number of students per educational background per gender.

IT students, in accordance with the program admission requirements, had been working for a minimum of two years in the health industry, mostly within the computer centers of various hospitals. Students from a health background included physicians, dentists, pharmacists, radiologists, health educators, and others.

Interestingly, and supporting arguments made earlier regarding the lower marriage possibilities for female professionals in the health field, only 7 out of 16 (44%) of the female students are married, while all 9 male students are married (Table 5). This could also mean that less married women in general seek graduate level education than single women. A married woman, may find it more difficult to hold a career, look after the children, as well as seek a graduate-level degree.

As far as the total group of students in concerned, they can be considered to be very computer savvy with 100% of the students owning a personal computer at home and having an Internet connection. Five female students spend 1 to 2 hours per day on the Internet, 7 spend 2 to 3 hours, while 2 spend more than 3 hours per day. One female only spends less than 1 hour per day on the Internet. Only 3 of the girls are connected through broadband (DSL) connection, and all remaining 13 female students (81%) are connecting using a modem.

With regard to male students, five spend between 1 to 2 hours per day on the Internet, one spends 2 to 3 hours per day, and two spend more than 3 hours. Only one male student, as in female students, spends less than 1 hour per day. Seven of the males students (78%) are connected through modem, while only one is connected through DSL. One other student is connected through Satellite connection. This information was collected from students through a different study instrument in the beginning of the semester.

Table 3. Number of male and female students in study sample.

Male students (M)	Female students (F)
9	16

Table 4. Number of students per educational background per gender.

Health		IT		Other	
M	F	M	F	M	F
7	11	0	5	2	0

Table 5. Marital status per gender type of the study sample.

Married		Single	
M	F	M	F
9	7	0	9

Reasons for low bandwidth connections by the majority of students can most probably be attributed to two main causes. First, is the un-availability of DSL coverage in all areas of the city, and second, very high costs for high bandwidth subscriptions. Up until the end of 2006, a typical 256 KB DSL connection cost Saudi Riyals 400 (US $107) per month, S.R.100 of which goes to the Saudi Telecommunications Company (STC) while S.R. 300 goes to the ISP. Costs for DSL services have recently been reduced for the same bandwidth for about S.R.266 (US $70) per month which is still very high compared to many DSL subscription fees at the global level.

7. STUDY FINDINGS

Table 6 helps provide a good idea about the levels of previous and current interactions with members of the opposite gender at the educational or job setting. Question 1 in the table affirms the suggestion earlier in the paper that more male students have the opportunity of pursuing higher-level education outside the country. Having studied outside Saudi Arabia most probably implies that the student has had a mixed-gender educational experience. This may or may not reduce the level of anxiety when speaking in the company of students from the opposite sex; even if they are not present in the same classroom and are only listening in.

Table 6. Level of interaction with members of the opposite sex.

	Males m = 9		**Females f = 16**	
Questions	Yes	No	Yes	No
1. Did you spend at least 1 year of your education outside of Saudi Arabia?	3	6	1	15
2. Do you interact with patients in your current job?	5	4	10	6
3. Do you interact with patients from the other gender in your current job?	5	4	7	9
4. Do you have co-workers from the other gender in your current job?	8	1	13	3

Numbers derived from question 4 of Table 1 in general indicate that most students, with a percentage of more than 80%, are part of an employment culture where integration of the sexes is common, and hence, this should result in a decreasing level of anxiety when participating in in-class discussions. An interesting difference, however, can be seen between answers for questions 3 and 4, where 10 out of 16 females (62%) claim to interact with patients; however only 7 of them (44%) claim to interact with patients of the opposite gender. This means that a good number of health-related jobs for females have them dealing exclusively with female patients. This is possibly a result of the fact that some women in society specifically request health services that are provided by female healthcare providers when available. It may also reflect the desire of some female healthcare providers to only treat female patients, and hence not interacting with men who are considered strange to them. Males in this study sample who interact with patients, on the other hand, all interact with patients of the opposite sex.

Eighty percent of the students participating in the study claimed to have had previous mixed-gender education experiences with students of the opposite sex in the same educational setting such as a hospital lab or a patient's room. This can be mainly attributed to the fact that the majority of the survey sample come from health education backgrounds.

As far as receiving education from an instructor from the opposite sex, 22 out of the 25 students combined claimed to have had such experience. When looking at each gender separately, all 16 female students in the study had such experience, compared to only 6 out of 9 of male students (67%).

All males who received instruction from an instructor of the opposite sex received it exclusively in the form of face-to-face interaction; most probably during their year of residency or from their overseas education where applicable. On the other hand, 14 out of the 16 female students (88%) had gotten a face-to-face instruction from an instructor of the opposite sex. Seven (44%) received instruction through CCTV with instructor in the same physical building. Five received instruction through CCTV with instructor present at a different campus. Three female students were involved with instruction through dark one-way see-through glass barrier, and two had such interaction through an online/Internet environment (Appendix A, Figure 1).

With regard to female students' declared barriers to participation in in-class discussions during previous educational experiences when students from the opposite gender were listening in through a distance

learning setting, 4 out of 16 (25%) expressed their discomfort in speaking through a microphone or telephone; six (38%) thought that the method for calling the instructor was too time consuming. Four (25%) did not want to upset other students by interrupting the faculty; and three students (19%) did not feel any barriers to participation. What is interesting to know, with regard to previous educational experiences, is that non of the female students was apprehensive about in-class participation as a result of not wanting members of the opposite sex to hear her voice. Male students at such an educational setting, most probably are not restricted with the need for speaking into a microphone and hence almost half of male students in this study sample claim that there was no barriers to their in-class participations. See Appendix A, Figure 2.

With regard to the students' experiences with the current course of study, and what they perceived as barriers to in-class discussions, two statements were posed to the students:

1. Having students from the opposite sex listening to what I might say has restricted my participation in class.
2. Not having a microphone especially for me (PC Mic.) has been a reason for me not participating enough

Figure 3 in Appendix A shows an almost equal split in agreement and disagreement to statement number 1 among both male and female students. A slight shift towards the disagreement side is visible through the graph for female students. Three female students strongly disagree with the statement, five disagree, and six female students (38%) agree with the statement. Male students are evenly divided with regard to this statement. Two agree and two disagree, while one strongly agrees and another strongly disagrees. Two other male students voted neutral.

With regard to the second statement, female students seem to mostly agree that not having a dedicated microphone for each one of them has been a reason for low level participation. The current classroom has only one wireless microphone that needs to be transferred back and forth in order for students to make a comment or ask a question. In the absence of visual eye contact, the instructor has no way of knowing that a female student is interested in asking a question or making a comment unless she speaks out into the available microphone. What seems to be a lengthy process of asking someone else to pass the microphone to the back of the lecture room or the front of it apparently has restricted female student participation. According to Figure 4 in Appendix A, ten out of the sixteen females students (62.5%) agree or strongly agree that not having a specialized personal microphone has restricted their ability to participate. Only three out of the 16 females disagreed with the statement. Male students were again equally distributed between agreeing and disagreeing with the second statement. Even though male students may speak up whenever they like and are immediately heard by the instructor, they are typically requested to speak into the microphone so that female students may hear the question or comment. Some may view this as a delaying factor and hence may refrain from pausing the question or comment.

As far as students' acceptance of the different tools used in teaching their current health informatics program including smart board technology, 89% of males expressed their agreement with the statement that the use of the technology had been beneficial to their educational experience. Only 69% of the females agreed with that statement. The remaining 31%, however, did not disagree and were neutral.

94% of females expressed that having an instructor within the same classroom for face-to-face interaction was more useful to students. 89% of males felt the same way as well. The remaining females and males voted neutral.

All female students (100%) agreed that not having the instructor in the same classroom causes them to lose concentration and that based on the close proximity of the instructor, they all agreed that having the instructor visit their classroom every once in a while to discuss important issues was necessary. Only 78% of males said that not having the instructor would cause them to lose concentration, and only 67% thought that it was necessary to have an instructor go into the room of students of the opposite gender to discuss important issues. The difference between male and female student answers

with regard to this question are definitely reflective of the suffering that female students experience by not having a face-to-face interaction with the instructor. Male students, on the other hand, have not really experienced not having an instructor during the course delivery process, and hence their judgment on this matter is lacking.

8. CONCLUSION

Based on this study, it is clear that female students feel a greater desire in having face-to-face instruction, even if given by an instructor from the opposite gender. This might be considered strange coming in a conservative society which holds close its cultural values, however, it is believed that the previous educational experiences coupled with the employment in health organizations, where gender intermixing is the norm, have played a major role toward this direction. It was additionally realized that more than cultural values, it is really technology or the improper application of it, such as in the case of the classroom microphone, that plays a major role in enabling or discouraging in-class participation in a distributed learning environment.

9. FUTURE STUDIES

The second round of students to be admitted into the program have also been requested to complete the survey. A different approach has already been permitted by the program administrators where a male faculty may now spend 50% of the lecture time with male students and the other 50% of the time with female students. The faculty simply walks over to the female students' lecture hall at half way through the class period and starts giving the lecture in a face-to-face interaction with female students. Male students are hence faced with the situation of not being in direct contact with the faculty.

While data has been collected from students in this new situation, results have yet to be analyzed and are set to be released in a future paper comparing results from both situations.

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APPENDIX A - FIGURES

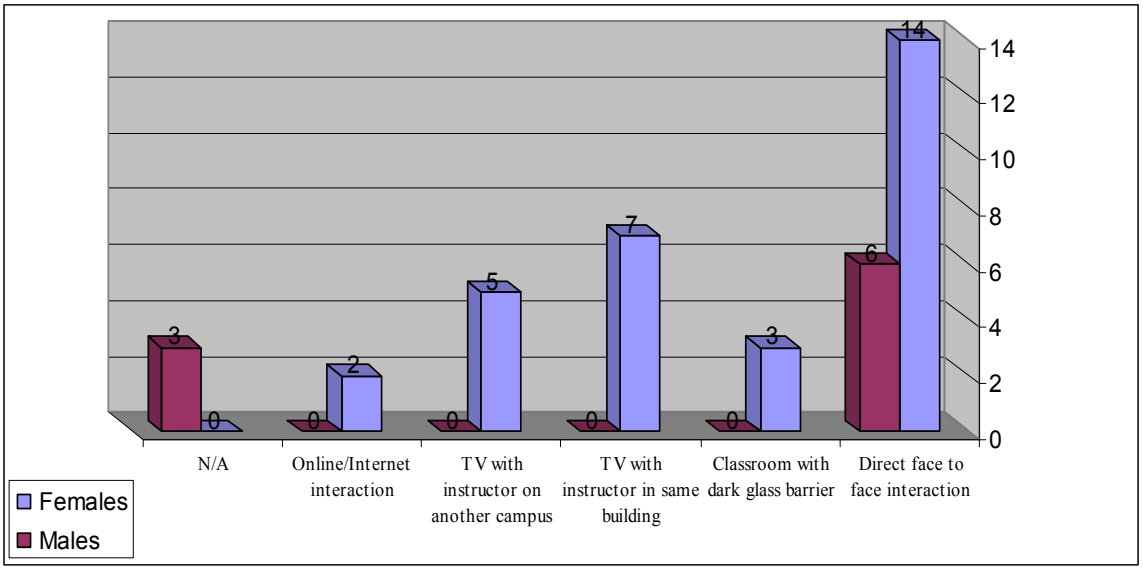

Figure 1. Type of interaction with instructor from opposite sex in previous educational program.

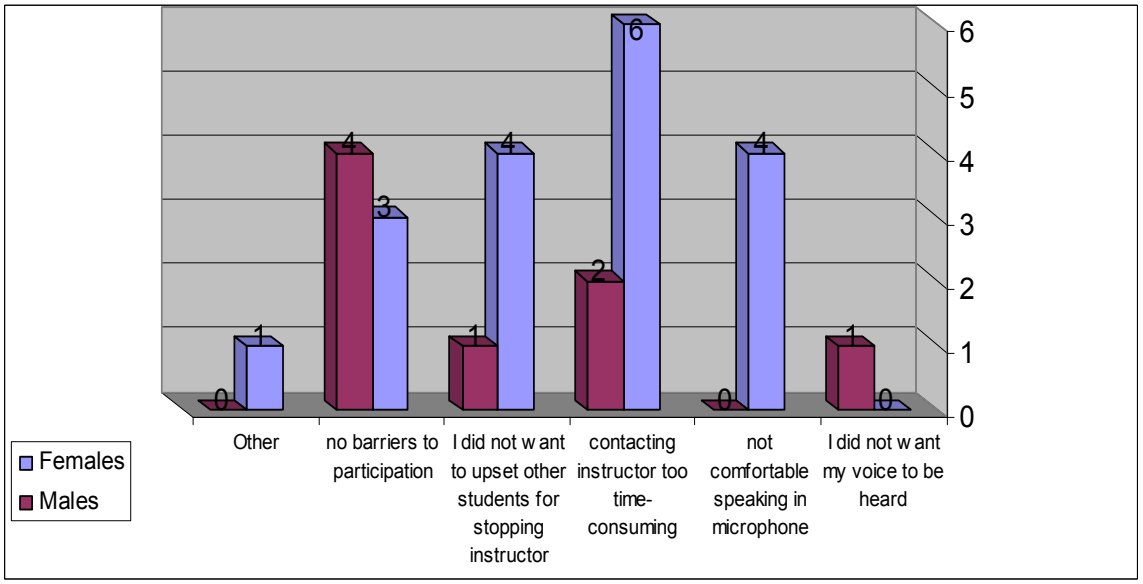

Figure 2. The greatest barriers to participation in in-class discussions.

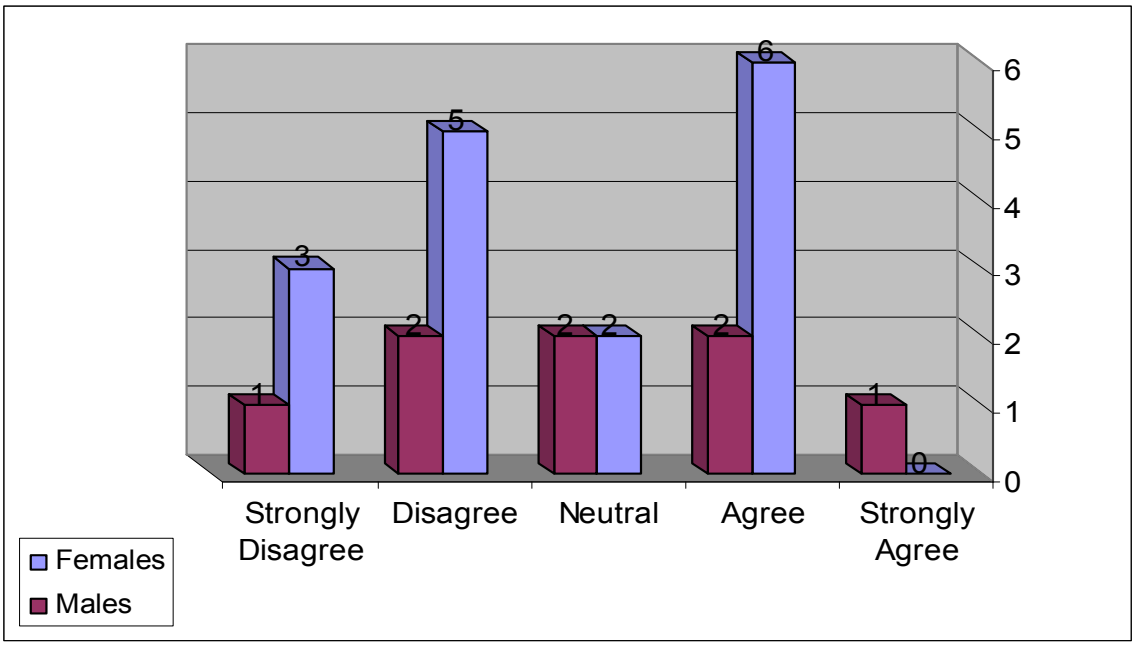

Figure 3. Statement 1: Having students from the opposite sex listening to what I might say has restricted my participation in class.

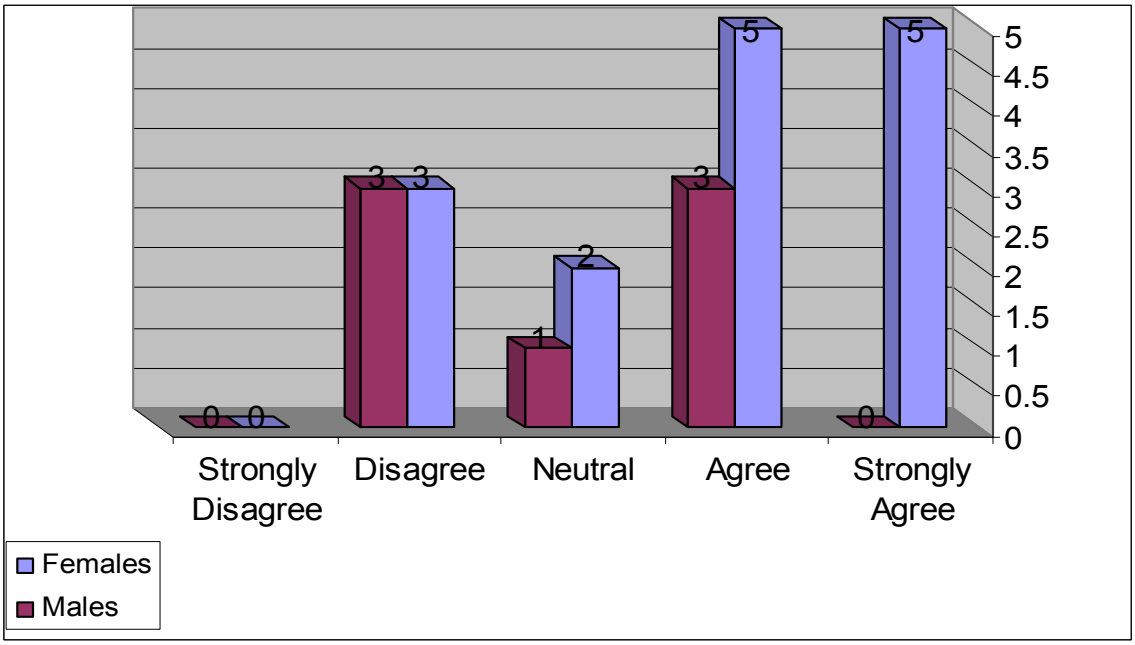

Figure 4. Statement 2: Not having a microphone especially for me has been a reason for me not participating enough.

APPENDIX B - SURVEY

The survey was actually passed to students using the quiz distribution tool as an excel file and then re-collected through the same system after they had all completed it. (Survey questions did not necessarily include section titles in all sections as presented here).

For the sake of space, where not mentioned, answer options are either yes/no, or strongly agree, agree, neutral, disagree, and strongly disagree.

Demographics

1. Educational Background
2. Sex
3. Marital Status
4. Region of country do come from?

Interaction with members of the opposite sex at the job or in overseas education

5. Did you spend at least 1 year of your education outside of Saudi Arabia (secondary and up)?
6. Do you interact with patients in your current job?
7. Do you interact with patients from the other sex in your current job?
8. Do you have co-workers from the opposite sex in your current job?

Experience with web-based course management tools

9. Have you ever heard about e-education tools called WebCT or Blackboard?
10. Have you ever used e-education tools like WebCT or Blackboard?
11. Have you ever taken any online courses or training?

Feelings about mixed-gender education

12. How do you feel about mixed-gender education in health studies?
    - Agree (unconditionally)
    - Agree (it is a necessity)
    - Neutral
    - Disagree
    - Strongly disagree
13. I am willing to treat or deal with patients from the other sex, but, not willing to study with them in the same classroom setting.

About Your Previous Studies (before the Health Informatics Program)

14. Have you had students from the opposite sex in the same classroom during your previous studies?
15. Have you had students from the opposite sex in the same educational setting (example: hospital lab or patient's room)?
16. Have you ever had an instructor from the opposite sex?
17. If yes, what percent of classes had instructors from opposite sex?
18. Type of interaction with instructor from opposite sex in previous educational programs (check all that apply).
    - Direct face to face interaction,
    - Classroom with dark glass barrier,

- TV with instructor in same building,
- TV with instructor on another campus,
- Online/Internet interaction,
- N/A

If you had students from opposite sex in the same classroom or educational setting before

19. I believe it was detrimental to my ability to participate and speak out freely.
20. I believe that it made my educational experience more beneficial.
21. I believe the instructor was more comfortable dealing with students from the same sex.
22. I believe it prepared me better for my job.

If you had a course with students from the opposite sex in another physical location before

23. I believe it was detrimental to my ability to participate and speak out freely.
24. I believe that it made my educational experience more beneficial.
25. I believe the instructor was more comfortable dealing with students from the same sex
26. I thought the students having the instructor with them benefited a lot more than I did
27. The greatest barrier to my participation in class discussions was
    - I did not want students from the other sex to hear my voice,
    - I did not feel comfortable speaking in the microphone or telephone,
    - I found the method to call or contact the instructor in-class was too time-consuming,
    - I did not want other students to get upset with me by stopping the instructor,
    - I did not feel any barriers to participation,
    - Other

About your Current Program (Health Informatics)

28. Having an instructor in the same classroom for face to face interaction with the students would be more useful for students.
29. Current solution of keeping females in a separate room than the instructor while being able to view the instructor via TV and view course material via the smart board is a very good solution to have in comparison with other mixed-gender educational experiences that I had.
30. Being able to access course presentations and other material via the network from the instructor's PC is a unique experience for me.
31. Being able to view course presentation on my own private monitor is better than having to look at the smart board.
32. Being able to see the instructor's facial expressions and body movement is important to get a better understanding of the subject being discussed.
33. It would be more useful to view the instructor on my PC monitor while viewing the presentation on the smart board.
34. Having an instructor go some times into the classroom of students from the opposite sex to discuss important issues with students is necessary (need for instructor to be close by).
35. Not having the instructor in the same classroom causes us to easily lose concentration and miss what the instructor is saying.
36. The instructor should attend the classroom with the most number of students regardless of the sex of the instructor/students.
37. It is the first time that I experience the form of education used for this program (including the closeness of the instructor + used technology).
38. Current smart-board technology and other technologies used in this program has been very beneficial for my study so far.

39. Instructors have used the Internet very well, when possible, in delivering needed understanding of specific course material.
40. Hands on practice and experiments with programs/PC applications has been very adequate for my study so far (during the first 2 semesters).
41. There is a great need to be able to communicate/chat with other students outside of the classroom setting through online communication tools.
42. It would like to view the grades for quiz/homework I completed in a course during the semester through the Internet.

Participation Issues in Current Health Informatics Program

43. I prefer to write and send questions to the instructor through the PC rather than asking questions by microphone.
44. Having students from the opposite sex listening to what I might say has restricted my participation in class.
45. Not having a microphone especially for me has been a reason for me not participating enough.

Regarding Distance Learning in General

46. It would be very beneficial for students to have access to a recorded lecture to download and view from home.
47. Reviewing the recorded classroom experience through VHS or DVD is/would be very helpful.
48. Being able to view an online lecture at a time that is good for me is more useful than attending a live lecture with an instructor.
49. Having unlimited repeats/reviews of the course material is very important to the studying process.
50. The best form of education is the good old face-to-face paper-based course.
51. Freedom to ask questions at any time through email is very helpful to students.
52. Online tutorial exercises would be very beneficial.
53. Reducing travel costs (time) is very important advantage of electronic education.
54. Taking quizes and exams online while in class is very acceptable to me.
55. The experience in getting this survey and completing it online has been very useful.