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Attitudes of female faculty toward the use of computer technologies and the barriers that limit their use of technologies in girls' colleges in Saudi Arabia

Taghreed Abdulaziz Almuqayteeb

ATTITUDES OF FEMALE FACULTY TOWARD THE USE OF COMPUTER TECHNOLOGIES AND THE BARRIERS THAT LIMIT THEIR USE OF TECHNOLOGIES IN GIRLS' COLLEGES IN SAUDI ARABIA

By

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The purpose of this study was to examine female faculty members' use of computer technologies, their attitudes toward computers, the factors that best predict their attitudes toward computers, and the barriers that limit their use of computer technologies in girls' colleges in Dammam and Jubail, Saudi Arabia. Also, this study examined how female faculty members' attitudes and use of computer technologies differ according to their demographic characteristics. 206 female faculty members participated in this study, and only 197 usable questionnaires were analyzed and used in this study. Descriptive statistics, a one-way ANOVA, and multiple regression analysis were conducted to analyze the data.

The findings of this study revealed that female faculty members had positive attitudes toward using computer technologies. Also, the results indicated that female faculty members had high levels of use of 3 common computer applications: e-mail, word processing, and the Internet. Furthermore, findings revealed that the barriers that

significantly limit faculty members' use of technology were lack of technical support, lack of effective training, lack of equipment and infrastructure, and lack of administrative support.

The results revealed that the demographic variables that had an influence on female faculty members' attitudes toward using computers were age, years of experience with computer technologies, subject taught, academic degree, access to a computer at the office, access to the Internet at the office, computer skill levels, and English language proficiency.

The findings indicated that the demographic variables that had an impact on female faculty members' use of computer technologies were age, teaching experience, years of experience with computer technologies, subject taught, access to the Internet at home, computer skill levels, and English language proficiency. The factors that best predict female faculty members' attitudes toward computers were reduced course quality, lack of time, lack of collegial support, and lack of self confidence.

This study presents several conclusions and recommendations to improve female faculty members' use of computer technologies at girls' colleges. Female faculty members need technical support services unit, more training, available equipments and infrastructure, more administrative support, and release time for learning about computer technologies to increase their use of computer technologies.

DEDICATION

I would like first to thank Allah (God) for giving me this opportunity to pursue my graduate education and to earn the Ph.D. degree. Without Allah's will and blessing on me, I would not be able to complete this dissertation.

This doctoral dissertation is dedicated to all my family for their support, encouragement, and tolerance. I would like to dedicate this work to my father, Abdulaziz Almuqayteeb, and my mother, Fawzya Almuqayteeb, for their love, prayers, support, and encouragement. My parents inspired me since I was a child to be more educated and knowledgeable. They taught me the importance of commitment and respect for work. Thank you for all what have you done for me, I love you both.

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CHAPTER I

INTRODUCTION

Technology knowledge and skills are increasingly considered as crucial to success in the 21st century (Bai & Lehman, 2003). Computer technologies provide powerful tools and applications that promote teaching and learning experiences. Utilizing technology has become the focus of educational managers and administrators (Steel & Hudson, 2001). With the increase emphasis on the use of computer technology in education, higher education institutions are challenged to prepare competent teacher educators who have the knowledge and skills to use computer technology effectively in the classroom (Rice & Miller, 2001; Sahin & Thompson, 2006).

Saudi Arabia, like other countries, has recognized the significant role of computer technologies in education, and makes efforts to provide computer technologies to K-12 schools, colleges, and universities. Educational policy planning in Saudi Arabia occurs every five years. The seventh development plan (2000 - 2005) in Saudi Arabia included a comprehensive plan to integrate Information Computer Technology (ICT) in its education system. Bridging the technological gap between Saudi Arabia and the technological advanced countries by 2020 is on the top of Saudi Arabia development plan's priority (Ministry of Communications and Information Technology, 2003). Accordingly, Saudi

Arabia needs to recognize the conditions that promote the use of computer technologies in education.

Faculty members play an essential and challenging role in preparing new generations for the workforce. Students are entering the information age in which most of the jobs will require them to have technology knowledge and skills (Del Favero & Hinson, 2007; Lamboy & Bucker, 2003). Teacher educators in higher education institutions are in charge of enabling these students to become competent in using technology (Finley, 2003). Finley (2003) stated that "If teacher education is going to meet the challenges of the information age, then teacher educators will have to realize their responsibility to utilize the existing and emerging technologies" (p. 10), while preparing future teachers. Faculty are expected to model the use of technology, use it in instruction, and support its use by students (Finley; Stephens, 2000).

Faculty members must be provided with adequate and appropriate training and support in order to use and integrate technology into their instruction (Al-Musawi, 2007; Bai & Lehman, 2003; Nworie, 2006-2007). Such training should not only focus on basic technology skills, but also how to integrate technology tools into teaching (Georgina & Olson; 2008; Gustafson, 2003-2004). Nevertheless, how faculty members perceive and use educational technologies are important factors because technology use is an individual choice in most higher education institutions (Peluchette & Rust, 2005; Xu & Meyer, 2007).

Surry and Land (2000) noted that "A key element in the effective utilization of any innovation in higher education is promoting faculty buy-in" (p. 152). However, some

faculty members are not prepared to accept the challenges of technology because the adoption of new innovations lead to many changes that take place in the teaching and learning process (Miller, Martineau, & Clark, 2000). Faculty members' use and integration of computer technologies could be influenced by different enabling factors and barriers (Ertmer, 1999; Ertmer, Ottenbreit-Leftwich, & York, 2006-2007).

Ertmer (1999) described two types of barriers and factors that may influence technology use and integration in the classroom. First-order barriers are extrinsic to teachers and include lack of access to hardware and software, lack of training, lack of time, and lack of technical and administrative support. Second-order barriers are intrinsic to teachers, including teachers' attitudes toward computers, teachers' belief systems about teaching and learning, and lack of confidence (Ertmer, 1999, Ertmer et al., 2006-2007). Ertmer et al. (2006-2007) explained that "Enablers and barriers may be viewed as having an inverse relationship. That is as enabling factors increase, barriers are likely to decrease" (p. 55). For instance, lack of training may be considered as a significant extrinsic barrier, while adequate training could be considered as a strong enabling factor (Ertmer et al., 2006-2007). Therefore, when extrinsic and intrinsic barriers are overcome, they become strong enabler factors that lead to greater technology use (Ertmer, 1999).

Several researchers have reported different extrinsic barriers that hinder teachers' use and integration of technology in the classroom such as lack of training and lack of technical support, (Al-Alwani, 2005; Alaugab, 2007; Almusalam, 2001; Gustafson, 2003-2004), access to technology (Brill & Galloway, 2007; Rogers 2000; Weston, 2005), and lack of time (Bai & Lehman, 2003; Owen & Demb, 2004; Peluchette & Rust, 2005).

Providing access can lead to the increase in the use of technology; yet, appropriate training and technical and administrative support are significant factors that encourage faculty members' use and integration of computer technology into instruction (Al-Musawi, 2007; Groves & Zemel, 2000; Sahin & Thompson, 2006). Furthermore, using and integrating technology in instruction require considerable time to learn how to use new technologies, to develop new instructional materials, and to implement technologies in the classroom (Peluchette & Rust, 2005; Rogers, 2000).

While extrinsic barriers may hinder teachers' use and integration of technology, intrinsic barriers play a key role in limiting teachers' use and integration of technology and might be more difficult to overcome because they are rooted and personal (Ertmer, 1999; Ertmer, 2005). Intrinsic barriers that influence teachers' use and integration of technology in the classroom include negative attitudes toward computers (Christensen, 2002; Rogers, 2000; Rovai & Childress, 2002-2003), personal beliefs about teaching and learning with technology (Al-Alwani, 2005; Ertmer, Ross, & Gopalakrishnan, 2000), and confidence and commitment to the use of technology (Ertmer et al., 2006-2007; Lim, 2002; Rovai & Childress, 2002-2003).

Intrinsic barriers are critical and should also be addressed because faculty members usually have personal concerns about the changes brought by new innovations and may resist these changes (Miller et al., 2000). To promote technology use in higher educational institutions, faculty members should be comfortable using computer technology and see it as a convenient and useful tool (Bennett & Bennett, 2003; Weston, 2005). Steel and Hudson (2001) noted that faculty members attempt to use technology

because of the perceived added value that technology brings to their teaching and student learning. Accordingly, Sahin (2008) concluded that faculty awareness of the positive consequences of educational technology might increase their willingness to use technology.

Faculty members' attitudes toward technology are recognized as a crucial intrinsic factor that might influence their use of computer technology while teaching (Dusick & Yildirim, 2000; Rogers 2000; Sahin & Thompson, 2006). Positive teacher attitudes toward computers are recognized as a necessary condition for effective use of computer technologies in the classroom (Albirini, 2006; Bullock, 2004; Kersaint, Horton, Stohl, & Garofalo, 2003). Thus, understanding faculty attitudes toward computer technologies is an important step that could provide insights into the utilization of technology.

Numerous studies have found a relationship between the attitude and use of computers; that is people with positive attitudes toward computers are more likely to use technology than those who have negative attitudes toward computers (Braak, 2001; Shapka & Ferrari, 2003; Teo, Lee, & Chai, 2008). Teo et al. (2008) explained that the successful use of computers in learning depends mainly on teachers' attitudes toward technology and their willingness to use technology. Therefore, assessing faculty members' use and attitudes toward computer technologies and investigating the barriers to faculty members' use of computer technologies are vital.

Statement of the Problem

Computer technologies have become important educational tools in higher education institutions in Saudi Arabia. They are powerful tools that could enhance students' learning; yet, their value depends on how effectively teachers might use computer technologies to support their teaching. In Saudi Arabia, female faculty members play a critical role in making decisions regarding the use and implementation of technology in their classrooms in girls' colleges. These decisions might be influenced by different factors such as extrinsic factors (e.g., training and technical support) or intrinsic factors (e.g., attitudes toward computers and beliefs about teaching and learning). In addition to these factors, female faculty members' use of computer technologies in Saudi Arabia is influenced by two conditions relevant to the girls' education system: the organizational structure of Saudi girls' education and the traditional teaching method used.

In Saudi Arabia, education is segregated by sex for all levels starting from first grade through universities. Females are taught either by female instructors or by male instructors on a closed circuit television (CCTV). CCTV was introduced in colleges and universities in order to keep women involved in education (Addawood, 1990). Girls' education in Saudi Arabia was under the responsibility of the Presidency of Girls' Education for many years. Within girls' education, girls' schools did not teach computer literacy (Ibin Dhaish et al., as cited by Al-Oteawi, 2002). In 1999, the Presidency of Girls' Education reported that they started teaching computer literacy in some girls' high schools (Al-Oteawi, 2002).

Until now, computer literacy course is not available in all girls' schools in Saudi Arabia. In fact, female students did not have the same opportunities as male students who were introduced to a general computer curriculum in high schools in 1985 (Ministry of Education, as cited in Al-Oteawi, 2002). Most of the efforts of female teachers and students to use computer technologies are personal by enrolling in workshops in private centers. In 2003, the General Presidency for Girls' Education was dissolved. Girls' education now is administrated by the Ministry of Education (Ministry of Education, 2006). In 2007, girls' colleges in the Eastern province joined King Faisal University. Since that joining a lot of changes have been undertaken to improve the use of computer technologies in girls' colleges.

Education in Saudi Arabia, in general, is based greatly on traditional teaching methods. In the traditional method, instruction is teacher-centered with students having a passive role (Miller et al., 2000). However, with the incorporation of technology in classrooms, traditional teaching methods and the teacher's role in classroom should be changed (Wang, 2001, 2002b). Teachers should work toward more student-centered teaching in which they work as facilitators in the technology classroom (Wang, 2001, 2002a). Therefore, faculty members' use of technology depends greatly on their willingness to execute changes in their teaching methods and their roles as teachers (Bennett & Bennett, 2003; Peluchette & Rust, 2005).

Given that there are a lot of changes that have been undertaken in girls' colleges in Saudi Arabia to improve the use of computer technologies, the questions considered here are: Are female faculty members ready to accept these changes? Are they ready to

use computer technologies as educational tools, If not why? What are their attitudes toward using computer technologies; and what are the barriers that delay their use of computer technologies?

According to Mitra, Steffensmeier, Lenzemeier, and Massoni (1999), the evaluation of the changes that institutions face as they attempt to accommodate the new technology is vital. Mitra et al. (1999) suggested that the evaluation needs to focus on faculty members' use of technology tools, and faculty members' attitudes and opinions toward computers. Currently, there are attempts to improve the use of computer technologies in girls' colleges, Eastern province, Saudi Arabia. However, there is no research that has been conducted to examine female faculty members' use of computer technologies, their attitudes toward computers and the barriers that limit their use of technology. Therefore, this study will focus on female faculty members' use of computer technologies, their attitudes toward computers, and the barriers that limit their use of technology in girls' colleges in Dammam and Jubail, Saudi Arabia.

Purpose

The purpose of this study was to examine female faculty members' use of computer technologies, their attitudes toward computers, and the barriers that limit their use of technologies in girls' colleges in Dammam and Jubail, Saudi Arabia. Also, this study examined how female faculty members' attitudes and use of computer technologies differ according to the personal and demographic characteristics of age, years of teaching experience, years of computer technology experience, subject taught, academic rank held,

highest degree earned, ownership of a computer at home and in the office, access to the Internet, computer skill level, and English language proficiency.

Research Questions

This study examined female faculty members' use of computer technologies, their attitudes toward computers, and the barriers that limit their use of computer technologies in girls' colleges in Saudi Arabia. The study answered the following research questions:

1. What are female faculty members' attitudes toward using computer technologies?
2. What types of computer technologies do female faculty members use?
3. To what extent do female faculty members use computer technologies for instructional purposes?
4. What are the barriers that limit female faculty members' use of computer technologies?
5. Are there statistically significant differences in female faculty members' attitudes toward computer technologies based on demographic characteristics (i.e., age, years of teaching experience, years of computer technology experience, subject taught, academic rank held, highest degree earned, ownership of a computer at home and in the office, access to the Internet, computer skill level, and English language proficiency)?
6. Are there statistically significant differences in female faculty members' use of computer technologies based on demographic characteristics (i.e., age, years of teaching experience, years of computer technology experience, subject taught,

academic rank held, highest degree earned, ownership of a computer at home and in the office, access to the Internet, computer skill level, and English language proficiency)?

7. Which factors best predict female faculty members' attitudes toward using computer technologies?

Definition of Terms

The following definitions were used in this study:

Attitude – "A positive or negative feeling or mental state of readiness learned and organized through experience that exerts specific influence on a persons' response to people, object, and situations" (Gibson, Ivancevich, & Donnelly, 1994, p. 114). Also, attitude is defined as "an evaluative disposition that is based upon cognitions, affective reactions, behavioral intentions, and past behaviors; and that evaluative disposition can influence cognition, affective responses, and future intentions and behavior" (Zimbardo & Leippe, 1991, p. 32).

Computer Attitudes – computer attitudes are defined as consisting of four elements as measured by the Computer Attitudes Scale (CAS): computer anxiety, computer confidence, computer liking, and perception of usefulness of computers (Loyd & Gressard, 1984; Loyd & Loyd, 1985)

Computer Technologies – are computer-based technologies such as word processing, database programs, electronic mail, Web pages, chat rooms, electronic bulletin boards, and presentation programs. (Peluchette & Rust, 2005).

Computer Technologies Use – the use of hardware and software as educational tools.

Girls' Colleges in Saudi Arabia – four-year colleges that prepare girl students to teach one subject matter (e.g., history, mathematics, science, etc.) in elementary, middle, and secondary schools.

Ministry of Education – An organization that is responsible for the development and fulfillment of the strategy for K-12 (boys) education (Al-Oteawi, 2002).

Presidency of Girls' Education – An organization that is responsible for the development and fulfillment of the strategy for K-12 (girls) education (Al-Oteawi, 2002).

Limitations

This study was limited to female faculty members in girls' colleges in Dammam and Jubail, Saudi Arabia. Generalization from the study should be limited to only the population described and can not be applied to any other group.

Justification of the Study

Saudi Arabia is faced with different challenges to reach the effective use and implementation of computer technologies. As computer technologies become an integral part in the education system in Saudi Arabia and specifically in higher education, understanding faculty members' use of computer technologies, their attitudes toward computers, and the barriers that limit their use of computer technologies will result in achieving successful use and implementation of computer technology.

Currently, little research on female faculty members' use of computer technologies has been reported in Saudi Arabia (Alaugab, 2007; Al-Kahtani, 2006). Particularly, there is no study that has been conducted on female faculty members' use of computer technologies and their attitudes toward using computers in girls' colleges in Dammam and Jubail, Saudi Arabia. Presently, there are efforts to improve the use of computer technologies in those colleges. There is a need for a study to assess female faculty members' use of computer technologies and their attitudes toward computers in girls' colleges in Dammam and Jubail, Saudi Arabia. These colleges serve a large number of female students; there were approximately 16,272 female students attending Dammam girls' colleges in 2008 (King Faisal University, 2008). Because of the rapid changes in incorporating computer technologies in girls' colleges in Saudi Arabia, there is a need: to investigate female faculty members' use of computer technologies and their attitudes toward computers, to identify the barriers that limit female faculty members' use of computer technologies, and to identify the factors including their demographic and personal characteristics that influence female faculty members' use and attitudes toward computer technologies.

The results from this study will greatly benefit female faculty who teach in girls' colleges in Saudi Arabia. First, female faculty members will better understand the current state of their use of computer technologies and their attitudes toward computers, which should motivate faculty to expand their knowledge and skills in the use of new technologies. Second, administrators of institutions in the Ministry of Higher Education in Saudi Arabia will become more knowledgeable of the current state of female faculty

members' preparedness and use of computer technologies in girls' colleges. Also, the findings in this study will draw administrators' attention to the challenges that female faculty are facing while using and integrating computer technologies in the classroom. Finally, findings in this study should assist administrators in making informed decisions regarding the training and development of female faculty that will result in increasing female faculty members' knowledge, skills, and use of computer technologies.

CHAPTER II

REVIEW OF RELATED LITERATURE

Today, computer technologies have increasingly become an integral part of both the educational arena and the work environment. The integration of technology into the teaching-learning process has become an important issue in higher education (Saleh, 2008). This study examined female faculty members' use of computer technologies, their attitudes toward computers, and the barriers that limit their use of technologies in girls' colleges in Dammam and Jubail, Saudi Arabia. Also, this study examined how female faculty members' attitudes and use of computer technologies differ according to the personal and demographic characteristics (i.e., age, years of teaching experience, years of computer technology experience, subject taught, academic rank held, highest degree earned, ownership of a computer at home and in the office, access to the Internet, computer skill level, and English language proficiency).

This chapter begins with a review of technology use in education in Saudi Arabia. The next section describes the related literature regarding technology use in education and barriers that limit the use of computer technologies. The next section describes teachers' attitudes toward computers. Finally, the chapter concludes with information relative to the demographic characteristics (i.e., age, years of teaching experience, years of computer technology experience, subject taught, academic rank held, highest degree

earned, ownership of a computer at home and in the office, access to the Internet, and English language proficiency), and how these characteristics affect faculty use of computer technologies and their attitudes toward computers.

Background of Technology Use in Education in Saudi Arabia

Education System in Saudi Arabia

There are three agencies that are responsible for educational policy in Saudi Arabia: the Ministry of Education, the Ministry of Higher Education, and the General Organization for Technical Education and Vocational Training. The Ministry of Education, established in 1953, provides general education for all male and female students. Responsibilities of the Ministry of Education includes policy-making, planning, teacher training , and providing educational materials and supplies to elementary, intermediate, and secondary schools (Ministry of Education, 2007).

The Ministry of Higher Education was established in 1975. It provides support for the universities and colleges in Saudi Arabia. It is responsible for the policy-making and planning for higher education, and also it supervises and monitors the private and the governmental universities. Moreover, the Ministry of Higher Education coordinates some training programs for faculty at higher education institutions in Saudi Arabia (Ministry of Education, 2007).

The General Organization for Technical Education and Vocational Training in Saudi Arabia was created in 1980. It aims to prepare students to work in industrial,

commercial, and agriculture fields. Its responsibility includes prevocational training centers, vocational and commercial secondary and high schools, and coordinates some training programs for employees in their fields (Ministry of Education, 2007).

Technology in Saudi Arabian Education

Saudi Arabia has increasingly realized the importance of the use of computer and information technology. The government continues to work to improve educational standards by increasing the use of educational technology in schools. Educational policy planning in Saudi Arabia occurs every five years. The fourth educational development plan (1985 -1990) created a significant change in Saudi's education system. In 1985, a new body called General Administration for Educational Technology (GAET) was established to be responsible for managing the utilization of technology and to develop and improve the quality of education through the use of technology (Moshaikeh, as cited in Alsebail, 2004). This department is responsible for the development of educational materials, supplying classrooms with educational technology, and training staff at the Ministry of Education in the use of educational technology (Moshaikeh, as cited in Alsebail, 2004).

As a result of forming the General Administration for Educational Technology department, computer programs were introduced at the secondary level and colleges. All high school curriculums in Saudi Arabia consist of a general curriculum for all levels of high school (Ministry of Education, 2007). For example, in 2000, a school computer project was launched to cover all the schools in Saudi Arabia. Also, the ministry

approved teaching of computer studies in primary schools starting from the academic year 2003/2004 (Ministry of Education, 2007). On the college level, a computer course in some Saudi universities such as King Fahad University and King Saud University was mandatory as a graduation requirement for all students.

In the early 1970's, entering a new era of rapid development of the country's infrastructure and economy, Saudi Arabia devoted special attention to developing its higher education programs. The Ministry of Higher Education developed a long-term master plan to enable Saudi's educational system to provide the highly trained manpower necessary to run the country's increasingly sophisticated economy. Saudi Arabia's eighth development plan (2005 - 2010) was designed to meet a number of challenges which influence the system of education. Realizing the challenges brought by information and communication technologies on teaching and learning, the development plans have set goals that specify the development of the infrastructure of information and communication technology and its use in the process of teaching and learning (The Centre for Educational Development, 2004).

The rapid development of technology in Saudi Arabia called for a need to change the way of acquiring skills and knowledge because maintaining the old ways of skills and knowledge acquisition would not meet the demands of the new information technology age (The Centre for Educational Development, 2004). Saudi Arabia is in the process of setting out a 25-year strategy to map out its higher education system, in order for it to be in tune with the country's development and job market requirements. A central element of the plan is information technology (McCloskey, 2007). Further, teachers will be

provided with modern information technology and will be given intensive training to help them become familiar with modern technology development and changes (Abdul Ghafour, 2007).

In conclusion, great changes have occurred in the educational system in Saudi Arabia since 1953. The numbers of students, schools, universities, and colleges have been gradually increasing. Statistics show that today there are around 300,000 students at Saudi universities and colleges, a dramatic improvement over the 7,000 students enrolled in 1970 (Ministry of Education, 2007). This statistic reflects the value being placed on education today in Saudi Arabia and how technology may play a vital role in the attainment of the objectives in the education system.

Technology Use in Education

With the rapid enhancement of information technology, computers and computer-related technology have become an essential part of teaching and learning (Bai & Ertmer, 2004; Rogers, 2000). Technology has the potential to enhance teaching and learning beyond what traditional methods allow by giving teachers more knowledge and alternatives to guide the process of learning, and giving students more control over their learning (Ouzts & Palombo, 2004)

Several researchers have identified different reasons why technology should be used in education (Bates, 2000; Miller et al., 2000). For instance, Miller et al. (2000) stated that "the use of technology in education can facilitate learning by providing more relevant learning opportunities, changing the orientation of the classroom from professor

to student-centered, preparing students for employment, increasing flexibility of delivery, increasing access, and potentially satisfying demands for efficiency" (p. 231). Also, Bates (2000) identified four reasons to justify the use technology for teaching: (a) to improve access to education and training, (b) to improve the quality of learning, (c) to reduce the cost of education, and (d) to improve the cost-effectiveness of education. Therefore, the impact of technology on teaching and learning should be a main concern for all educators (Roberts, Kelley, & Medlin, 2007).

Technology Use in Higher Education

Motivation to enhance the educational status quo has increased the pressure on higher education institutions to reevaluate their traditional educational practices (Del Favero & Hinson, 2007; Lamboy & Bucker, 2003). The pressure on faculty to utilize more instructional technology is affected by the fact that as students are entering the 21st century, they should be provided with appropriate computer technology skills that prepare them for the workplace demands (Balotsky & Christensen, 2004; Del Favero & Hinson, 2007). As a result, teaching is being challenged dramatically by the advancement of new technologies (Bennett & Bennett, 2003; Brill & Galloway, 2007; Sahin, 2008). Thus, higher education institutions have an immense burden to prepare faculty members with new kinds of expertise and skills that were not required in the past (Epper, 2001).

The use of computer technology at universities and colleges has grown and changed significantly through the past twenty years (Weston, 2005). Universities and colleges are facing numerous challenges because of the rapid development of information

technology (Bates & Poole, 2003; Groves & Zemel, 2002; Lamboy & Bucker, 2003). Rice and Miller (2001) stated that:

> Institutions face major challenges in trying to keep pace with technological advances. These challenges include keeping up with the costs of rapidly changing technologies, fostering changes in the learning processes and teaching methods, providing students with the electronic resources they expect, competing with private enterprises investing in distance learning, and training faculty in the use and integration of various technologies. (p. 330)

To cope with these challenges, many universities and colleges have made significant investments in new technologies with the hope that it will help to improve teaching and research roles of their faculty, as well as student learning outcomes (Owen & Demb, 2004; Weston, 2005). Nevertheless, Mereba (2003) suggested that efforts by higher education institutions to achieve success with their instructional technology programs, in order to enhance teaching and learning, require fundamental shifts in the way academic institutions view the application of instructional technologies. For higher education institutions to benefit from their investments in technology, faculty members should utilize and incorporate technology to improve their teaching and their students' learning (Epper & Bates, 2001). This can be achieved when higher education institutions provide support for faculty in the use of pedagogy and instructional technologies (Nworie, 2006-2007).

To insure the adoption of all new technologies, this requires a systematic infrastructure that supports the use of technology and accessible computer information

and materials (Finley, 2003; Groves & Zemel, 2000). Also, there is a need for improved methods of faculty professional development to increase the use of up-to-date technology (Sahin & Thompson, 2007). Several researchers have found that most faculty members have the most experience with low-order technology such as word processing and older technologies (e.g. VCR, overhead projector), while having less experience with newer technologies (e.g., multimedia, distance education) (Brill & Galloway, 2007; Georgina & Olson, 2008; Groves & Zemel, 2000; Peluchette & Rust, 2005; Wozney et al., 2006). An effective way to encourage faculty to use newer computer technologies in the classroom is to increase their level of competency (Dusick & Yildirim, 2000; Sahin & Thompson, 2006; Wozney et al., 2006).

Almusalam (2001) conducted a study to identify the extent to which business education teachers at Saudi technical colleges have adopted computer technologies into their instructional and related professional practices. He found that there is a low level of use and integration of computer technologies into professional tasks. The most frequently used applications were word processing, Internet, and spreadsheets and CD-ROM, 46%, 31%, 29%, respectively. He concluded that three factors that influenced the low level use of technology were teacher perceived proficiency with computer technologies, computer experience, and administrative support.

Hartman and Davis (2001) suggested that an institution that wishes to create an environment that fosters faculty use of technology in teaching must address four elements. The authors explained that faculty use of technology occurs as a four-stage process: (a) access to the basic tools of technology, (b) awareness of the existence of

resources and faculty understanding of how technology can be applied to their work, (c) having the skills needed to use technology resources in ways that are relevant to their teaching, and (d) application of technology in their teaching.

University administrators should carefully plan for the introduction and utilization of technology in their campuses in order to increase the potential of computer technologies (Surry & Land, 2000). A crucial element in the effective utilization of technology is faculty motivation to use it (Hagner & Schneebeck, 2001; Surry & Land, 2000; Weston, 2005). Yet, if institutions expect faculty to embrace new technologies, then institutions must provide a supporting environment that enables faculty to implement technology in their courses successfully (Bai & Lehman, 2003; Brill & Galloway, 2007; Sahin & Thompson, 2006).

Effective Use of Technology

Several researchers (Brinkerhoff, 2006; Sahin & Thompson, 2006; Lamboy & Bucker, 2003) suggested that faculty development is a critical issue in the effective use of technology. In fact, "If higher education institution wants to survive in the expansion of technology, then it must be prepared and prepare its faculty to implement the new technologies within their classrooms" (Hagenson & Castle, as cited in Sahin & Thompson, 2006, p. 81). Further, Braak (2001) found that teachers' personal willingness to improve their teaching practice through the use of computer in class, combined with their belief to change education through technology, will result in an effective utilization of computer technologies.

Bates (2000) asserted that the effective use of technology requires a revolution in thinking about teaching and learning. He explained that "part of that revolution necessitates restructuring universities and colleges—that is, changing the way higher education institutions are planned, managed, and organized" (xiii). The introduction of technology in higher education is a challenging process. Bates (2001) stated that:

> Moving an institution into the intelligent use of new technologies for teaching is not an easy task. It requires a huge effort. It requires management committed to change, an understanding of the limitations as well as the benefits of teaching through technology, the willingness to make mistakes…, faculty members committed to teaching and open to new ideas, a recognition that faculty members need adequate instructional and technical support and appropriate and substantive rewards for their efforts, and major reallocation of resources. (p. 151)

Bates (as cited in Lamboy & Bucker, 2003) suggested four steps in order to effectively develop skills in using technology in teaching. First, faculty must understand the importance of using technology for teaching. Second, they need some basic understanding of teaching and learning processes and different approaches. Third, they must realize the roles that technology can play in teaching and how this changes the organization of content. Fourth, they should know how to use a particular piece of technology. Accordingly, for effective technology integration, Zhao, Pugh, Sheldon, and Byers (2002) concluded that teachers need to be computer competent in order to use the different technologies as well as to know how specific technologies could support their teaching practices and curricular goals.

Barriers and Factors Influencing the Use of Technology

There has been a growing recognition that technology has a great impact on instruction (Brill & Galloway, 2007; Groves & Zemel, 2000; Ouzts & Palombo, 2004; Weston, 2005; Wozney et al., 2006). Faculty can use new computer technologies to enhance their style of teaching such as presenting lectures using computer-managed electronic presentations, or make notes available on a web site for students (McInnis, 2002). However, faculty members make only limited formal academic use of technology during their teaching and learning because of various factors that limit the utilization of technology (Alaugab, 2007; Selwyn, 2007). Learning about the factors that could influence faculty members' level of instructional technology use might increase their use of technology in higher education (Hoerup, as cited in Sahin & Thompson, 2007).

Barriers are defined as any factor preventing or restricting teachers' use of technology in the classroom (Ertmer, 1999). Barriers to successful use of technology appear to have internal and external sources (Ertmer, 1999; Rogers, 2000). Internal barriers include teachers' attitudes or perceptions about technology, while external barriers include the availability and accessibility of hardware and software, and the presence of technical and institutional support (Ertmer, 1999; Rogers, 2000).

Faculty Willingness to Use Technology

Several researchers have found that faculty members are not using technology as a tool for teaching, though computer technologies have created opportunities for higher education faculty (Al-Musawi, 2007; Rice & Miller, 2001; Sahin & Thompson, 2006;

Surry & Land, 2000). To encourage faculty members to use technology, they need to understand how the use of technology can lead to improvements in their teaching and enhanced students' learning (Roberts et al., 2007; Wozney et al., 2006).

Faculty members attempt to use technology because of the perceived added value that technology brings to their teaching and student learning in terms of flexibility, resource opportunities, and enhancement of learning (Steel & Hudson, 2001). Braak (2001) suggested that to raise awareness and acceptance among teachers regarding the use of technology, they should be exposed to examples of good practices during in-service training in order to help them get familiar with computers, with their use in the classroom, and with their value as a pedagogical tool.

Weston (2005) asserted that faculty may not wish to change their instructional practices for newer or more time consuming practices that incorporate technology, especially if the benefits of the new approach are poorly defined. Therefore, Sahin (2008) noted that faculty awareness of the positive consequences of educational technology might increase their interest in and willingness to use technology. He concluded that faculty members' interest with respect to educational technology is an important factor in determining their commitment to use technology (Sahin, 2008). Thus, emphasizing the impact of technology on teaching and learning should be a top priority.

Bennett and Bennett's (2003) study sought to identify the characteristics of instructional technology that may influence faculty members' willingness to integrate technology into their teaching. The authors found four factors that influence the adoption rate of technology: (a) beliefs about the usefulness of computers as instructional tools, (b)

beliefs about whether computers enhance student learning, (c) faculty members' sense of efficacy—that they are competent at using computers as instructional tools, and (d) faculty members' attitudes toward computers. Considering these factors when designing a technology training program will significantly impact individual's adoption of technology (Bennett & Bennett, 2003).

Faculty Role in Classroom

The introduction of new information technologies has caused various changes in higher education (Rice & Miller, 2001). As a result, faculty members have to rethink their roles and teaching practices (Steel & Hudson, 2001). When instructors incorporate new technologies in their instruction, they are no longer the "gatekeepers to knowledge" (Bates & Poole, 2003, p. 248). Wang (2002a) and Gustafson (2003-2004) suggested that effective teaching with computers requires that teachers shift from the traditional authoritative teachers' role to a more learner-centered approach. Teaching with computer technology involves a change in teachers' roles, in student-teacher interactions, and in assessment practices (Snoeyink & Ertmer, 2001-2002).

The technology advances required higher education to move toward a more learner-centered approach in which teaching focuses on the activities and outcomes of the learners (Bates & Poole, 2003; Bennett & Bennett, 2003). A learner-centered approach is based on constructivist theory (Wang, 2002a; Wang, 2002b; Witfelt, 2000). According to Witfelt (2000), within a constructivist classroom, the role of the teacher will not be simply to instruct content knowledge. He explained that teachers' role must shift from

being lecturers to becoming organizers and facilitators in constructivist learning environment. Bennett and Bennett (2003) concluded that faculty members may resist adopting instructional technology, unless they are willing to use a learner-centered approach in their teaching,

Bai and Ertmer (2004) found that instructors who had more learner-centered beliefs tended to use various software programs and have students use technology more frequently in a constructivist way; while the instructors who had non-learner-centered beliefs about learners tended to use various software programs less frequently. Similarly, Wozney et al. (2006) concluded that teachers who reported preferring student-centered styles of teaching were more likely to integrate computer technologies frequently into their teaching, perceived themselves as having a higher level in computer proficiency, and place themselves at a higher stage in the process of integrating computer technologies in classrooms.

Faculty members should be trained to learn new ways of teaching that promote their use of technology in the classrooms. Rao and Rao (as cited in Bennett & Bennett, 2003) suggested that faculty development should evolve from simply teaching about software to training faculty in how to use the software in a learning environment. Thus, in order to maximize teachers' use of technology, they need to understand that students-centered computer practice requires different strategies, including using different classroom management skills, designing curriculum-related activities, and developing evaluation methods (Wang, 2002b).

Technology Training of Faculty

Several researchers reported different barriers that hinder teachers' use of computer technologies in their classrooms. Lack of technical training has been found to be an important cause that limit teachers' implementation of technology into instruction (Al-Alwani, 2005; Alaugab, 2007; Almaraee, 2003; Almusalam, 2001; Al-Musawi, 2007; Groves & Zemel, 2000; Gustafson, 2003-2004; Lamboy & Bucker, 2003). Universities and colleges investments in technology cannot be completely successful unless faculty members receive the necessary training and are willing to become fully capable of using computer technologies (Georgina & Olson, 2008; Nworie, 2006-2007; Rice & Miller, 2001; Sahin & Thomposn, 2006). Full utilization of new technologies requires professors to develop new skills and assume new functions (Del Favero & Hinson, 2007; Lamboy & Bucker, 2003).

Al-Alwani (2005) found that lack of information technology training contributed significantly to low technology use by science teachers in Saudi Arabia. He concluded that the Ministry of Education should provide more staff development for teachers to reach successful integration of IT. Further, Sahin and Thompson (2006) found that faculty members have low knowledge of computer applications and this influences their instructional computer use. Alshehri (2005) reported that 79% of faculty members ranked lack of knowledge and skills as the first barrier that hinders implementing online courses in at the Institute of Public Administration in Saudi Arabia. Similarly, Al-Ghonaim (2005) found that instructors at Buraidah College of Technology in Saudi Arabia

identified lack of effective training as an important barrier that limits their implementation of online instruction.

Technology-related training plays a crucial role in developing teachers' competency with computer applications (Sahin & Thompson, 2006; Wozney et al., 2006). Brill and Galloway (2007) recommended that institutions should provide workshops that show how different technologies can positively influence certain practices in the classroom (e.g., presentation, interaction), so that instructors develop proficiency at selecting the most useful technologies that meet specific pedagogical goals. Professional development should address faculty members' content needs and assess faculty in the technical aspects of the technology tools as well as their pedagogical objectives and practices in the alignment of technology (Bai & Lehman, 2003; Gustafson, 2003-2004).

Dusick and Yildirim (2000) and Georgina and Olson (2008) described appropriate training as providing training in a context that allows the individual to see and experience the use of technology specifically in his or her professional field because technology alone does nothing to enhance pedagogy. This means that faculty must be trained in the use of these tools and not just given access to the tools (Georgina & Olson, 2008). Al-Alwani (2005) concluded that a quality training program needs to integrate a goal-oriented, complementary, and reinforcing sequence to optimize time and help build both competency and confidence in integrating information technology into instruction.

Wozney et al. (2006) and Wilson and Notar (2003) found that the amount of technology-related training was significantly related to computer use in the classroom. Teachers with more technological training were more likely to use it in their classrooms

over those with less training (Wilson & Notar, 2003; Wozney et al., 2006). Yet, the manner in which training is conducted is vastly important (Brinkerhoff, 2006). Barrette (as cited in Ezziane, 2007) asserted that proper technology training requires that faculty gain familiarity with a tool, observe someone experienced in its use and implementing it successfully, use the tool themselves, and then determine its potential to help them meet their pedagogical goals. Thus, teachers' preparation would be the first step towards successful use of technology for instructional purposes (Bauer & Kenton, 2005; Lamboy & Bucker, 2003).

Several researchers have suggested different ways to increase faculty use of technology (Brinkerhoff, 2006; Georgina & Olson, 2008). For example, Brinkerhoff (2006) found that long-duration professional development increases teachers' technology skills and lead to significant change in their technology beliefs. The author pointed out that teachers need opportunities to apply newly acquired skills to personal use and experiment the effectiveness of technology in the classroom. Also, he concluded that setting a clear goal of technology professional development will foster more focused instructions and assessment of the professional development effort (Brinkerhoff)

Georgina and Olson (2008) found that using small group forums with a trainer strategy maximized faculty members' utilization and integration of technology. They reported that 56% of faculty members reported preferring training strategy of small group forums with a trainer. The most effective training occurs when it incorporates peer to peer training in which faculty shared ideas and practices (Ertmer, 2005; Georgina &

Olson, 2008). Thus, faculty professional development in technology use is vital (Bai & Lehman, 2003; Brinkerhoff, 2006).

According to Groves and Zemel (2000), the problem that most faculty face when attempting to use technology is that they often feel unprepared for the demands of using technology in their teaching because they have had little instruction in its use. Therefore, teachers should be professionally prepared to use technology in their classrooms (Al-Musawi, 2007; Bauer & Kenton, 2005; Wozney et al., 2006).

Availability of Resources and Infrastructure

Lack of resources have been identified by numerous studies as one of the most persistent barriers impeding technology utilization and integration (Al-Alwani, 2005; Alaugab, 2007; Almaraee, 2003; Al-Musawi, 2007; Brill & Galloway, 2007; Groves & Zemel, 2000; Gustafson, 2003-2004; Weston, 2005). Resource barriers may relate to insufficient computers or equipments, limited Internet access, poor classroom environment (Al-Alwani, 2005; Brill & Galloway, 2007; Gustafson, 2003-2004) or out-of-date hardware and software (Almusalam, 2001; Al-Musawi, 2007). Also, an infrastructure that supports the use for the teaching-learning process must be perceived by faculty to insure the adoption of all new technologies (Groves & Zemel, 2000; Sahin & Thompson, 2006).

In Weston's (2005) study, the greatest obstacle to integrate instructional software was the fundamental difficulty in finding resources to install computers to run the software in traditional anatomy laboratories. Similarly, Al-Musawi (2007) found that lack

of technology equipment was a strong barrier to the faculty use of computer technology for instructional purposes. In the context of Saudi Arabia, several researchers (Al-Alwani, 2005; Alaugab, 2007; Al-Ghonaim, 2005) found that lack of equipment and infrastructure were significant barriers that limit teachers' use of technology and online instruction. Alwani (2005) concluded that initial focus should be on infrastructure and resources.

Availability of technology equipments and technology access are important factors that promote the use and integration of technology (Al-Alwani, 2005; Brill & Galloway, 2007; Sahin & Thompson, 2006). Saleh (2008) concluded that increased access to computers and the Internet on and off campus is an essential component in reducing the barriers and increasing the use of technology in higher education. Further, there is a need to increase the numbers of updated technologies equipment in order to reach more effective levels of instructional technology applications in higher education institutions (Almusalam, 2001; Al-Musawi, 2007).

Support for Faculty

Administrative support was found to be an important barrier that hinders teachers' use of technology (Al-Alwani, 2005; Alaugab, 2007; Rogers, 2000; Sahin & Thompson, 2006). However, administrators play a crucial role in increasing faculty use of technology. For example, Almusalam (2001) found that administrative support is a significant predictor of integrating the computer technology into teaching activities. Also, Sahin and Thompson (2006) noted that administrators should organize faculty training

programs and minimize barriers to computer access in order to increase faculty members' instructional computer knowledge and use.

Lack of technical support is a significant barrier that might limit the use of technology in teaching and learning (Al-Alwani, 2005; Alaugab, 2007; Brill & Galloway, 2007; Sahin & Thompson, 2006). According to Rogers (2000), it is meaningless to purchase high-end computers without providing technical support. He also emphasized that technicians should have appropriate skills available and accessible when needed by teachers. Similarly, Brill and Galloway (2007) asserted that instructors expressed their needs for technical support in order to realize their desire to integrate newer technologies such as the World Wide Web into teaching practices.

Al-Alwani (2005) concluded that science teachers in Saudi Arabia proposed that the limited availability of specialist trainers to train them on the use of information technology hinder their use of information technology in their classrooms. Likewise, Alshehri (2005) reported that faculty members anticipated increasing the current level of technical support by recruiting and employing more qualified technicians to maximize their implementation of online courses at the Institute of Public Administration in Saudi Arabia.

Collegial support and interaction was found to affect the utilization of computer technologies (Roberts et al., 2007; Sahin & Thompson, 2007). Sahin and Thompson (2006) found that it is crucial that faculty development efforts in instructional technologies emphasize collegial interaction and communication. Sahin and Thompson (2007) found that collegial interaction was a significant predictor of the technology

adoption level of faculty in that it provides the means for faculty members to discuss technology applications with one another. Therefore, Roberts et al. (2007) suggested that a system of social support should be fostered, and faculty sharing should be encouraged to maximize the use and integration of technology applications in the classroom.

Time

Workload and lack of time are important barriers that limit faculty members' learning and abilities to use computer technologies for instructional purposes (Al-Alwani, 2005; Almaraee, 2003; Bai & Lehman, 2003; Dusick & Yildirim, 2000; Sahin & Thompson, 2006; Weston, 2005). Rogers (2000) suggested that teachers need time to develop new course materials, time to learn new skills, and time to adjust their attitudes toward the role technology holds in teaching and learning. Peluchette and Rust (2005) reported that 75% of faculty viewed time constraint as limiting their ability to learn new instructional technologies. Similarly, Owen and Demb (2004) and Gustafson (2003-2004) found that faculty members feel that technology increases the work load and that many instructors did not want to learn how to use technology because of the time it requires.

Almaraee (2003) and Al-Alwani (2005) concluded that lack of time is an important factor affecting the utilization of computer technologies in Saudi Arabia. Al-Alwani (2005) explained that lack of time during the school day influence teachers' use of technology because of the busy schedule. Moreover, Almaraee (2003) found that lack of time to participate in professional development affect faculty use of technology in the classrooms.

Attitudes toward Using Computers

Teachers' attitudes toward computers have been found by various studies to be a critical factor that affects technology use and integration in teaching and learning (Albirini, 2006; Braak, 2001; Sahin & Thompson, 2006; Teo et al., 2008). Rogers (2000) noted that attitudes play an important role because it may become the major barrier to adopting any technology in which negative attitudes might affect individual desire to adopt new technology.

Several researchers have suggested that given technology availability and required skills and knowledge to use it, technology may not be used unless teachers have positive attitudes necessary to infuse technology into the curriculum (Albirini, 2006; Rovai & Childress, 2002-2003). Dunlap (as cited in Saleh, 2008) found that without positive attitudes and computer self-efficacy, faculty members are less likely to seek training, increase their use of technology, or consider the integration of technology into their instruction.

Other studies have shown that the successful implementation of educational technologies depends largely on the attitudes of educators, who ultimately determine how technologies are used in the classroom (Bullock, 2004; Saleh, 2008). Teachers who possess positive attitudes toward computers tend to use computers in teaching and have more efficient strategies in their use of computer technology (Braak, 2001; Shapka & Ferrari, 2003; Teo et al., 2008). For instance, Bullock (2004) found that teachers' attitudes are a major enabling/disabling factor in the adoption of technology. Similarly, Kersaint et al. (2003) concluded that faculty members who have positive attitudes toward

technology feel more comfortable using it and usually incorporate into in their teaching. Therefore, a good understanding of teachers' attitudes toward computers will shed light on their use of computer technology in their instruction (Teo et al., 2008).

Sahin and Thompson's (2006) study on faculty members' instructional computer use found that faculty members had positive attitudes toward computer use for instructional purposes. They also found that attitudes toward computer use correlated significantly with the adoption of instructional computer applications. Similarly, Yildirim (2000) found that pre-service teachers who used computers more would tend to develop positive attitudes that promote future use of the computer for instructional purposes.

Braak (2001) investigated the relationship between computer use in the classroom and several factors that might influence teachers' computer use including general computer attitudes and attitudes toward computers in education. He found that teachers' attitudes toward computers in education are significantly related to computer usage in which increased computer usage should lead to favorable computer attitudes and vice versa. The findings of the study indicated that teachers with positive attitudes toward computer use are more likely to utilize computers to enhance the quality of education (Braak, 2001).

Abanamei (2002) conducted a study to examine high school students' attitudes toward computers in Saudi Arabia. He found that students have positive attitudes toward computers. The results revealed some personal characteristics that influence students' attitudes toward computers: family income, parents' education, computer experience, what age students start using computers, and the use of computers outside school. The

results suggested that demographic and personal characteristics should be of a main concern when examining attitudes toward computers.

Alzamil (2003) examined high school social studies teachers' attitudes toward using instructional technology in Saudi Arabia. The results revealed that teachers have positive attitudes toward using instructional technology. However, teachers reported that lack of resources, lack of opportunities to learn about computers, and lack of school and district support diminish their use of instructional technology.

In his study on online education, Alshehri (2005) investigated faculty members' attitudes toward online courses at the Institute of Public Administration in Saudi Arabia. The results revealed that participants had positive attitudes toward online courses. However, the researcher reported obstacles that significantly limit the implementation of online courses such as resistance to change. Similarly, Al-Ghonaim (2005) found that instructors at Buraidah College of Technology in Saudi Arabia have positive attitudes toward the implementation of online instruction.

The literature reported that attitudes toward computers are influenced by different variables. For instance, teachers' computer competency has been found to be a significant predictor of their attitudes toward computers (Berner, 2003). Dusick and Yildirim (2000) found that faculty who used computers had a positive attitude toward technology. The authors concluded that attitude is significantly related to computer competency, and therefore has an indirect effect on computer use. Al-Oteawi (2002) found that most teachers who showed negative or neutral attitudes toward the use of ICT in education lacked knowledge and skills about computers. Therefore, "The institution must provide

faculty with the necessary training to alleviate negative perceptions from a fear of the unknown" (Miller et al., 2000, p. 232). Training programs should focus on increasing technical proficiency, changes in attitudes, and increased awareness of the potential applications of technology to classroom teaching (Saleh, 2008).

While a negative attitude is a detrimental factor in technology use, negative attitudes are not immune from change. Yildirim (2000) found that pre-service teachers' computer attitudes improve significantly after participating in a computer literacy course. Also, Lim (2002) suggested that by exposing students and employees to more computer-related materials or computerized instruction, change in their computer attitudes can occur. Similarly, Christensen (2002) found that technology integration education fosters positive attitudes toward information technology among teachers. Since positive attitudes toward computer technologies usually predict future computer use (Braak, 2001), policy-makers can make use of teachers' attitudes toward technology to better prepare them for the incorporation of computer technology into their teaching practices (Albirini, 2006).

In conclusion, given that faculty members are the key to effective utilization of computers in classroom (Surry & Land, 2000), it is important to understand faculty members' attitudes and the factors that influence theses attitudes. The successful use of computer technologies will depend largely on the attitudes of teachers and their willingness to embrace technology (Braak, 2001; Rogers 2000; Sahin & Thompson, 2006; Teo et al., 2008). Therefore, examining faculty members attitudes could answer some questions relating to their use of technology in teaching and learning.

Demographic Variables Related to Faculty Use and Attitudes toward Technology

Several studies have shown relationships between use and attitudes toward computer technologies and teachers' demographic characteristics such as age (Ahadiat, 2008; Xu & Meyer 2007), years of teaching experience (Alaugab, 2007; Lamboy & Bucker, 2003), years of computer technology experience (Almusalam, 2001; Sahin & Thompson, 2006), subject taught (Ahadiat, 2008; Al-Ghonaim, 2005), academic rank held (Alshehri, 2005; Xu & Meyer, 2007), highest degree earned (Almusalam, 2001; Xu & Meyer, 2007), ownership of a computer at home and in the office (Sahin & Thompson, 2006), access to the Internet (Alaugab, 2007; Xu & Meyer, 2007), and English language proficiency (Al-Kahtani, 2006; Almaraee, 2003).

Age

Age demonstrates a significant negative relationship with computer skills in which older people need more education and training to use computer successfully; they demonstrate low levels of computer skills (Ahadiat, 2008; Lamboy & Bucker, 2003; Xu & Meyer 2007). For example, Lamboy and Bucker (2003) found that younger faculty members were more familiar with higher-order technical skills than older faculty. Similarly, Xu and Meyer (2007) and Ahadiat, (2008) reported that younger faculty use e-mail and the web more. They found that younger faculty members were more comfortable with using technology as a tool to enhance their teaching and research.

Faculty members' age demonstrates a negative relationship with attitudes toward technology. Al-Ghonaim (2005) found that there is a negative relationship between age and instructors' attitude toward online instruction at Buraidah College of Technology in Saudi Arabia. Younger instructors had more positive attitudes toward online instruction than older instructors who had lower positive attitudes. He explained that instructors who are younger are more likely to implement online instruction in their classes than those who are older. Similarly, Alshehri (2005) found that age of faculty members have an impact on their attitudes toward implementing online courses at the Institute of Public Administration in Saudi Arabia.

Teaching Experience

Lamboy and Bucker (2003) and Ahadiat (2008) found that years of teaching have a negative relationship with technology use in that faculty with more teaching experience tend to use less technology tools than those with less teaching experience. Alshehri (2005) reported that years of teaching experience of faculty members have an impact on their attitudes toward implementing online courses.

Likewise, Alaugab (2007) found that teaching experience negatively correlated with the faculty's overall attitudes toward online instruction in which as the number of years teaching increased, a positive attitude toward online instruction decreased. Alzamil (2003) found opposing results that there were no significant differences in attitudes toward using instructional technology between social studies teachers with more teaching experience and teachers with less teaching experience in Saudi Arabia.

Computer Experience

Computer competency and previous computer training are found to be significant predictors of whether faculty members used computer technology for instructional purposes (Dusick & Yildirim, 2000; Wozney et al., 2006). An effective way to encourage faculty to use computers in the classroom is to increase their level of competency (Dusick & Yildirim, 2000; Georgina & Olson, 2008; Wozney et al., 2006). Sahin and Thompson (2006) found that computer experience is an important factor influencing faculty members' use of computer technologies. If faculty members do not have enough experience in computer use, they can not be expected to adopt computer technologies in their instruction. The authors concluded that more experience with computers would have a positive relationship with computer skills.

Several researchers have found that there is a strong relationship between teachers' computer experience and their attitudes toward computers in that previous computer experience has an effect on their attitudes (Hong & Koh, 2002; Lim, 2002; Yildirim, 2000). Almusalam (2001) found that faculty members with higher levels of computer experience reported higher levels of confidence in using computer technologies. Alzamil (2003) found opposing results that there were no significant differences in high school social studies teachers' attitudes toward using instructional technology between the more experienced teachers and the less experienced teachers, and he explained that both have highly positive attitudes toward the use of instructional technology.

In their study on online instruction in Saudi Arabia, Al-Ghonaim (2005) and Alshehri (2005) found that instructors' experience with information technology had a significant relationship with a positive attitude; instructors with a high experience level have a more positive attitude toward the implementation of online instruction than those with a low experience level. Similarly, Abanmie (2002) reported that students who have a high computer experience held a significantly more favorable attitude toward computers than those who had a low level or no experience.

Subjects Taught

Several researchers have found that differences among departments were very great in technical skills (Ahadiat, 2008; Lamboy & Bucker, 2003). For example, Lamboy and Bucker (2003) investigated faculty members' preparedness for the integration of technology into the curriculum. They found that faculty members in the Science Technology and Business departments scored higher in technical skills than those in the Liberal Arts.

Al-Ghonaim (2005) reported that instructors' major affect their attitudes toward online instruction in Saudi Arabia. For instance, instructors who have Islamic, Arabic, and English majors were more likely to implement online instruction in their courses than those whose majors were in technical and electrical engineering. Alzamil (2003) found opposing results that there were no significant differences among high school social studies teachers' attitudes toward using instructional technology due to their academic majors.

Academic Rank Held and Highest Degree Earned

Xu and Meyer (2007) reported that higher academic ranks and education level strongly correlated with using more technology use for research. Ahadiat (2008) found that faculty members with higher academic ranks attempted to use technology for research more frequently than those with lower ranks. He pointed out that research pressure and the need to use data analysis software lead to more use of technology among faculty with high academic ranks.

Almusalam (2001) also found that the highest academic degree obtained has a positive relationship on instructors' use of technology in that instructors with doctorates or master degrees use computer technologies more frequently. Similarly Al-Musawi (2007) reported that Ph.D. holders are better able to use instructional software. Academic ranks have been found to impact faculty attitudes. Alshehri (2005) found that the academic ranks of faculty members have an impact on their attitudes toward implementing online courses.

Access to Computer and Internet at Home and Office

Access to a computer at home and in the office correlated significantly with the level of computer use and is an important factor that influences the use of computers for instructional purposes in that having a computer will increase overall use of computer technology (Dusick & Yildirim, 2000; Sahin & Thompson, 2006). Also, several researchers have found that ownership of a personal computer at home correlated

significantly with positive computer attitudes (Carey, Chisholm, & Irwin, 2002; Hong & Koh, 2002; Teo, 2006; Yildirim, 2000).

Xu and Meyer (2007) found that Internet access is a significant factor related to faculty technology use in teaching. They indicated that having convenient Internet access significantly contributed to faculty use. If faculty members are expected to use technology, they must have access to technology tools. Also, Alaugab (2007) reported that lack of Internet access was listed among the top ten barriers among faculty and students at Saudi Arabia that hinder their use of online instruction. Similarly, Al-Kahtani (2006) found that Saudi female faculty members indicated that lack of access to the Internet at home and work limit their use of the Internet technology for research.

English Language Proficiency

Almaraee (2003) found that 80% of faculty felt that the English language presents an obstacle in effectively using the Internet in their teaching. Alaugab (2007) reported that lack of English language skills was listed among the top ten barriers that hinder the use of online instruction among faculty and students at Saudi Arabia. He also found that students who have better English language skills had more positive attitudes toward online instruction.

Al-Alwani (2005) also found that the lack of basic English language training was listed among the top ten barriers that affect science teachers' integration of information technology in their classrooms. Likewise, Al-Kahtani (2006) reported that Saudi female faculty members indicated that lack of skills in the English language limit their use of the

Internet technology for research. She concluded that most of the sources on the Internet are in English; therefore, Saudi female faculty should improve their proficiency in the English language.

Summary of the Review of Related Literature

Emerging technologies are increasingly being infused into schools, universities and colleges (Bennett & Bennett, 2003; Weston, 2005; Wilson & Notar, 2003) and have a major effect on teaching and learning practices (Brill & Galloway, 2007; Rogers, 2000). Technology has the potential to enhance teaching and learning by giving the teachers more knowledge and alternatives to guide the process of learning, and giving students more control over their learning (Ouzts & Palombo, 2004). To facilitate technology integration, faculty should be motivated and willing to incorporate technology into their classrooms (Sahin, 2008; Surry & Land, 2000).

The rapid advancement of new technologies has brought about changes in many aspects of society, including higher education (Steel & Hudson, 2001). Al-Musawi (2007) noted that educational technology plays an important role in the teaching and learning process in higher education institutions and is an important part of educational systems and practices. Thus, faculty are facing challenges to use and integrate technology in their classrooms as societies move towards a technological era (Brill & Galloway, 2007; Russell, Bebell, Dwyer, & O'connor, 2003). Russell et al. (2003) suggested that the educational benefits of technology could not be realized unless teachers are prepared to use computer technologies for instructional purposes.

Even though universities and colleges have made significant investments in new technologies (Owen & Demb, 2004; Weston, 2005), "technology will not be used unless faculty members have the skills, knowledge, and attitudes necessary to infuse it into the curriculum" (Baylor & Ritchie, 2002, p. 398). To encourage faculty to use technologies in their classrooms, they need to understand how the use of technology can lead to improvements in their teaching and enhance student learning (Roberts et al., 2007; Steel & Hudson, 2001; Surry & Land, 2000). Higher education institutions should provide supportive environments with necessary facilities, support, and resources to encourage faculty members to begin using technology in their teaching (Al-Musawi, 2007; Bai & Lehman, 2003; Sahin & Thompson, 2006).

Faculty development is a critical issue in the effective use of technology (Brinkerhoff, 2006; Lamboy & Bucker, 2003; Sahin & Thompson, 2006). Wilson and Notar (2003) recommended that teachers be trained on how to integrate technology into the curriculum rather than just showing them how technology works. Also, Georgina and Olson (2008) noted that, if an instructor has the technological proficiency levels needed to integrate technology, then it is very likely that the instructor will integrate technology into pedagogical practices. Thus, appropriate training must be emphasized to increase faculty members' use of technology (Lamboy & Bucker, 2003).

Several researchers (Al-Musawi, 2007; Sahin & Thompson, 2006) have acknowledged the importance of faculty members' use of technology to enhance teaching and learning; yet, there are various barriers that could limit faculty utilization of technology. Some of these barriers are lack of technical training (Al-Alwani, 2005;

Almusalam, 2001; Gustafson, 2003-2004), lack of resources (Alaugab, 2007; Brill & Galloway, 2007), lack of administrative support (Rogers, 2000; Sahin & Thompson, 2006), lack of technical support (Al-Alwani, 2005; Brill & Galloway, 2007), and lack of time (Bai & Lehman, 2003; Weston, 2005). However, Ertmer (1999) noted that when barriers are overcome, they become strong enabling factors that lead to greater technology use.

Attitudes toward computers have been found as an important factor for using or avoiding computer technologies (Sahin & Thompson, 2006; Yildirim, 2000). Researchers (Albirini, 2006; Bullock, 2004; Kersaint et al., 2003) have found that positive teacher attitudes toward computers are necessary conditions for effective use of computer technologies in classrooms. Miller et al. (2000) suggested that technology training should include various strategies for changing attitudes and addressing the fear factor. Numerous studies have found a relationship between the attitude and use of computers; that is, people with positive attitudes toward computers are more likely to use technology than those who have negative attitudes toward computers (Braak, 2001; Shapka & Ferrari, 2003; Teo et al., 2008). Teo et al. (2008) concluded that the successful use of computers in learning depends mainly on teachers' attitudes toward technology and their willingness to use technology.

Faculty members' demographic characteristics may influence their technology use and attitudes toward computers. For example, age demonstrates a significant negative relationship with computer skills and attitudes toward computers in which older people need more training to use computers successfully and have negative attitudes toward

computers (Al-Ghonaim, 2005; Xu & Meyer 2007). Also, years of teaching experience have a negative relationship with faculty members' technology use and attitudes toward computers (Ahadiat, 2008; Alshehri, 2005). Sahin and Thompson (2006) and Alshehri (2005) reported that computer experience is an important factor influencing faculty members' use of computer technologies and their attitudes toward computers. Several researchers have found that faculty members' technical skills differ according to their majors (Ahadiat, 2008; Lamboy & Bucker, 2003). Researchers found that faculty with higher academic ranks tend to use technology and have positive computer attitudes (Teo, 2006; Xu & Meyer, 2007). Almaraee (2003) and Alaugab (2007) found that lack of skills in the English language presents an obstacle in effective use of the Internet and online instruction by faculty members.

CHAPTER III

METHODOLOGY

The purpose of this study was to examine female faculty members' use of computer technologies, their attitudes toward computers, and the barriers that limit their use of technologies in girls' colleges in Dammam and Jubail, Saudi Arabia. Also, this study examined how female faculty members' attitudes and use of computer technologies differ according to the personal and demographic characteristics of age, years of teaching experience, years of computer technology experience, subject taught, academic rank held, highest degree earned, ownership of a computer at home and in the office, access to the Internet, computer skill level, and English language proficiency.

This chapter describes the methodology that was used to conduct the study. This chapter includes the following sections: research design, variables of the study, population, instrumentation, data collection, and data analysis.

Research Design

The design of this research was descriptive and causal-comparative. Gay and Airasian (2003) stated that descriptive studies are "useful for investigating a variety of educational problems, and concerned with assessing attitudes, opinions, preferences,

demographics, practices, and procedures" (p. 277). Therefore, a descriptive method was appropriate because of the nature of information that was sought from the participants. Descriptive statistics were used to describe female faculty members' attitudes toward computer technologies, to determine the types of technology they use, to determine to what extent they use computer technologies for instructional purposes, and to determine the barriers that limit their use of computer technologies.

According to Fraenkel and Wallen (2006), in causal-comparative studies, researchers attempt to determine the cause or consequences of differences that already exist between or among groups of individuals. Also, Gay and Airasian (2003) noted that causal-comparative studies attempt to identify cause-effect relationships that may lead to experimental studies. Thus, a casual-comparative study was suitable to examine how female faculty members' attitudes and use of computer technologies differ according to the personal and demographic characteristics of age, years of teaching experience, years of computer technology experience, subject taught, academic rank held, highest degree earned, ownership of a computer at home and in the office, access to the Internet, computer skill level, and English language proficiency.

Variables of the Study

The variables that were examined in this study were female faculty members' use of computer technologies, female faculty members' attitudes toward computers, the barriers that limit their use of technologies, and demographic characteristics. The variables female faculty members' use of computer technologies, attitudes toward

computers, and the barriers that limit their use of technologies are interval. The demographic variables are nominal; and they are age, years of teaching experience, years of computer technology experience, subject taught, academic rank held, highest degree earned, ownership of a computer at home and in the office, access to the Internet, computer skill level, and English language proficiency.

In this study, the dependent variables were female faculty members' attitudes toward computer technologies variables and female faculty members' use of computer technologies. The independent variables were the demographic variables and the following factors: increase workload for instructors, lack of equipment and infrastructure, lack of software, lack of time for learning about computer technologies, lack of effective learning, lack of technical support, lack of administrative support, lack of collegial support and interaction, lack of designing interaction activities between instructors and students in your course, lack of self confidence, lack personal interest, and reduced course quality.

Population

The target population for this study was all female faculty members at girls' colleges in Dammam and Jubail in Saudi Arabia. The population consisted of 310 instructors. One hundred twenty-five faculty members work in the Liberal Arts College in Dammam; one hundred forty-two faculty members work in the Science College in Dammam; and forty-three faculty members work in the College of Education in Jubail.

Instrumentation

A survey consisting of five parts was used in this study (see Appendix A). Part I of the survey was designed to collect demographic data and background information. Part II is the "Computer Attitudes Scale" (CAS), Part III is the "Degree of Computer Technologies Use", Part IV is the "Extent of Computer Technologies Use", and Part V is the "Perceived Major Barriers that Limit the Use of Computer Technologies".

The first part of the survey contains questions related to demographic and background information of faculty members (e.g., age, years of teaching experience, and academic rank).

The second part of the survey, "Computer Attitudes Scale", was developed by Loyd and Gressard (1984) and Loyd and Loyd (1985) and was designed to measure attitudes toward computers. This is the revised version of CAS and consisted of 40-items, each reflecting a negative or positive attitude toward computer technologies. The CAS instrument is divided into four 10-item subscales: (a) computer anxiety (e.g., Computers do not scare me at all), (b) computer confidence (e.g., I'm no good with computers), (c) computer liking (e.g., I would like working with computers), and (d) computer usefulness (e.g., I will use computers many ways in my life). The anxiety subscale included questions 1, 5, 9, 13, 17, 21, 25, 29, 33, and 37. The confidence subscale included questions 2, 6, 10, 14, 18, 22, 26, 30, 34, and 38. The liking subscale included questions 3, 7, 11, 15, 19, 23, 27, 31, 35, and 39. The usefulness subscale included questions 4, 8, 12, 16, 20, 24, 28, 32, 36, and 40.

Participants addressed each statement using a 4-point Likert-type scale: strongly agree; agree; disagree; strongly disagree. The responses for the positively worded items were recorded as Strongly Disagree = 1, Disagree = 2, Agree = 3, and Strongly Agree = 4. The responses for the negatively worded items were recorded as Strongly Agree = 1, Agree = 2, Disagree = 3, and Strongly Disagree = 4. Therefore, twenty statements (2, 5, 7, 8, 10, 13, 15, 18, 20, 21, 23, 24, 26, 29, 31, 32, 34, 37, 39, and 40) in the survey were reversed.

The third part of the survey, "Degree of Computer Technologies Use", was adapted from Al-Alwani (2005) and it was designed to evaluate teachers' degree of computer technologies use. This part consisted of 13 statements related to faculty members' use of computer technologies for instructional purposes (e.g., indicate your current level of use of computer technologies such as word processing programs, database programs). Participants addressed each statement by indicating their current level of technology use: 0 = never use; 1 = use rarely; 2 = use a few times a month; 3 = use a few times a week; and 4 = use daily.

The fourth part of the survey, "Extent of Computer Technologies Use", was adapted from Al-Alwani (2005) and it was designed to evaluate teachers' extent of computer technologies use in their professional activities. This part consisted of nine statements related to female faculty members' extent of computer technologies use for instructional purposes (e.g., to create instructional materials, to create multimedia presentations for the classroom). Participants addressed each statement by indicating how frequently they use computer technologies: 0 = never use; 1 = 1-2 times during the

semester; 2 = 1-2 times per month; 3 = 1-2 times per week; and 4 = 3 times or more per week.

The fifth part of the survey, "Perceived Major Barriers that Limit the Use of Computer Technologies", was adapted from Al-Ghonaim (2005) and it was designed to identify the major barriers that limit faculty members' implementation of online instruction. This part was slightly modified by adding three statements related to barriers that limit use of computer technologies. This part consisted of twelve statements related to the barriers that limit female faculty members' use of computer technologies (e.g., increased workload for instructors, lack of equipment and infrastructure). Participants addressed each statement using a 5-point Likert-type scale: Strongly Disagree = 1; Disagree = 2; Neither Agree nor Disagree = 3; Agree = 4; Strongly Agree = 5.

The second instrument, Loyd and Gressard (1984) and Loyd and Loyd (1985), was translated to Arabic by Alsebail (2004) and was revised by experts who were fluent in speaking both English and Arabic to check for accuracy of translation. Also, the other instruments, created by Al-Alwani (2005) and Al-Ghonaim (2005), were translated to Arabic by the researchers and were revised by specialists who were fluent in speaking both English and Arabic languages to check for accuracy of translation and that it will be easily understood by the participants.

Validity and Reliability of "Computer Attitude Scale"

To determine the reliability and validity of the CAS instrument, Loyd and Loyd (1985) conducted a study that indicated that the CAS was reliable and valid for

measuring attitudes toward computers. The coefficient alpha reliabilities were .95 for the total scale and .90, .89, .89, and .82 for computer anxiety, computer confidence, computer liking, and computer usefulness, respectively. Loyd and Loyd (1985) concluded that the reliability coefficient of the four subscales was stable enough to be used separately and that the total score gave a reliable and valid measure of attitudes toward computer.

Validity and Reliability of "Degree of Computer Technologies Use" and "Extent of Computer Technologies Use"

Al-Alwani (2005) conducted a pilot study to measure the reliability of the two parts of the survey and the validity was also checked. Al-Alwani (2005) reported that the reliability coefficient for the two parts was .88. To test the validity, the survey was sent to several professors at the University of Kansas, as well as several professors from Saudi Arabia and Oman. According to Al-Alwani, the items of the survey were modified based on the recommendations, and that it was found to be reliable and valid.

The researcher adapted the two parts of Al-Alwani's (2005) survey with minor modifications. The title was changed from "Degree of Information Technology Use" to "Degree of Computer Technologies Use" and from "Frequency of Use" to "Extent of Computer Technologies Use". Also, in the first part only thirteen out of fourteen statements were used and in the second part only 9 statements were used for the purpose of the study.

Validity and Reliability of "Perceived Major Barriers that Limit the Use of Computer Technologies"

Part of Al-Ghonaim's (2005) survey was adapted which is related to the perceived barriers that limit the use of computer technologies. Al-Ghonaim (2005) reported that the validity of the survey was established by a panel of experts and that the survey was revised based on their recommendations. Al-Ghonaim (2005) reported that the reliability coefficient of the survey was .71.

The researcher adapted only one part of Al-Ghonaim's (2005) survey with minor modifications. The title was changed from "Perceived Major Barriers that Affect Adoption of Online Instruction" to "Perceived Major Barriers that Limit the Use of Computer Technologies". The "Online instruction" statement was omitted from two statements. Only nine out of ten statements were used for the purpose of the study. Also, three statements related to barriers that limit use of computer technologies were added. So, the total statements in this part were 12 statements.

Permission to use the instruments of "Degree of Computer Technologies Use", "Extent of Computer Technologies Use", and "Perceived Major Barriers that Limit the Use of Computer Technologies" was obtained from Dr. Al-Alwani, and Dr. Al-Ghonaim, respectively (see Appendix C).

Pilot Study

According to Gay and Airasian (2003), the purpose of a pilot study is "to identify unanticipated problems or issues" (p. 39) before conducting the study. Also, the authors

noted that a pilot study "identifies flaws or weaknesses" (p. 39) before the study is carried out. Therefore, a pilot study was conducted to eliminate ambiguity and vagueness of statements included on the survey instrument.

A formal request to conduct this study was submitted to the Institutional Review Board (IRB) at Mississippi State University. A second permission was granted from King Faisal University at Saudi Arabia to conduct the study at its girls' colleges. Participants were from three girls' colleges: Liberal Arts College in Dammam; Science College in Dammam; and College of Education in Jubail.

After obtaining approval from the Institutional Review Board (IRB) at Mississippi State University (see Appendix D) to conduct the study, 10 female faculty members were selected from a population similar to those who participated in the actual study. A cover letter and the survey (both in Arabic) were mailed or handed to the selected faculty members (see Appendix B). A five-part survey instrument, the "Demographic Information", the "Computer Attitudes Scale", the "Degree of Computer Technologies Use", the "Extent of Computer Technologies Use", and the "Perceived Major Barriers that Limit the Use of Computer Technologies", were given to the faculty and they were asked to participate in the pilot study (see Appendices B and E). The participants needed approximately 15-20 minutes to complete the survey.

The participants in the pilot study were provided with an assessment form that asked them to review each statement in the survey, point out any unclear or ambiguous statements, and make suggestions and recommendations (see Appendix E). Based on the participants' suggestions on the assessment form, some modifications have been made on

the first part that is the demographic part in which two items were modified, and also an item about computer skill level was added.

Data Collection

Prior to collecting the data, an approval from the Institutional Review Board (IRB) at Mississippi State University was obtained to conduct the study (see Appendix D). A second permission was granted from King Faisal University at Saudi Arabia to conduct the study on its girls' colleges (see Appendix E). Participants were from three girls' colleges: Liberal Arts College in Dammam; Science College in Dammam; and College of Education in Jubail.

To collect the data, the researcher distributed the Arabic version of the survey in paper copies to all the participants. The head of departments in each college collaborated with the researcher to make sure that all the faculty members were given a copy of the survey. A copy of the five-part survey was given to each participant along with a cover letter that explained the purpose of the study and how their participation is important to the success of the study, and that their participation is voluntary. The participants needed approximately 15-20 minutes to complete the survey. Also, the participants were asked to complete the survey, seal the survey in the envelope given, and return the survey within a week to the dean's office. A drop-off box was provided in the deans' secretary offices to collect the survey copies.

A follow-up procedure was used to collect the data. After two weeks from distributing the survey, the researcher distributed a reminder message along with copies

of the survey to all the faculty members in order to obtain more respondents. According to Gay and Airasian (2003), when using a questionnaire, the first time of distributing the questionnaire "typically results in a 30 to 50% return rate" (p. 289), and the second time of distributing the questionnaire will increase the percentage about 20%. Thus, obtaining a 70% response rate will be acceptable (Gay & Airasian, 2003). A 66.45% response rate was obtained in this study.

Data Analysis

The data obtained from this study were analyzed using the Statistical Package for Social Science (SPSS) 12.0 program. A descriptive statistical analysis using means, frequencies, percentages, and standard deviations was used to describe the demographic variables and answer questions 1, 2, 3, and 4.

Analysis of variance (ANOVA) was used for questions 5 and 6 to determine if there are significant differences among the means of the groups (two or more groups). According to Fraenkel and Wallen (2006), analysis of variance is used when the researchers desire to find out whether there are significant differences between the means of two or more groups. When more than two groups are being compared, a post hoc analysis was used to find out which group is significantly different from other groups (Fraenkel & Wallen, 2006). The test of post-hoc comparison was used with a probability of .05 significance level. The Scheffé test is a widely used post-hoc test and offers the most protection against a Type 1 error (Gay & Airasian, 2003).

A hierarchical multiple regression analysis was used to answer question 7. "Multiple regression is a technique that enables researchers to determine a correlation between a criterion variable and the best combination of two or more predictor variables" (Fraenkel & Wallen, 2006, p. 338). The hierarchical regression was used because it shows the changes in the explained variance (R^2) as a new variable is entered while controlling for the other variables. Also, in conducting the hierarchical multiple regression analysis, a stepwise method was used because it is helpful in eliminating none statistically significant independent variables. Furthermore, it helps in examining the contribution of the retained independent variables to the regression model (Hair, Black, Babin, Anderson, & Tatham, 2006).

Research Question 1

What are female faculty attitudes toward using computer technologies? This question was answered by using descriptive statistical analysis of means and standard deviations to analyze the 40 items on the Computer Attitude Scale (CAS).

Research Question 2

What types of computer technologies do female faculty members use in their instruction? To answer this question, the researcher used descriptive statistical analysis using means, standard deviations, and percentages to analyze the 13 items that measure female faculty members' use of computer technologies.

Research Question 3

To what extent do female faculty members use computer technologies for instructional purposes? This question was answered by utilizing descriptive statistical analysis of means, standard deviations, and percentages to analyze the nine items that measure to what extent female faculty members' use computer technologies for instructional purposes.

Research Question 4

What are the barriers that limit female faculty members' use of computer technologies? This question was answered using descriptive statistical analysis of means, standard deviations, and percentages to analyze the 12 items to determine the barriers that limit faculty members' use of computer technologies.

Research Question 5

Are there statistically significant differences in female faculty members' attitudes toward computer technologies based on demographic characteristics such as age, years of teaching experience, years of computer technology experience, subject taught, academic rank held, highest degree earned, ownership of a computer at home and in the office, access to the Internet, computer skill level, and English language proficiency?

To answer research question 5, the researcher used descriptive and inferential statistics. The dependent variable was female faculty members' attitudes toward computer technologies and the independent variables were the demographic variables.

Descriptive statistics such as frequencies and percentages were used to analyze the demographic variables. Analysis of variance (ANOVA) was used to determine if there are statistically significant differences among the means of the groups (two or more groups). One- way analysis of variance was used to compare the mean scores of two groups in the independent variables (e.g. means of attitude score between faculty members who own computers at their homes and those who do not, access to the Internet, and English language proficiency). Moreover, one- way analysis of variance was used to compare the mean scores of more than two groups in the independent variables (e.g. age, years of teaching experience, years of computer technology experience, subject taught, academic rank held, and highest degree earned). When more than two groups were being compared, a Scheffé test of post-hoc comparison was used to find out which group was significantly different from other groups.

Research Question 6

Are there statistically significant differences in female faculty members' use of computer technologies based on demographic characteristics such as age, years of teaching experience, years of computer technology experience, subject taught, academic rank held, highest degree earned, ownership of a computer at home and in the office, access to the Internet, computer skill level, and English language proficiency?

To answer research question 6, the researcher used inferential statistics. The dependent variable was female faculty members' use of computer technologies and the independent variables were the demographic variables. Analysis of variance (ANOVA)

was used to determine if there are statistically significant differences among the means of the groups (two or more groups). One-way analysis of variance was used to compare the mean scores of two groups in the independent variables (e.g. means of use of computer technology score between faculty members who have computers at their homes and those who do not, access to the Internet, and English language proficiency). Moreover, one-way analysis of variance was used to compare the mean scores of more than two groups in the independent variables (e.g. age, years of teaching experience, years of computer technology experience, subject taught, academic rank held, and highest degree earned). When more than two groups are being compared, a Scheffé test of post-hoc comparison was used to find out which group is significantly different from other groups.

Research Question 7

Which factors best predict female faculty members' attitudes toward using computer technologies? This question was answered by employing a hierarchical multiple regression analysis. A hierarchical multiple regression analysis was used to examine which factors best predict female faculty members' attitudes toward using computer technologies. The dependent variable was female faculty members' attitudes toward using computer technologies and the independent variables were the following factors: increase workload for instructors, lack of equipment and infrastructure, lack of software, lack of time for learning about computer technologies, lack of effective learning, lack of technical support, lack of administrative support, lack of collegial support and interaction, lack of designing interaction activities between instructors and

students in your course, lack of self confidence, lack personal interest, and reduced course quality.

To perform the multiple regression analysis, the demographic variables were entered simultaneously into the regression equation as control variables. In the second step, the independent variables were entered into the regression equation by using stepwise method. Stepwise method is helpful in eliminating none statistically significant independent variables. Also, it helps in examining the contribution of the retained independent variables to the regression model (Hair et al., 2006).

CHAPTER IV

RESULTS

Computer technologies have become important educational tools in higher education institutions in Saudi Arabia. They are powerful tools that could enhance students' learning; yet, their value depends on how effectively teachers might use computer technologies to support their teaching. In Saudi Arabia, female faculty members play a critical role in making decisions regarding the use and implementation of technology in their classrooms in girls' colleges.

The purpose of this study was to examine female faculty members' use of computer technologies, their attitudes toward computers, and the barriers that limit their use of computer technologies in girls' colleges in Dammam and Jubail, Saudi Arabia. Also, this study examined how female faculty members' attitudes and use of computer technologies differ according to the personal and demographic characteristics of age, years of teaching experience, years of computer technology experience, subject taught, academic rank held, highest degree earned, ownership of a computer at home and in the office, access to the Internet, computer skill level, and English language proficiency.

This chapter includes the description of the survey results and the analysis of the data in this study. The research design of this study was descriptive and causal-

comparative. Data collected from the five-part survey were used to answer the research questions. The following are the research questions that were addressed in the study:

1. What are female faculty attitudes toward using computer technologies?
2. What types of computer technologies do female faculty members use?
3. To what extent do female faculty members use computer technologies for instructional purposes?
4. What are the barriers that limit female faculty members' use of computer technologies?
5. Are there statistically significant differences in female faculty members' attitudes toward computer technologies based on demographic characteristics (i.e., age, years of teaching experience, years of computer technology experience, subject taught, academic rank held, highest degree earned, ownership of a computer at home and in the office, access to the Internet, computer skill level, and English language proficiency)?
6. Are there statistically significant differences in female faculty members' use of computer technologies based on demographic characteristics (i.e., age, years of teaching experience, years of computer technology experience, subject taught, academic rank held, highest degree earned, ownership of a computer at home and in the office, access to the Internet, computer skill level, and English language proficiency)?
7. Which factors best predict female faculty members' attitudes toward using computer technologies?

The total population was ($N = 310$) female faculty teaching in girls' colleges in Dammam and Jubail, Saudi Arabia. Only 206 (66.45%) participants from the actual population participated in this study. The return rate of 66.45% was achieved after two survey rounds. One hundred eighty (58.06%) respondents returned the survey the first time distributed, and twenty-six (8.4%) respondents returned the survey in the follow-up distribution.

The reliability of the survey (Arabic version) was assessed by examining its internal consistency. Reliability coefficients (Cronbach's alpha) were .94 for the total attitude scale and .86, .83, .79, and .70 for computer anxiety, computer confidence, computer liking, and computer usefulness, respectively. The researcher also assessed the reliability for parts 3, 4, and 5 and Cronbach's alpha of .81, .80, and .78 were found for the scales of degree of computer technologies use, extent of computer technologies use, and perceived major barriers that limit the use of computer technologies, respectively. These results suggest that the scales were reliable.

Demographic Data

Demographic characteristics were collected from Part I of the survey (see Appendix A). The demographics information include: age, years of teaching experience, years of computer technology experience, subject taught, academic rank held, highest degree earned, ownership of a computer at home and in the office, access to the Internet, computer skill level, and English language proficiency.

The population in this study consisted of 310 female faculty who taught in girls colleges (Liberal Art College in Dammam, Science College in Dammam, and College of Education in Jubail) in the spring of the academic year 2009. Out of the 310 surveys distributed, only 206 were returned for a response rate of 66.45%. Surveys with three unusable parts (parts that have one missing item or more) were excluded. Also, any survey that had five or more missing items in the demographic part was excluded because the demographic items will be used in answering two questions. Thus, the researcher excluded 9 surveys. Therefore, a total of 197 surveys were used in this study. The demographic information results of female faculty are summarized in tables 1 through 12.

Age of Participants

Of the respondents (n = 192), 148 (75.1%) were over the age of 30. Table 1 summarizes the results of the age distribution of the participants.

Number of Years in Teaching Experience as a Faculty

Table 2 shows the distribution for the number of years of teaching experience the respondents had as a faculty. Of the respondents (n = 189), 126 (64%) had 6 years or more in teaching experience at the collegiate level.

Table 1

Frequency and Percent of Faculty by Age

Age	Frequency	Percentage
20-29	44	22.3
30-39	70	35.5
40-49	64	32.5
50-59	13	6.6
60 or more	1	0.5
Not reported	5	2.5
Total	197	100

Table 2

Frequency and Percent of Faculty by Numbers of Years of Teaching Experience as Faculty

Years	Frequency	Percentage
5-years or less	63	32.0
6-10	33	16.8
11-15	36	18.3
16-20	19	9.6
More than 20	38	19.3
Not reported	8	4.1
Total	197	100

Number of Years of Experience with Computer Technology

The distribution for the number of years of experience the respondents had with computer technology is presented in Table 3. Of the respondents (n = 193), 67 (34%) had

6-10 years of experience with computer technology. Fifty-five participants (27.9%) reported using computer technology over 10 years. Only, thirty-eight of them specified the number of years of experience with computer technology: 23 participants used technology for 11-15 years, 10 participants used computer technology for 16-20 years, and 5 participants used computer technology for 21-30 years.

Table 3

Frequency and Percent of Faculty by Years of Experience with Computer Technology

Years	Frequency	Percentage
None	6	3.0
Under 1 year	7	3.6
1-3	32	16.2
4-5	26	13.2
6-10	67	34.0
Over 10	55	27.9
Not reported	4	2.0
Total	197	100

Subject Taught by Participants

Table 4 summarizes the results of the distribution of the participants according to the subjects taught. Of the respondents (n = 164), 100 (50.7%) taught science courses and 59 (29.9%) taught liberal arts courses.

Table 4

Frequency and Percent of Faculty by Subject Taught

Subject	Frequency	Percentage
Arabic Language	8	4.1
Islamic Studies	12	6.1
English Language	19	9.6
History	14	7.1
Geography	6	3.0
Physics	17	8.6
Chemistry	17	8.6
Botany and Microbiology	12	6.1
Mathematics	25	12.7
Animal Science	18	9.1
Computer	11	5.6
Kindergartens	3	1.5
Education and Psychology	2	1.0
Not reported	33	16.8
Total	197	100

Highest Academic Degree Obtained by Participants

Of the respondents (n = 194), 107 (54.4%) obtained Ph.D. degree. Table 5 summarizes the results of the distribution for the highest academic degree obtained by the participants.

Table 5

Frequency and Percent of Faculty by Academic Degree

Academic Degree	Frequency	Percentage
Ph.D.	107	54.3
Master	46	23.4
Bachelor	41	20.8
Other	0	0
Not reported	3	1.5
Total	197	100

Academic Rank Held by Participants

Of the respondents (n = 178), 73 (37.1%) were assistant professors, 39 (19.8%) graduate assistants, and 39 (19.8%) lecturers. Table 6 summarizes the results of the distribution for the academic rank held by the participants.

Table 6

Frequency and Percent of Faculty by Academic Rank

Academic Rank	Frequency	Percentage
Professor	10	5.1
Associate Professor	16	8.1
Assistant Professor	73	37.1
Lecturer	39	19.8
Graduate assistant	39	19.8
Teacher	1	0.5
Not reported	19	9.6
Total	197	100

Access to a Computer at Home

The majority of the respondents (*n* =195, 99%) owned a computer at home. Table 7 shows the distribution of the faculty according to ownership of a computer at home.

Table 7

Frequency and Percent of Faculty by Access to a Computer at Home

Access	Frequency	Percentage
No	1	0.5
Yes	195	99.0
Not reported	1	0.5
Total	197	100

Access to a Computer at Office

Table 8 shows the distribution of the faculty according to having access to a computer at the office. The majority of the respondents (n = 151, 76.6%) had a computer at the office.

Table 8

Frequency and Percent of Faculty by Access to a Computer at Office

Access	Frequency	Percentage
No	42	21.3
Yes	151	76.6
Not reported	4	2.0
Total	197	100

Access to the Internet at Home

The majority of the respondents (n = 187, 94.9%) had access to the Internet at home. The distribution of the faculty according to having access to the Internet at home is summarized in Table 9.

Table 9

Frequency and Percent of Faculty by Access to the Internet at Home

Access	Frequency	Percentage
No	7	3.6
Yes	187	94.9
Not reported	3	1.5
Total	197	100

Access to the Internet at Office

The majority of the respondents (n = 127, 64.5%) did not have access to the Internet at the office. Table 10 summarizes the results of access to the Internet at the office as the respondents reported.

Table 10

Frequency and Percent of Faculty by Access to the Internet at Office

Access	Frequency	Percentage
No	127	64.5
Yes	65	33.0
Not reported	5	2.5
Total	197	100

Computer Skill Level

Table 11 summarizes the distribution of the respondents by their computer skill level. Of the respondents (n = 193), 99 (50.3%) reported that they are proficient when using computer technologies.

English Language Level

Table 12 shows the distribution of the respondents by their English language level. Of the respondents (n = 194), 72 (36.5%) reported that their English level is very good, and 71 (36 %) reported that their English level is good.

Table 11

Frequency and Percent of Faculty by Computer Skill Level

Skill Level	Frequency	Percentage
Novice	10	5.1
Proficient	99	50.3
Very Proficient	84	42.6
Not reported	4	2.0
Total	197	100

Table 12

Frequency and Percent of Faculty by English Language Level

Language Level	Frequency	Percentage
Excellent	40	20.3
Very Good	72	36.5
Good	71	36.0
Weak	10	5.1
None	1	0.5
Not reported	3	1.5
Total	197	100

Analysis of Research Questions

Data collected from the five-part survey: demographic information, computer attitudes, degree of computer technologies use, extent of computer technologies use, and perceived major barriers that limit the use of computer technologies were analyzed to answer the following seven research questions.

Research Question 1

What are female faculty attitudes toward using computer technologies? Data regarding female faculty attitudes toward using computer technologies were collected from Part II "Computer Attitude Scale" of the survey (see Appendix A). Attitudes were measured using the mean score derived from the Computer Attitude Scale (CAS). The CAS includes five scores: the Total Computer Attitude Scale, and subscales of Computer Anxiety, Computer Confidence, Computer Liking, and Computer Usefulness. Descriptive analysis of means and standard deviations of the computer attitude scale and its subscales were used to examine this question and are represented in Table 13.

Participants answered the CAS using a 4-point Likert-type scale ranges from Strongly Disagree = 1, Disagree = 2, Agree = 3, and Strongly Agree = 4. Mean scores above 2.50 represent positive attitudes toward computers and they are classified into three subscales: mean scores range from 2.50 to 2.99 represent low positive attitudes toward computers; mean scores range from 3.00 to 3.25 represent moderate positive attitudes toward computers; and mean scores above 3.25 represent high positive attitudes toward computers.

As shown in Table 13, the overall mean score of the total computer attitude scale ($M = 3.28$, $SD = 0.37$) was high which indicates that female faculty have positive attitudes toward computers. Also, the results revealed that the mean score of computer anxiety subscale ($M = 3.28$, $SD = 0.47$) was high which indicates that female faculty have low degree of anxiety toward computers. On the computer confidence subscale, the mean score ($M = 3.31$, $SD = 0.44$) was high which implies that female faculty have high confidence in using computers. The mean score of computer liking subscale ($M = 3.03$, $SD = 0.45$) was moderate which indicates that female faculty are moderate in liking computers. Finally, on the computer usefulness subscale, the mean score ($M = 3.44$, $SD = 0.32$) was high which indicates that female faculty perceive that computers are useful.

Table 13

Means and Standard Deviations of Faculty Attitudes toward Computers

Attitude	*N*	Mean	*SD*
Total Attitude	170	3.28	0.37
Computer Anxiety	183	3.28	0.47
Computer Confidence	185	3.31	0.44
Computer Liking	184	3.03	0.45
Computer Usefulness	189	3.44	0.32

Research Question 2

What types of computer technologies do female faculty members use in their instruction?

Data regarding types of computer technologies that female faculty members use in their instruction were collected from Part III "Degree of Computer Technologies Use" of the survey (see Appendix A). Participants were asked to indicate their current level of computer technologies use for instructional purposes: 0 = never use; 1 = use rarely; 2 = use a few times a month; 3 = use a few times a week; and 4 = use daily. Descriptive statistical analysis of means, standard deviations, and percentages were used to analyze this question.

The mean of the level of use for each computer technology application was ranked from the most frequent to the least frequent uses of computer technology by female faculty members. As shown in Table 14 and Table 15, female faculty members had high levels of use of four computer technologies in which they were reported being used daily: e-mail (M = 3.35, 65%), word processing (M = 3.30, 61.9%), computers in general (M = 3.29, 57.4%), and Internet (M = 3.17, 58.9%). There is a gap between the mean scores of these common computer applications and the more complicated computer applications such as spreadsheet (M = 1.85), image and drawing program (M = 1.22), and multimedia programs (M = 1.21) as represented in Table 14. Also, female faculty reported that they never use the more complicated computer applications such as web page creation programs (M = 0.61, 68.5%) and 3-D design programs (M = 0.40, 78.2%) (see Table 14 and 15).

Table 14

Means and Standard Deviations of Degree of Computer Technologies Use by Faculty

Technology Type	Rank	*N*	Mean[a]	*SD*
E-mail programs (e.g., Outlook Express, Yahoo, Hotmail…etc.)	1	197	3.35	1.10
Word processing programs (e.g., Microsoft Word)	2	197	3.30	1.08
Computers in general	3	193	3.29	1.01
Internet browsers (e.g., Internet Explorer, Netscape)	4	196	3.17	1.22
Presentation programs (e.g., Power Point)	5	197	2.66	1.27
Reference information on CD-ROM	6	195	2.13	1.47
Spreadsheet programs (e.g., Microsoft Excel)	7	196	1.85	1.32
Drill and Practice/Tutorial programs	8	191	1.24	1.25
Image & Drawing editing programs (e.g., Adobe Photoshop)	9	196	1.22	1.26
Multimedia programs (e.g., Flash)	10	194	1.21	1.34
Database programs (e.g., Microsoft Access)	11	196	0.89	1.13
Web page creation programs (e.g., Front Page, Dream weaver)	12	196	0.61	1.12
3-D design programs (e.g., 3-D Studio)	13	196	0.40	0.91

Note. [a] Mean of computer technologies use: 0: never use, 1: use rarely, 2: use a few times a month, 3: use a few times a week, and 4: use daily.

Table 15

Percentage of Degree of Computer Technologies Use by Faculty

Technology Type	never use (0)	use rarely (1)	use a few times a month (2)	use a few times a week (3)	use daily (4)
E-mail programs (e.g., Outlook Express, Yahoo, Hotmail…etc.)	4.6	4.6	7.6	18.3	65.0
Word processing programs (e.g., Microsoft Word)	3.0	6.1	10.7	18.3	61.9
Computers in general	2.0	4.6	13.7	20.3	57.4
Internet browsers (e.g., Internet Explorer, Netscape)	6.1	6.6	10.2	17.8	58.9
Presentation programs (e.g., Power Point)	7.1	14.2	17.8	26.9	34.0
Reference information on CD-ROM	19.3	17.3	19.3	17.8	25.4
Spreadsheet programs (e.g., Microsoft Excel)	18.3	25.4	23.9	17.3	14.7
Drill and Practice/Tutorial programs	34.5	27.9	20.3	5.1	9.1
Image & Drawing editing programs (e.g., Adobe Photoshop)	37.6	27.9	15.7	11.2	7.1
Multimedia programs (e.g., Flash)	41.6	23.9	13.2	10.7	9.1
Database programs (e.g., Microsoft Access)	48.7	28.9	10.7	6.6	4.6

Table 15 cont.

Web page creation programs (e.g., Front Page, Dream weaver)	68.5	16.2	4.6	5.1	5.1
3-D design programs (e.g., 3-D Studio)	78.2	10.2	6.1	2.5	2.5

In the open ended question the respondents list other technology applications that they use including computer language programs and application programs. Computer language programs were reported by the participants such as C, C++, Visual Basic, Dos, Borland C++, Java, FORTRAN, html, Q-Basic. Application programs were reported by the participants such as Mat lab, SPSS, Minitab, Ticker Chart, real player programs, AutoCAD, Mathematica, Cool Edit, sound programs, Latex, Dos, Amzi prolog, Visual studio, translation programs, scientific programs for chemical formula "Chem Drow", programs to add pictures, program for chemical drawing, programs for designing maps mapinfo, Geographic information systems, Maple, program for nuclear analysis, Germany program for nuclear analysis Ge-Spe-Co, and scientific programs for drawing analysis.

Research Question 3

To what extent do female faculty members use computer technologies for instructional purposes?

Data regarding extent of female faculty members' use of computer technologies in their instruction were collected from Part IV "Extent of Computer Technologies Use"

of the survey (see Appendix A). Participants were asked to indicate to what extent they use computer technologies in their professional activities: 0 = never use; 1 = 1-2 times during the semester; 2 = 1-2 times per month; 3 = 1-2 times per week; and 4 = 3 times or more per week. Descriptive statistical analysis of means, standard deviations, and percentages were used to analyze this question.

The mean score for each professional activity was ranked from the most frequent to the least frequent uses of professional activities by female faculty members. As shown in Table 16 and Table 17, three professional activities represented the most frequent use by female faculty members in which they were reported for being used more than 1-2 times per month and less than 1-2 times per week: to access information and research on best practices for teaching ($M = 2.73$), to do administrative record keeping ($M = 2.49$), and to communicate with colleagues and/or other professionals ($M = 2.29$). However, the highest percentage for these professional activities were reported by the participants as being used 3 times or more per week as follows: to access information and research on best practices for teaching ($n = 193$, 40.1%), to do administrative record keeping ($n = 194$, 33%), and to communicate with colleagues and/or other professionals ($n = 196$, 29.4%). Three professional activities represented the least frequent use by female faculty members in which the highest percentages were reported for being never used: to communicate with students outside of classroom hours ($M = 1.18$, 47.2%), to post/share student work on the web ($M = 0.56$, 70.1%), and to communicate with students' parents ($M = 0.31$, 86.3%).

Table 16

Means and Standard Deviations of Extent of Computer Technologies Use by Faculty

Professional Activity	Rank	*N*	Mean[a]	*SD*
Access information and research on best practices for teaching	1	193	2.73	1.30
Do administrative record keeping (i.e., grades, attendance, etc.)	2	194	2.49	1.39
Communicate with colleagues and/or other professionals	3	196	2.29	1.45
Learn about computers and/or improve your computer skills	4	193	2.06	1.39
Create multimedia presentation for the classroom	5	195	2.02	1.50
Post homework or other class requirements, project information or suggestions	6	195	1.42	1.38
Communicate with students outside of classroom hours	7	195	1.18	1.40
Post/share student work on the Web	8	195	0.56	1.04
Communicate with students' parents	9	196	0.31	0.92

Note. [a] Mean of extent of computer technologies use: 0: never use, 1: 1-2 times during the semester, 2: 1-2 times per month, 3: 1-2 times per week, and 4: 3 times or more per week.

Table 17

Percent of Extent of Computer Technologies Use by Faculty

Professional Activity	never use (0)	1-2 times during the semester (1)	1-2 times per month (2)	1-2 times per week (3)	3 times or more per week (4)
Access information and research on best practices for teaching	6.6	12.2	22.8	16.2	40.1
Do administrative record keeping (i.e., grades, attendance, etc.)	11.2	15.2	19.3	19.8	33.0
Communicate with colleagues and/or other professionals	16.2	15.2	21.3	17.3	29.4
Learn about computers and/or improve your computer skills	16.2	21.3	21.3	18.3	20.8
Create multimedia presentation for the classroom	22.3	19.3	14.7	19.3	23.4
Post homework or other class requirements, project information or suggestions	35.5	21.3	19.3	11.2	11.7
Communicate with students outside of classroom hours	47.2	17.3	13.7	10.7	10.2
Post/share student work on the Web	70.1	13.2	8.6	3.6	3.6
Communicate with students' parents	86.3	4.6	3.6	1.0	4.1

In the open ended question, the respondents reported other uses of computer technologies in their professional activities and they are summarized below:

1. For scientific research work and to gather information resources for research.

2. To communicate with scientific associations.
3. To communicate with scientific journals.
4. To communicate with students of the official group in the department by posting commercials, schedules, lectures and assignments.
5. To research articles through Google Scholar.
6. To prepare lectures.

Research Question 4

What are the barriers that limit female faculty members' use of computer technologies?

Data regarding the barriers that limit female faculty members' use of computer technologies were collected from Part V "Perceived Major Barriers that Limit the Use of Computer Technologies" of the survey (see Appendix A). Participants reported the barriers using a 5-point Likert-type scale range from Strongly Disagree = 1, Disagree = 2, Neither = 3, Agree = 4, and Strongly Agree = 5. Descriptive statistical analysis of means, standard deviations, and percentages were used to analyze this question.

As shown in Table 18 and Table 19, the most identified barrier that limited female faculty use of computer technologies was lack of technical support ($M = 4.04$) in which 79.7% of the participants either strongly agreed or agreed on this statement. The second barrier was lack of effective training ($M = 3.93$) in which 75.6% of the participants either strongly agreed or agreed on this barrier. The third barrier was lack of equipment and infrastructure ($M = 3.83$) in which 72.1% of the participants either strongly agreed or

agreed on this statement. The fourth barrier was lack of administrative support (M = 3.80) in which 68.5% of the participants either strongly agreed or agreed on this barrier.

The fifth barrier was increase workload for instructors (M = 3.62) in which 61.9% of the participants either strongly agreed or agreed on this barrier. The sixth and seventh barriers were lack of time for learning about computer technologies and lack of software (M = 3.57) were in the same degree in which 62.5%, 59.4% of the participants either strongly agreed or agreed on this barrier, respectively. The eighth barrier was lack of designing interaction activities between instructors and students (M = 3.55) in which 57.8% of the participants either strongly agreed or agreed on this barrier. The ninth barrier was lack of collegial support (M = 3.22) in which 43.6% either strongly agreed or agreed on this barrier. The barriers that were least identified by the participants as limiting their use of computer technologies were reduced course faculty (M = 2.30), lack of personal interest (M = 2.23), and lack of self confidence (M = 1.95) as represented in Table 18.

Table 18

Means and Standard Deviations of Barriers that Limit Faculty Use of Computer Technologies

Barrier	Rank	*N*	Mean[a]	*SD*
Lack of technical support	1	197	4.04	0.99
Lack of effective training	2	197	3.93	1.10
Lack of equipment and infrastructure	3	196	3.83	1.25
Lack of administrative support	4	197	3.80	1.14
Increase workload for instructors	5	194	3.62	1.34
Lack of time of learning about computer technologies	6	197	3.57	1.19
Lack of software	7	197	3.57	1.29
Lack of designing interaction activities between instructors and students in your course	8	194	3.55	1.15
Lack of collegial support and interaction	9	197	3.22	1.16
Reduced course quality	10	194	2.30	1.15
Lack of personal interest	11	196	2.23	1.31
Lack of self confidence	12	196	1.95	1.12

Note. [a] Mean of the extent that a barrier limit faculty to use computer technologies: 1: strongly disagree, 2: disagree, 3: neither agree nor disagree, 4: agree, and 5: strongly agree.

Table 19

Percent of Barriers that Limit Faculty Use of Computer Technologies

Barrier	SD[a]	D[a]	N[a]	A[a]	SA[a]
Lack of technical support	2.0	8.1	10.2	43.7	36.0
Lack of effective training	3.0	12.2	9.1	39.6	36.0
Lack of equipment and infrastructure	6.1	14.7	6.6	34.5	37.6
Lack of administrative support	3.6	13.7	14.2	36.0	32.5
Increase workload for instructors	9.6	14.7	12.2	28.9	33.0
Lack of time of learning about computer technologies	4.1	21.8	11.7	38.1	24.4
Lack of software	6.6	19.8	14.2	28.9	30.5
Lack of designing interaction activities between instructors and students in your course	4.6	16.8	19.3	36.0	21.8
Lack of collegial support and interaction	5.6	26.4	24.4	27.9	15.7
Reduced course quality	29.9	30.5	19.3	15.7	3.0
Lack of personal interest	38.1	31.5	6.6	15.7	7.6
Lack of self confidence	43.1	35.0	9.6	6.6	5.1

Note. [a] SD: strongly disagree, D: disagree, N: neither agree nor disagree, A: agree, and SA: strongly agree.

In the open ended question, the respondents reported other barriers that limit their use of computer technologies, and they are summarized below:

1. Students lack the personal interest to use computer technologies.

2. Lack of update equipments (printers, LCD projectors, Laptop) and all the equipments provided are not activated in classes. And if the equipments are provided, they are old and slow.
3. Lack of Internet connections in the computer labs for students and teachers.
4. Lack of team work including faculty and technicians to facilitate using computer technologies in all departments.
5. Lack of access to computers and Internet at the office.
6. Regulations in the colleges.
7. The culture of using computer technologies is not spread between colleagues for collaboration and exchange opinions.
8. Limited time of lectures and the huge curriculum that faculty should teach.
9. The large numbers of students which exceed 400 students which make it hard to communicate with students because of the lack of time.
10. Lack of incentives (both emotional and financial) for using computer technologies.
11. Faculty members get used to teach with traditional teaching method. Using technology requires more time and effort than traditional teaching method.

Research Question 5

Are there statistically significant differences in female faculty members' attitudes toward computer technologies based on demographic characteristics such as age, years of teaching experience, years of computer technology experience, subject taught, academic

rank held, highest degree earned, ownership of a computer at home and in the office, access to the Internet, computer skill level, and English language proficiency?

A one-way ANOVA was used to determine whether there were significant differences in female faculty members' attitudes (total attitude, computer anxiety, computer confidence, computer liking, and computer usefulness) toward computer technologies based on the demographic variables. When differences exist among the different groups, a Scheffé post hoc test was used to identify which group is significantly different from other groups.

Before running the ANOVA, two changes were made to two demographic variables of age and subject taught. The age group of 60 or more was added to the group 50-59 because there was only one participant who was age 60 or more. Also, the group of education and psychology faculty was considered missing because only one participant reported teaching this subject.

Computer Attitude Scale by Faculty Age

Total attitude. The one-way ANOVA revealed that there were no statistically significant differences ($p = 0.212$) in female faculty members' attitudes toward computers based on faculty members' age: age of 20-29 ($M = 3.39$), 30-39 ($M = 3.26$), 40-49 ($M = 3.25$), and 50 or more ($M = 3.22$). Age did not appear to make a significant difference in female faculty members' attitudes toward computers (see Table 20).

Computer anxiety. As shown in Table 20, a one-way ANOVA revealed that there were no statistically significant differences ($p = 0.349$) in female faculty members'

computer anxiety based on faculty members' age: age groups of 20-29 (M = 3.37), 30-39 (M = 3.21), 40-49 (M = 3.33), and 50 or more (M = 3.26). Female faculty age did not appear to make a significant difference in computer anxiety (see Table 20).

Computer confidence. The one-way ANOVA revealed that there were statistically significant differences (p = 0.020) in the computer confidence of female faculty members based on the faculty members' age (see Table 20). A Scheffé post hoc test was used to determine which age group is significantly different from other groups. The results revealed that the mean for age group of 40-49 (M = 3.22) was significantly lower than age group of 20-29 (M = 3.50) as represented in Table 20. Female faculty members who were age 20-29 have more computer confidence than faculty members who were age 40-49. There were no significant differences between the other groups on the computer confidence subscale.

Computer liking. The one-way ANOVA revealed that there were no statistically significant differences (p = 0.730) in female faculty members' computer liking based on the faculty members' age: age groups of 20-29 (M = 3.09), 30-39 (M = 3.01), 40-49 (M = 3.02), and 50 or more (M = 2.95). Female faculty members' age did not appear to make a significant difference in computer liking (see Table 20).

Computer usefulness. The one-way ANOVA revealed that there were no statistically significant differences (p = 0.291) in female faculty members' computer usefulness based on the faculty members' age: age groups of 20-29 (M = 3.51), 30-39 (M = 3.45), 40-49 (M = 3.41), and 50 or more (M = 2.34). Age did not appear to make a significant difference in computer usefulness (see Table 20).

Table 20

Analysis of Variance of Computer Attitude Scale by Faculty Age

	Age	*N*	Mean	*SD*	Std. Error	*F*	*P*
Total Attitude	20-29	40	3.39	0.38	0.06		
	30-39	63	3.26	0.39	0.05		
	40-49	53	3.25	0.35	0.05		
	50 or more	10	3.22	0.33	0.11		
	Total	166	3.29	0.38	0.03	1.518	0.212
Anxiety	20-29	41	3.37	0.49	0.08		
	30-39	68	3.21	0.49	0.06		
	40-49	56	3.33	0.45	0.06		
	50 or more	13	3.26	0.41	0.11		
	Total	178	3.29	0.47	0.04	1.104	0.349
Confidence	20-29	41	3.50	0.45	0.07		
	30-39	67	3.31	0.45	0.05		
	40-49	61	3.22	0.41	0.05		
	50 or more	11	3.27	0.37	0.11		
	Total	180	3.32	0.44	0.03	3.371*	0.020
Liking	20-29	42	3.09	0.55	0.08		
	30-39	68	3.01	0.46	0.06		
	40-49	58	3.02	0.40	0.05		
	50 or more	12	2.95	0.25	0.07		
	Total	180	3.03	0.45	0.03	0.432	0.730
Usefulness	20-29	42	3.51	0.33	0.05		
	30-39	67	3.45	0.33	0.04		
	40-49	63	3.41	0.29	0.04		
	50 or more	12	3.34	0.36	0.10		
	Total	184	3.44	0.32	0.02	1.255	0.291

Note. *Indicates a statistically significant difference at the 0.05 level.

Computer Attitude Scale by Faculty Teaching Experience

Total attitude. As shown in Table 21, a one-way ANOVA revealed that there were no statistically significant differences ($p = 0.082$) in female faculty members' attitudes toward computers based on years of teaching experience at the collegiate level: 5 years or less ($M = 3.38$), 6-10 years ($M = 3.20$), 11-15 years ($M = 3.19$), 16-20 years ($M = 3.18$), and more than 20 years ($M = 3.26$). Female faculty members' teaching experience at the collegiate level did not appear to make a significant difference in their attitudes toward computers.

Computer anxiety. The one-way ANOVA revealed that there were no statistically significant differences ($p = 0.128$) in the computer anxiety of female faculty members based on years of teaching experience at the collegiate level: 5 years or less ($M = 3.37$), 6-10 years ($M = 3.23$), 11-15 years ($M = 3.12$), 16-20 years ($M = 3.18$), and more than 20 years ($M = 3.29$). Teaching experience at the collegiate level did not appear to make a significant difference in computer anxiety (see Table 21).

Computer confidence. The one-way ANOVA revealed that statistically significant differences ($p = 0.007$) exist in female faculty members' computer confidence based on years of teaching experience at the collegiate level (see Table 21). However, the Scheffé post hoc test revealed that there were no significant mean differences among the groups of 5 years or less ($M = 3.47$), 6-10 years ($M = 3.22$), 11-15 years ($M = 3.23$), 16-20 years ($M = 3.15$), and more than 20 years ($M = 3.21$) on the computer confidence subscale (see Table 21).

Table 21

Analysis of Variance of Computer Attitude Scale by Teaching Experience

	Teaching Experience	*N*	Mean	*SD*	Std. Error	*F*	*P*
Total Attitude	5 years or less	55	3.38	0.37	0.05		
	6-10 years	28	3.20	0.39	0.07		
	11-15 years	35	3.19	0.41	0.07		
	16-20 years	16	3.18	0.38	0.10		
	More than 20 years	29	3.26	0.29	0.05		
	Total	163	3.27	0.37	0.03	2.114	0.082
Anxiety	5 years or less	59	3.37	0.46	0.06		
	6-10 years	30	3.23	0.44	0.08		
	11-15 years	36	3.12	0.53	0.09		
	16-20 years	18	3.18	0.46	0.11		
	More than 20 years	33	3.29	0.44	0.08		
	Total	176	3.26	0.47	0.04	1.817	0.128
Confidence	5 years or less	60	3.47	0.43	0.06		
	6-10 years	32	3.22	0.40	0.07		
	11-15 years	36	3.23	0.49	0.08		
	16-20 years	16	3.15	0.42	0.11		
	More than 20 years	34	3.21	0.39	0.07		
	Total	178	3.30	0.44	0.03	3.638[*a]	0.007
Liking	5 years or less	58	3.08	0.52	0.07		
	6-10 years	32	2.98	0.43	0.08		
	11-15 years	36	2.99	0.45	0.07		
	16-20 years	18	2.97	0.46	0.11		
	More than 20 years	33	2.96	0.30	0.05		
	Total	177	3.01	0.45	0.03	0.522	0.720
Usefulness	5 years or less	61	3.49	0.32	0.04		
	6-10 years	33	3.39	0.36	0.06		
	11-15 years	35	3.43	0.31	0.05		
	16-20 years	16	3.35	0.34	0.09		
	More than 20 years	37	3.39	0.31	0.05		
	Total	182	3.43	0.33	0.02	1.019	0.399

Note. *Indicates a statistically significant difference at the 0.05 level.

[a]The Scheffé post hoc test revealed that there were no significant mean differences among the groups.

Computer liking. The one-way ANOVA revealed that there were no statistically significant differences ($p = 0.720$) in the computer liking of female faculty members based on years of teaching experience at the collegiate level: 5 years or less ($M = 3.08$), 6-10 years ($M = 2.98$), 11-15 years ($M = 2.99$), 16-20 years ($M = 2.97$), and more than 20 years ($M = 2.96$). Female faculty members' teaching experience at the collegiate level did not appear to have an impact on computer liking (see Table 21).

Computer usefulness. The one-way ANOVA revealed that there were no statistically significant differences ($p = 0.399$) in female faculty members' computer usefulness based on years of teaching experience at the collegiate level: 5 years or less ($M = 3.49$), 6-10 years ($M = 3.39$), 11-15 years ($M = 3.43$), 16-20 years ($M = 3.35$), and more than 20 years ($M = 3.39$). Female faculty members' teaching experience at the collegiate level did not appear to make a significant difference in computer usefulness (see Table 21).

Computer Attitude Scale by Faculty Computer Experience

Total attitude. As shown in Table 22, a one-way ANOVA revealed that statistically significant differences ($p = 0.000$) exist in female faculty members' attitudes toward computers based on years of computer technology experience. The Scheffé post hoc test showed that the mean for faculty who had 1-3 years experience with computer technology ($M = 2.88$) was significantly lower than the mean for faculty who had 5-4 years experience with computer ($M = 3.24$), faculty who had 6-10 years experience with computer ($M = 3.35$), and faculty who had more than 10 years experience with computer

($M = 3.41$) as represented in Table 22. Female faculty members who had more experience with computer technology held more favorable attitudes toward computers than faculty who had less experience with computer technologies. There were no significant differences in attitudes toward computers between the faculty who had 1-3 years computer experience and those with no computer experience or less than one year of computer experience.

Computer anxiety. The one-way ANOVA revealed that there were statistically significant differences ($p = 0.000$) in the computer anxiety of female faculty members based on years of computer technology experience (see Table 22). The Scheffé post hoc test revealed that the mean for faculty who had 1-3 years experience with computer ($M = 2.81$) was significantly lower than the mean for faculty who had 6-10 years experience with computer ($M = 3.37$) and faculty who had more than 10 years experience with computer ($M = 3.45$) (see Table 22). Female faculty members who had more experience with computer technologies held less computer anxiety than faculty who had less experience with computer technologies. There were no significant differences in computer anxiety among the faculty members who had 1-3 years computer experience, no computer experience, less than one year, or 5-4 years.

Computer confidence. The one-way ANOVA revealed that there were statistically significant differences ($p = 0.000$) in the computer confidence of female faculty members' based on years of computer technology experience (see Table 22). The Scheffé post hoc test indicated that the mean for faculty who had 1-3 years experience with computer ($M = 2.88$) was significantly lower than the mean for faculty who had 5-4 years

experience with computer ($M = 3.29$), faculty who had 6-10 years experience with computer ($M = 3.42$), and faculty who had more than 10 years experience with computer ($M = 3.42$) as represented in Table 22. Female faculty members who had more experience with computer technology held more computer confidence than faculty who had less experience with computer technologies. There were no significant differences in computer confidence among the faculty who had 1-3 years computer experience and those with no computer experience or less than one year.

Computer liking. As shown in Table 22, a one-way ANOVA revealed that statistically significant differences ($p = 0.000$) exist in female faculty members' computer liking based on years of computer technology experience. The Scheffé post hoc test revealed that the mean for faculty who had 1-3 years experience with computer ($M = 2.64$) was significantly lower than the mean for faculty who had 6-10 years experience with computer ($M = 3.12$) and faculty who had more than 10 years experience with computer ($M = 3.16$) (see Table 22). Female faculty members who had more experience with computer technologies like the computers more than faculty who had less experience with computer technologies. There were no significant differences in computer liking among the faculty members who had 1-3 years computer experience, no computer experience, less than one year, or 5-4 years.

Computer usefulness. The one-way ANOVA revealed that there were statistically significant differences ($p = 0.000$) in female faculty members' computer usefulness based on years of computer technology experience (see Table 22). The Scheffé post hoc test revealed that the mean for faculty who had 1-3 years experience with computer ($M =$

3.17) was significantly lower than the mean for faculty who had 6-10 years experience with computer ($M = 3.49$) and faculty who had more than 10 years experience with computer ($M = 3.54$). Female faculty members who had more experience with computer technologies had a higher degree of perceived computer usefulness than faculty who had less experience with computer technologies (see Table 22). There were no significant differences in computer usefulness among the faculty members who had 1-3 years computer experience, no computer experience, less than one year, or 5-4 years.

Table 22

Analysis of Variance of Computer Attitude Scale by Computer Experience

	Computer Experience	*N*	Mean	*SD*	Std. Error	*F*	*P*
Total Attitude	no experience	6	3.12	0.43	0.17		
	less than one year	7	3.22	0.31	0.12		
	1-3 years	23	2.88	0.30	0.06		
	5-4 years	19	3.24	0.38	0.09		
	6-10 years	65	3.35	0.36	0.04		
	More than 10 years	46	3.41	0.30	0.04		
	Total	166	3.28	0.38	0.03	8.989*	0.000
Anxiety	no experience	6	3.20	0.36	0.15		
	less than one year	7	3.23	0.48	0.18		
	1-3 years	28	2.81	0.45	0.08		
	5-4 years	21	3.17	0.50	0.11		
	6-10 years	66	3.37	0.43	0.05		
	More than 10 years	51	3.45	0.38	0.05		
	Total	179	3.27	0.47	0.04	9.385*	0.000

Table 22 cont.

Confidence	no experience	6	3.05	0.41	0.17		
	less than one year	7	3.34	0.40	0.15		
	1-3 years	28	2.88	0.35	0.07		
	5-4 years	20	3.29	0.46	0.10		
	6-10 years	66	3.42	0.42	0.05		
	More than 10 years	54	3.42	0.38	0.05		
	Total	181	3.31	0.44	0.03	8.901*	0.000
Liking	no experience	6	2.88	0.54	0.22		
	less than one year	7	2.93	0.24	0.09		
	1-3 years	28	2.64	0.36	0.07		
	5-4 years	24	2.97	0.42	0.09		
	6-10 years	66	3.12	0.47	0.06		
	More than 10 years	49	3.16	0.36	0.05		
	Total	180	3.02	0.45	0.03	6.707*	0.000
Usefulness	no experience	6	3.35	0.46	0.19		
	less than one year	7	3.39	0.29	0.11		
	1-3 years	29	3.17	0.30	0.06		
	5-4 years	24	3.40	0.33	0.07		
	6-10 years	65	3.49	0.30	0.04		
	More than 10 years	54	3.54	0.28	0.04		
	Total	185	3.43	0.33	0.02	6.275*	0.000

Note. * Indicates a statistically significant difference at the 0.05 level.

Computer Attitude Scale by Subject Taught

Total attitude. As shown in Table 23, a one-way ANOVA revealed that there were statistically significant differences ($p = 0.001$) in female faculty members' attitudes toward computers based on the subject they teach. The Scheffé post hoc test revealed that the mean for faculty who teach Arabic language ($M = 2.82$) was significantly lower than the mean for faculty who teach computer ($M = 3.69$) (see Table 23). Female faculty members who teach computer courses held more favorable attitudes toward computers

than those who teach Arabic language courses. There were no significant differences in attitudes toward computers among the faculty members who teach Arabic language and faculty who teach other courses such as Islamic studies, geography, physics, and mathematics.

Computer anxiety. The one-way ANOVA revealed that statistically significant differences ($p = 0.022$) exist in the computer anxiety of female faculty members based on the subject they teach (see Table 23). However, the Scheffé post hoc test revealed that there were no significant mean differences among the different subjects of Arabic language ($M = 2.90$), Islamic studies ($M = 3.32$), English language ($M = 3.36$), history ($M = 3.16$), geography ($M = 3.48$), physics ($M = 3.32$), chemistry ($M = 3.34$), botany and microbiology ($M = 3.02$), mathematics ($M = 3.22$), animal science ($M = 3.18$), computer ($M = 3.69$), and kindergartens ($M = 3.00$) on computer anxiety subscale (see Table 23).

Computer confidence. As shown in Table 23, a one-way ANOVA revealed that there were statistically significant differences ($p = 0.001$) in female faculty members' computer confidence based on the subject they teach. A Scheffé post hoc test indicated that the mean for faculty who teach Arabic language ($M = 2.94$) was significantly lower than the mean for faculty who teach computer ($M = 3.85$). Also, the mean for faculty who teach history ($M = 3.02$) was significantly lower than the mean for faculty who teach computer ($M = 3.85$) (see Table 23). Female faculty members who teach a computer course had more computer confidence than those who teach Arabic language and history. There were no significant differences in computer confidence between the faculty

members who teach Arabic language and history and faculty who teach other courses such as Islamic studies, geography, physics, and mathematics.

Computer liking. The one-way ANOVA revealed that there were statistically significant differences ($p = 0.001$) in the computer liking of female faculty members based on the subject they teach (see Table 23). The Scheffé post hoc test revealed that the mean for faculty who teach Arabic language ($M = 2.59$) was significantly lower than the mean for faculty who teach computer ($M = 3.57$) as shown in Table 23. Female faculty members, who teach computer courses, like computer technologies more than those who teach Arabic language. There were no significant differences in computer liking between the faculty members who teach Arabic language and faculty who teach other courses such as Islamic studies, geography, physics, and mathematics.

Computer usefulness. The one-way ANOVA revealed that there were statistically significant difference ($p = 0.018$) in female faculty members' computer usefulness based on the subject they teach (see Table 23). However, the Scheffé post hoc test showed that there were no significant mean differences among the different subjects: Arabic language ($M = 3.16$), Islamic studies ($M = 3.33$), English language ($M = 3.47$), history ($M = 3.32$), geography ($M = 3.75$), physics ($M = 3.53$), chemistry ($M = 3.31$), botany and microbiology ($M = 3.39$), mathematics ($M = 3.40$), animal science ($M = 3.44$), computer ($M = 3.62$), and kindergartens ($M = 3.33$) on computer usefulness subscale.

Table 23

Analysis of Variance of Computer Attitude Scale by Subject Taught

	Subject	*N*	Mean	*SD*	Std. Error	*F*	*P*
Total Attitude	Arabic	6	2.82	0.29	0.12		
	Islamic Studies	10	3.26	0.43	0.14		
	English	15	3.36	0.32	0.08		
	History	10	3.20	0.33	0.10		
	Geography	6	3.45	0.32	0.13		
	Physics	14	3.40	0.30	0.08		
	Chemistry	14	3.23	0.43	0.11		
	Botany & Microbiology	12	3.10	0.36	0.10		
	Mathematics	25	3.23	0.38	0.08		
	Animal Science	15	3.27	0.29	0.08		
	Computer	10	3.69	0.14	0.04		
	Kindergartens	3	3.03	0.33	0.19		
	Total	140	3.27	0.37	0.03	3.210*	0.001
Anxiety	Arabic	6	2.90	0.36	0.15		
	Islamic Studies	12	3.32	0.50	0.14		
	English	16	3.36	0.43	0.11		
	History	12	3.16	0.62	0.18		
	Geography	6	3.48	0.44	0.18		
	Physics	15	3.32	0.40	0.10		
	Chemistry	16	3.34	0.46	0.11		
	Botany & Microbiology	12	3.02	0.51	0.15		
	Mathematics	25	3.22	0.45	0.09		
	Animal Science	16	3.18	0.41	0.10		
	Computer	11	3.69	0.18	0.05		
	Kindergartens	3	3.00	0.46	0.26		
	Total	150	3.27	0.47	0.04	2.123*a	0.022
Confidence	Arabic	7	2.94	0.38	0.14		
	Islamic Studies	10	3.28	0.51	0.16		
	English	16	3.36	0.41	0.10		
	History	14	3.02	0.42	0.11		
	Geography	6	3.38	0.41	0.17		
	Physics	16	3.38	0.31	0.08		
	Chemistry	17	3.28	0.44	0.11		
	Botany & Microbiology	12	3.20	0.39	0.11		

Table 23 cont.

	Mathematics	25	3.29	0.47	0.09		
	Animal Science	16	3.39	0.34	0.08		
	Computer	11	3.85	0.23	0.07		
	Kindergartens	3	3.10	0.61	0.35		
	Total	153	3.31	0.44	0.04	3.213*	0.001
Liking	Arabic	7	2.59	0.39	0.15		
	Islamic Studies	12	2.94	0.49	0.14		
	English	18	3.04	0.40	0.10		
	History	13	2.89	0.36	0.10		
	Geography	6	3.20	0.37	0.15		
	Physics	15	3.15	0.40	0.10		
	Chemistry	15	3.09	0.45	0.12		
	Botany & Microbiology	12	2.78	0.54	0.15		
	Mathematics	25	3.01	0.45	0.09		
	Animal Science	15	3.08	0.38	0.10		
	Computer	10	3.57	0.28	0.09		
	Kindergartens	3	2.70	0.56	0.32		
	Total	151	3.03	0.46	0.04	3.116*	0.001
Usefulness	Arabic	8	3.16	0.39	0.14		
	Islamic Studies	11	3.33	0.29	0.09		
	English	18	3.47	0.27	0.06		
	History	13	3.32	0.33	0.09		
	Geography	6	3.75	0.14	0.06		
	Physics	16	3.53	0.36	0.09		
	Chemistry	16	3.31	0.39	0.10		
	Botany & Microbiology	12	3.39	0.25	0.07		
	Mathematics	25	3.40	0.31	0.06		
	Animal Science	16	3.44	0.28	0.07		
	Computer	11	3.62	0.23	0.07		
	Kindergartens	3	3.33	0.21	0.12		
	Total	155	3.42	0.32	0.03	2.182*[a]	0.018

Note. * Indicates a statistically significant difference at the 0.05 level.
[a]The Scheffé post hoc test revealed that there were no significant mean differences among the groups.

Computer Attitude Scale by Academic Degree

Total attitude. As shown in Table 24, a one-way ANOVA revealed that statistically significant differences ($p = 0.017$) exist in female faculty members' attitudes toward computers based on the academic degree obtained. The Scheffé post hoc test revealed that the mean for faculty who hold a Ph.D. degree ($M = 3.25$) was significantly lower than the mean for faculty who hold a bachelor degree ($M = 3.43$). Also, the mean for faculty who hold a master's degree ($M = 3.21$) was significantly lower than the mean for faculty who hold a bachelor degree ($M = 3.43$). Female faculty members who had a bachelor degree held more favorable attitudes toward computers than faculty who had a Ph.D. or master's degree. There were no significant differences in attitudes toward computers between the faculty members who hold a Ph.D. degree and those who hold a master's degree.

Computer anxiety. The one-way ANOVA revealed that there were statistically significant differences ($p = 0.030$) in female faculty members' computer anxiety based on the academic degree they obtained (see Table 24). The Scheffé post hoc test indicated that the mean for faculty who hold a master's degree ($M = 3.17$) was significantly lower than the mean for faculty who hold a bachelor degree ($M = 3.44$) as represented in Table 24. Female faculty members who hold a bachelor degree had less computer anxiety than faculty who hold a master's degree. There were no significant differences in computer anxiety between the faculty members who hold a Ph.D. degree and faculty who hold a master's or a bachelor degree.

Computer confidence. The one-way ANOVA revealed that there were statistically significant differences ($p = 0.011$) in the computer confidence of female faculty members' based on the academic degree they obtained (see Table 24). The Scheffé post hoc test revealed that the mean for female faculty members who hold a Ph.D. degree ($M = 3.25$) was significantly lower than the mean for faculty who hold a bachelor degree ($M = 3.50$). Female faculty members who hold a bachelor degree had more confidence when using computers than faculty who hold a Ph.D. degree (see Table 24). There were no significant differences in computer confidence between the faculty members who hold a Ph.D. and faculty who hold a master's degree.

Computer liking. As shown in Table 24, a one-way ANOVA revealed that there were no statistically significant differences ($p = 0.350$) in female faculty members' computer liking based on the academic degree they obtained: faculty who hold a Ph.D. degree ($M = 3.01$), faculty who hold a master's degree ($M = 2.98$), and faculty who hold a bachelor degree ($M = 3.12$). The academic degree that female faculty members held did not appear to have an impact on faculty members' computer liking.

Computer usefulness. The one-way ANOVA revealed that there were statistically significant differences ($p = 0.044$) in female faculty members' computer usefulness based on the academic degree they obtained (see Table 24). The Scheffé post hoc test revealed that the mean for female faculty who hold a Ph.D. degree ($M = 3.39$) was significantly lower than the mean for faculty who hold a bachelor degree ($M = 3.54$) (see Table 24). Female faculty members who hold a bachelor degree had a higher degree of perceived computer usefulness than faculty who hold a Ph.D. degree. There were no significant

differences in computer usefulness between the faculty members who hold a Ph.D. degree and faculty who hold a master's degree.

Table 24

Analysis of Variance of Computer Attitude Scale by Academic Degree

	Academic Degree	*N*	Mean	*SD*	Std. Error	*F*	*P*
Total Attitude	Ph.D.	85	3.25	0.35	0.04		
	Master's	44	3.21	0.40	0.06		
	Bachelor	38	3.43	0.36	0.06		
	Total	167	3.28	0.37	0.03	4.166*	0.017
Anxiety	Ph.D.	96	3.26	0.46	0.05		
	Master's	45	3.17	0.47	0.07		
	Bachelor	39	3.44	0.48	0.08		
	Total	180	3.28	0.47	0.04	3.568*	0.030
Confidence	Ph.D.	97	3.25	0.41	0.04		
	Master's	46	3.29	0.48	0.07		
	Bachelor	39	3.50	0.42	0.07		
	Total	182	3.32	0.44	0.03	4.591*	0.011
Liking	Ph.D.	96	3.01	0.40	0.04		
	Master's	45	2.98	0.49	0.07		
	Bachelor	40	3.12	0.51	0.08		
	Total	181	3.03	0.45	0.03	1.056	0.350
Usefulness	Ph.D.	100	3.39	0.30	0.03		
	Master's	46	3.44	0.36	0.05		
	Bachelor	40	3.54	0.30	0.05		
	Total	186	3.44	0.32	0.02	3.183*	0.044

Note. * Indicates a statistically significant difference at the 0.05 level.

Computer Attitude Scale by Academic Rank

Total attitude. The one-way ANOVA revealed that there were no statistically significant differences ($p = 0.502$) in female faculty members' attitudes toward computers based on their academic rank: professor ($M = 3.24$), associate professor ($M = 3.33$), assistant professor ($M = 3.25$), lecturer ($M = 3.22$), and graduate assistant ($M = 3.36$). The academic rank that female faculty members held did not appear to make a significant difference in their attitudes toward computers (see Table 25).

Computer anxiety. The one-way ANOVA revealed that there were no statistically significant differences ($p = 0.501$) in female faculty members' computer anxiety based on the academic rank they held: professor ($M = 3.23$), associate professor ($M = 3.36$), assistant professor ($M = 3.27$), lecturer ($M = 3.19$), and graduate assistant ($M = 3.36$). The academic rank that female faculty members held did not appear to have an impact on computer anxiety (see Table 25).

Computer confidence. The one-way ANOVA revealed that there were no statistically significant differences ($p = 0.387$) in female faculty members' computer confidence based on the academic rank they held: professor ($M = 3.30$), associate professor ($M = 3.35$), assistant professor ($M = 3.25$), lecturer ($M = 3.32$), and graduate assistant ($M = 3.43$) as represented in Table 25. The academic rank that female faculty members held did not appear to make a statistically significant difference in computer confidence.

Table 25

Analysis of Variance of Computer Attitude Scale by Academic Rank

	Academic Rank	*N*	Mean	*SD*	Std. Error	*F*	*P*
Total Attitude	Professor	6	3.24	0.37	0.15		
	Associate Professor	13	3.33	0.28	0.08		
	Assistant Professor	59	3.25	0.36	0.05		
	Lecturer	37	3.22	0.40	0.07		
	Graduate Assistant	38	3.36	0.39	0.06		
	Total	153	3.28	0.37	0.03	0.839	0.502
Anxiety	Professor	8	3.23	0.46	0.16		
	Associate Professor	15	3.36	0.39	0.10		
	Assistant Professor	65	3.27	0.45	0.06		
	Lecturer	38	3.19	0.47	0.08		
	Graduate Assistant	39	3.36	0.48	0.08		
	Total	165	3.28	0.46	0.04	0.841	0.501
Confidence	Professor	8	3.30	0.29	0.10		
	Associate Professor	15	3.35	0.29	0.07		
	Assistant Professor	66	3.25	0.43	0.05		
	Lecturer	39	3.32	0.48	0.08		
	Graduate Assistant	39	3.43	0.47	0.08		
	Total	167	3.32	0.44	0.03	1.043	0.387
Liking	Professor	7	3.00	0.28	0.11		
	Associate Professor	14	3.10	0.33	0.09		
	Assistant Professor	68	3.00	0.40	0.05		
	Lecturer	38	2.98	0.46	0.07		
	Graduate Assistant	40	3.05	0.56	0.09		
	Total	167	3.01	0.44	0.03	0.281	0.890
Usefulness	Professor	9	3.42	0.41	0.14		
	Associate Professor	15	3.50	0.29	0.07		
	Assistant Professor	68	3.38	0.29	0.03		
	Lecturer	39	3.43	0.35	0.06		
	Graduate Assistant	40	3.49	0.32	0.05		
	Total	171	3.43	0.32	0.02	0.919	0.455

Computer liking. The one-way ANOVA revealed that there were no statistically significant differences ($p = 0.890$) in female faculty members' computer liking based on the academic rank they held: professor ($M = 3.00$), associate professor ($M = 3.10$), assistant professor ($M = 3.00$), lecturer ($M = 2.98$), and graduate assistant ($M = 3.05$) as shown in Table 25. The academic rank that female faculty members held did not appear to make a significant difference in computer liking.

Computer usefulness. As shown in Table 25, a one-way ANOVA revealed that there were no statistically significant differences ($p = 0.455$) in female faculty members' computer usefulness based on their academic rank: professor ($M = 3.42$), associate professor ($M = 3.50$), assistant professor (M=3.38), lecturer ($M = 3.43$), and graduate assistant ($M = 3.49$). The academic rank that female faculty members held did not appear to make a significant difference in computer usefulness.

Computer Attitude Scale by Access to a Computer at Home and Office

ANOVA has not been conducted on access to a computer at home because there were no two groups to be compared in which only one participant reported not having a computer at home, and one hundred ninety-five participants reported having a computer at home. However, a one way ANOVA was conducted to determine whether there were significant differences in female faculty members' attitudes (total attitude, computer anxiety, computer confidence, computer liking, and computer usefulness) toward computer technologies based on having access to a computer at the office.

Total attitude. The one-way ANOVA revealed that there were no statistically significant differences ($p = 0.063$) in attitudes toward computers between female faculty members who had access to a computer at the office ($M = 3.31$) and those who did not have access to a computer at the office ($M = 3.18$) (see Table 26). Access to a computer at the office did not appear to make a significant difference in female faculty members' attitudes toward computers.

Computer anxiety. The one-way ANOVA results revealed that statistically significant differences ($p = 0.009$) exist in computer anxiety between female faculty members who had access to a computer at office ($M = 3.33$) and those who did not have access ($M = 3.11$) as represented in Table 26. Female faculty members who had access to a computer at the office had less anxiety than faculty members who did not have a computer at the office.

Computer confidence. The one-way ANOVA revealed that there were no statistically significant differences ($p = 0.528$) in computer confidence between female faculty members who had access to a computer at the office ($M = 3.32$) and those who did not have access to a computer at the office ($M = 3.27$) (see Table 26). Access to a computer at the office did not appear to make a significant difference in faculty members' computer confidence.

Computer liking. The one-way ANOVA revealed that there were no statistically significant differences ($p = 0.075$) between female faculty members who had access to a computer at the office ($M = 3.06$) and those who did not have access to a computer at the

office ($M = 2.92$) on the computer liking subscale (see Table 26). Access to a computer at the office did not appear to have an impact on the participants' computer liking.

Table 26

Analysis of Variance of Computer Attitude Scale by Computer at Office

	Computer at Office	*N*	Mean	*SD*	Std. Error	*F*	*P*
Total Attitude	No	39	3.18	0.38	0.06		
	Yes	128	3.31	0.37	0.03		
	Total	167	3.28	0.38	0.03	3.506	0.063
Anxiety	No	41	3.11	0.49	0.08		
	Yes	138	3.33	0.46	0.04		
	Total	179	3.28	0.47	0.04	7.039*	0.009
Confidence	No	40	3.27	0.44	0.07		
	Yes	141	3.32	0.45	0.04		
	Total	181	3.31	0.45	0.03	0.400	0.528
Liking	No	42	2.92	0.45	0.07		
	Yes	138	3.06	0.45	0.04		
	Total	180	3.03	0.45	0.03	3.204	0.075
Usefulness	No	42	3.37	0.30	0.05		
	Yes	144	3.45	0.33	0.03		
	Total	186	3.43	0.32	0.02	2.118	0.147

Note. * Indicates a statistically significant difference at the 0.05 level.

Computer usefulness. The one-way ANOVA revealed that there were no statistically significant differences ($p = 0.147$) between female faculty members who had access to a computer at the office ($M = 3.45$) and those who did not have access to a computer at office ($M = 3.37$) on the computer usefulness subscale (see Table 26). Access

to a computer at the office did not appear to make a significant difference in faculty members' computer usefulness.

Computer Attitude Scale by Access to the Internet at Home

Total attitude. As shown in Table 27, a one-way ANOVA revealed that there were no statistically significant differences ($p = 0.464$) in attitudes toward computers between female faculty members who had access to the Internet at home ($M = 3.29$) and those who did not have access to the Internet at home ($M = 3.17$) on the. Access to the Internet at home did not appear to make a significant difference in female faculty members' attitudes toward computers.

Computer anxiety. The one-way ANOVA revealed that there were no statistically significant differences ($p = 0.700$) in computer anxiety between female faculty members who had access to the Internet at home ($M = 3.28$) and those who did not have access to the Internet at home ($M = 3.21$) as represented in Table 27. Access to the Internet at home did not appear to make a significant difference in faculty members' computer anxiety.

Computer confidence. As shown in Table 27, a one-way ANOVA results revealed that there were no statistically significant differences ($p = 0.270$) in computer confidence between female faculty members who had access to the Internet at home ($M = 3.32$) and those who did not have access to the Internet at home ($M = 3.12$). Access to the Internet at home did not appear to have an impact on faculty members' computer confidence.

Computer liking. The one-way ANOVA revealed that there were no statistically significant differences ($p = 0.499$) in computer liking between female faculty who had

access to the Internet at home ($M = 3.03$) and those who did not have access to the Internet at home ($M = 2.91$) as represented in Table 27. Access to the Internet at home did not appear to make a significant difference in faculty members' computer liking.

Table 27

Analysis of Variance of Computer Attitude Scale by Internet at Home

	Internet at Home	*N*	Mean	*SD*	Std. Error	*F*	*P*
Total Attitude	No	6	3.17	0.35	0.14		
	Yes	162	3.29	0.38	0.03		
	Total	168	3.28	0.38	0.03	0.539	0.464
Anxiety	No	7	3.21	0.34	0.13		
	Yes	173	3.28	0.48	0.04		
	Total	180	3.28	0.47	0.04	0.149	0.700
Confidence	No	6	3.12	0.44	0.18		
	Yes	176	3.32	0.45	0.03		
	Total	182	3.32	0.45	0.03	1.226	0.270
Liking	No	7	2.91	0.38	0.15		
	Yes	174	3.03	0.45	0.03		
	Total	181	3.03	0.45	0.03	0.458	0.499
Usefulness	No	7	3.29	0.40	0.15		
	Yes	180	3.44	0.32	0.02		
	Total	187	3.44	0.32	0.02	1.551	0.215

Computer usefulness. The one-way ANOVA revealed that there were no statistically significant differences ($p = 0.215$) in computer usefulness between female faculty who had access to the Internet at home ($M = 3.44$) and those who did not have

access to the Internet at home ($M = 3.29$) (see Table 27). Access to the Internet at home did not appear to make a significant difference in faculty members' computer usefulness.

Computer Attitude Scale by Access to the Internet at Office

Total attitude. As shown in Table 28, a one-way ANOVA revealed that statistically significant differences ($p = 0.049$) exist in attitudes toward computers between female faculty who had access to the Internet at the office ($M = 3.36$) and those who did not have access to Internet at the office ($M = 3.24$). Female faculty members who had access to the Internet at the office held more favorable attitudes toward computers than faculty members who did not have access to the Internet at the office.

Computer anxiety. The one-way ANOVA revealed statistically significant differences ($p = 0.037$) between female faculty who had access to the Internet at the office ($M = 3.38$) and those who did not have access ($M = 3.22$) on the computer anxiety subscale (see Table 28). Female faculty members who had access to the Internet at the office had less anxiety than faculty members who did not have access to the Internet at the office.

Computer confidence. The one-way ANOVA revealed that there were no statistically significant differences ($p = 0.200$) between female faculty who had access to the Internet at the office ($M = 3.38$) and those who did not have access to the Internet at the office ($M = 3.29$) on the computer confidence subscale (see Table 28). Access to the Internet at the office did not appear to have an impact on faculty members' computer confidence.

Computer liking. The one-way ANOVA revealed that there were no statistically significant differences ($p = 0.309$) in the computer liking between female faculty who had access to the Internet at the office ($M = 3.07$) and those who did not have access to the Internet at the office ($M = 3.00$) (see Table 28). Access to the Internet at the office did not appear to make a significant difference in faculty members' computer liking.

Table 28

Analysis of Variance of Computer Attitude Scale by Internet at Office

	Internet at Office	*N*	Mean	*SD*	Std. Error	*F*	*P*
Total Attitude	No	113	3.24	0.38	0.04		
	Yes	53	3.36	0.36	0.05		
	Total	166	3.28	0.38	0.03	3.933*	0.049
Anxiety	No	120	3.22	0.48	0.04		
	Yes	59	3.38	0.46	0.06		
	Total	179	3.27	0.48	0.04	4.429*	0.037
Confidence	No	120	3.29	0.44	0.04		
	Yes	60	3.38	0.43	0.06		
	Total	180	3.32	0.44	0.03	1.655	0.200
Liking	No	120	3.00	0.44	0.04		
	Yes	59	3.07	0.46	0.06		
	Total	179	3.02	0.45	0.03	1.041	0.309
Usefulness	No	123	3.41	0.32	0.03		
	Yes	61	3.50	0.33	0.04		
	Total	184	3.44	0.32	0.02	3.312	0.070

Note. * Indicates a statistically significant difference at the 0.05 level.

Computer usefulness. The one-way ANOVA revealed that there were no statistically significant differences ($p = 0.070$) between female faculty who had access to the Internet at the office ($M = 3.50$) and those who did not have access to the Internet at the office ($M = 3.41$) on the computer usefulness subscale (see Table 28). Access to the Internet at the office did not appear to make a significant difference in faculty members' computer usefulness.

Computer Attitude Scale by Faculty Computer Skill Level

Total attitude. The one-way ANOVA revealed that there were statistically significant differences ($p = 0.000$) in female faculty members' attitudes toward computers based on their computer skill level (see Table 29). A Scheffé post hoc test revealed that the mean for faculty who reported themselves as novice ($M = 2.79$) was significantly lower than the mean for faculty who reported themselves as proficient ($M = 3.16$) and faculty who reported themselves as very proficient ($M = 3.47$) on the total attitude computer scale. Also, the mean for faculty who reported themselves as proficient ($M = 3.16$) was significantly lower than the mean for faculty who reported themselves as very proficient ($M = 3.47$) as represented in Table 29. Female faculty members who perceived themselves as being very proficient when using computers held more favorable attitudes toward computers than faculty members who perceived themselves as being novice or proficient when using computer technologies.

Computer anxiety. As shown in Table 29, a one-way ANOVA revealed that there were statistically significant differences ($p = 0.000$) in the computer anxiety of female

faculty members based on their computer skill level. The Scheffé post hoc test indicated that the mean for faculty who reported themselves as novice ($M = 2.71$) was significantly lower than the mean for faculty who reported themselves as proficient ($M = 3.17$). Also, the mean for faculty who reported themselves as proficient ($M = 3.17$) was significantly lower than the mean for faculty who reported themselves as very proficient ($M = 3.46$) as represented in Table 29. Female faculty members who perceived themselves as being very proficient when using computers held less computer anxiety than faculty members who perceived themselves as being novice or proficient when using computer technologies.

Computer confidence. The one-way ANOVA revealed that there were statistically significant differences ($p = 0.000$) in female faculty members' computer confidence based on their computer skill level (see Table 29). A Scheffé post hoc test revealed that the mean for faculty who reported themselves as novice ($M = 2.67$) was significantly lower than the mean for faculty who reported themselves as proficient ($M = 3.14$). Also, the mean for faculty who reported themselves as proficient ($M = 3.14$) was significantly lower than the mean for faculty who reported themselves as very proficient ($M = 3.57$) (see Table 29). Female faculty members who perceived themselves as being very proficient when using computers have more confidence when using computers than faculty members who perceived themselves as being novice or proficient when using computer technologies.

Table 29

Analysis of Variance of Computer Attitude Scale by Computer Skill Level

	Skill Level	*N*	Mean	*SD*	Std. Error	*F*	*P*
Total Attitude	Novice	10	2.79	0.24	0.08		
	Proficient	80	3.16	0.36	0.04		
	Very Proficient	76	3.47	0.30	0.03		
	Total	166	3.28	0.38	0.03	30.237*	0.000
Anxiety	Novice	10	2.71	0.35	0.11		
	Proficient	88	3.17	0.48	0.05		
	Very Proficient	81	3.46	0.39	0.04		
	Total	179	3.28	0.48	0.04	17.918*	0.000
Confidence	Novice	10	2.67	0.28	0.09		
	Proficient	90	3.14	0.38	0.04		
	Very Proficient	81	3.57	0.35	0.04		
	Total	181	3.31	0.45	0.03	46.442*	0.000
Liking	Novice	10	2.63	0.31	0.10		
	Proficient	90	2.86	0.43	0.05		
	Very Proficient	80	3.25	0.37	0.04		
	Total	180	3.02	0.45	0.03	25.541*	0.000
Usefulness	Novice	10	3.13	0.28	0.09		
	Proficient	93	3.36	0.33	0.03		
	Very Proficient	82	3.54	0.28	0.03		
	Total	185	3.43	0.32	0.02	12.653*	0.000

Note. * Indicates a statistically significant difference at the 0.05 level.

Computer liking. As shown in Table 29, a one-way ANOVA revealed that there were statistically significant differences ($p = 0.000$) in female faculty members' computer liking based on their computer skill level. The Scheffé post hoc test revealed that the mean for faculty who reported themselves as novice ($M = 2.63$) was significantly lower than the mean for faculty who reported themselves as very proficient ($M = 3.25$). Also,

the mean for faculty who reported themselves as proficient ($M = 2.86$) was significantly lower than the mean for faculty who reported themselves as very proficient ($M = 3.25$) (see Table 29). Female faculty members who perceived themselves as being very proficient when using computers like the computers more than faculty members who perceived themselves as being novice or proficient when using computer technologies.

Computer usefulness. The one-way ANOVA revealed that there were statistically significant differences ($p = 0.000$) in female faculty members' computer usefulness based on faculty computer skill level (see Table 29). The Scheffé post hoc test showed that the mean for faculty who reported themselves as novice ($M = 3.13$) was significantly lower than the mean for faculty who reported themselves as very proficient ($M = 3.54$). Also, the mean for faculty who reported themselves as proficient ($M = 3.36$) was significantly lower than the mean for faculty who reported themselves as very proficient ($M = 3.54$) as shown in Table 29. Female faculty members who perceived themselves as being very proficient when using computers had a higher degree of perceived computer usefulness than faculty members who perceived themselves as being novice or proficient when using computer technologies.

Computer Attitude Scale by Faculty English Language Level

Total attitude. The one-way ANOVA revealed that there were statistically significant differences ($p = 0.001$) in female faculty members' attitudes toward computers based on their English language level (see Table 30). A Scheffé post hoc test revealed that the mean for faculty who reported their English level as weak ($M = 2.94$) was

significantly lower than the mean for faculty who reported their English level as excellent ($M = 3.39$) and faculty who reported their English level as very good ($M = 3.34$) on the total attitude computer scale (see Table 30). Female faculty members who perceived themselves as having excellent English language level held more favorable attitudes toward computers than faculty members who perceived themselves as having weak or very good English language level.

Computer anxiety. The one-way ANOVA revealed that there were significant differences ($p = 0.028$) in the computer anxiety of female faculty members' based on their English language level (see Table 30). However, a Scheffé post hoc test revealed that there were no statistically significant mean differences in computer anxiety among the faculty members whose English language levels were weak ($M = 2.98$), good ($M = 3.19$), very good ($M = 3.35$), and excellent ($M = 3.36$) as shown in Table 30.

Computer confidence. The one-way ANOVA revealed that there were statistically significant differences ($p = 0.000$) in female faculty members' computer confidence based on their English language level (see Table 30). A Scheffé post hoc test indicated that the mean for faculty who reported their English level as weak ($M = 2.87$) was significantly lower than the mean for faculty who reported their English level as excellent ($M = 3.44$) and faculty who reported their English level as very good ($M = 3.41$) on computer confidence (see Table 30). Female faculty members who perceived themselves as having excellent English language level have more confidence when using computers than faculty members who perceived themselves as having weak or very good English language level.

Computer liking. The one-way ANOVA revealed that there were statistically significant differences ($p = 0.007$) in female faculty members' computer liking based on their English language level (see Table 30). The Scheffé post hoc test showed that the mean for faculty who reported their English level as weak ($M = 2.71$) was significantly lower than the mean for faculty who reported their English level as very good ($M = 3.11$) on computer liking subscale (see Table 30). Female faculty members who perceived themselves as having excellent English language level like the computers more than faculty members who perceived themselves as having weak or very good English language level.

Computer usefulness. The one-way ANOVA revealed that there were statistically significant differences ($p = 0.010$) in female faculty members' computer usefulness based on their English language levels (see Table 30). However, a Scheffé post hoc test revealed that the mean differences in computer usefulness are not statistically significant based on English language levels: faculty whose English language levels were weak ($M = 3.25$), good ($M = 3.37$), very good ($M = 3.48$), and excellent ($M = 3.53$) as represented in Table 30.

Table 30

Analysis of Variance of Computer Attitude Scale by English Language Level

	English Level	*N*	Mean	*SD*	Std. Error	*F*	*P*
Total Attitude	Excellent	34	3.39	0.30	0.05		
	Very good	66	3.34	0.36	0.04		
	Good	58	3.21	0.37	0.05		
	Weak	10	2.94	0.47	0.15		
	Total	168	3.28	0.37	0.03	5.651*	0.001
Anxiety	Excellent	36	3.36	0.43	0.07		
	Very good	71	3.35	0.46	0.05		
	Good	63	3.19	0.48	0.06		
	Weak	10	2.98	0.61	0.19		
	Total	180	3.28	0.47	0.04	3.095*[a]	0.028
Confidence	Excellent	36	3.44	0.38	0.06		
	Very good	70	3.41	0.41	0.05		
	Good	66	3.21	0.44	0.05		
	Weak	10	2.87	0.55	0.17		
	Total	182	3.31	0.44	0.03	7.251*	0.000
Liking	Excellent	39	3.11	0.36	0.06		
	Very good	68	3.11	0.44	0.05		
	Good	64	2.94	0.48	0.06		
	Weak	11	2.71	0.45	0.14		
	Total	182	3.03	0.45	0.03	4.121*	0.007
Usefulness	Excellent	38	3.53	0.27	0.04		
	Very good	70	3.48	0.30	0.04		
	Good	67	3.37	0.35	0.04		
	Weak	11	3.25	0.38	0.11		
	Total	186	3.44	0.32	0.02	3.860*[a]	0.010

Note. * Indicates a statistically significant difference at the 0.05 level.
[a]The Scheffé post hoc test revealed that there were no significant mean differences among the groups.

Research Question 6

Are there statistically significant differences in female faculty members' use of computer technologies based on demographic characteristics such as age, years of teaching experience, years of computer technology experience, subject taught, academic rank held, highest degree earned, ownership of a computer at home and in the office, access to the Internet, computer skill level, and English language proficiency?

A one-way ANOVA was used to determine whether there were significant differences in female faculty members' use of computer technologies based on the demographic variables. When differences exist among the different groups, a Scheffé post hoc test was used to identify which group is significantly different from other groups.

Computer Technologies Use by Faculty Age

As shown in Table 31, a one-way revealed that there were statistically significant differences ($p = 0.012$) in female faculty members' use of computer technologies based on faculty members' age. A Scheffé post hoc test was used to determine which group was significantly different from other groups and it revealed that the mean of use of computer technologies for age group 30-39 ($M = 1.80$) was significantly lower than age group 20-29 ($M = 2.20$).

Female faculty members who were age 20-29 use computer technologies more than faculty members who were age 30-39. There were no statistically significant differences among the other groups on the mean of use of computer technologies. Female

faculty members' age appear to make significant differences in their use of computer technologies.

Table 31

Analysis of Variance of Faculty Use of Computer Technologies by Age

	Age	*N*	Mean	*SD*	Std. Error	*F*	*P*
Use of Computer Technologies	20-29	43	2.20	0.62	0.09		
	30-39	64	1.80	0.60	0.07		
	40-49	60	1.91	0.67	0.09		
	50 or more	12	1.74	0.73	0.21		
	Total	179	1.93	0.65	0.05	3.775*	0.012

Note. * Indicates a statistically significant difference at the 0.05 level.

Computer Technologies Use by Faculty with Teaching Experience

The one-way ANOVA revealed that there were statistically significant differences ($p = 0.005$) in the use of computer technologies of female faculty members based on faculty teaching experience at the collegiate level (see Table 32). The Scheffé post hoc test indicated that the mean of use of computer technologies for faculty who had more than 20 years teaching experience ($M = 1.71$) was significantly lower than the mean for faculty who had 5 years or less of teaching experience ($M = 2.15$).

Teaching experience at the collegiate level appears to have an impact on female faculty members' use of computer technologies in which young faculty who had less teaching experience tend to use more computer technologies than faculty who are older and had more teaching experience.

Table 32

Analysis of Variance of Faculty Use of Computer Technologies by Teaching Experience

	Teaching Experience	*N*	Mean	*SD*	Std. Error	*F*	*P*
Use of Computer Technologies	5 years or less	58	2.15	0.60	0.08		
	6-10 years	31	1.87	0.58	0.11		
	11-15 years	35	1.79	0.63	0.11		
	16-20 years	17	1.67	0.69	0.17		
	More than 20 years	34	1.71	0.68	0.12		
	Total	175	1.90	0.65	0.05	3.845*	0.005

Note. * Indicates a statistically significant difference at the 0.05 level.

Computer Technologies Use by Faculty with Computer Experience

The one-way ANOVA revealed that there were statistically significant differences ($p = 0.003$) in female faculty members' use of computer technologies based on their computer experience (see Table 33). The Scheffé post hoc test revealed that the mean of use of computer technologies for faculty who had 1-3 years experience with computer ($M = 1.56$) was significantly lower than the mean for faculty who had 6-10 years of experience with computer technologies ($M = 2.04$) and faculty who had more than 10 years of experience with computer technologies ($M = 2.09$) (see Table 33).

Female faculty members who had more experience with computer technology are using computer technologies more than faculty who had less experience with computer technologies. There were no significant differences in the use of computer technologies between the faculty members who had 1-3 years computer experience and those with no computer experience or less than one year.

Table 33

Analysis of Variance of Faculty Use of Computer Technologies by Computer Experience

	Computer Experience	*N*	Mean	*SD*	Std. Error	*F*	*P*
Use of Computer Technologies	No experience	5	1.48	0.21	0.09		
	Less than one year	6	1.73	0.97	0.40		
	1-3 years	31	1.56	0.64	0.12		
	5-4 years	24	1.89	0.61	0.12		
	6-10 years	63	2.04	0.64	0.08		
	More than 10 years	50	2.09	0.59	0.08		
	Total	179	1.93	0.65	0.05	3.810*	0.003

Note. * Indicates a statistically significant difference at the 0.05 level.

Computer Technologies Use by Subject Taught

As shown in Table 34, a one-way ANOVA revealed that there were statistically significant differences ($p = 0.000$) in female faculty members' use of computer technologies based on the subjects they taught. The Scheffé post hoc test indicated that the mean of use of computer technologies for faculty who teach computer ($M = 2.72$) is higher than the mean for faculty who teach Arabic language ($M = 1.62$), Islamic studies ($M = 1.41$), English language ($M = 1.71$), history ($M = 1.38$), and mathematics ($M = 1.67$) (see Table 34). Female faculty members who teach computer courses use computer technologies more than those who teach other courses such as Arabic language, Islamic studies, and mathematics.

Table 34

Analysis of Variance of Faculty Use of Computer Technologies by Subject Taught

	Subject	*N*	Mean	*SD*	Std. Error	*F*	*P*
Use of Computer Technologies	Arabic	8	1.62	0.60	0.21		
	Islamic Studies	11	1.41	0.57	0.17		
	English	19	1.71	0.54	0.12		
	History	12	1.38	0.41	0.12		
	Geography	6	1.92	0.94	0.38		
	Physics	15	2.20	0.47	0.12		
	Chemistry	17	2.12	0.62	0.15		
	Botany & Microbiology	11	2.20	0.61	0.18		
	Mathematics	23	1.67	0.59	0.12		
	Animal science	15	2.07	0.57	0.15		
	Computer	11	2.72	0.33	0.10		
	Kindergartens	3	1.87	1.04	0.60		
	Total	151	1.90	0.66	0.05	5.330*	0.000

Note. * Indicates a statistically significant difference at the 0.05 level.

Computer Technologies Use by Academic Degree

The one-way ANOVA revealed that there were significant differences ($p = 0.047$) in female faculty members' use of computer technologies based on the academic degree faculty obtained (see Table 35). However, the Scheffé post hoc test revealed that the mean differences are not significant among female faculty members who had a bachelor degree ($M = 2.15$), a master's degree ($M = 1.81$), and a Ph.D. degree ($M = 1.91$).

There were no statistically significant differences in the use of computer technologies between the faculty members who held a Ph.D. degree, master's, or

bachelor degree. Academic degree did not appear to make a significant difference in female faculty members' use of computer technologies.

Table 35

Analysis of Variance of Faculty Use of Computer Technologies by Academic Degree

	Academic Degree	*N*	Mean	*SD*	Std. Error	*F*	*P*
Use of Computer Technologies	Ph.D.	99	1.91	0.63	0.06		
	Master	43	1.81	0.58	0.09		
	Bachelor	39	2.15	0.71	0.11		
	Total	181	1.94	0.65	0.05	3.112*[a]	0.047

Note. * Indicates a statistically significant difference at the 0.05 level.
[a]The Scheffé post hoc test revealed that there were no significant mean differences among the groups.

Computer Technologies Use by Academic Rank

As shown in Table 36, a one-way ANOVA revealed that there were significant differences ($p = 0.009$) in female faculty members' use of computer technologies based on the academic degree faculty held. However, the Scheffé post hoc test indicated that the mean differences are not significant among female faculty members who are professors ($M = 2.33$), associate professors ($M = 2.02$), assistant professors ($M = 1.81$), lecturers (M=1.73), and graduate assistants ($M = 2.15$) as represented in Table 36.

There were no significant differences in female faculty members' use of computer technologies based on the academic rank that faculty held. Academic rank did not appear

to make a significant difference in female faculty members' use of computer technologies.

Table 36

Analysis of Variance of Faculty Use of Computer Technologies by Academic Rank

	Academic Rank	*N*	Mean	*SD*	Std. Error	*F*	*P*
Use of Computer Technologies	Professor	8	2.33	0.57	0.20		
	Associate Professor	15	2.02	0.56	0.14		
	Assistant Professor	69	1.81	0.67	0.08		
	Lecturer	36	1.73	0.53	0.09		
	Graduate Assistant	40	2.15	0.71	0.11		
	Total	168	1.92	0.65	0.05	3.470*[a]	0.009

Note. * Indicates a statistically significant difference at the 0.05 level.
[a]The Scheffé post hoc test revealed that there were no significant mean differences among the groups.

Computer Technologies Use by Access to a Computer at Home and Office

ANOVA has not been conducted on access to a computer at home because there were no two groups to be compared in which only one participant reported not having a computer at home, and one-hundred ninety five participants reported having a computer at home. However, a one way ANOVA was conducted to determine whether there were significant differences in female faculty members' use of computer technologies based on having access to a computer at the office.

The one-way ANOVA revealed that there were no statistically significant differences ($p = 0.470$) in the use of computer technologies between female faculty

members who had access to a computer at the office ($M = 1.95$) and those who did not have access to a computer at the office ($M = 1.87$) as represented in Table 37. Access to a computer at the office did not have an impact on female faculty members' use of computer technologies.

Table 37

Analysis of Variance of Faculty Use of Computer Technologies by Computer at Office

	Computer at Office	*N*	Mean	*SD*	Std. Error	*F*	*P*
Use of Computer Technologies	No	37	1.87	0.62	0.10		
	Yes	143	1.95	0.65	0.05		
	Total	180	1.94	0.65	0.05	0.524	0.470

Computer Technologies Use by Access to the Internet at Home and Office

As shown in Table 38, a one-way ANOVA revealed that statistically significant differences ($p = 0.015$) exist in the use of computer technologies between female faculty members who had access to the Internet at home ($M = 1.95$) and those who did not have access to the Internet at home ($M = 1.23$). Access to the Internet at home appears to have an impact on faculty members' use of computer technologies.

Table 38

Analysis of Variance of Faculty Use of Computer Technologies by Internet at Home

	Internet at Home	*N*	Mean	*SD*	Std. Error	*F*	*P*
Use of Computer Technologies	No	5	1.23	0.82	0.37		
	Yes	175	1.95	0.64	0.05		
	Total	180	1.93	0.65	0.05	6.048*	0.015

Note. * Indicates a statistically significant difference at the 0.05 level.

The one-way ANOVA revealed that there were no statistically significant differences ($p = 0.320$) in the use of computer technologies between female faculty members who had access to the Internet at the office ($M = 2.00$) and those who did not have access to the Internet at the office ($M = 1.89$) (see Table 39). Access to the Internet at the office did not appear to make a significant difference in faculty members' use of computer technologies.

Table 39

Analysis of Variance of Faculty Use of Computer Technologies by Internet at Office

	Internet at Office	*N*	Mean	*SD*	Std. Error	*F*	*P*
Use of Computer Technologies	No	117	1.89	0.67	0.06		
	Yes	61	2.00	0.62	0.08		
	Total	178	1.93	0.65	0.05	0.996	0.320

Computer Technologies Use by Faculty Based on Computer Skill Level

The one-way ANOVA revealed that there were statistically significant differences ($p = 0.000$) in female faculty members' use of computer technologies based on their computer skill level (see Table 40). A Scheffé post hoc test indicated that the mean of use of computer technologies for faculty who reported themselves as novice ($M = 0.98$) was significantly lower than the mean for faculty members who reported themselves as proficient ($M = 1.74$) and faculty who reported themselves as very proficient ($M = 2.27$) in the use of computer technologies. Also, the mean for faculty members who reported themselves as proficient ($M = 1.74$) was significantly lower than the mean for faculty who reported themselves as very proficient ($M = 2.27$) as shown in Table 40.

Female faculty members who perceived themselves as being very proficient when using computers use computer technologies more than faculty members who perceived themselves as being novice or proficient when using computer technologies.

Table 40

Analysis of Variance of Faculty Use of Computer Technologies by Computer Skill Level

	Computer Level	*N*	Mean	*SD*	Std. Error	*F*	*P*
Use of Computer Technologies	Novice	10	0.98	0.45	0.14		
	Proficient	96	1.74	0.59	0.06		
	Very Proficient	75	2.27	0.52	0.06		
	Total	181	1.92	0.65	0.05	33.568*	0.000

Note. * Indicates a statistically significant difference at the 0.05 level.

Computer Technologies Use by Faculty English Language Level

As shown in Table 41, a one-way ANOVA revealed that there were statistically significant differences ($p = 0.000$) in female faculty members' use of computer technologies based on their English language level. A Scheffé post hoc test showed that the mean of use of computer technologies for faculty who reported their English level as weak ($M = 1.27$) was significantly lower than the mean for faculty who reported their English level as excellent ($M = 2.08$) and faculty who reported their English level as very good ($M = 2.08$) as represent in Table 41.

Female faculty members who perceived themselves as having an excellent English language level are using computer technologies more than faculty members who perceived themselves as having weak or very good English language levels.

Table 41

Analysis of Variance of Faculty Use of Computer Technologies by English Language Level

	English Level	*N*	Mean	*SD*	Std. Error	*F*	*P*
Use of Computer Technologies	Excellent	39	2.08	0.57	0.09		
	Very Good	67	2.08	0.58	0.07		
	Good	66	1.80	0.66	0.08		
	Weak	9	1.27	0.73	0.24		
	Total	181	1.94	0.64	0.05	6.540*	0.000

Note. * Indicates a statistically significant difference at the 0.05 level.

Research Question 7

Which factors best predict female faculty members' attitudes toward using computer technologies?

A hierarchical multiple regression analysis was employed to determine the factors that best predict female faculty attitudes toward computers. The hierarchical regression was used because it shows the changes in the explained variance (R^2) as a new variable is entered while controlling for the other variables. The dependent variables in this analysis were the mean of the Computer Attitude Scale (CAS) and its four subscales. The independent variables were the twelve factors that limit female faculty use of computer technologies (see Appendix A, Part V of the survey, items 1-12). Also, statistically significant demographic variables were entered into the regression equations as control variables.

The regression analysis used seven dummy variables as control variables. These control variables were selected through three steps. First, seven demographic variables (i.e., age, years of computer technology experience, academic degree earned, access to a computer at office, access to the Internet at office, computer skill level, and English language proficiency) were selected because they have significant ANOVA effect on female faculty members' attitudes toward computers. Since these demographic variables are categorical, they were recoded into dummy variables. Age, which has four levels, was recoded into three dummy variables (20-29 = 1, else = 0; 30-39 = 1, else = 0; 40-49 = 1, else = 0). Years of computer technology experience, which has six levels, was recoded into five dummy variables (None = 1, else = 0; under 1 year = 1, else = 0; 1-3 years = 1,

else = 0; 4-5 years = 1, else = 0; 6-10 years = 1, else = 0). Academic degree earned, which has three levels, was recoded into two dummy variables (Ph.D. = 1, else = 0; Master = 1, else = 0). Access to a computer at the office, which has two levels, was recoded into one dummy variable (Yes = 1, else = 0). Access to the Internet at the office, which has two levels, was recoded into one dummy variable (Yes = 1, else = 0). Computer skill level, which has three levels, was recoded into two dummy variables (proficient = 1, else = 0; very proficient = 1, else = 0). English language proficiency, which has four levels, was recoded into three dummy variables (excellent = 1, else = 0; very good = 1, else = 0; good = 1, else = 0). Accordingly, the seven demographic variables were recoded into 17 dummy variables.

Second, the 17 dummy variables were entered simultaneously into the regression analysis as independent variables with each of the five dependent variables (i.e., CAS, computer anxiety subscale, computer confidence subscale, computer liking subscale, and computer usefulness subscale). When using a stepwise method, 7 out of 17 dummy variables were found statistically significant with the CAS or its four subscales. These dummy variables are: age “20-29”, experience with computer “less than a year”, access to a computer at the office, computer skill level “very proficient”, and English language level “good”. Lastly, these significant dummy variables were used in the regression analysis with their associated dependent variables (CAS, computer anxiety subscale, computer confidence subscale, computer liking subscale, and computer usefulness subscale).

All the variables used in the regression analysis were checked for normal distributions. Examining the skewness and kurtosis values of the variables reveals that the maximum statistic values of skewness and kurtosis among the variables are 1.27 and 1.01, respectively. According to Bachman (2004), "As a rule of thumb, values for skewness and kurtosis of between -2 and +2 indicate a reasonably normal distribution" (p. 74). Thus, all variables were considered to be reasonably normal distributed. Furthermore, the regression analyses were checked for multicollinearity by examining the variance inflation factor (VIF). According to Hair et al. (2006), large VIF values indicated high collinearity in which the common cutoff threshold is a VIF value of 10.0. The VIF was examined and it reveled that the maximum VIF value among the independent variables is 1.55. Therefore, multicollinearity among the independent variables is not a problem.

The hierarchical multiple regression analysis was conducted using two steps. In the first step, the demographic variables were entered simultaneously into the regression equation. In the second step, the independent variables were entered into the regression equation by using stepwise method. Stepwise method is helpful in eliminating none statistically significant independent variables. Also, the second step will help in examining the contribution of the retained independent variables to the regression model (Hair et al., 2006).

Table 42 presents two models (i.e., Model 1, and 2) of the hierarchical regression analysis. Model 1 showed that there was a significant relationship between each of the demographic variables (as control variables) and the mean of faculty members' attitudes

(as a dependent variable). Demographic variables were found to explain 35.4% of female faculty members' attitudes toward computers. While controlling the demographic variables, Model 2 revealed that reduced course quality (β = -0.282, $p \leq 0.001$, ΔR^2 = 0.075) has a significant negative relationship with female faculty members' attitudes toward computers in which reduced course quality explains 7.5% of faculty attitudes variance. This means that when female faculty members perceive that using computers reduce course quality, their attitudes toward computer technologies decrease.

Table 42

Hierarchical Regression Analysis for Variables Predicting Faculty Attitudes toward Computer Technologies

Dependent Variable: Total Attitude		
Independent Variable	Model 1 Beta	Model 2 Beta
Computer Skill Level – Very Proficient	0.347***	0.315***
Experience with Computer – Less than a Year	-0.320***	-0.322***
Access to Computer at Office	0.227***	0.166*
Age 20 – 29	0.164*	0.167**
Reduce Course Quality		-0.282***
R^2	0.354	0.429
Adjusted R^2	0.337	0.411
ΔR^2	0.354***	0.075***

N = 159, * $p \leq 0.05$, ** $p \leq 0.01$, *** $p \leq 0.001$

Table 43 presents two models (i.e., Model 1, and 2) of the hierarchical regression analysis. Model 1 showed that there was a significant relationship between each of the demographic variables (as control variables) and the mean of faculty members' computer

anxiety (as a dependent variable). Demographic variables were found to explain 27% of female faculty computer anxiety. While controlling the demographic variables, Model 2 revealed that reduced course quality, lack of collegial support, lack of time, and lack of self confidence have significant relationships with female faculty members' computer anxiety score. Those factors explain 16.5% ($\Delta R^2 = 0.165$) of faculty members' computer anxiety variance.

Table 43

Hierarchical Regression Analysis for Variables Predicting Faculty Computer Anxiety

Dependent Variable: Anxiety		
Independent Variable	Model 1 Beta	Model 2 Beta
Computer Skill Level – Very Proficient	0.245***	0.211***
Experience with Computer – Less than a Year	-0.342***	-0.361***
Access to Computer at Office	0.212**	0.165**
Reduce Course Quality		-0.159*
Lack of Collegial Support		0.244***
Lack of Time		-0.230***
Lack of Self Confidence		-0.232**
R^2	0.267	0.432
Adjusted R^2	0.254	0.407
ΔR^2	0.267***	0.165***

$N = 172$, $^{*}p \leq 0.05$, $^{**}p \leq 0.01$, $^{***}p \leq 0.001$

Specifically, reduced course quality ($\beta = -0.159$, $p \leq 0.05$) has a significant negative relationship with female faculty computer anxiety score (i.e., less computer anxiety) in which when female faculty members perceive that using computers reduce

course quality, their computer anxiety increase. Also, the results revealed that lack of collegial support ($\beta = 0.244$, $p \leq 0.001$) has a significant positive relationship with female faculty computer anxiety score (i.e., less computer anxiety) in which if lack of collegial support increases, computer anxiety will decrease. In other words computer anxiety would increase among female faculty if they have to depend on their colleagues support. Furthermore, lack of time ($\beta = -0.230$, $p \leq 0.001$) has a significant negative relationship with female faculty computer anxiety score (i.e., less computer anxiety) in which when female faculty members perceive that using computers in teaching requires more time, their computer anxiety increase. Also, lack of self confidence ($\beta = -0.232$, $p \leq 0.01$) has a significant negative relationship with female faculty computer anxiety score (i.e., less computer anxiety) in which when female faculty lack self confidence in using computer technologies, their computer anxiety increase.

Table 44 presents two models (i.e., Model 1, and 2) of the hierarchical regression analysis. Model 1 revealed that there was a significant relationship between each of the demographic variables (as control variables) and the mean of faculty members' computer confidence (as a dependent variable). Demographic variables were found to explain 40.2% of female faculty members' computer confidence. While controlling the demographic variables, Model 2 revealed that reduced course quality ($\beta = -0.196$, $p \leq 0.01$) and lack of self confidence ($\beta = -0.178$, $p \leq 0.01$) have significant negative relationships with female faculty members' computer confidence in which those factors explain 10.3% ($\Delta R^2 = 0.103$) of faculty members' computer confidence variance. The results revealed that when female faculty members perceive that using computers reduce

course quality, their computer confidence decrease. Also, when female faculty lack self confidence in using computer technologies, their computer confidence decrease.

Table 44

Hierarchical Regression Analysis for Variables Predicting Faculty Computer Confidence

Dependent Variable: Confidence		
Independent Variable	Model 1 Beta	Model 2 Beta
Computer Skill Level – Very Proficient	0.404***	0.396***
Experience with Computer – Less than a Year	-0.284***	-0.291***
Access to Computer at Office	0.130*	0.084
Age 20 – 29	0.195**	0.201***
English Language Level – Good	-0.133*	-0.117*
Reduce Course Quality		-0.196**
Lack of Self Confidence		-0.178**
R^2	0.402	0.505
Adjusted R^2	0.384	0.485
ΔR^2	0.402***	0.103***

$N = 172$, $^{*}p \leq 0.05$, $^{**}p \leq 0.01$, $^{***}p \leq 0.001$

Table 45 presents two models (i.e., Model 1, and 2) of the hierarchical regression analysis. Model 1 revealed that there was a significant relationship between each of the demographic variables (as control variables) and the mean of faculty members' computer liking (as a dependent variable). Demographic variables were found to explain 28% of female faculty members' computer liking. While controlling the demographic variables, Model 2 revealed that reduced course quality (β = -0.232, $p \leq 0.001$, $\Delta R^2 = 0.052$) has a significant negative relationship with female faculty computer liking in which it explains

5.2% of faculty computer liking variance. The results revealed that when female faculty members perceive that using computers reduce course quality, their computer liking decrease.

Table 45

Hierarchical Regression Analysis for Variables Predicting Faculty Computer Liking

Dependent Variable: Liking		
Independent Variable	Model 1 Beta	Model 2 Beta
Computer Skill Level – Very Proficient	0.369***	0.350***
Experience with Computer – Less than a Year	-0.244***	-0.261***
Access to Computer at Office	0.169*	0.127*
Reduce Course Quality		-0.232***
R^2	0.277	0.329
Adjusted R^2	0.264	0.313
ΔR^2	0.277***	0.052***

$N = 173$, * $p \leq 0.05$, ** $p \leq 0.01$, *** $p \leq 0.001$

Table 46 presents two models (i.e., Model 1, and 2) of the hierarchical regression analysis. Model 1 revealed that there was a significant relationship between each of the demographic variables (as control variables) and the mean of faculty members' computer usefulness (as a dependent variable). Demographic variables were found to explain 17% of female faculty members' computer usefulness. While controlling the demographic variables, Model 2 revealed that reduced course quality (β = -0.219, $p \leq 0.001$, ΔR^2 = 0.048) has a significant negative relationship with female faculty computer liking in which it explains 4.8% of faculty members' computer usefulness variance. The results

revealed that when female faculty members perceive that using computers reduce course quality, the degree of perceived computer usefulness decrease.

Table 46

Hierarchical Regression Analysis for Variables Predicting Faculty Computer Usefulness

Dependent Variable: Usefulness		
Independent Variable	Model 1 Beta	Model 2 Beta
Computer Skill Level – Very Proficient	0.206**	0.187**
Experience with Computer – Less than a Year	-0.298***	-0.309***
Reduce Course Quality		-0.219***
R^2	0.166	0.214
Adjusted R^2	0.157	0.201
ΔR^2	0.166***	0.048***

$N = 178$, $^{*}p \leq 0.05$, $^{**}p \leq 0.01$, $^{***}p \leq 0.001$

Summary of Results

The results of this study revealed that female faculty members had positive attitudes toward computers. Also, the results indicated that female faculty members had high levels of use of three common computer applications: e-mail, word processing, and Internet. The most frequent use of computer technologies reported by female faculty was for three professional activities: to access information and research on best practices for teaching, to do administrative record keeping, and to communicate with colleagues and/or other professionals. Furthermore, findings revealed that the barriers that limit faculty members' use of technology were lack of technical support, lack of effective

training, lack of equipment and infrastructure, lack of administrative support, increase workload for instructors, lack of time for learning about computer technologies, lack of software, and lack of designing interaction activities between instructors and students.

The results suggested that eight demographic variables had an influence on female faculty members' attitudes toward computers. Female faculty members' attitudes toward computers (i.e., total attitude, computer anxiety, computer confidence, computer liking, and computer usefulness) differ based on the years of experience with computer technologies and their computer skill levels. Age of female faculty had an impact only on faculty confidence when using computers. The subject that female faculty taught and faculty English language level had an influence on faculty total attitudes, computer confidence, and computer liking. Academic degree that female faculty obtained had an impact on their total attitudes toward computers, computer anxiety, computer confidence, and computer usefulness. Also, access to a computer at the office had an impact only on female faculty computer anxiety. Finally, access to the Internet at the office had an influence on female faculty members' total attitudes toward computers and computer anxiety.

The results indicated that seven demographic variables had an influence on female faculty members' use of computer technologies. Female faculty members' use of computer technologies differ based on age, teaching experience, years of experience with computer technologies, subject taught, access to the Internet at home, computer skill levels, and English language proficiency. Findings revealed that there were four factors that best predict female faculty members' attitudes toward computers (i.e., total attitude,

computer anxiety, computer confidence, computer liking, and computer usefulness).The factor that best predict female faculty members' total attitudes toward computers was reduced course quality. Factors that best predict female faculty members' computer anxiety were reduced course quality, lack of time, lack of collegial support, and lack of self confidence. Also, factors that best predict female faculty members' computer confidence were reduced course quality and lack of self confidence. The factor that best predict female faculty members' computer usefulness and liking was reduced course quality.

CHAPTER V

SUMMARY, DISCUSSION, CONCLUSIONS, AND RECOMMENDATIONS

Summary

The use of computer technologies is growing rapidly in higher education institutions in Saudi Arabia. Girls' colleges, among other higher education institutions, are being challenged to make effective use of computer technologies. Since female faculty members, in girls' colleges, play a critical role in making decisions regarding the use of computer technology in their classrooms, understanding female faculty attitudes toward computers and their use of computer technologies are crucial. Therefore, the purpose of this study was to examine female faculty members' use of computer technologies, their attitudes toward computers, and the barriers that limit their use of computer technologies in girls' colleges in Dammam and Jubail, Saudi Arabia. Also, this study examined how female faculty members' attitudes and use of computer technologies differ according to the personal and demographic characteristics of age, years of teaching experience, years of computer technology experience, subject taught, academic rank held, highest degree earned, ownership of a computer at home and in the office, access to the Internet, computer skill level, and English language proficiency.

The research design of this study was descriptive and causal-comparative. Data were analyzed by using different statistical methods including descriptive statistics, a one-way ANOVA, and multiple regression analysis. Descriptive statistics were used to describe female faculty members' attitudes toward using computer technologies, to determine the types of technology they use, to determine to what extent they use computer technologies for instructional purposes, and to determine the barriers that limit their use of computer technologies. A one-way ANOVA was used to examine how female faculty members' attitudes toward computers and the use of computer technologies differ according to the personal and demographic characteristics of age, years of teaching experience, years of computer technology experience, subject taught, academic rank held, highest degree earned, ownership of a computer at home and in the office, access to the Internet, computer skill level, and English language proficiency. A hierarchal multiple regression analysis was used to determine which factors best predict female faculty members' attitudes toward using computer technologies.

The participants completed a five-part survey instrument. Part I of the survey was designed to collect demographic data and background information. Part II, "Computer Attitudes Scale" (CAS) was designed to collect data that examined female faculty members' attitudes toward computers. Part III, "Degree of Computer Technologies Use" was designed to evaluate teachers' degree of computer technologies use. Part IV, "Extent of Computer Technologies Use" was designed to evaluate teachers' extent of computer technologies use in their professional activities. Part V, "Perceived Major Barriers that Limit the Use of Computer Technologies" was designed to identify the major barriers

that limit faculty members' use of computer technologies. Two hundred six female faculty members completed and returned the survey instrument of this study. Because of incomplete answers, only one hundred ninety-seven surveys were analyzed and used in this study.

Discussion

The results of this study revealed that most of the female faculty members (75.1%) were over the age of 30. Of the female faculty members, 64% have 6 years or more in teaching experience at the collegiate level. Also, 50.7% of female faculty members teach science courses and 29.9% teach liberal art courses.

This study addressed seven questions. The following is a discussion of the findings of the study for each research question. Descriptive statistics were used to provide the answers to research questions 1- 4. A one-way ANOVA was used to provide the answers to research questions 5-6. A hierarchical multiple regression analysis was used to provide the answer to research question 7.

Research Question 1

What are female faculty attitudes toward using computer technologies? The results of this study revealed that female faculty members have positive attitudes toward using computer technologies; the overall mean score of the total computer attitude scale was 3.28 out of 4. Also, the CAS subscales (computer anxiety, computer confidence, computer liking, and computer usefulness) mean scores were 3.28, 3.31, 3.03, and 3.44,

respectively that indicated positive attitudes toward using computer technologies. The positive attitudes that female faculty held toward using computers indicated that female faculty recognized the importance of using computer technologies. Specifically on the computer usefulness subscale, female faculty members scored a high mean of 3.44. This indicated a higher degree of perceived computer usefulness which may lead to more use of computer technologies. This is consistent with Steel and Hudson (2001) who noted that faculty members attempt to use technology because of the perceived added value that technology brings to their teaching and student learning in terms of flexibility, resource opportunities, and enhancement of learning.

The findings regarding female faculty members' positive attitudes toward using computer technologies were consistent with previous studies of Alzamil (2003), Al-Ghonaim (2005) and Alshehri (2005) who found that faculty members had positive attitudes toward technology and online instruction at Saudi Arabia.

Research Question 2

What types of computer technologies do female faculty members use in their instruction?

The results revealed low levels of computer technologies use by female faculty members in general. Specifically, the results revealed that the frequency of use of computer technologies was high only for four common computer technology applications being used daily by female faculty members: e-mail (65%), word processing (61.9%), computers in general (57.4%), and Internet browsers (58.9%). The respondents showed

moderate use for presentation programs and reference information on CD-ROM in which female faculty use range from daily to a few times a week. The researcher found that there is a gap between the mean scores of these common computer applications and the more complicated computer applications such as spreadsheet, image and drawing programs, and multimedia programs. Also, the majority of female faculty members reported that they never use the more complicated computer applications such as web page creation programs (68.5%) and 3-D design programs (78.2%). This means that female faculty members need more training on the different computer technologies to enhance the use of computer technologies in their instruction.

Theses findings support other researchers who found that most faculty members have the most experience with low-order technology such as word processing and older technologies (e.g., VCR, overhead projector), while having less experience with newer technologies (e.g., multimedia, distance education) (Brill & Galloway, 2007; Georgina & Olson, 2008; Groves & Zemel, 2000; Peluchette & Rust, 2005; Wozney et al., 2006). Also, the results are consistent with Almusalam (2001) who found that instructors in nine technical colleges in Saudi Arabia showed low levels of use and integration of computer technologies into professional tasks. He reported that the most frequently used applications were word processing, Internet, spreadsheets, and CD-ROM.

Although the results revealed that female faculty members showed low levels of computer technologies use in general, in the open ended question some of the respondents list other computer technologies that they used including computer language programs and computer application programs. The researcher believes that those

participants are considered high level users of computer technologies; they might be among the 42.6% who considered themselves very proficient when using computer technologies. Also, most of the computer programs that were listed were used by female faculty members who teach science courses such as mathematics, physics, computer, and chemistry.

Research Question 3

To what extent do female faculty members use computer technologies for instructional purposes?

The results of this study revealed that the frequency of female faculty members' use of computer technologies for professional activities was moderate in which the use of professional activities was between 1-2 times per month and less than 1-2 times per week. Findings showed that three professional activities represented the most frequent use by female faculty members: to access information and research on the best practices for teaching, to do administrative record keeping, and to communicate with colleagues and/or other professionals. Five of the participants reported, in the open ended question, that they use computer technologies for scientific research work and to gather information resources for research. The researcher noticed that those professional activities depend on using the common computer applications such as word processing and the Internet.

The findings also showed that three professional activities represented the least frequent use by female faculty members in which the highest percentages were reported

for being never used: to communicate with students outside of classroom hours, to post/share student work on the web, and to communicate with students' parents. The participants reported that they never use the complicated technology applications such as web page creation programs. Accordingly, posting student work on the web requires that female faculty members should be competent in using technology in order to use the complicated technology applications. Several researchers emphasize that an effective way to encourage faculty to use newer computer technologies in the classroom is to increase their level of competency (Dusick & Yildirim, 2000; Sahin & Thompson, 2006; Wozney et al., 2006). In fact, technology-related training plays a crucial role in developing teachers' competency with computer applications (Sahin & Thompson, 2006; Wozney et al., 2006).

The results of this study were opposite the results of Al-Alwani (2005) who found science teachers at Saudi Arabia have low use of instructional technology (IT) in which the frequency of use of IT by science teachers was low, about 1-2 times during a semester. However, the results are consistent with Al-Alwani (2005) regarding the least frequent use of IT for professional activities which were to communicate with students outside of classroom hours and to post/share student work on the web. Female faculty members' use of computer technologies for instructional purposes is found to be moderate because of some barriers that limit their use of computer technologies.

Research Question 4

What are the barriers that limit female faculty members' use of computer technologies?

The findings of this study revealed that there are different barriers that limit female faculty members' uses of computer technologies. Ertmer (1999) classified two types of barriers that may influence technology use and integration in the classroom: barriers that are extrinsic to teachers and barriers that are intrinsic to teachers. The results revealed that female faculty members did not encounter intrinsic barriers that limit their use of computer technologies, and this is clear in their positive attitudes toward using computer technologies. Also, the last three barriers of reduced course quality, lack of personal interest, and lack of self confidence were least identified by female faculty members as limiting their use of computer technologies. This means that most female faculty members are willing to use computer technologies in their instruction.

The barriers that were most identified by female faculty as limiting their use of computer technologies were extrinsic barriers including lack of technical support, lack of effective training, lack of equipment and infrastructure, lack of administrative support, increase workload for instructors, lack of time for learning about computer technologies, lack of software, lack of designing interaction activities between instructors and students, and lack of collegial support.

The most identified barrier that female faculty members reported limiting their use of computer technologies was lack of technical support with a mean of 4.04 out of 5. This result was consistent with other researchers who found that lack of technical support

is a significant barrier that limits the use of technology in teaching and learning (Al-Alwani, 2005; Alaugab, 2007; Al-Ghonaim, 2005; Sahin & Thompson, 2006). In this study, female faculty members reported that they use only the common technology applications, and this is due to the fact that 79.7% of them believe that lack of technical support limits their use of computer technologies. Also, in the open ended question, a participant reported that "lack of team work between faculty members and technicians limit their use of technologies". Similarly, Al-Alwani (2005) found that the limited availability of specialist trainers to train science teachers on the use of information technology hinders their use of information technology in their classrooms in Saudi Arabia.

Lack of effective training, lack of equipment and infrastructure, and lack of software were found also to be important barriers that limit female faculty members' use of computer technologies. Participants in this study reported that lack of update equipments (printers, laptops, and LCD projectors) and lack of access to computers and Internet at the office limit their use of computer technologies. These results were consistent with the studies of Alaugab (2007), Al-Ghonaim (2005), Almaraee (2003), and Almusalam (2001). To improve the use of technology, faculty professional development in technology use is vital (Bai & Lehman, 2003; Brinkerhoff, 2006). Also, there is a need to increase the numbers of updated technologies equipment in order to reach more effective levels of instructional technology applications in higher education institutions (Almusalam, 2001; Al-Musawi, 2007).

Lack of administrative support was found to be another important barrier affecting the use of computer technologies in girls' colleges. Many researchers have agreed with this finding (Almusalam, 2001; Alaugab, 2007; Rogers, 2000; Sahin & Thompson, 2006). For example, Almusalam (2001) found that administrative support is a significant predictor of integrating the computer technology into teaching activities by faculty members.

Increase workload for instructors and lack of time for learning about computer technologies are important barriers that limit female faculty members' use of computer technologies. Participants in this study reported that "limited time for lectures and the huge curriculum that faculty members should teach diminish their use of computer technologies". Also, the participants expressed a concern that the "large numbers of students which exceed 400 students in some classrooms make it hard to communicate with students by using technology", and that "using technology requires more time and effort than the traditional teaching method". These results were supported by Al-Alwani, (2005) and Almaraee (2003) who found that lack of time is an important factor affecting the utilization of computer technologies in Saudi Arabia. Similarly, Owen and Demb (2004) and Gustafson (2003-2004) found that faculty members feel that technology increases the work load and that many instructors did not want to learn how to use technology because of the time it requires.

Lack of designing interaction activities between instructors and students was found to limit female faculty use of computer technologies. Female faculty members need more training on how to use computer technologies effectively to enhance their

teaching. Brill and Galloway (2007) recommended that institutions should provide workshops that show how different technologies can positively influence certain practices in the classroom (e.g., presentation, interaction), so that instructors develop proficiency in selecting the most useful technologies that meet specific pedagogical goals.

Lack of collegial support was not found as a major barrier that limits female faculty members' use of computer technologies. This was not consistent with Roberts et al. (2007) and Sahin and Thompson (2007) who found that collegial support and interaction affects the utilization of computer technologies. This might be due to cultural and/or gender issues.

Research Question 5

Are there statistically significant differences in female faculty members' attitudes toward computer technologies based on demographic characteristics such as age, years of teaching experience, years of computer technology experience, subject taught, academic rank held, highest degree earned, ownership of a computer at home and in the office, access to the Internet, computer skill level, and English language proficiency?

An important remark before discussing this question pertains to the criterion used in data analysis. The following variables of teaching experience, subject taught, and English language proficiency was significant on the *F* value for the analysis of variance. However, when a Scheffé post hoc test was conducted for these variables, the results revealed no significant differences on three subscales: (a) female faculty members' computer confidence based on teaching experience, and (b) female faculty members'

computer anxiety based on subject taught and English language proficiency, and (c) computer usefulness based on subject taught and English language proficiency. This indicated that the effect size for the analysis of variance for these variables was small. The researcher used the Scheffé test because it is very conservative, has more control for Type I error, and more robust than other post hoc tests such as LSD test (Gay & Airasian, 2003).

Age of female faculty members was found to have an impact on faculty confidence when using computers. Younger faculty members have more computer confidence than older faculty members. However, there were no statistically significant differences among the age groups on total attitude toward computers, anxiety toward computers, computer liking, and computer usefulness. This result is supported by Al-Ghonaim (2005) and Alshehri (2005) who found that age of faculty members have impact on their attitudes toward online instruction in Saudi Arabia. The researcher found that younger instructors had more positive attitudes toward online instruction than older instructors who had lower positive attitudes.

Teaching experience at the collegiate level did not appear to make a significant difference in female faculty members' attitudes toward computers, computer anxiety, computer confidence, computer liking, or computer usefulness. This finding is not consistent with Alshehri (2005) who found that years of teaching experience of faculty members have an impact on their attitudes toward implementing online courses. Also, this finding is not consistent with Alaugab (2007) who found that teaching experience negatively correlated with the faculty's overall attitudes toward online instruction at

Saudi Arabia. He found that as the number of years of teaching experience increased, a positive attitude toward online instruction decreased.

Years of experience with computer technology was found to demonstrate significant differences. That is, female faculty members who had more experience with computer technologies have more favorable attitudes toward computers, less computer anxiety, higher computer confidence, higher computer liking, and higher degree of perceived computer usefulness than faculty members who had less experience with computer technologies. Therefore, increasing female faculty computer competency will lead to more positive attitudes toward using computer technologies. This finding is consistent with Almusalam (2001) who found that faculty members with higher levels of computer experience reported higher levels of confidence in using computer technologies. Similar findings, also, were reported by Al-Ghonaim (2005) and Alshehri (2005) who found that instructors' experience with information technology had a significant relationship with a positive attitude; instructors with a high experience level have a more positive attitude toward the implementation of online instruction than those with a low experience level. However, this finding differs from that of Alzamil (2003) who found that there were no significant differences in high school social studies teachers' attitudes toward using instructional technology between the more experienced teachers and the less experienced teachers, and he reported that both have highly positive attitudes toward the use of instructional technology.

The subject that female faculty members taught had an influence on their attitudes toward computers, computer confidence, and computer liking. There were no significant

differences among female faculty members by subject taught on computer anxiety, or computer usefulness. The results revealed that female faculty members who taught computer courses held more favorable attitudes toward computers and higher computer liking than those who taught Arabic language courses. Also, female faculty members who taught computer courses had more computer confidence than those who taught Arabic language and history. This finding is consistent with Al-Ghonaim (2005) who reported that instructors' major affect their attitudes toward online instruction in Saudi Arabia.

The academic degree that female faculty members obtained had an impact on their attitudes toward computers, computer anxiety, computer confidence, and computer usefulness. Female faculty members who held a bachelor degree had more favorable attitudes toward computers, less computer anxiety, higher computer confidence, and a higher degree of perceived computer usefulness than faculty members who held a Ph.D degree. There was no significant evidence that there are differences among female faculty members' computer liking based on the academic degree obtained.

The academic rank that female faculty members held did not appear to make a significant difference in their attitudes toward computers, computer anxiety, computer confidence, computer liking, or computer usefulness. This finding differs from that of Alshehri (2005) who found that the academic ranks of faculty members have an impact on their attitudes toward implementing online courses at Saudi Arabia.

Although the results revealed that access to a computer at the office had an impact on female faculty members' computer anxiety, there were no statistically significant differences between the two groups in terms of ownership of a computer at the office on

the total attitudes toward computers, computer confidence, or computer usefulness. Female faculty members who had access to a computer at the office had less computer anxiety than faculty members who did not have a computer at the office

Access to the Internet at home did not appear to have an impact on faculty members' attitudes toward computers, anxiety toward computer, computer confidence, computer liking, or computer usefulness. However, access to the Internet at the office had an influence on female faculty members' total attitudes toward computers and computer anxiety. Female faculty members who had access to the Internet at the office held more favorable attitudes toward using computer technologies and less computer anxiety than faculty members who did not have access to the Internet at the office. One possible reason for this finding may be due to cultural issues. Female faculty members have a lot of duties at home due to living in large families; thus, having access to a computer and Internet at the office will facilitate female faculty work on computers within the working hours at girls' colleges. Lack of access to a computer and Internet at the office will negatively influence female faculty members' attitudes toward computers. There were no statistically significant differences between the two groups in terms of access to the Internet at the office on computer confidence, computer liking, or computer usefulness.

Computer skill level was found to demonstrate significant differences in female faculty members' attitudes toward computers, computer anxiety, computer confidence, computer liking, and computer usefulness. Female faculty members who perceived themselves as being very proficient when using computer technologies held more favorable attitudes toward computers, less computer anxiety, higher computer

confidence, higher computer liking, and a higher degree of perceived computer usefulness than faculty members who perceived themselves as being novice or proficient when using computer technologies. The results are consistent with Almusalam (2001) who found that faculty members with higher levels of computer experience reported higher levels of confidence in using computer technologies.

Female faculty English language proficiency had an influence on faculty members' attitudes toward computers, computer confidence, and computer liking. However, there were no statistically significant differences among female faculty members by their English language proficiency on computer anxiety and computer usefulness subscales. Female faculty members who perceived themselves as having excellent English language skills have more favorable attitudes toward computers, higher confidence, and higher computer liking than faculty members who perceived themselves as having weak or very good English language skills. This finding is consistent with Alaugab (2007) who found that students who have better English language skills had more positive attitudes toward online instruction. Therefore, enhancing female faculty members' English language proficiency and at the same time creating more Arabic educational websites will increase female faculty members' positive attitudes toward using computer technologies.

Research Question 6

Are there statistically significant differences in female faculty members' use of computer technologies based on demographic characteristics such as age, years of

teaching experience, years of computer technology experience, subject taught, academic rank held, highest degree earned, ownership of a computer at home and in the office, access to the Internet, computer skill level, and English language proficiency?

An important remark before discussing this question pertains to the criterion used in data analysis. The following variables of academic degree and academic rank were significant on the *F* value for the analysis of variance. However, when Scheffe post hoc test was conducted the results revealed no significant differences in female faculty members' use of computer technologies based on these two variables. This indicated that the effect size for the analysis of variance for these variables was small. The researcher used the Scheffé test because it is very conservative, has more control for Type I error, and more robust than other post hoc tests such as LSD test (Gay & Airasian, 2003).

Female faculty members' age appear to make significant differences in their use of computer technologies in which younger female faculty members use computer technologies more than older faculty members. This finding is consistent with Lamboy and Bucker (2003) who found that age demonstrates a significant negative relationship with computer skills in which older faculty members need more education and training to use computers successfully than younger faculty. Similar findings were reported by Xu and Meyer (2007) and Ahadiat (2008) who found that younger faculty use e-mail and the web more than older faculty, and that younger faculty members were more comfortable with using technology as tool to enhance their teaching and research.

Teaching experience at the collegiate level appears to have an impact on female faculty members' use of computer technologies in which younger faculty members who

had less teaching experience tend to use more computer technologies than faculty who are older and had more teaching experience. This finding is consistent with Lamboy and Bucker (2003) and Ahadiat (2008) who found that years of teaching have a negative relationship with technology use in that faculty members with more teaching experience tend to use less technology tools than those with less teaching experience.

Female faculty members who had more experience with computer technology are using computer technologies more than faculty who had less experience with computer technologies. This means that computer experience play an important role in increasing female faculty members' use of computer technologies. This result is consistent with Sahin and Thompson (2006) who found that computer experience is an important factor influencing faculty members' use of computer technologies. The authors explained that if faculty members do not have enough experience in computer use, they can not be expected to adopt computer technologies in their instruction. Similar finding was also reported by Almusalam (2001) who found that there was a significant positive relationship between computer experience and instructors' level of computer use in which faculty with the greater computer experience use computer technologies more frequently.

Subjects taught by female faculty members appear to have an impact on their use of computer technologies. Female faculty members who teach computer courses use computer technologies more than those who teach other courses such as Arabic language, Islamic studies, and mathematics. In the open ended question, female faculty members reported different computer programs that were used for mathematics, physics, and

chemistry courses. Also, some participants commented that Arabic and Islamic studies depend more on the traditional teaching method than using technology. In general, female faculty members who teach science courses were found to use computer technologies more than faculty members who teach liberal art courses. This finding is consistent with Lamboy and Bucker (2003) who found that faculty members in the Science Technology and Business departments scored higher in technical skills than those in the Liberal Arts departments.

Academic degree did not appear to make a significant difference in female faculty members' use of computer technologies. There were no statistically significant differences in the use of computer technologies between the faculty members who held Ph.D. degrees, masters', or bachelors' degrees. This finding is not consistent with Almusalam (2001) who found that the highest academic degree obtained has a positive relationship with instructors' use of technology in that instructors with doctorates or master degrees use computer technologies more frequently. Al-Musawi (2007) found, in his study, that Ph.D. degree holders were better able to use instructional software which is inconsistent with the results of the researcher's study.

Academic rank did not appear to make a significant difference in female faculty members' use of computer technologies. This finding is not consistent with Xu and Meyer (2007) who reported that higher academic ranks and education level strongly correlated with using more technology for research. Also, Ahadiat (2008) found that faculty members with higher academic ranks attempted to use technology for research more frequently than faculty with lower ranks.

Access to a computer at the office did not have an impact on female faculty members' use of computer technologies. This is a surprising finding because access to a computer has been found a major influence on the low levels of computer technologies use (Dusick & Yildirim, 2000; Sahin & Thompson, 2006). One possible reason for this fining is that most female faculty members have limited use of a computer at the office because of the lack of time due to their busy schedules at the colleges. This finding is not consistent with Sahin and Thompson (2006) who found that computer access correlated significantly with the level of computer use and is an important factor that influences the use of computers for instructional purposes in that having a computer will increase overall use of computer technology.

Access to the Internet at home appears to have an impact on faculty members' use of computer technologies. This result is consistent with Xu and Meyer (2007) who found that Internet access is a significant factor related to faculty technology use in teaching. They indicated that having convenient Internet access significantly contributed to faculty use. However, access to the Internet at the office did not appear to make a significant difference in faculty members' use of computer technologies. One possible reason for this finding is that most female faculty members are not using the Internet at the office because of lack of technical support at the colleges, and this lack has been identified as a significant barrier that limit their use of technologies.

Female faculty members who are very proficient in using computer technologies use computer technologies more than novice or proficient faculty members. These findings are consistent with Wozney et al. (2006) who reported that computer

competency and previous computer training are significant predictors of whether faculty members used computer technology for instructional purposes.

Female faculty members who perceived themselves as having excellent English language skills are using computer technologies more than faculty members who perceived themselves as having weak or very good English language skills. This result is supported by the findings of Almaraee (2003) who found that 80% of faculty felt that the lack of English language skills present an obstacle in effectively using the Internet in their teaching. Similar findings were reported by Al-Kahtani (2006) who reported that Saudi female faculty members indicated that lack of skills in the English language limit their use of the Internet technology for research. She concluded that most of the sources on the Internet are in English; therefore, Saudi female faculty should improve their proficiency in the English language. Furthermore, this could be solved by creating more Arabic educational websites to increase female faculty members' use of computer technologies.

Research Question 7

Which factors best predict female faculty members' attitudes toward using computer technologies?

Findings revealed that there were four factors that best predict female faculty members' attitudes toward the use of computer technologies (i.e., total attitude, computer anxiety, computer confidence, computer liking, and computer usefulness). The factor that best predicted female faculty members' total attitudes toward using computer

technologies was reduced course quality. Reduced course quality has a significant negative relationship with female faculty members' attitudes toward computers. This means that when female faculty members perceive that using computer technologies reduce course quality, their attitudes toward using computer technologies decrease. This finding is consistent with Steel and Hudson (2001) who reported that faculty members attempt to use technology because of the perceived added value that technology brings to their teaching and student learning. However in this study, female faculty members did not consider reduced course quality as a significant barrier, and this is reflected in their high positive attitudes toward computer technologies, especially on the computer usefulness subscale. This indicated that female faculty members perceive that using computer technologies enhances the course quality.

Factors that best predicted female faculty members' computer anxiety were reduced course quality, lack of time for learning about computer technologies, lack of collegial support, and lack of self confidence. Reduced course quality has a significant negative relationship with female faculty computer anxiety score (i.e., less computer anxiety) in which when female faculty members perceive that using computers reduce course quality, their computer anxiety increase.

The results also revealed that lack of collegial support has a significant positive relationship with female faculty computer anxiety score (i.e., less computer anxiety) in which if lack of collegial support increases, computer anxiety will decrease. This means that computer anxiety would increase among female faculty if they have to depend on their colleagues support. This may be due to cultural issues. In this study, the results

revealed that lack of collegial support was not a key barrier because it was ranked as the ninth among the twelve barriers that limit female faculty members' use of computer technologies. It is clear that female faculty members' attitudes toward using computer technologies will be enhanced if their use of computer technologies will not depend on collegial support. This finding is not consistent with Sahin and Thompson's (2007) who found that collegial interaction was a significant predictor of the technology adoption level of faculty. Thus, emphasizing faculty team work during technology training workshops may enhance the positive perception of collegial interaction and support.

Furthermore, lack of time for learning about computer technologies and lack of self-confidence have significant negative relationships with female faculty computer anxiety score (i.e., less computer anxiety). This means that if female faculty members perceive that using computers in teaching requires more time and/or they lack self confidence in using computer technologies, their computer anxiety increase. Providing female faculty members with time to work and learn about technology during working hours and/or increasing their computer confidence will decrease their computer anxiety. This result is supported by the findings of Hong and Koh (2002) who found that many teachers had computer anxiety because of lack of technical skills for working with computer hardware. Rogers (2000) recommended that teachers need time to develop new course materials, time to learn new skills, and time to adjust their attitudes toward the role technology holds in teaching and learning.

Factors that best predicted female faculty members' computer confidence were reduced course quality and lack of self confidence. Reduced course quality and lack of

self confidence have significant negative relationships with female faculty members' computer confidence. This means that if female faculty members perceive that using computers reduce course quality, their computer confidence decrease. Also, if female faculty members lack self confidence in using computer technologies, their computer confidence decreases. This finding is consistent with Dunlap (as cited in Saleh, 2008) who found that without positive attitudes and computer self-efficacy, faculty members are less likely increase their use of technology or consider the integration of technology into their instruction.

The factor that best predicted female faculty members' computer liking and usefulness was reduced course quality. Reduced course quality has a significant negative relationship with female faculty computer liking and computer usefulness. This means that if female faculty members perceive that using computers reduce course quality, their computer liking and the degree of perceived computer usefulness decrease. This finding is consistent with Sahin (2008) who found that raising faculty members' awareness of the positive consequences of educational technology will increase their interest and willingness to learn and use technology. Thus, female faculty members understanding of the benefits of computer technologies will lead to more positive attitudes toward using computer technologies in terms of computer liking and usefulness.

Conclusions of the Study

Computer technologies have become important educational tools in higher education institutions in Saudi Arabia. However, the value of these tools depends on how effectively faculty members might use computer technologies to support their teaching. To better understand the use of computer technologies in girls' colleges, this study examined female faculty members' use of computer technologies, their attitudes toward using computer technologies, and the barriers that limit their use of technology.

According to the findings of this study, female faculty members showed positive attitudes toward using computers. The positive attitudes that female faculty have toward using computer technologies indicated that female faculty members recognized the importance of using computer technologies. However, the results of this study also revealed that female faculty members have low levels of computer technologies use in general. It was found that female faculty members use low-order technology such as word processing, Internet, and e-mail. These results indicated that there are different barriers that limit female faculty members' use of computer technologies.

According to the findings of this study, female faculty members are facing significant barriers that limit their use of computer technologies. Most of faculty (63%) had over 6 years of computer experience; thus, there is potential to increase female faculty members' use of computer technologies. To encourage female faculty members' use of computer technologies, barriers that limit their use of computer technologies should be removed. The barriers that were most identified by female faculty as limiting their use of computer technologies were lack of technical support, lack of effective

training, lack of equipment and infrastructure, and lack of administrative support. Using the newer technologies requires that female faculty members have technical and administrative support, be well trained on how to use different computer technologies, and have access to up-to-date technology. The findings of this study should assist administrators in girls' colleges in understanding that female faculty members are willing to use computer technologies and this is clear in their positive attitudes toward computers, yet significant barriers should be removed to encourage female faculty members' use of computer technologies.

According to the findings in this study, female faculty members rank lack of technical support as the first barrier that limits their use of computer technologies. If female faculty members are expected to use computer technologies, girls' colleges need to have technicians who have appropriate skills and are available when needed by faculty members in order to improve female faculty members' use of computer technologies. Providing the infrastructure and equipments will not be enough without having technicians who can follow up on technology problems. At the same time, equipments will not be used to its full potential unless female faculty members have proper training on how to use these computer technologies to enrich their teaching. Therefore, administrators should organize faculty training programs that will lead to increasing female faculty members' knowledge, skills, and use of computer technologies.

According to the findings in this study, several demographic and personal characteristics have an impact on female faculty members' attitudes toward using computer technologies and their use of computer technologies. The differences in female

faculty members' attitudes and use of computer technologies based on the demographic variables implied that technology training should be suitable for all different groups' needs to increase their positive attitudes and use of computer technologies. Technology training workshops should range from exploring the basics of computers for those with little or no prior technology experience to advance technology workshops to those who are highly experienced computer users.

The findings revealed that the factor that most predict female faculty members' attitudes toward computers was reduced course quality. However, in this study, female faculty members showed a higher degree of perceived computer usefulness. In conclusion, girls' colleges at King Faisal University need to be aware of the significant barriers that were found in this study, if they want to enhance female faculty use of computer technologies. Administrators will have to consider the importance of providing effective training, and infrastructure and equipment, and increasing technical and administrative support to improve female faculty use of computer technologies.

Recommendations

Recommendations for Girls' Colleges

Based on the results of this study, several recommendations are presented for enhancing female faculty members' use of technology:

1. The results revealed that female faculty members have low levels of computer technologies use. Therefore, King Faisal University should provide up-to-date

technology training programs on a regular basis for female faculty members on how to effectively use computer technologies for instruction, communication, and research. Technology training workshops should range from exploring the basics of computers for those with little or no prior technology experience to advance technology workshops to those who are highly experienced computer users. Also, during the collection of the data, the researcher noticed that some female faculty members have limited information about the effective use of computer technologies for instructional purposes in which faculty members limited the use of technologies to power point presentations. Therefore, training workshops should not only focus on increasing computer skills, but also demonstrate how female faculty members could integrate different computer technologies into their teaching.

2. The results of this study revealed that lack of technical support was the most significant barrier that limits female faculty members' use of computer technologies. Therefore, it is recommended to establish a technology support services unit at girls' colleges to support female faculty members in the use of computer technologies.
3. King Faisal University should provide infrastructure, equipments, and software at girls' colleges to enhance female faculty members' use of technology because without available resources computer technologies will not be used. Also, female faculty members should have access to computers and Internet in their offices to increase their use of computer technologies.

4. The results of this study revealed that lack of time for learning about computer technologies was a significant barrier that limits female faculty use of computer technologies; therefore, female faculty members should have release time for training.
5. In this study, lack of collegial support was not found to be a major barrier. Further analysis revealed that lack of collegial support predicts female faculty members' attitudes (computer anxiety) toward computer technologies. Female faculty members' attitudes toward using computer technologies will be enhanced if their use of computer technologies does not depend on collegial support. This is an unexpected result and may be related to cultural and/or gender issues. Therefore, it is recommended that administrators at girls' colleges provide programs that focus on changing such negative perceptions toward collegial support in order to enhance the use of computer technologies at girls' colleges.
6. It is recommended that faculty professional development should include presenting successful experiences in other colleges and universities of how to integrate technology in teaching and learning to encourage female faculty members to use computer technologies in their teaching.

Recommendations for Future Research

Several recommendations are made for future research based on the findings of this research:

1. This study only examined the factors that best predict female faculty members' attitudes toward using computer technologies; future research could be conducted to investigate the factors that best predict female faculty members' use of computer technologies.
2. Based on the written comments from some respondents in this study that their preference is to use the traditional teaching method, future research may examine female faculty members' beliefs about teaching and learning when using computer technologies and whether their beliefs influence their use of technology.
3. Based on previous studies and literature, collegial support is an important factor that positively influences faculty members' use of technology. However, the results of this study revealed that lack of collegial support is negatively associated with female faculty members' attitudes toward computers which indirectly influence the use of technology. This may be due to cultural and/or gender issues. Future research should investigate female faculty members' perception toward collegial support and how such perception influences the use of technology.
4. Future studies may employ a mixed-method approach including both quantitative and qualitative data to provide more insights into female faculty members' use of computer technologies.

5. Based on the written comments from respondents in this study that most students lack personal interest to use technology, future research may examine students' attitudes toward computer technologies and examine the factors that best predict their attitudes toward computer technologies.
6. Future research may examine the influence of computer technologies use for instructional purposes on student learning and performance.
7. This study could be replicated at other academic sites at Saudi Arabia. Replication at other sites would enhance the generaliziability of this research.

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APPENDIX A

THE SURVEY INSTRUMENT (ENGLISH VERSION)

March xx, 2009

Dear Participant:

I am a doctoral candidate in the department of Instructional Systems and Workforce Development at Mississippi State University. I am conducting a research study that is designed to examine female faculty members' use of computer technologies, their attitudes toward computers and the barriers that limit their use of technology. The results of this study will benefit faculty by making them aware of the current state of their use of computer technologies. Also, the results of this study will help administrators in their future planning for faculty training and development, especially in the area of computer technologies.

The Institutional Review Board (IRB) at Mississippi State University has approved this study. If you have any questions about your rights as a research subject in this study, you may contact the Office for Regulatory Compliance at Mississippi State University at 662-325-5220 or via e-mail at irb@research.msstate.edu.

The population for this study is 382 faculty members from 3 girl's colleges in Saudi Arabia. Therefore, you were selected to participate in this study. I realize that your time is valuable, but without your assistance this research study cannot be completed. Your responses to the survey will take approximately 15-20 minutes of your time. Your participation in this study is strictly voluntary and you may withdraw at any time or refuse to answer any specific question you do not wish to answer. Your responses will be kept completely confidential and the results will be summarized along with others who respond to the survey.

I respectfully request that you complete the survey, seal the survey in the envelope enclosed, and drop it in the locked drop-off box in the deans' office by March xx, 2009. I will personally collect the surveys from the locked drop-off box. No one else will have access to your surveys. If you have any questions about this study, please contact me at muqayteeb@yahoo.com, or my advisor Dr. Linda Cornelious at LCornelious@colled.msstate.edu. Thanking you in advance for your cooperation. Your time and assistance are greatly appreciated.

Sincerely,

Taghreed Almuqayteeb
Doctoral Candidate
Mississippi State University

MSU IRB
Approved: 3/10/09
Expires: —/—/—

Survey of Faculty Use, Barriers, and Attitudes toward Computer Technologies

Part I: Demographic Information:

For each of the following questions, please CHECK the item that best applies to you:

1. Age:

☐ 20-29 ☐ 30-39 ☐ 40-49 ☐ 50-59 ☐ 60 or more

2. Number of years in teaching experience at the collegiate level:

☐ 5-years or less

☐ 6–10 years

☐ 11–15 years

☐ 16–20 years

☐ More than 20 years

3. Number of years of experience with computer technology:

☐ None

☐ Under 1 year

☐ 1-3 years

☐ 4-5 years

☐ 6-10 years

☐ Over 10 years, Please specify_____

4. What subject do you teach? _____

5. Highest academic degree obtained:

☐ Ph.D.

☐ Masters

❑ Bachelors

❑ Others, Please specify_____

6. Academic Rank:

❑ Professor

❑ Associate Professor

❑ Assistant Professor

❑ Lecturer

❑ Graduate Assistant

❑ Teacher

7. Do you have access to a computer at home?

❑ Yes ❑ No

8. Do you have access to a computer at office?

❑ Yes ❑ No

9. Do you have access to the Internet at home?

❑ Yes ❑ No

10. Do you have access to the Internet at office?

❑ Yes ❑ No

11. What is your skill level of using computer technologies?

❑ Novice ❑ Proficient ❑ Very proficient

12. What is your English language level?

❑ Excellent ❑ Very good ❑ Good ❑ Weak ❑ None

Part II: Computer Attitude Scale

Below are a series of statements. There are no correct answers to these statements. They are designed to permit you to indicate the extent to which you agree or disagree with the ideas expressed. Place a CHECKMARK in the space under the label which is closest to your agreement or disagreement with the statements.

Attitudes toward Computers	**Strongly Agree**	**Agree**	**Disagree**	**Strongly Disagree**
1. Computers do not scare me at all.	☐	☐	☐	☐
2. I'm no good with computers.	☐	☐	☐	☐
3. I would like working with computers.	☐	☐	☐	☐
4. I will use computers many ways in my life.	☐	☐	☐	☐
5. Working with computers will make me very nervous.	☐	☐	☐	☐
6. Generally, I would feel OK about trying a new problem on the computer.	☐	☐	☐	☐
7. The challenge of solving problems with computers does not appeal to me.	☐	☐	☐	☐
8. Learning about computers is a waste of time.	☐	☐	☐	☐
9. I do not feel threatened when others talk about computers.	☐	☐	☐	☐
10. I don't think I would do advanced computer work.	☐	☐	☐	☐
11. I think working with computers would be enjoyable and stimulating.	☐	☐	☐	☐
12. Learning about computers is worthwhile.	☐	☐	☐	☐

Attitudes toward Computers	Strongly Agree	Agree	Disagree	Strongly Disagree
13. I feel aggressive and hostile toward computers.	❑	❑	❑	❑
14. I am sure I could work with computers.	❑	❑	❑	❑
15. Figuring out computer problems does not appeal to me.	❑	❑	❑	❑
16. I' II need a firm mastery of computers for my future work.	❑	❑	❑	❑
17. It wouldn't bother me at all to take computer courses.	❑	❑	❑	❑
18. I'm not the type to do well with computers.	❑	❑	❑	❑
19. When I have a problem with a computer that I can't immediately solve, I would stick with it until I have the answer.	❑	❑	❑	❑
20. I expect to have little use for computers in my daily life.	❑	❑	❑	❑
21. Computers make me feel uncomfortable.	❑	❑	❑	❑
22. I am sure I could learn a computer language.	❑	❑	❑	❑
23. I don't understand how some people can spend so much time working with computers and seem to enjoy it.	❑	❑	❑	❑
24. I can't think of any way that I will use computers in my career.	❑	❑	❑	❑
25. I would feel at ease in a computer class.	❑	❑	❑	❑
26. I think using a computer would be very hard to me.	❑	❑	❑	❑
27. Once I start to work with computer, I would find it hard to stop.	❑	❑	❑	❑

Attitudes toward Computers	Strongly Agree	Agree	Disagree	Strongly Disagree
28. Knowing how to work with computers will increase my job possibilities.	☐	☐	☐	☐
29. I get a sinking feeling when I think of trying to use a computer.	☐	☐	☐	☐
30. I could get good grades in computer courses.	☐	☐	☐	☐
31. I will do as little work with computers as possible.	☐	☐	☐	☐
32. Anything that a computer can be used for, I can do just as well some other way.	☐	☐	☐	☐
33. I would feel comfortable working with a computer.	☐	☐	☐	☐
34. I do not think I could handle a computer course.	☐	☐	☐	☐
35. If a problem is left unsolved in a computer class, I would continue to think about it afterward.	☐	☐	☐	☐
36. It is important to me to do well in computer classes.	☐	☐	☐	☐
37. Computers make me feel uneasy and confused.	☐	☐	☐	☐
38. I have a lot of self-confidence when it comes to working with computers.	☐	☐	☐	☐
39. I do not enjoy talking with others about computers.	☐	☐	☐	☐
40. Working with computers will not be important to me in my life's work.	☐	☐	☐	☐

Part III: Degree of Computer Technologies Use:

The following items relate to your current use of computer technologies for instructional purposes (e.g., lectures, presentation, class preparation, etc). Please indicate your current level of use by CHECKING the number that best applies to you:

- 0 never use
- 1 use rarely
- 2 use a few times a month
- 3 use a few times a week
- 4 use daily

	0	**1**	**2**	**3**	**4**
1. Computers in general.	❑	❑	❑	❑	❑
2. Word processing programs (e.g., Microsoft Word).	❑	❑	❑	❑	❑
3. Spreadsheet programs (e.g., Microsoft Excel).	❑	❑	❑	❑	❑
4. Database programs (e.g., Microsoft Access).	❑	❑	❑	❑	❑
5. 3-D design programs (e.g., 3-D Studio).	❑	❑	❑	❑	❑
6. Presentation programs (e.g., Power Point).	❑	❑	❑	❑	❑
7. Image & Drawing editing programs (e.g., Adobe Photoshop).	❑	❑	❑	❑	❑
8. Multimedia programs (e.g., Flash).	❑	❑	❑	❑	❑
9. Reference information on CD-ROM.	❑	❑	❑	❑	❑
10. Internet browsers (e.g., Internet Explorer, Netscape).	❑	❑	❑	❑	❑
11. E-mail programs (e.g., Outlook Express, Yahoo, Hotmail…etc.).	❑	❑	❑	❑	❑
12. Web page creation programs (e.g., Front Page, Dream weaver).	❑	❑	❑	❑	❑

13. Drill and Practice/Tutorial programs. ❑ ❑ ❑ ❑ ❑

Other, please specify: _____

Part IV: Extent of Computer Technologies Use:

For each objective listed below, please indicate to what extent you use computer technologies for instructional purpose by CHECKING the number that best applies to you:

- 0 never use
- 1 1-2 times during the semester
- 2 1-2 times per month
- 3 1-2 times per week
- 4 3 times or more per week

How do you use computer technologies in your professional activities	**0**	**1**	**2**	**3**	**4**
1. … to access information and research on best practices for teaching.	❑	❑	❑	❑	❑
2. …to create multimedia presentation for the classroom.	❑	❑	❑	❑	❑
3. …to do administrative record keeping (i.e., grades, attendance, etc.).	❑	❑	❑	❑	❑
4. …to communicate with colleagues and/or other professionals.	❑	❑	❑	❑	❑
5. ...to communicate with students' parents.	❑	❑	❑	❑	❑
6. …to communicate with students outside of classroom hours.	❑	❑	❑	❑	❑
7. …to post homework or other class requirements, project information or suggestions.	❑	❑	❑	❑	❑
8. …to post/share student work on the Web.	❑	❑	❑	❑	❑
9. …to learn about computers and/or improve your computer skills.	❑	❑	❑	❑	❑

Other, please specify: _____

Part V: Perceived Major Barriers that Limit Faculty Use of Computer Technologies:

For each statement, please place a CHECKMARK to indicate the extent to which you agree or disagree with the statement.

- SA strongly agree
- A agree
- N neither agree nor disagree
- D disagree
- SD strongly disagree

Some of the barriers that limit faculty use of computer technologies include:	**SA**	**A**	**N**	**D**	**SD**
1. Increase workload for instructors.	❑	❑	❑	❑	❑
2. Lack of equipment and infrastructure.	❑	❑	❑	❑	❑
3. Lack of software.	❑	❑	❑	❑	❑
4. Lack of time of learning about computer technologies.	❑	❑	❑	❑	❑
5. Lack of effective training.	❑	❑	❑	❑	❑
6. Lack of technical support.	❑	❑	❑	❑	❑
7. Lack of administrative support.	❑	❑	❑	❑	❑
8. Lack of collegial support and interaction.	❑	❑	❑	❑	❑
9. Lack of designing interaction activities between instructors and students in your course.	❑	❑	❑	❑	❑
10. Lack of self confidence.	❑	❑	❑	❑	❑
11. Lack of personal interest.	❑	❑	❑	❑	❑
12. Reduced course quality.	❑	❑	❑	❑	❑

Other, (please explain): _____

….Thank you for your time……

APPENDIX B

THE SURVEY INSTRUMENT (ARABIC VERSION)

بسم الله الرحمن الرحيم

أختي عضو هيئة التدريس ..... المكرمة

السلام عليكم ورحمة الله وبركاته .... وبعد،

هذه الإستبانة مقدمة من طالبة دكتوراه في قسم الأنظمة التعليمية بجامعة ميسسيبي الحكومية بالولايات المتحدة الأمريكية. وهذه الإستبانة جزء من رسالتي للدكتوراه والتي تبحث في مدى استخدام أعضاء هيئة التدريس لتقنية الحاسب الآلي، وما هي اتجاهتهن والمعوقات التي تحد من استخدام هذه التقنية. وأهمية هذه الرسالة تكمن في أنها دراسة ميدانية لواقع استخدام تقنية الحاسب الآلي من قبل أعضاء هيئة التدريس بكليات البنات. وإنني آمل بأن تكون نتائج هذه الدراسة عامل مساعد في إعداد خطط مستقبلية للبرامج التدريبية اللازمة في مجال إستخدام تقنية الحاسب الآلي.

وهذه الدراسة قد تم الموافقة عليها من قبل لجنة المراجعة العلمية بجامعة ميسسيبي الحكومية، حيث يمكنك الإتصال بهذه اللجنة على هاتف 6623255220 أو على البريد الالكتروني<irb@research.msstate.edu> للإستفسار عن حقوقك كمشاركة في هذه الدراسة.

والباحثة مدركة أن وقتك كعضو هيئة التدريس ثمين، ولكن إسهامك في هذه الدراسة مهم للغاية. علماً بأن الإجابة على فقرات الإستبانة سوف تستغرق في حدود 15-20 دقيقة. وأنوه أن المشاركة في هذه الدراسة هي إختيارية ولا تتطلب كتابة الإسم أو أي معلومات خاصة. لذا تأمل الباحثة مساعدتها في جمع البيانات والمعلومات لإتمام هذه الدراسة، وتؤكد الباحثة أن جميع البيانات والمعلومات سوف تعامل بسرية تامة ولن تستخدم إلا لأغراض البحث العلمي.

فبعد إكمال تعبئة هذه الإستبانة، الرجاء وضعها في الظرف المرفق وإغلاقه، ومن ثم وضع الظرف في الصندوق المغلق المتواجد بمكتب سكرتارية العميدة خلال أسبوع من تاريخ إستلام الإستبانة، إن أمكن. حيث أنني شخصياً سأقوم بجمعها من هذا الصندوق، ولن يطلع على هذه الإستبانة أحد غيري. كما ترحب الباحثة بأي سؤال أو إستفسار حول هذه الإستبانة على البريد الالكتروني<muqayteeb@yahoo.com> أو الإتصال بمشرفة الرسالة الدكتورة ليندا كورنيليوس على البريد الالكتروني LCornelious@colled.msstate.edu> .

شاكرة لك مقدماً حسن تعاونك، ولك خالص تحياتي .....

الباحثة
تغريد بنت عبدالعزيز المقيطيب

استبانة لقياس اتجاهات أعضاء هيئة التدريس نحو استخدام تقنيات الحاسب الآلي والمعوقات التي تؤثر في استخدام تقنيات الحاسب الآلي

الجزء الأول: معلومات شخصية

فضلا ضعي علامة (✓) في المكان اللذي يتفق مع إجابتك:

1. العمر:
   - [ ] 29-20
   - [ ] 39-30
   - [ ] 49-40
   - [ ] 59-50
   - [ ] 60 أو أكثر

2. عدد سنوات الخبرة كعضو هيئة تدريس في الكلية:
   - [ ] 5 سنوات أو أقل
   - [ ] 10-6 سنوات
   - [ ] 15-11 سنة
   - [ ] 20-16 سنة
   - [ ] أكثر من 20 سنة

3. عدد سنوات الخبرة في استخدام تقنية الحاسب الآلي:
   - [ ] لا يوجد خبرة
   - [ ] أقل من سنة
   - [ ] 3-1 سنوات
   - [ ] 5-4 سنوات
   - [ ] 10-6 سنوات
   - [ ] أكثر من عشر سنوات (حددي) .....

4. ماهي المادة التي تدرسينها.....

5. المؤهل العلمي:
   - [ ] الدكتوراه
   - [ ] ماجستير
   - [ ] بكالوريوس
   - [ ] أخرى (حددي) .....

6. الدرجة العلمية:
   - [ ] أستاذ
   - [ ] أستاذ مشارك
   - [ ] أستاذ مساعد
   - [ ] محاضر
   - [ ] معيدة
   - [ ] معلمة

7. هل لديك حاسب آلي في المنزل؟
   نعم _____ لا _____

8. هل لديك حاسب آلي في المكتب؟
   نعم _____ لا _____

9. هل لديك إنترنت في المنزل؟
   نعم _____ لا _____

10. هل لديك إنترنت في المكتب؟
    نعم _____ لا _____

11. ما هو مستوى مهارتك في استخدام الحاسب الآلي؟
    - [ ] مبتدئ
    - [ ] متوسط
    - [ ] متقدم

12. ماهو مستواك في اللغة الإنجليزية؟
    - [ ] ممتاز
    - [ ] جيدجدا
    - [ ] جيد
    - [ ] ضعيف
    - [ ] لا أجيد اللغة الإنجليزية

الجزء الثاني: اتجاهات نحو الحاسب الآلي

فيما يلي مجموعة من العبارات. فضلاً ضعي إشارة (✓) على الإختيار المناسب لكل عبارة بكل دقة وصراحة، علماً أنه لاتوجد إجابة صحيحة وأخرى خاطئة.

العبارة	أوافق بشدة	أوافق	لا أوافق	لا أوافق بشدة
1. الحاسب الآلي لا يخيفني.....	☐	☐	☐	☐
2. لا أحسن استخدام الحاسب الآلي.....	☐	☐	☐	☐
3. أرغب في استخدام الحاسب الآلي.....	☐	☐	☐	☐
4. سوف استخدم الحاسب الآلي بأساليب متعددة في حياتي العلمية....	☐	☐	☐	☐
5. العمل على الحاسب الآلي يجعلني عصبياً جداً.....	☐	☐	☐	☐
6. بشكل عام، أرتاح لمحاولة حل مشاكل جديدة باستخدام الحاسب الآلي.....	☐	☐	☐	☐
7. التحدي لحل بعض المسائل بالحاسب الآلي لا يناسبني.....	☐	☐	☐	☐
8. تعلم الحاسب الآلي مضيعة للوقت.....	☐	☐	☐	☐
9. لا أنزعج عندما يتحدث الأخرون عن الحاسب الآلي.....	☐	☐	☐	☐
10. لا أعتقد أني أرغب في استخدام مهارات الحاسب الآلي المتقدمة....	☐	☐	☐	☐
11. أعتقد أن العمل باستخدام الحاسب الآلي ممتع ومشجع.....	☐	☐	☐	☐
12. تعلم الحاسب الآلي جدير بالإهتمام.....	☐	☐	☐	☐
13. أشعر بعدوانية تجاه الحاسب الآلي.....	☐	☐	☐	☐
14. بكل تأكيد أستطيع أن أقوم بعملي باستخدام الحاسب الآلي.....	☐	☐	☐	☐
15. حل مشاكل الحاسب الآلي لايروق لي.....	☐	☐	☐	☐
16. سوف أحتاج لبراعة في الحاسب الآلي لعملي في المستقبل.....	☐	☐	☐	☐
17. لا يزعجني أن أدرس مواد الحاسب الآلي.....	☐	☐	☐	☐

العبارة	أوافق بشدة	أوافق	لا أوافق	لا أوافق بشدة
18. لست من النوع الذي يحسن استخدام الحاسب الآلي.....	☐	☐	☐	☐
19. عند حدوث خلل أو مشكلة في الحاسب الآلي ولا أستطيع حله في الحال، فإنني أواصل المحاولة حتى أجد الحل.....	☐	☐	☐	☐
20. أتوقع أن يكون استخدامي للحاسب الآلي قليل في حياتي اليومية.....	☐	☐	☐	☐
21. الحاسب الآلي يشعرني بعدم الأرتياح.....	☐	☐	☐	☐
22. بكل تأكيد أستطيع تعلم لغة البرمجة.....	☐	☐	☐	☐
23. أستغرب أن يقضي البعض وقتا طويلا بالعمل على الحاسب الآلي ويبدو أنهم يستمتعون بذلك.....	☐	☐	☐	☐
24. لا أستطيع أن أفكر بأي طريقة لاستخدام الحاسب في مهنتي.....	☐	☐	☐	☐
25. أشعر بالراحة في مادة الحاسب الآلي.....	☐	☐	☐	☐
26. أعتقد أن استخدام الحاسب الآلي صعب جداً بالنسبة لي.....	☐	☐	☐	☐
27. عندما أبدأ بالعمل على الحاسب الآلي يصعب علي التوقف.....	☐	☐	☐	☐
28. معرفة العمل بالحاسب يزيد من احتمالات حصولي على العمل....	☐	☐	☐	☐
29. أشعر بالإحباط أو عدم الطمأنينة عندما أفكر في محاولة استخدام الحاسب الآلي.....	☐	☐	☐	☐
30. أستطيع الحصول على درجات مرتفعة في مواد الحاسب الآلي.....	☐	☐	☐	☐
31. سوف أقوم بالحد الأدنى لاستخدام الحاسب الآلي.....	☐	☐	☐	☐
32. أي شئ يمكن أن يستخدم به الحاسب الآلي أستطيع أن أقوم به بأي طريقة أخرى.....	☐	☐	☐	☐
33. أشعر بالإرتياح عند العمل بالحاسب الآلي.....	☐	☐	☐	☐
34. لاأعتقد أني أستطيع دراسة مادة الحاسب الآلي.....	☐	☐	☐	☐

العبارة	أوافق بشدة	أوافق	لا أوافق	لا أوافق بشدة
35. إذا لم تحل مشكلة في مادة الحاسب الآلي، فإنني أستمر في التفكير بها..... ..	☐	☐	☐	☐
36. مهم بالنسبة لي أن أحقق مستوى جيدا في مادة الحاسب الآلي.....	☐	☐	☐	☐
37. الحاسبات الآلية تجعلني أشعر بالقلق وبتشويش الذهن.....	☐	☐	☐	☐
38. أشعر بكثير من الثقة بالنفس عند التعامل مع الحاسب الآلي.....	☐	☐	☐	☐
39. لاأستمتع بالحديث مع الآخرين حول الحاسب الآلي.....	☐	☐	☐	☐
40. العمل باستخدام الحاسب لن يكون مهما لي في حياتي العملية.....	☐	☐	☐	☐

الجزء الثالث: درجة استخدام تقنيات الحاسب الآلي

العبارات التالية متعلقة بمدى استخدامك لتقنيات الحاسب الآلي في أنشطتك التعليمية (مثل المحاضرات، العروض التقديمية، تحضير الدروس.. الخ). من فضلك - بناء على التدرج التالي حددي درجة استخدامك في التطبيقات التالية:

(0) لم استخدمها مطلقاً
(1) استخدمها نادراً
(2) استخدمها مرات قليلة في الشهر
(3) استخدمها مرات قليلة في الأسبوع
(4) استخدمها يومياً

حددي درجة استخدامك في كل من التطبيقات التالية	0	1	2	3	4
1. أجهزة الحاسب بصفة عامة.....	☐	☐	☐	☐	☐
2. برامج معالجة الكلمات مثل (مايكروسوفت ورد)..... (Microsoft Word)	☐	☐	☐	☐	☐
3. برامج الجداول الإكترونية مثل (مايكروسوفت إكسل)..... (Microsoft Excel)	☐	☐	☐	☐	☐
4. برامج قواعد البيانات مثل (مايكروسوفت إكسس)..... (Microsoft Access)	☐	☐	☐	☐	☐
5. برامج التصميم الثلاثي الأبعاد مثل (ثريدي ستيديو ماكس)..... (3D Studio Max)	☐	☐	☐	☐	☐

(0) لم استخدمها مطلقاً
(1) استخدمها نادراً
(2) استخدمها مرات قليلة في الشهر
(3) استخدمها مرات قليلة في الأسبوع
(4) استخدمها يومياً

حددي درجة استخدامك في كل من التطبيقات التالية	0	1	2	3	4
6. برامج العروض التقديمية مثل (باور بوينت)..... (Microsoft PowerPoint)	☐	☐	☐	☐	☐
7. برامج الصور والرسومات مثل (برنامج الفوتوشب تعديل)..... (Adobe PhotoShop)	☐	☐	☐	☐	☐
8. برامج الوسائط المتعددة مثل (الفلاش) (Flash).....	☐	☐	☐	☐	☐
9. معلومات مرجعية على أقراص الليزر السي دي روم..... (CD-ROM)	☐	☐	☐	☐	☐
10. برامج تصفح الإنترنت مثل (إنترنت إكسبلورر، ونت سكيب)..... (Internet Explorer, Netscape)	☐	☐	☐	☐	☐
11. برامج البريد الإلكتروني مثل (أوت لوك إكسبرس، ياهوو، هوت ميل) (Outlook Express, Yahoo, Hotmail)	☐	☐	☐	☐	☐
12. برامج تصميم الصفحات على الإنترنت مثل (الفرونت بيج ،الدريم ويفر) (Front Page, Dreamweaver)	☐	☐	☐	☐	☐
13. برامج التدريب والممارسة/ برامج التعلم الذاتية.....	☐	☐	☐	☐	☐

برامج أخرى (حددي من فضلك) .....

الجزء الرابع: مدى تكرار استخدام تقنيات الحاسب الآلي

في كل بند من بنود هذه الفقرة، من فضلك حددي عدد المرات التي استخدمت فيها تقنيات الحاسب الآلي في أنشطتك التعليمية بناء على التدرج التالي:

(0) لم استخدمها أبداً
(1) (1-2) مرة أو أثنين خلال الفصل الدراسي
(2) (1-2) مرة أو أثنين في الشهر
(3) (1-2) مرة أو أثنين في الأسبوع
(4) ثلاث مرات فأكثر في الأسبوع

كيف تستخدمين تقنيات الحاسب الآلي في أنشطتك التعليمية	0	1	2	3	4
1. للعثور على معلومات وأبحاث عن أفضل طرق التدريس والتعليم.....	☐	☐	☐	☐	☐
2. لعمل عروض متحركة بالصوت والصورة واستخدامها في الفصل أثناء التدريس.....	☐	☐	☐	☐	☐
3. للإحتفاظ بسجلات إدارية للفصل (مثل الدرجات والحضور والغياب وغير ذلك).....	☐	☐	☐	☐	☐
4. للتواصل مع زملاء التخصص أو الزملاء من التخصصات الأخرى.....	☐	☐	☐	☐	☐
5. للتواصل مع أولياء أمور الطالبات.....	☐	☐	☐	☐	☐
6. للتواصل مع الطالبات في غير ساعات الدراسة.....	☐	☐	☐	☐	☐
7. لإرسال الواجبات أو أي متطلبات دراسية أخرى أو معلومات لمشروع تعليمي أو الإقتراحات ذات الصلة.....	☐	☐	☐	☐	☐
8. لنشر الأعمال الطلابية على شبكة الإنترنت.....	☐	☐	☐	☐	☐
9. لتعلم المزيد عن الحاسب الآلي أو لتطوير مهاراتك في استخدام الحاسب الآلي أكثر.....	☐	☐	☐	☐	☐

اسخدامات أخرى وضحي من فضلك .....

الجزء الخامس: العقبات التي تحول دون تبني أعضاء هيئة التدريس استخدام تقنيات الحاسب الآلي

من فضلك حددي درجة موافقتك أو عدم موافقتك على العبارات التالية وذلك بوضع علامة (✓) على الإختيار المناسب لكل عبارة:

معوقات استخدام تقنيات الحاسب الآلي	أوافق بشدة	أوافق	حيادي	لا أوافق	لا أوافق بشدة
1. زيادة أعباء العمل على أعضاء هيئة التدريس.....	☐	☐	☐	☐	☐
2. عدم توفر الأجهزة والبنية التحتية.....	☐	☐	☐	☐	☐
3. عدم توفر برامج الحاسب الآلي.....	☐	☐	☐	☐	☐
4. عدم توفر الوقت الكافي لتعلم تقنيات الحاسب الآلي.....	☐	☐	☐	☐	☐
5. عدم توفر التدريب الفعال.....	☐	☐	☐	☐	☐
6. عدم توفر الدعم التقني.....	☐	☐	☐	☐	☐
7. عدم توفر الدعم الإداري.....	☐	☐	☐	☐	☐
8. عدم توفر الدعم والتفاعل الإجتماعي مع زملاء المهنة.....	☐	☐	☐	☐	☐
9. عدم تصميم أنشطة تفاعلية بين المعلمة والطالبات في الفصل عند استخدام تقنية الحاسب الآلي.....	☐	☐	☐	☐	☐
10. ضعف الثقة بالنفس.....	☐	☐	☐	☐	☐
11. عدم توفر الرغبة الشخصية.....	☐	☐	☐	☐	☐
12. إنخفاض مستوى الاستفادة من المادة الدراسية.....	☐	☐	☐	☐	☐

عقبات أخرى وضحي من فضلك .....

.....انتهت الاستبانة وشكرا للمشاركة.....

APPENDIX C

PERMISSION TO USE SURVEY INSTRUMENTS

Date: Fri, 27 Mar 2009 17:44
From: Abdulkareem alalwani <aalalwani@gmail.com>
To: Taghreed Almuqayteeb <ta64@msstate.edu>
Subject: Re: Permission to use your dissertation instrument

Dear Dr.Taghreed Almuqayteeb,
Asslam Alekum.

YES and please make sure that you credit me. The citation will be good.
I would be very happy to get a copy of your dissertation after you are done.

Regards,

Dr. Abdulkareem Al-Alwani

Date: Sun, 22 Mar 2009 12:41
From: Hamad Alghonaim <alghonaimhs@yahoo.com>
To: Taghreed Almuqayteeb <ta64@msstate.edu>
Subject: Re: Permission to use your dissertation instrument

Dear Ms. Taghreed Almuqayteeb,

You have my permission to use my dissertation instrument for your dissertation to measure the barriers that affect female faculty use of computer technologies in girls' colleges in Saudi Arabia.

I wish you the best of luck in your studies and it would be great if you would forward the results of your study to me.

Sincerely,

Hamad S. Alghonaim, Ph.D
Educational Communication and Technology
Manager of E-Learning and Training Center
Council of Technical and Vocational Training in Gassim
Technical and Vocational Training Corporation (TVTC)
Buraidah, Qassem, Saudi Arabia
P.O. Box 1656,
Buraidah 51441
Tel. +966 553261113
Fax. +966 6 3857102
e-mail: alghonaimhs@yahoo.com

APPENDIX D

INSTITUTIONAL REVIEW BOARD (IRB) APPROVAL

Mississippi State University
Office of Regulatory Compliance
Post Office Box 6223
Mississippi State, MS 39762

Compliance Division
Administrative Offices
Animal Care and Use (IACUC)
Human Research Protection Program (IRB)
1207 Hwy 182 West
Starkville, MS 39759
(662) 325-3496 - fax

Safety Division
Biosafety (IBC)
Radiation Safety
Hazardous Waste
Chemical & Lab Safety
70 Morgan Avenue
Mississippi State, MS 39762
(662) 325-8776 - fax

http://www.orc.msstate.edu
compliance@research.msstate.edu
(662) 325-3294

March 10, 2009

Taghreed Almuqayteeb
106 Tabor St
Starkville, Ms 39759

RE: IRB Study #08-343: Attitudes of Female Faculty Toward the Use of Computer Technologies and the Barriers That Limit Their Use of Technologies in Girls' Colleges in Saudi Arabia

Dear Ms Almuqayteeb:

The above referenced project was reviewed and approved via administrative review on 3/10/2009 in accordance with 45 CFR 46.101(b)(2). Continuing review is not necessary for this project. However, any modification to the project must be reviewed and approved by the IRB prior to implementation. Any failure to adhere to the approved protocol could result in suspension or termination of your project. The IRB reserves the right, at anytime during the project period, to observe you and the additional researchers on this project.

Please note that the MSU IRB is in the process of seeking accreditation for our human subjects protection program. As a result of these efforts, you will likely notice many changes in the IRB's policies and procedures in the coming months. These changes will be posted online at http://www.orc.msstate.edu/human/aahrpp.php. The first of these changes is the implementation of an approval stamp for consent forms. The approval stamp will assist in ensuring the IRB approved version of the consent form is used in the actual conduct of research.

Please refer to your IRB number (#08-343) when contacting our office regarding this application.

Thank you for your cooperation and good luck to you in conducting this research project. If you have questions or concerns, please contact me at cwilliams@research.msstate.edu or call 662-325-5220.

Sincerely,

[For use with electronic submissions]

Christine Williams
IRB Administrator

cc: Linda Cornelious

APPENDIX E

KING FAISAL UNIVERSITY APPROVAL

بسم الله الرحمن الرحيم

KINGDOM OF SAUDI ARABIA
Ministry of Higher Education
KING FAISAL UNIVERSITY

المملكة العربية السعودية
وزارة التعليم العالي
جامعة الملك فيصل
الرمز (٠٣٧)

الرقم: ٨/٥٢/١٥٨٨ التاريخ: 12-3-1430 H المرفقات:

Dear Taghreed AbdulAziz Almuqayteeb

I am pleased to inform you that the University Administration approved your request to apply your research tools in the Girls' Colleges at King Faisal University.

Please feel free to contact the colleges that you requested for this purpose directly.

Dr. Mohammed A. Alomair

The Vice President for Girls' Colleges

الأحساء ص.ب ٤٠٠ - تلكس ٨٦١٠٢٩ فيصل أس جي - تلفون ٥٨٠٠٠٠٠ - فاكس ٥٨١٠١٢٤٣ الدمام ص.ب ١٩٨٢ - تلكس ٨٧١٣٠٢ فيصل أس جي - تلفون ٨٥٧٧٠٠٠ فاكس ٨٥٧٨٠٤٨
Al-Ahsa P.O. Box 400 Telex 861028 Faisal S.J. Tel: 5800000 Fax: 5801243 Dammam P.O. Box 1982 Telex 870020 Faisal S.J.Tel.8577000 Fax 8578048

بسم الله الرحمن الرحيم

KINGDOM OF SAUDI ARABIA
Ministry of Higher Education
KING FAISAL UNIVERSITY

المملكة العربية السعودية
وزارة التعليم العالي
جامعة الملك فيصل
الرمز (٠٣٧)

الرقم: ٨٨ - ١/٢٥/٤ التاريخ: ١٢/ ٣/ ١٤٣٠هـ المرفقات:

سعادة الأستاذة / تغريد بنت عبدالعزيز المقيطيب المحترمة

السلام عليكم ورحمة الله وبركاته ... وبعد :-

أشير إلى خطابك المؤرخ في ١٤٣٠/٣/١١هـ المتضمن رغبتك توزيع استبانه لإتمام دراستك لمرحلة الدكتوراه في عدد من كليات البنات (الآداب بالدمام ، العلوم بالدمام ، التربية بالجبيل).

يطيب لي إفادتك بالموافقة على ذلك ، مع تمنياتي لك بالسداد والتوفيق.

وتقبلوا تحياتي وتقديري ،،،

وكيل الجامعة لكليات البنات

د. محمد بن عبد الرحمن العمير

ج/العملية

الأحساء ص.ب ٤٠٠ - تلكس ٨٦١٠٢٨ فيصل أس جي - تلفون ٥٨٠٠٠٠٠ - فاكس ٥٨٠١٢٤٣ الدمام ص.ب ١٩٨٢ - تلكس ٨٧٠٠٢٠ فيصل أس جي - تلفون ٨٥٧٧٠٠٠ فاكس ٨٥٧٨٠٤٨
Al-Ahsa P.O. Box 400 Telex 861028 Faisal S.J. Tel: 5800000 Fax: 5801243 Dammam P.O. Box 1982 Telex 870020 Faisal S.J.Tel.8577000 Fax 8578048

APPENDIX F

PILOT STUDY: SURVEY ASSESSMENT FORM

Attitudes of Female Faculty toward the Use of Computer Technologies
and the Barriers that Limit their use of Technologies in
Girls' Colleges in Saudi Arabia

Survey Instrument Assessment Form for
Pilot Study

Please read the directions for each part of the survey instrument that is attached. As you review each item, please read each statement for clarity, preciseness of instructions, and appropriateness of content. If an error appears in the directions, please mark that error on the form. List the statements that are unclear, vague, or ambiguous in the space provided below. Please make any suggestions and/or recommendations that would improve the survey instrument in the space entitled, "Comments".

Part I: Demographic Information

Unclear statements:

_____
_____

Comments: _____
_____
_____

Part II: Computer Attitudes Scale

Unclear statements:_____
_____

Comments: _____
_____
_____

Part III: Degree of Computer Technologies Use

Unclear statements:_____
_____

Comments: _____
_____
_____

Part IV: Extent of Computer Technologies Use

Unclear statements:_____
_____

Comments: _____
_____
_____

Part V: Perceived Major Barriers that Limit the Use of Computer Technologies

Unclear statements:_____
_____

Comments: _____
_____
_____

اتجاهات أعضاء هيئة التدريس نحو استخدام تقنية الحاسب الآلي والمعوقات التي تؤثر في استخدام تقنية الحاسب الآلي في كليات البنات في المملكة العربية السعودية

استمارة تقييم للإستبيان للبحث المبدئي

من فضلك قراءة تعليمات كل جزء في الإستبيان، وإذا وجدت أي عبارة غير واضحة في التعليمات، الرجاء وضع علامة عليها. أيضا من خلال قراءتك وإجابتك للإستبيان، الرجاء كتابة أي عبارة غير واضحة أو غامضة في الفراغ المتاح لكل جزء من الإستبيان أو كتابة أي اقتراح أو توصية لتحسين الإستبيان.
شاكرة لكم حسن تعاونكم.....

الجزء الأول: معلومات شخصية

عبارات غير واضحة:_____
_____
_____

اقتراحات:_____
_____
_____

الجزء الثاني: اتجاهات نحو الحاسب الآلي

عبارات غير واضحة:_____
_____
_____

اقتراحات:_____
_____
_____

الجزء الثالث: درجة استخدام تقنيات التعليم

عبارات غير واضحة:_____
_____
_____

اقتراحات:_____
_____
_____

الجزء الرابع: مدى تكرار استخدام تقنيات التعليم

عبارات غير واضحة:_____
_____
_____

اقتراحات:_____
_____
_____

الجزء الخامس: العقبات التي تحول دون تبني استخدام تقنية المعلومات

عبارات غير واضحة:_____
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اقتراحات:_____
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