STUDENTS' ATTITUDES TOWARD COMPUTERS AT THE COLLEGE OF NURSING AT KING SAUD UNIVERSITY (KSU)

By

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DEDICATION

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Students' Attitudes toward Computers at the

College of Nursing at King Saud University (KSU)

Abstract

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Computer knowledge and skills are becoming essential components technology in nursing education. Saudi nurses must be prepared to utilize these technologies for the advancement of science and nursing practice in local and global communities.

Little attention has been directed to students' attitudes about computer usage in academic communities in Saudi Arabia. Their attitudes about the use of computers for the enhancement of learning are relatively unknown. Few research studies have been identified that explicate Saudi Arabian nursing students' attitudes toward computer usage for the acquisition of knowledge and skills.

Males and females matriculate at King Saud University (KSU), but attend classes in gender-specific groups. This descriptive correlation study will contribute to the body of knowledge related to nursing students' attitudes toward computer usage in their baccalaureate education at KSU. The research included all students enrolled in the College of Nursing at KSU in Riyadh, in the summer semester of the academic year 2009/2010. The total number of undergraduate nursing students were 600; 195 were males and 405 were females (KSU, 2008).

The findings ($n = 335$; $n_m = 133$ & $n_f = 222$) suggest that females were more anxious

about computer usage (Mean=31.53; 32.7) than males. None of the independent variables explained the variance in the dependent variable, computer usage. Findings did indicate that students had less anxiety if they had access to a computer at home or at school; their anxiety was even less if they had computer exposure at both home and school. Implications of these findings are presented with regard to educating future nurses at KSU for complex roles in health care systems. The study also raises issues about the possibility of planning intervention studies for future research about computer learning, possibly using simulation-based approaches and virtual systems. Issues regarding gender, socioeconomic status, age, learner attitudes, and other variables will need to be systematically investigated. Future studies should assist with the unraveling of traditional cultural issues, including gender-specific roles and expectations for computer usage in nursing and health care delivery.

Chapter I

Introduction

Saudi Arabia is the fastest growing developing country in the Arab world. It is ranked 20th in the global economy and has an economic base that sustains its development. This overall development was created by the discovery of oil in the late 1930s (Marrone, 1999). In the early 1940s, the Saudi government began planning for the creation and development of the country's infrastructure and proceeded to address the most fundamental concerns of its people. Included in its strategies for development were key areas that could impact the nation's people: education, health, transportation, agriculture, and industry were the topics of greatest concern. As a result of the overall development of the country and the insight to implement the use of computers in daily life, the Saudi government explored the utility of this novel technology. Over the years, Saudi society has been increasingly supportive of and transformed by a wide variety of computer technologies that it uses. As a result of the government's emphasis on technology, Saudi Arabia has become a technologically oriented nation, where computers can be found almost anywhere including the homes of the Saudi people. As computer technology has grown and developed, the Saudi government has also realized the potential benefits of computer technology in education. Hence, all schools in Saudi Arabia are being equipped with computers, and children and youth are beginning to master the available technology. School systems are developing and enhancing computer literacy programs that will help teachers, students, and others to utilize this technology in a variety of educational settings.

It is anticipated that teaching and learning at all levels in society will be impacted by innovations that are associated with computer technology. The profound potential that is related to the use of computers will overlap all aspects of human life. Computer technology will also link Saudi Arabia to other Arab countries as well as every country in the global community (Al-Farsi, 2001; Mufti, 2002).

Technology usage is an important component of health care planning and delivery. Its use is moving at a phenomenal rate. Technology will impact Saudi society in a way that is similar to its influence on other world communities. Specifically, technology will help the Saudis to increase their research efforts at the molecular levels of scientific investigations (e.g., genetics). It is an essential tool for conducting epidemiological research and for implementing community-based research in large populations. Computer technology will enable Saudi scientists and clinicians to participate in research on the world stage and reduce costs by utilizing resources for implementing health care that are available in other global communities. Importantly, the use of technology will enable the Saudi people to generate and utilize evidence-based practice approaches to health care, expand research, and generate new knowledge that is specific to the Saudi people. These novel approaches that are available because of technology also have challenges. The Saudi government, like other governments in the world community, will need to give in-depth consideration to technology-related issues such as confidentiality and ethical decision making. Nevertheless, the advantages of technology in Saudi Arabia have been embraced by the society and government. All health care providers are expected to become computer literate and utilize technology in their practice, research, and education and training (McLaughlin et. al , 2008).

It is crucial that Saudi nurses be prepared with the knowledge and skills that are essential for providing quality care in Saudi Arabia and the world community. Computer knowledge is fast becoming an essential work-related skill. The use of technology in nursing education is a relatively new and novel phenomenon. From the beginning of the high technological orientation in health care in the 1970s to the personal computer in the 1980s and the Internet boom of the 1990s, technology usage has impacted nursing education dramatically (Mallow & Gilje, 1999). In response to this trend, the College of Nursing at King Saud University (KSU) has initiated a requirement that all students must successfully complete an introductory computer class (Tech 227). This requirement began about 15 years ago. This mandatory two-credit-hour course consists of face-to-face classroom lectures and additional laboratory-based practice with computers. To accommodate the needs of students, and, at the same time, facilitate their acquisition of skills, the college has equipped two laboratories with 40 computers.

These technological advances have assisted the students by enhancing their learning. One practice, however, remains constant. Although the University invites males and females to its campus, the religious and cultural practices that dictate that males and females will be educated in different classrooms remains a strong basic value within Saudi culture. Hence, although the KSU male and female students share all resources, they continue to learn in separate classroom environments (KSU, 2008; MOHE, 2008; Moshaikeh, 1992).

The technology has become accessible and available to the students at KSU. However, there has been little attention given to the students' attitudes about computer usage in the academic community in Saudi Arabia. In fact, student and faculty attitudes

about the use of computers in academic settings are unknown (AAAS, 1998; Alsebail, 2004; Everett, 1995; Moshaikeh, 1992; Stewart, 1999; World Bank, 1995). Scholars have assumed that students and faculty would adapt to this technology and exploit its many advantages in teaching and learning (Tumulty, 2001) but no evidence exists to support this assumption.

Despite studies that have been conducted in the United States and other western industrial countries about students' attitudes toward computers (Moshaikeh, 1992; Stewart, 1999), such studies that focus on Saudi students' attitudes about computer usage in the learning environment are limited. There is no evidence that the use of computer technology in Saudi has been empirically examined. This proposed study will contribute to the body of knowledge related to student nurses' attitudes toward computer usage during their pursuits of baccalaureate degrees in nursing at KSU.

Purpose of the Study

The purpose of this study is to examine the attitudes of baccalaureate degree seeking student nurses' attitudes toward computer usage at the College of Nursing at King Saud University (KSU), Riyadh, Saudi Arabia. Specifically, the study has been designed to investigate the influence of gender, age, socioeconomic status, academic classification, grade point average, and mandatory computer classes on students' attitudes toward computer usage. In this study, the independent variables are gender, age, socioeconomic status, academic classification, grade point average, length of previous computer experience before enrolling in KSU, access to computers outside of KSU, number of household members who use the household's computer, marital status, geographical region of the nation that is considered to be home for the students and

mandatory computer classes (Tech 227). The dependent variable is attitudes toward computer use as self-reported by students in the College of Nursing at KSU. The measure that will be used to determine the students' attitudes is a four-point Likert-like scale consisting of 40 items distributed among four 10-item subscales that measure computer anxiety, computer confidence, attitude toward computers, and perceptions of the usefulness of computers.

Statement of the Problem

The attitudes toward computers in the academic community in Saudi Arabia are largely unknown. More specifically, no studies that explicate Saudi Arabian nursing students' attitudes toward computer usage for the acquisition of knowledge and skills have been identified in literature. A major consideration that must be articulated in this study is that the Saudi Arabian educational system has produced few gender-specific schools of nursing for males (MOH, 2002). As is the current practice, the educational system tends to be gender specific. That is, males and females do not, as a rule, attend the same academic institutions. However, over the years, the Saudi government has not established many male-dominated schools of nursing.

The College of Nursing at KSU has been selected as the setting for this research because it is the first and only school of nursing in Saudi Arabia that awards a baccalaureate degree in nursing (BSN) to both sexes (KSU, 2008; MOHE, 2008). This practice began in 2004. In Saudi Arabia, male and female nursing students in the same educational milieu represent a new and novel approach in nursing education. The future of this policy change (gender-integrated learning) will be evaluated over the next few years (Tumulty, 2001).

Significance of the Study

There are numerous noteworthy computer-related technological developments that have occurred over the last 5 to 10 years in Saudi Arabia (Alsebail, 2004; Moshaikeh, 1992). Among them all are (a) the acquisition of knowledge in all areas of nursing that allows the students to participate in self-directed learning; (b) the emergence of low-cost, high-performance technology that provides opportunities for self-directed learning to occur in a variety of settings, (c) improved proficiencies in manipulating technologies in healthcare delivery, (d) the use of computer technology to improve students' learning environments and enhance their knowledge and skill levels, and (e) the reduction of students' dropout rates related to academic deficits (Chin, 2001). Finding the best way to create a technological learning environment that may improve teaching methods and learning attitudes, and reduce the number of low-performing students would benefit nursing as a discipline, and would also help to improve health outcomes across the nation. Perhaps these outcomes could become more resolute if there were empirical data about the students' attitudes regarding the use of computer technology in baccalaureate nursing education in a gender-integrated educational milieu in Saudi Arabia.

One factor that determines the successful implementation of computer instruction is users' attitudes toward computers (Ajuwon, 2003; Alsebail, 2004; Ayoub et al., 1999; Chin, 2001; Lewis, 1999; Mastrian & McGonigle, 1999). This proposed research will be the first study in Saudi Arabia to explore nursing students' attitudes about the use of computers in their baccalaureate nursing education program. It will provide information regarding the students' attitudes toward the utilization of computers at KSU. The findings

are expected to be beneficial to university leaders, the nursing faculty and staff, and the students. Based on the findings of this study, the leaders in the schools of nursing and the students could begin to identify approaches and methods that could be used within KSU to increase student acceptance of computer usage as a mechanism to enhance their learning and skills acquisition. It also has implications for other areas of education that serve as the foundation of nursing. Included are the core academic courses that are essential for critical thinking and decision making in nursing. Areas of study in which knowledge and skills must be acquired include, for example, the core requirements such as mathematics, physics, language, biology, and other related content. The linkage is that, if nursing students could be taught or coached to learn to use the computer for the enhancement of their education, could this approach also be introduced in other areas of academic instruction at KSU?

Research Questions

1. What are the personal demographics (age, gender, socioeconomic status, geographical location, and program level) of the nursing student body at the KSU College of Nursing?
2. Does anxiety about computer usage in academic learning vary among males and females at KSU College of Nursing?
3. Do length of previous computer experience before enrolling in KSU College of Nursing, access to computers outside of KSU, number of household members who use computers, and the mandatory computer class (Tech 227) predict the students' attitudes toward computer usage?

4. Do gender, age, GPA, and the mandatory computer class (Tech 227) predict attitudes about computer usage in academic learning among the baccalaureate students at the College of Nursing at KSU?
5. Do gender, age, and socioeconomic status predict attitudes about computer usage in academic learning among the baccalaureate students in the College of Nursing at KSU?

Theoretical and Operational Definitions of Study

Computer, Theoretical Definition

Computer: An electronic device that is capable of storing, manipulating, and retrieving information as designed through the use of precise mathematical instructions that are guided by software (Mary Webster, 2007). An example of software that manages data is Excel, a spreadsheet program.

Computer, Operational Definition

In this study, a Dell Inspiron computer (electronic device) will be used to manipulate several software programs including Word, Excel, and Statistical Package for the Social Sciences (SPSS, 18).

Attitude, Theoretical Definition

Attitude is an enduring view regarding a person, object, or activity that consists of a cognitive element (perceptions and beliefs) and an emotional element (positive or negative feelings). It is also conceptualized as a positive or negative mental state of readiness, learned and organized through experience that influences the individual's response/reaction to people, objects, places, and situations (Ajzen & Fishbein, 1975).

Attitudes affect the behaviors of people toward objects, events, and individuals (Scarpa, Smeltzer, & Jasion, 1992).

Attitude, Operational Definition

Student's attitude toward computers is defined as the total score on the four subscales as measured by the CAS: computer anxiety, computer confidence, computer liking, and computer usefulness (Loyd & Gressard, 1987).

Anxiety, Theoretical Definition

Computer anxiety is defined as the sense of fear or negative feelings toward computers and a reluctance to learn or manipulate the computer in the academic environment. Computer anxiety involves an array of emotional reactions including fear, apprehension, uneasiness, and distrust of computer technology in general (Loyd & Gressard, 1987). It can also be defined as hesitation or self-doubt in one's own ability to learn about and use computers in the academic environment. This type of anxiety is related to one's sense of self-efficacy about learning and mastering the use of computers (Loyd & Gressard, 1987).

Anxiety, Operational Definition

The CAS Questionnaire will be used to determine the level of computer anxiety that the students manifest. Specifically, items 1, 5, 9, 13, 17, 21, 25, 29, 33, and 37on the CAS measure will be used to determine computer anxiety levels among the students (Loyd & Gressard, 1987).

Computer Confidence, Theoretical Definition

Computer confidence is associated with the inherent belief in one's ability to master the use of computers in the academic environment and to use this technology to enhance individual and group learning (Loyd & Gressard, 1987).

Computer Confidence, Operational Definition

Items on the CAS Questionnaire will be used to measure computer confidence. As indicated on the questionnaire, an expression of computer confidence (or lack thereof) may include statements like "I am sure I could do work with computers," "I'm not the type to do well with computers," and "I could get good grades in computer courses." Questionnaire items 2, 6, 10, 14, l8, 22, 26, 30, 34, and 38 are concerned with computer confidence on CAS (Loyd & Gressard, 1987).

Computer Liking, Theoretical Definition

Computer liking is defined as the internal feeling of enjoyment and stimulation, or the desire to learn about, think about, or converse with others about the characteristics and advantages of the computer and its multiple uses (Loyd & Gressard, 1987).

Computer Liking, Operational Definition

Computer liking will be measured by statements such as "I would like to work with computers," or "Once I start to work with the computer, I would find it hard to stop," or "I don't understand how some people can spend so much time working with computers and seem to enjoy it." Items 3, 7, 11, 15, 19, 23, 27, 31, 35, and 39 on the CAS will be used to measure this concept (Loyd & Gressard, 1987).

Computer Usefulness, Theoretical Definition

Computer usefulness is the extent to which a person believes that using a computer system could/will enhance his or her job performance and improve his/her knowledge and skills (Loyd & Gressard, 1987).

Computer Usefulness, Operational Definition

Computer usefulness, in this study, will be measured by computing items 4, 8, 12, 16, 20, 24, 28, 32, 36, and 40 on the CAS Questionnaire.

As a convenience to the reader, Table 1 details the subscales on the CAS and the specific questions that address the study concepts that appear on the subscales.

Table 1

The Four Subscales and Associated Items on the CAS Questionnaire

Subscales	Questions	
Computer anxiety	1, 5, 9, 13, 17, 21, 25, 29, 33, and 37	10
Computer confidence	2, 6, 10, 14, 18, 22, 26, 30, 34, and 38	10
Computer liking	3, 7, 11, 15, 19, 23, 27, 31, 35, and 39	10
Computer usefulness	4, 8, 12, 16, 20, 24, 28, 32, 36, and 40	10
Total		40

Computer Attitudes Scale (CAS)

The CAS is an instrument adapted from Loyd and Loyd (1985) to assess the attitudes of individuals toward computers. The CAS is 40-item instrument divided into four l0-item subscales: anxiety, fear, or phobia; confidence in using a computer; enjoyment of computer use; and usefulness of computers.

Chapter II

Literature Review

The purpose of this literature review is to explore the science that provides a framework for investigating student nurses' attitudes toward the use of computers in a baccalaureate nursing education program. This chapter will highlight the following key areas: (a) computers in baccalaureate nursing education; (b) computer usage in nursing education in Saudi Arabia; (c) new opportunities for advanced education; (d) attitudes toward computers; (e) CAS studies in the world community; and (f) the demographic variables (age, gender, geographical location, socioeconomic status, previous computer usage, and level of matriculation at the university) that influence their attitudes toward computer-based learning in the classroom.

Computers in Baccalaureate Nursing Education

Over the last 20 years, technology usage in nursing education has grown exponentially (Mallow & Gilje, 1999). Nurse educators throughout the global community have witnessed the increased use of overhead projectors in the classroom to the virtual learning environment that connects learners and scientists across continents. This breakthrough technology has greatly influenced education in all areas of inquiry (Shellenbarger, 1999). One of the many advantages of computer-based learning is the students' capacity to participate in rehearsals that help to ensure competency and self-efficacy (Ayoub et al., 1999). It also provides a time-related convenience that could not have been previously envisioned.

Assisting and encouraging students to use computer technology and multimedia software to learn and retrieve information helps to keep the students engaged in learning;

it appeals to their needs to be stimulated through their multiple senses, and it allows them to increase their confidence with computer-based technology that transcends all components of their didactic and clinical learning (Ayoub, 1999). Regarding clinical learning, a major component of the knowledge and skills that must be acquired by the learner, computer technology is becoming a major teaching/learning tool. For example, SimMan technology, which is used to demonstrate and teach critical care knowledge and skills, is becoming one of the standard teaching instruments that are available in most colleges and university (Dannhausen, et al. , 2007; Sletten, 2005). The following example provides an example of the infusion of computer technology that is available to teach knowledge and skills to students, and to ensure that they are competent practitioners. The use of technology for learning has many components, and Sim-Man is one example of how it advances learning. Another more universal segment of computer usage is desktop and laptop technology that is used for learning, clinical electronic record keeping, research, and health policy analyses.

As computer technology becomes a common component in educational institutions, its pedagogical use will continue to gain status and notoriety (Oblinger & Rush, 1997). Core curricula in many colleges and universities now include computer literacy as a basic requirement and for faculty and students. At some institutions, computer literacy is mandatory. Young (1997) listed a number of institutions (n = 8) that had begun mandatory computer literacy programs for their students. Beginning in the fall of 1998, these institutions required that all of their students either own or have access to a computer. Functionally, computers are used in education for three types of activities: management; instruction and learning; and educational research (Forcier, 1996). The use

of computers for management activities includes school and classroom applications in budgeting, accounting, record keeping, printed and electronic communication, and information retrieval. These management activities are essential for nurse leaders who are responsible for planning and implementing health programs in a variety of settings. Budgeting and accounting is activated at the unit level in many hospitals and clinics throughout the world. Nurses are now responsible for nursing care and for financial management. Computer usage is essential in both instances. In addition, use of computers for instruction and learning involves teacher-centered interactions as well as student-centered learning. Teacher-centered instruction provides teachers with greater control in the design, development, and delivery of instructional materials. Student-centered learning gives the individual more freedom to construct activities that would lead to learning, and this method could help the learner to acquire a sense of competence about the acquisition of knowledge and skills. Computers are also used in research, evidence-based practice, statistical analysis, and information retrieval and synthesis. Collectively, these activities contribute to the learning process and help to foster competency among nurses and others (Forcier, 1996; Freedman, 1996; Teo & Lim, 1996).

Computer Usage in Nursing Education in Saudi Arabia

The Saudi Arabian School System adopted a gender-dual education system that is separate and different for males and females. The male education system has been administrated since 1953 by the Ministry of Education, which is responsible for the development of a national educational policy that focuses on the Saudi male learner. The institutions are located throughout the nation and are the hallmarks of education for the Saudi male learner (Al-Farsi, 2001). On the other hand, the female educational system

was established in 1960 under the Presidency of Girls Education, a government body that was created specifically to handle educational matters for women (Al-Farsi, 2001). Females are required to attend the female gender institutions, and they, too, can matriculate in nursing at the baccalaureate level at the institutions that have been created for them.

There are 35 universities in Saudi Arabia that award baccalaureate degrees in a variety of majors. Of these 35 universities, 28 of them offer baccalaureate degree program for Saudi females. These universities are located throughout the kingdom. Twenty-eight universities offer baccalaureate degree programs for Saudi males. However, KSU is the only Saudi university that provides a baccalaureate degree program in nursing (BSN) for males and females. This new program will graduate its first class in 2009 (KSU, 2008; MOHE, 2008). Other academic choices are also available for the Saudi female. The total number of female institutions in Saudi Arabia is 28, and the average age of the students at these institutions is 20. Nursing is one of the career choices that the female learner can select when matriculating at these universities.

In the Kingdom of Saudi Arabia, education policy reviews and planning occur every 5 years. The Fourth Educational Development Plan (1985-1990) is considered to have been a critical point for education in Saudi Arabia. It was at this conference that the officials established a new structure: the General Administration for Educational Technology (GAET). GAET was charged with the responsibility of overseeing the utilization of technology in educational development, especially in institutions of higher learning. One of the major outcomes of this plan was the integration of computer learning into secondary schools, colleges, and universities. The first wave of implementation

included schools that were referred to as *Developed High Schools*, which were established in 1985. Their curricula required that all students complete two credit hours of Computer Introduction, three credit hours of Basic Programming Language, and three credit hours of Computer and Information Systems. There were some barriers, however, that were associated with the implementation of this new policy. Specifically, this requirement was abandoned due to a lack of computer laboratories in the schools and the institutions of higher learning. In a brief period, these initial curricula were replaced with general computer curricula for all levels of education in the Saudi high schools (Moshaikeh, 1992).

Around the same time, at the college and university levels, computer literacy programs were required. It is important to remember that, initially, computer knowledge was a requirement for those individuals who were matriculating in the computer science departments. That is to say, courses were initially offered in the Department of Computer Science and Computer Engineering at King Fahad University (KFPMU, 2007), which was established in 1978. In 1982, King Saud University began to offer Computer Science and Computer Engineering in the College of Science and the College of Engineering, respectively. The College of Computer Science and Information Systems was established at this university 2 years later (KSU, 2007). The past decade has witnessed phenomenal growth in the Saudis' interest in and use of computer technology. The College of Nursing at King Saud University reflects this trend.

King Saud University's College of Nursing now requires that all students successfully complete a computer course (Tech 227). This is a mandatory two-credit-hour class in which students spend 2 hours in the classroom where didactic learning occurs and

an additional hour in the learning laboratory where skills are acquired. To accommodate the needs of students, the college of nursing is equipped with computer laboratories that house state-of-the-art computers (KSU, 2007).

New Opportunities for Advanced Education

In 2006, President George W. Bush and King Abdullah met in Texas to discuss mechanisms that could be developed that would provide opportunities for Saudi students to study in the United States. The first wave of students will graduate in the spring semester of 2008. The projected number of students who will be funded through this international agreement is around 23,000 over a 5-year period. This initiative will provide advanced education for Saudis to study in a variety of science and technology fields. Numerous American universities are involved in the educational enterprise, which is known as the King Abdulla Scholarship Program. In addition, similar programs have been enacted with the Saudi government and other countries including China, India, South Korea, New Zealand, Jordan, England, Germany, Spain, France, Canada, and others. This initiative is considered a major investment for the Saudis, and it also symbolizes a concerted focus on strengthening the educational opportunities for its citizens (MOHE, 2006).

Attitudes toward Computers

Attitudes toward computer use among Saudis have not been systematically studied. Attitudes are consistent opinions that are shaped by experiences, worldviews, cognition, and emotions that determine an individual's opinion about computers, or people, or events (Ajzen & Fishbein, 1975). This perspective suggests that attitudes influence the reactions that people have toward computers, others, and events that occur

over time. Furthermore, it suggests that students who are exposed to computers in their academic programs might have some preexisting opinions about the use of computers as an enhancement for the acquisition of knowledge and skills in nursing.

Loyd & Gressard (1987) identified several responses to computer usage, including computer anxiety and fears. These responses are likely to develop when the individual does not have the confidence that he/she has or can develop the skills necessary to utilize the computer in an advantageous manner. Computer anxiety consists of a variety of negative feelings toward the use of the computer; there is also some resistance toward learning how to use the computer to one's advantage. This abiding anxiety involves a diverse range of human emotional states, including fear, apprehension, uneasiness, distrust, and a lack of confidence about the essential skills that are needed to display even minimal knowledge about the computer (Loyd & Gressard, 1987). Anxiety is a basic human emotion that has psychological and physiological manifestations. Humans are genetically programmed to avoid anxiety-provoking situations. Hence, if students have negative attitudes about the use of computers, they will perhaps avoid them and continue to learn from models with which they are familiar (Anderson, 1996; Henderson, Deane, & Ward, 1995; Loyd & Gressard, 1987). Indeed, these individuals will not benefit from the science and technology that computers offer in knowledge and skills acquisition and in delivering health care (Francisa, Katzb, & Jones, 2000).

Several studies concluded that actual computer experience reduced computer anxiety. Gayle and Thompson (1995) theorized that both the type and amount of computer experience are linked to lower levels of computer anxiety. Dyck and Smither (1994) found that higher levels of experience were associated with lower levels of

computer anxiety and more positive attitudes toward computers for both older (over 55) and younger (under 30) users. However, they also found that the relationship between computer experience and computer enjoyment was lower for females than it was for males. There was not a clear rationale for this finding. In addition to gender and experience, several other factors could influence students' abilities to learn computer skills. These factors could include instructional design, student age, English literacy, and family income (Baker, Scher, & Mackler, 1997; Krendl & Broihier, 1992; National Center for Education Statistics, 1998; Paul, 2000). These factors could be labeled as personal characteristics of the learner (Hess & Muira, 1985; Linn, 1985; Simon, Grover, Teng, & Whitcomb, 1996; Simon & Werner, 1996).

Bohlin (1993) conducted a study that was designed to determine appropriate methods for overcoming the fear and anxiety that is typically associated with adopting computers as a major mechanism for learning in academic settings. He investigated the effect of instructional design and learner characteristics on reducing computer anxiety. He identified a trend among female students that suggests that they tend to avoid experiences with computers. The findings also indicated that female students are highly underrepresented in computer-related fields and are not willing users of computers for their daily work. Bohlin also observed that educators should not ignore the critical fact that female students generally perceive their computer competency to be significantly lower than their male counterparts across a variety of disciplines and usages. Other technology-related research that has focused on teaching practices that utilized computers is related to the relationships between student successes in microcomputer classes and other background factors, such as keyboarding skills, prior computer experiences, and

computer anxiety (Wiggs & Enhal, 1998). The results of these studies suggest that prior computer experience, the use of the computer for other class assignments, and the time spent on assignments influenced achievement and skill acquisition (Wiggs & Enhal, 1998). Comber, Colley, Hargreaves, and Dom (1997) found that males had more extensive experiences with computers and tended to appreciate the potential for this technology more than females.

Another important aspect that is related to computer usage and mastery is computer confidence. This aspect of computer usage is explained as the belief in one's own ability to learn to use and master this technology for a variety of reasons, including the acquisition of knowledge in nursing education (Bandura, 1997) research, practice, and the delivery of quality health care (Ribbons, 1998) in numerous settings. An expression of computer confidence may be evident in the amount of time that a person spends working with the computer, the use of the computer for the exploration of new knowledge and skills, and the acquisition of expertise in new fields of inquiry (Loyd & Gressard, 1987). Conversely, individuals who express or demonstrate a lack of computer confidence might shun the computer, revert to older and more restrictive models of learning, and never discover the joy of learning through this electronic medium (Ayoub, 1999).

In general, researchers have found that students' level of confidence with technology has increased as a result of practice and experience (Arndt et al., 1985; Dalton & Hannafin, 1985; Griffin et al., 1989; Koohang, 1989; Krendel & Broihier, 1992; Pope-Davis & Vispoel, 1993). Comber et al. (1997) found that males had greater experience with computers. This is a finding that reflects the world community. In a study of 281

college students in a computer applications course, Wiggs and Enhal (1998) found that prior computer experience, the use of the computer for other class assignments, and the amount of time spent on assignments influenced student achievement. Geissler and Horridge (1993) found that students who had taken a high school computer course reported significantly different levels of computer knowledge than students who had not taken such a course. This finding suggests that taking a formal course in computer technology is a useful approach to introducing the computer to students and it is also an effective method for reinforcing and strengthening computer knowledge and skills.

Computer liking is the third element in the CAS, and it is conceptualized as a sense of enjoyment, exhilaration, stimulation, and a willingness to learn about computers. Behaviors such as talking and thinking about computers are typical actions that are reported by students and others. Talking and thinking about computers tend to enhance one's interest and improve his/her knowledge and skills, which are needed to master the computer. When students make statements about the computer ("I think I would enjoy working with computers"), they are an indication that the person is interested in or liking the computer to the extent that more time and effort could be invested in this medium (Loyd & Gressard, 1987).

Computer usefulness is referred to as the extent to which an individual thinks that using a computer will improve or enhance his/her performance. It also encompasses the notion that computers could be helpful in the completion of other tasks and in future work (Davis, 1989; Loyd & Gressard, 1987). When students internalize the sense of computer usefulness, they are likely to explore the use of the computer for their individual learning and mastery. Student age has also been shown to affect computer-

related attitudes. Krendl and Broihier (1992) found that younger students enjoyed working with computers more than older students. They were also more confident and enthusiastic about computer use than their older counterparts.

In summary, Table 2 presents the four elements of attitude as described by Loyd and Gressard (1987) that are related to computer usage.

Table 2

The Four Elements of Attitude, Loyd & Gressard (1987)

Attitude	Computer anxiety
	Computer confidence
	Liking of computers
	Computers usefulness

According to the National Center for Education Statistics (1998), between 1984 and 1993, in the United States, the proportions of students in grades 7-12 who used a computer at home or at school increased at similar levels across family income. Students from high-income families were more likely to report using a computer at home or at school than students from low-income families. According to Baker, Scher, and Mackler (1997), adults read to children in poor families less often, and they achieved less understanding of the value of reading books and printed materials when compared with children in moderate and high-income families (Baker, Scher, & Mackler, 1997). These findings suggest that children form attitudes that are based on exposure and experience about books and reading. It could also be argued that they form attitudes about computers in a similar manner (Paul, 2000).

CAS Studies in the World Community

Chin (2001) conducted a study to investigate the attitudes of Taiwanese undergraduate non-traditional students toward computer usage at the Chihlee Institute of Commerce in Taiwan. The study included (n = 354) students who were enrolled at the Institute. The purpose of the study was to determine if there were differences in students' attitudes based on age, major area of study, and work experience. The findings of the study suggested that non-traditional students at the Chihlee Institute of Commerce had a positive attitude toward computers; they also found that age was a significant variable that predicted attitudes toward computer usage. That is, younger non-traditional students reported more positive attitudes toward computers than did older students at the Institute. Also, male non-traditional students reported more positive attitudes toward computers than their female counterparts. Finally, non-traditional students who had access to computers at home reported more positive attitudes toward computers than those without access to a computer at home. From this study, it can be inferred that earlier exposure to computers suggests a more positive attitude toward this technology, and a greater understanding of its usefulness in education and daily living activities. In addition, the findings also suggest that exposure to computers in the home had a positive impact on the students' attitudes about computers and their willingness to use them for learning and other projects.

In another world community, students at the College of Education at King Saud University (KSU) in Riyadh revealed interesting findings. Alsebail (2004) conducted a study to investigate the influence of gender on students' attitudes toward computers. The target population in this study were students (n = 256) who were matriculating in the College of Education at the University. The sample included both genders. The result of

his study revealed that gender did not influence the students' attitudes toward computers. However, on the subscale items, female students reported greater confidence in their ability to acquire the knowledge and skills that are necessary to utilize this technology for educational purposes. Interestingly, the female students reported higher scores on computer liking than did their male counterparts. This is one of the few findings that report the liking of computers among females in academic settings. This finding is particularly interesting because it is at the KSU where the proposed research will be conducted. A note of caution indicates that these findings cannot be generalized to other students that KSU.

Gender issues in computer and technology acceptance have been the source of significant research interest over the past 2 decades (Acker & Oakley, 1993; Bryson & De Castell, 1999). Empirical evidence suggests that gender differences do exist in technology-related attitudes, participation, and achievement. Additionally, some researchers have found that there is also a difference in the way male and female students react to computers (Simon et al., 1996; Simon & Werner, 1996). With regard to Saudi male and female nursing students, no inferences can be drawn about them from these studies. Yet, these studies raise interesting and researchable questions that could be explored with nursing students at KSU.

There is another line of thought that purports that male students seem to have an advantage over female students in learning computer skills. Hess and Muira (1985) and Linn (1985) argued that male students had lower anxiety, higher confidence, and greater liking of computing than did females. Colley, Gale, and Harris (1994) support the findings of Hess and Muira (1985) and Linn (1985). These studies also found that male

students were more likely to enroll in computer programming courses. However, Krendl and Broihier (1992) concluded that female students enjoyed using computers less than did males. These results might be associated with the finding that males have been the dominant group in computer classes and in the initial computer-related workforce. Kay (1992a) and Moon (1994) found that male students had significantly greater confidence about computers, and used them more often. Simon and Werner (1996) and Chou and Wang (2000) found that male students had better learning performance, higher computer self-efficacy, and lower computer anxiety. More computer usage has a tendency to increase one's computer skills, knowledge, and confidence. This perspective is grounded in learning theory (Bandura, 1997). Other studies have corroborated the learning theory school of thought Chou supported these findings.

Chmielewski (1998) and Otomo (1998) reported differences between men and women in computer anxiety. Marszalek and Lockard (1999) reported that female students had significantly higher science anxiety than males. Among many people in the world community, computer use has been labeled as a science that requires highly developed technical skills. Odeans and Laney (1998) found that boys were more likely to be socialized to adapt to and learn computer technology than were girls. Brosnan (1998b) studied (n = 47) undergraduate students (39 males and 8 females) at London University in 1996. He found that 64% of the females agreed that computing was a male activity and that men were better than women at computing. Females who agreed with this latter statement were significantly less computer anxious than females who did not agree with the statement. In his conclusion, Brosnan stated, "the present study has demonstrated that

most females and males hold the perception that computers have become masculinized" (p. 75).

Al-Jabri (1998) conducted a study of gender differences in computer attitudes among secondary school students in Saudi Arabia. He used a survey approach to examine computer-associated attitudes among 187 secondary school students (81 males and 106 females). Al-Jabri concluded that there were significant gender differences in computer anxiety, computer confidence, and computer liking. His findings suggest that male students were less anxious and had greater confidence in their abilities to learn and master the use of computers. Al-Jabri also found that male students tended to like working with computers more than did female students. In his conclusion, he stated that "Male and female students have positive attitudes toward computers" (p.73). However, Males' attitudes are significantly higher than their female counterparts". His findings also indicate that males tend to be less anxious about learning and using computers; as a rule, they are typically more confident about working with computers. These two factors (less anxiety and more confidence), perhaps, increase the chances that males will use computers more frequently than females and enjoy the experience. Hence, over time, they will become more knowledgeable and skillful in computer technology. Others, however, have conceptualized the male and female approach to computer technology from a different angle.

Several studies do not support the notion that male students are inherently better prepared to learn computer technology. In a study on *Attitude of Mississippi State University Education and Business Students toward Learning and Working with Computers*, Gunter (1994) stated, "Gender did not influence students' attitudes toward

computers" (p. 107). Instead, she found experience to have a statistically significant influence on students' attitudes toward learning and working with computers. Other support was also evident. Dyck and Smither (1994) found no gender differences in anxiety after previous experience was controlled for. Davis (1999) concluded that female students achieved and performed at about the same level as male students, even if they were more likely to be more computer anxious, field-dependent, and less satisfied than male students. Rosen and Maguire (1990) found a slight gender difference as it relates to computer phobia. They wrote, "While nearly half of the computer phobia research studied gender differences, the results indicated only a slight variation that indicated that females were more computer phobic than males" (p. 180).

In a study of the effects of gender and academic programs on learning styles and attitudes of undergraduate students using multimedia, web-based anatomy labs, Katz, Maitland, Hannah, Burggraf, and King (1999) concluded that although women report less comfort using computers, they were more likely to view the computer as a useful tool than the males in their peer groups.

One possible explanation for any gender differences in computer-related attitudes and aptitudes could be gender bias and socialization in public schools, a topic on which there has been considerable research. Over time, particular concern has been expressed regarding bias against females in science and mathematics classes. This trend has been observed throughout the world. In fact, in some areas of the academic society, it was a foregone conclusion that women could not be mathematically inclined and should invest in other academic areas like music and the soft technologies such as textiles and food preparation (Henrion, 1997). Since the introduction of computers, this concern has again

intersected with gender factors. Sanders (1993) asserted that the practice among some teachers of giving preference to boys in a classroom was a major cause of female students not choosing careers in computer-related fields and mathematics. Additionally, Bohlin (1993) identified a trend among female students in their college years to avoid experiences with computers. He noted that female students were highly underrepresented in computer classes, and that they were not proficient with the use of this technology. Again, the socialization that occurred during the early years of growth and development would have to been considered. Bohlin also noted that educators couldn't ignore the critical fact that female students generally perceived their computer competency to be significantly lower than their male counterparts. The extent to which this perception is a sociological factor that becomes a "self-fulfilling prophesy" has not yet been carefully examined in the scientific literature.

In recent years, there has been an international interest in developing a scale that could help to determine people's attitudes about computers. In Israel, Francisa et al. (2000) reported on the development of the Hebrew language edition of the CAS instrument. This instrument was translated and checked for accuracy through back translation by experts. Data (n = 298) on female undergraduate students at a university revealed high reliability and validity of the Hebrew version of this instrument. Alpha coefficients of .84, .85 and .88 were good indicators of the reliability of the three subscales (computer anxiety, computer liking, and computer confidence). Construct validity was demonstrated by correlations ranging between .21 and .53 with various measures of previous computer-related behavior or behavioral intentions. The construct validity was relatively low. This study reported on the translation and empirical

evaluation of the Hebrew version of the Computer Attitude Scale, an instrument originally developed in the US by Loyd and Gressard (1987) and subsequently employed in a number of studies among pre-service and in-service teachers in the US and UK. The data supporting the reliability and validity of this scale were robust enough to recommend the scale for further use among Hebrew-speaking subjects. Together, with the Turkish translation developed by Berberoglu and Calikoglu (1993), the present study promotes the internalization of one specific measure for computer-related attitudes that could be used among many diverse groups of people. The CAS is a reliable scale, available in numerous languages, easy to administer, and considered to be sufficient to use in cross-cultural studies concerned with exploring the correlates of computer-related attitudes. The development of other language editions of the CAS is also being encouraged.

Other studies continue to support the underpinnings of the CAS. Burger and Blignaut (2004) conducted a study at the University of the Free State in South Africa to determine whether computer users' attitudes changed as the students gained more self-efficacy with the technology. They were particularly interested in understanding the elements of computer anxiety, computer liking, computer confidence, and the degree to which their attitudes changed over time as they became more experienced with computers. The sample (n = 306) students (155 White, and 151 Black students) participated in this study. Frequencies, correlations, reliability, and factor routines were the major statistical methods that they used in their study. Their findings revealed a negative relationship between computer attitude and computer experience among all subjects in the study. Contrary to other findings, as the students gained more experience with computers, their computer confidence and computer liking decreased, and their

computer anxiety increased. Their overall attitudes towards working with computers were not enhanced. This finding provokes thoughts about the environment, the methods used in computer instruction, and other determinants of behaviors that the students experienced. The research did not provide an in-depth explanation of these findings. Several questions do, however, emerge. What was the nature of the instruction that were provided for the students? Was there sufficient time for practice and application? Was the utility of the computers explained and demonstrated? What were the attitudes of the teachers that were transmitted to the learners? What was the level of expertise among the teachers? These questions are rhetorical; they were not addressed in the completed research, and they will not be addressed in the proposed research.

Theoretical Model

The theoretical model consists of several factors that represent the intrinsic principles of social learning theory. Self-efficacy is a theory that is embedded in social learning principles, and it is an important approach to changing behaviors. An effective self-efficacy based program should include learning methods that adapt and merge new thinking and behaviors that are related to a targeted goal. Bandura (1997) describes self-efficacy as a theory that involves (a) an individual's self-confidence in various situations, (b) the development of an individual's self-confidence to master a particular task, and(c) the person's sense of achieving the desired outcomes that should positively impact the person's behavior. .

According to Bruning, Schraw, and Ranning (1999), *Reciprocal Determinism* is one of the core concepts of Bandura's theory. It suggests that learning is the interaction among three factors: personal, behavioral, and individual responses to a particular

situation that could have a positive or a negative outcome. For example, consider the situation where a graduate student receives a low test grade (individual behavior). This person is likely to respond with anger and dissatisfaction. Included in the response to this situation would be the person's appraisal of the environment (teacher feedback and the academic expectations of students), and the reactions of significant others (parents and peers). Figure 1 shows the relationships among these three factors.

Furthermore, several personal factors significant influence the other variables included in Reciprocal Determinism. These factors include the beliefs and attitudes that positively affect the learning process.

This model suggests that an individual's beliefs and practices help to determine the individual's response and to interpretation of the environmental component of the interaction. Several researchers have indicated that individual factors are related to behaviors and environmental roles that influence the person's response to situations. In addition, the individual's interpretation of the environmental roles and functions of others will help to determine the response of this individual in any situation.

Bandura further suggests that personal factors such as beliefs and attitudes that affect learning play significant roles in behavioral and environmental interpretations. The factors that have a significant impact on the person's behavior are self-efficacy and desired outcomes. According to Bandura (1997), self-efficacy is defined as the individual's confidence that he/she manifests toward achieving particular goals.

According to Bandura (1997), self-efficacy depends on the individual's capability to think critically and to organize his/her thoughts in order to produce the desire aims. However, numerous researchers define self-efficacy as the individual's ability to control

his/her decision making and behaviors, which reflects the desired outcomes of the person who initiated the action. Self-efficacy can be related to behavioral implications and can be adopted to provide a theoretical framework to account for behaviors in many aspects of life. Cha and others (2007) examined individuals' behaviors related to risky sexual activities. Woodruff, and Leatherdale (2008) used the framework to examine smoking cessation; Hays, Damush, and Clark (2005) studied an exercise intervention program to test the extent to which the program helped individuals to utilize exercise in their lives and make lifestyle changes. In a similar manner, Bandera's self-efficacy theory can be applied to students who are being introduced to technology as a tool to facilitate their learning and knowledge acquisition (Brosnan, 1999; Francisco, Barbeite, & Elizabeth, 2004).

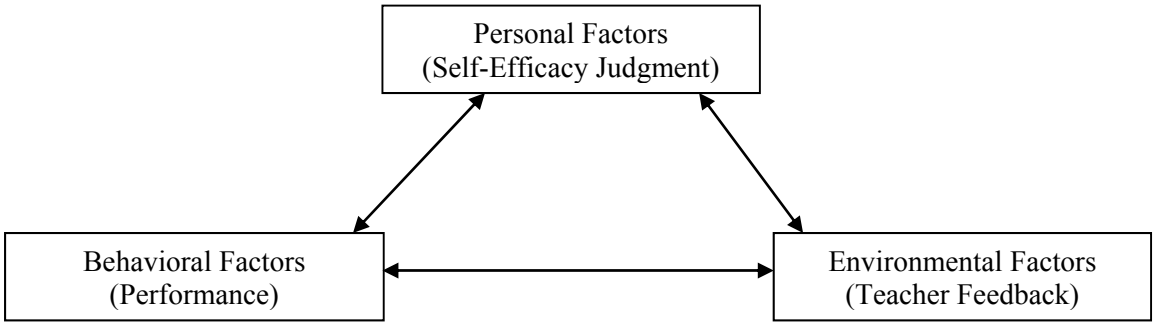


Figure 1. Reciprocal Determinism Model.

In Bandura's model, performance capabilities can be assessed through physiological perception. However, in an aroused state, an individual may interpret this experience as a loss of strength and a position of limited control that could lead to fear and defeat. In addition, individuals with low self-efficacy could embody the sense of feeling defeated, being dissatisfied with life, or having to endure anxiety states, all of which could negatively affect them and their work. Over time, their self-concept and self-esteem will be affected.

Self-efficacy plays a significant role in individual development among males and females. It helps to shape career choices, levels of interest across a variety of professional careers, and the extent to which these career choices will be explored and addressed. Bandura posits that there are other factors that influence attitudes and behaviors. Indeed, self-efficacy can be influenced by the individual's beliefs about the phenomena being studied, which, in this case, is the use of computers for learning and knowledge acquisition. These beliefs may include cultural constraints, home and family behavioral patterns, inequitable incentives in the workplace, and truncated opportunity structures. These factors can have different outcomes among people who live in the same family or reside in the identical community or neighborhood.

Bandura and other social theorists suggest that self-efficacy can be maintained to assist the individual with the continuous acquisition of skills that are important for achieving mastery and competency over an extended period of time. According to Dusick (1998) there are four basic types of interventions that have significant roles in the development of self-efficacy. These types of interventions include (a) accomplishment of a high performance level (expert in computer use), (b) vicarious experiences (observing others using a computer), (c) verbal persuasion (mentoring and coaching others in the acquisition of computer skills), and (d) emotional arousal (avoiding anxiety-producing computer-related situations). Brosnan (1999) has written that computer use increases the level of self-efficacy among individuals. That is to say, the more a person uses the computer, the more opportunity for skills acquisition. Francisco et al. (2004) suggest that the individual should control the anxiety generated from computer usage when seeking to attain high levels of self-efficacy. Bandura (1997) emphasized the importance of the

relationship between anxiety and avoidance when the objective is the mastery of computer technology.

Figure 2 indicates the substruction of the model being used in this research. The first part identifies personal and environmental constructs, and the second part identifies the concepts of attitude and family environment. The last section in the diagram consists of the measures that will be used to describe the concepts.

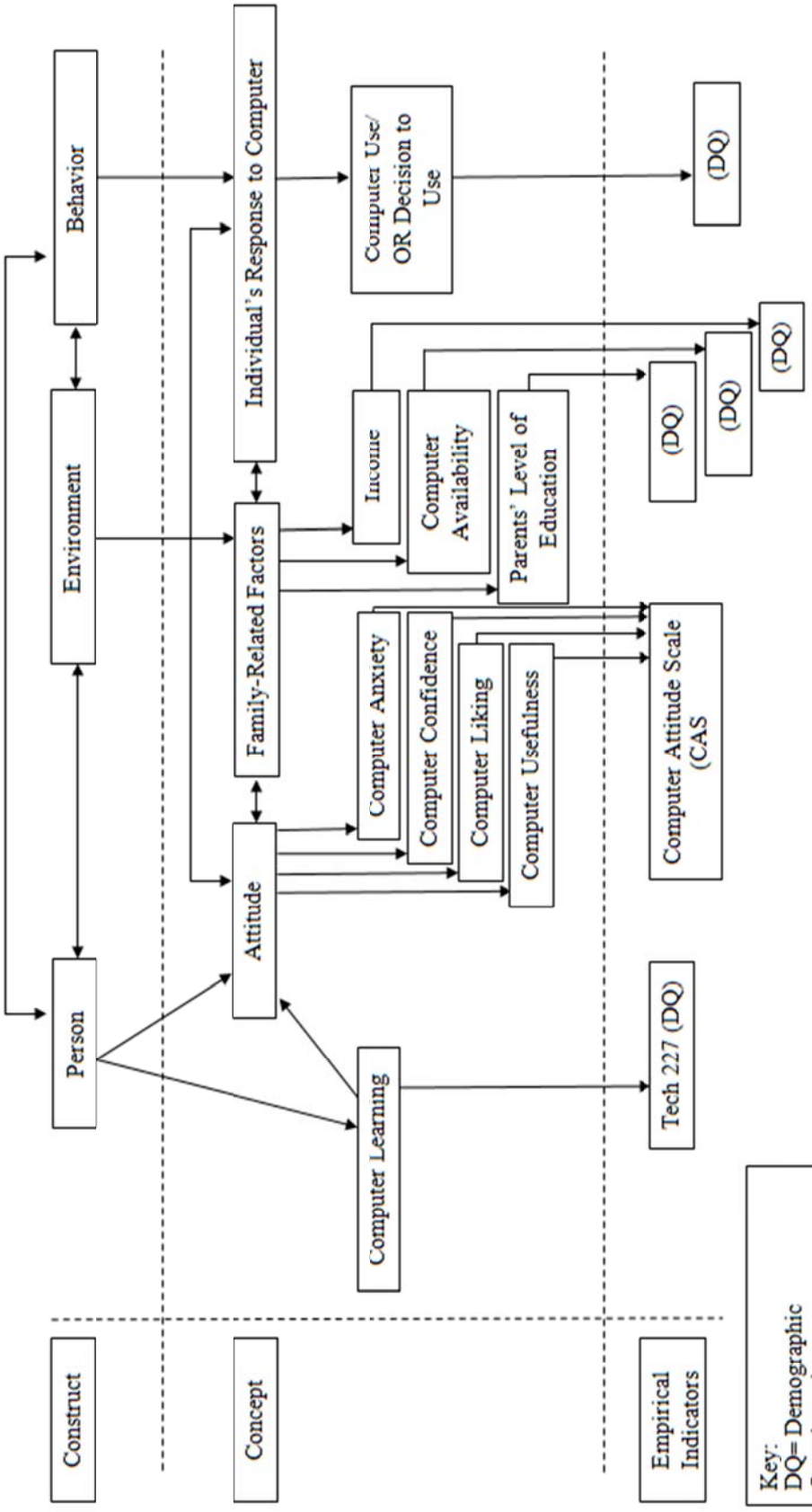


Figure 2. Concept of the study.

Chapter III

Research Methodology

This chapter describes the methodology and procedures used to conduct the study. It includes the following sections: setting, research design, major variables in the study, population and sample, instrumentation, and data collection and data analyses plans.

Setting

The study took place at KSU in Riyadh, the capital of Saudi Arabia, and the largest city in the country. The total population of Saudi Arabia is about 27 million, including 6 million who are non-Saudi citizens. About 40% of the Saudi population lives in villages and small communities dispersed throughout the kingdom; the majority (about 60%) resides in the major cities in the country. The age ranges of the people vary, and a large percentage are young. The population that is between the ages of 0-14 years (about 42.4%) provides evidence of a relatively youthful population. Those who are 15-64 years of age comprise about 54.8% of the total population. Individuals over 56 years of age comprise 2.8% of the Saudi population (MOI, 2007; World Bank, 2007). Saudi Arabia, therefore, has a population that is relatively young when compared to other nations such as the United States where the largest segment of the population is between the ages of 1 and 45. Figure 3-5 shows the distribution of the Saudi population for the years 2000, 2005, and 2010. These data should help the reader to discern the slight changes in age among the Saudi population over the next 3 years (US Census Bureau). In Figure 1, which depicts the 2000 population profile, it should be noticed that males (age 35-45) tend to live longer than females. The trend is unlike data from other countries such as Japan, Germany, and the United States.

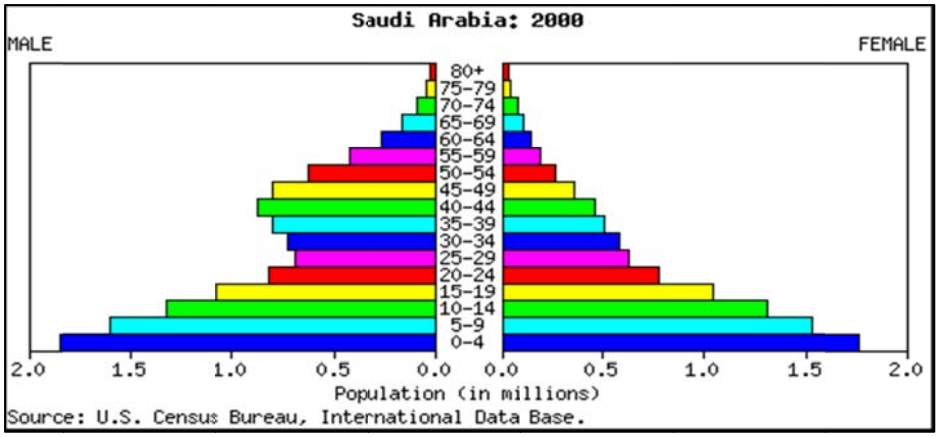


Figure 3. Saudi Arabia Population Pyramid for 2000 (Nation Master, 2005).

In Figure 4, the same trend can be noticed although males and females experience similar patterns of mortality during the formative years. The change, however, seems to begin at around midlife (ages 45) and extends to old age. The explanation for these differences is not yet understood. See Figure 4.

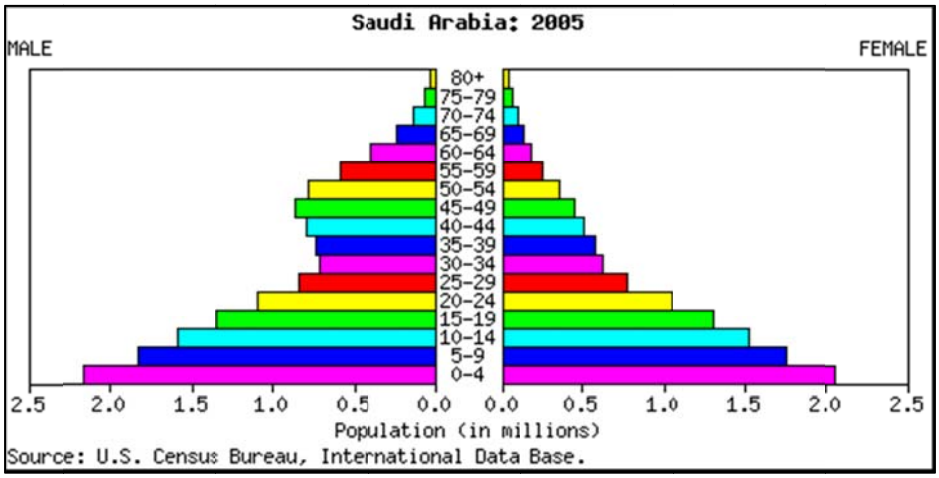


Figure 4. Saudi Arabia Population Pyramid for 2005 (Nation Master, 2005).

In Figure 5, the population pyramid does not reveal much change in the trends. In fact, the profile closely mirrors the previous 5 years (2005). One explanation for the stability of the profiles over these 5 years is the nation's investment in health services for its people. In Saudi Arabia, all people can receive health care, which is provided without

cost to individuals and families. In addition, the government has heavily invested in improving educational opportunities for its people. Since educational attainment and health status are linked (WHO) it should be expected that the general population would have similar mortality profiles.

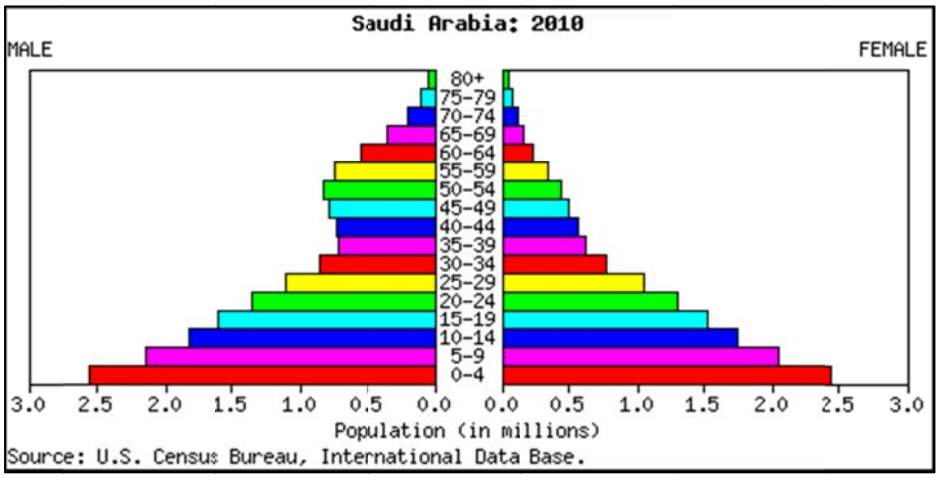


Figure 5. Saudi Arabia Population Pyramid for 2010 (Nation Master, 2005).

History of Saudi Arabia

Saudi Arabia has an important history in global geography. It is the world's largest producer of oil. About 10 million barrels of oil are extracted from the earth and shipped to the world community each day. In addition, it owns about 260 billion barrels of oil reserves that are stored in the county. These statistics represent about 24% of the world's petroleum reserves. The gross domestic product of Saudi Arabia is about 45% of the nation's total income. It is a nation that has grown and developed at an astounding pace. Most of the growth has occurred over the past 30 years. Riyadh is the "nerve center" for the nation. It is one of the most modern cities in the world, and it boasts a per capita income of $20,700. The natural resources in the country have provided the Saudi people with opportunities for advanced education and health care. Health care in the nation is without cost to its citizens; there is universal health coverage for all Saudis.

Education is also free to its citizens, and the privilege ranges from early childhood education to higher education at one of the universities (MOI, 2008) in Saudi Arabia and in other world communities. To help orient the reader to the geography of Saudi Arabia, a map has been included in Figure 6. Recall that Saudi Arabia is considered the "hub" of the Arab nations.

Figure 6. Map of Saudi Arabia.

The map of Saudi Arabia should help the reader to quickly become orientated to the geographical location of the nation. It is bordered by the Red Sea to the west, and Kuwait, Qatar, Oman, and the United Arab Emirates (UAE) on the east. At the north, it is bordered by Jordan, Syria, and Iraq. The southern part of the nation shares a border with Yemen. Saudi Arabia is centrally positioned in a cluster of Arab nations, and it is one of the wealthiest nations in the world.

In 1945, Saudi schools, including colleges and universities, numbered about 226; 30,000 students were enrolled in these institutions of higher learning. Today, Saudi

Arabia has a public education system that consists of 34 universities and more than 24 colleges and technical institutions (Al-Farsi, 2001; MOE, 2007; MOHE, 2010). Other training institutions are also available to Saudi citizens. Over 25% of the nation's budget is devoted to education, including vocational training. Today, there are more than 4 million students, including 2.1 million male students who are enrolled in 11,587 schools and approximately 1.9 million female students who are enrolled in 10,493 schools (MOE, 2008-2009). Policies that address the education of females are evolving overtime. King Saud University is one example of how gender policies are changing in the country, and KSU was the site for the proposed research.

Among the top 500 universities worldwide, KSU has been rated by the esteemed Shanghai Rankings, which determines excellence among the world's academic institutions of higher learning. The Shanghai Rankings is also referred to as the Academic Ranking of World Universities (ARWU). The proposed study will explore the attitudes toward computer use among adult male and female students in the College of Nursing at KSU. The rationale for selecting KSU is related to its history and the important transition regarding educational philosophy that has occurred at the university and within the nation. It is important to emphasize that the College of Nursing at KSU is the first and the only school of nursing in the Kingdom of Saudi Arabia that awards a BSN degree to both genders (males and females). The practice is a relatively recent innovation. The current enrollment at KSU is about 63,000 students. The total number of male students is 38,000, and the total number of female students is 25,000 (KSU, 2009). However, in the KSU College of Nursing, the demographic statistics are different; there are a total of 600 students matriculating at the institution. Of these numbers, there are 195 males (32.5%)

and 405 (67.5%) females who are actively enrolled in academic nursing courses. This fact makes KSU a unique setting in the nation because of its gender profile in nursing and the historical significance that is related to educating male and female adult students in the same physical academic environment.

Design

The study utilized a descriptive correlation design, appropriate for the investigation of the relationships of demographic characteristics (e.g., age, gender, socioeconomic status, previous exposure to computers, years of study at KSU, successful completion of a computer class [Tech 227], and students' attitudes toward computer usage at KSU). The independent variables in the study were gender, age, socioeconomic status, academic classification, grade point average, length of previous computer experience before enrolling at KSU, access to computers outside of KSU, number of household members who use the household's computer, marital status, geographical region of the nation that is considered to be the students' home, and completion of the mandatory computer classes (Tech 227). There were four dependent variables that were derived from the subscales on one instrument, the CAS measure. These subscales include computer anxiety, computer confidence, liking of computers, and computer usefulness. Collectively, they were used to describe the nursing students' attitudes toward computer use at KSU.

Sample

The researcher invited all officially enrolled students at the College of Nursing at KSU in Riyadh, Saudi Arabia in the summer semester of the academic year 2009 who met the criteria to participate. Recent (2007-2008) statistical data revealed that there were

a total of 63,315 undergraduate students at KSU: 38,092 males and 25,223 females. More specifically, the total number of undergraduate nursing students was 600: 195 males and 405 females (KSU, 2008). From these data, it was hypothesized that the majority of the study sample might be females.

The inclusion criteria for participation in the study were: (a) both sexes (males and females), (b) all educational levels at the university (freshman, sophomore, junior, and senior), (c) 18 years of age or older, (d) enrolled as full-time students at KSU, (e) a Saudi citizen, and (f) willingness to participant in this study as evidenced by the signed Informed Consent Form that was completed by each participant before he/she could enter the research study. Other students who did not fit these criteria were not invited to participate in this research study. A clear explanation was provided to the students.

Instruments

Demographic Questionnaire

The Demographic Questionnaire was used to collect data about the personal characteristics of the enrolled students in the sample. This questionnaire has 13 items that query the subjects about variables such as age, gender, family income, number of years of previous exposure to computer usage, perceived level of expertise in computer usage, years of matriculation at KSU, marital status, and geographical region of the nation that is considered to be home. The instrument was developed by the researcher. It will be presented to the study participants in the Arabic language.

Computer Attitude Scale (CAS)

The Arabic Version of the Computer Attitude Scale (CAS) was used in this study to describe the students' attitudes toward computer usage. The CAS was developed by

Loyd and Loyd in 1984 and was modified 1985. It is a four-point Likert-like scale consisting of 40 items distributed among four 10-item subscales that measure computer anxiety, computer confidence, liking of computers, and perceptions of the usefulness of computers. Each of the subscales consists of both positively and negatively phrased statements (Table 3). In response to the statements, the subjects were requested to indicate which of four responses, on a rating scale of 1-4, best described their attitudes toward computers. In this questionnaire, 4 = *strongly agree*; 3 = *slightly agree*; 2 = *slightly disagree*; and 1 = *strongly disagree*. The study participants were also asked to select the items on the questionnaire that best fit their experiences with computers. The questions were coded: the higher the score, the more positive the attitude. The total CAS score can range from 40-160. Again, higher scores correspond to more positive attitudes about computer usage. For example, a high score could indicate that the student has more confidence in computer usage. On the other hand, a high anxiety score could suggest that the person is not comfortable with computers, and could be experiencing some computer anxiety. Table 4 depicts the CAS subscale items that are positively worded and those items that are negatively worded. Table 4 also delineates the four subscales, and the questions on the instrument that are used to measure the particular concept.

Table 3

Positively and Negatively Worded Items on the CAS Measure

Subscales	Questions
Positively worded items	1, 3, 4, 6, 9, 11, 12, 14, 16, 17, 19, 22, 25, 27, 28, 30, 33, 35, 36, 38
Negatively worded items	2, 5, 7, 8, 10, 13, 15, 18, 20, 21, 23, 24, 26, 29, 31, 32, 34, 37, 39, 40

Table 4

The Four Subscales on the CAS (Loyd & Gressard, 1987)

Subscales	Questions	
Computer anxiety	1, 5, 9, 13, 17, 21, 25, 29, 33, and 37	10
Computer confidence	2, 6, 10, 14, 18, 22, 26, 30, 34, and 38	10
Computer liking	3, 7, 11, 15, 19, 23, 27, 31, 35, and 39	10
Computer usefulness	4, 8, 12, 16, 20, 24, 28, 32, 36, and 40	10
Total		40

Table 5 and 6 depict the concepts, indicators, instruments, and levels of measurement that were used in this research. The four subscales of the CAS are highlighted as well.

Table 5

Study Variables, Description of Demographic Questioner Instruments, Levels of Measurement, and Four Subscales in the Study

Concepts	Indicators	Level of Measure
Demographic Questioner Instruments	Major	Nominal
	Education Level	Ordinal
	GPA	Ratio
	Gender	Nominal
	Age	Ratio
	Marital Status	Nominal
	Geographical Region	Nominal
	Family Income (SES)	Ratio
	Academic Computer Experience	Nominal
	Length of Computer Experience	Ordinal
	Access to Computer	Ordinal
	Number of Household Members Who Use the Computer	Ratio
	Recommended Subject	Nominal

Table 6

Study Variables, Description of CAS Instruments, Levels of Measurement, and Four Subscales in the Study

Concepts	Indicators	Level of Measure
Computer Anxiety	Score attitude on 4-point Likert-like scale (10 items)	Ordinal
Computer Confidence	Score attitude on 4-point Likert-like scale (10 items)	Ordinal
Computer Liking	Score attitude on 4-point Likert-like scale (10 items)	Ordinal
Computer Usefulness	Score attitude on 4-point Likert-like scale (10 items)	Ordinal

Validity and Reliability of the Measures

This study used the revised version of the CAS by Loyd and Gressard (1987). This instrument has been employed by a diverse group of researchers in numerous global communities. Countries where the measure has been used include Israel (Francisa et al., 2000), China (Chin, 2001), South Africa (Burger & Blignaut, 2004), and Saudi Arabia (Abanmie, 2002; Alsebail, 2004). The reliability and validity of the instrument have been well-established. The reliability coefficient for the Arabic version is 0.91 for the total scale. The validity has been evaluated by Loyd and Gressard (1987), and found to be an effective instrument for differentiating teachers' attitudes based on varying degrees of

computer experiences. Each of the 10 subscales was able to stand alone and produce their own psychometric properties. Table 7 provides the Cronbach's alpha values for each of the various cultural versions of the measure as determined by the language.

Table 7

Cronbach's Alpha Values for the Previous Studies (Total & Subscale)

Study	Country/Language	Cronbach's alpha values
Loyd & Gressard, 1987	English	T=0.95, A=0.90, C=0.89,L=0.89, and U=0.82
Francis, Katzb, & Jones, 2000	Hebrew	T=0.95, A=0.86, C=0.91,and L=0.91
Burger & Blignaut, 2004	English	T=0.89, A=0.89, C=0.89,and L=0.95
Alsebail, 2004	Arabic	T=0.78, A=0.77, C=0.73,L=0.71,and U=0.71

Note. T = Total, A = Anxiety, C = Confidence, L = Liking, and U = Usefulness.

Sample Size Calculations

The College of Nursing at KSU has an enrollment of 195 male and 405 female students. Hence, the researcher determined that the sample will consist of 67.5% female students and 32.5% males, making the total sample equal to 100% of the profile of the student body in nursing. In addition, it was stressed to the administrators and the students at the university that the study was voluntary. That is, if an individual did not wish to participate, there were no consequences for a refusal to join the study. The study was

coordinated through the Office of the Dean of Academic Affairs, and the Dean of the College of Nursing at KSU.

G-Power software was used to determine both sample size and effect size by examining the F-test (Multiple regression: Omnibus [R^2 deviation from zero]) and (a priori: compute required sample size-given α, power, and a medium effect size of 0.15) with 15 predictors. A medium effect size assured that the robustness of the study was acceptable, and allowed the researcher to detect slight differences in the statistical outcomes (Mertler & Vannata, 2005). Given these properties, the sample size was calculated to be 199 (males = 64; females = 135), reflecting one-third of the total student body (n = 600) for the academic year summer 2009.

A review of the literature revealed several studies that have used the CAS measure. These studies occurred throughout the world community. Depicted in Table 8 are several studies with effect size and sample size delineated. The sample sizes are different. However, none of these studies used correlation, multiple regression, or logistic regression as the statistical tests in their research. The sample sizes in the published studies have been delineated for the reader's convenience.

Table 8

Previous Study Statistics, Effect Sizes, Statistical Tests, and Sample Sizes

Country	Author(s), Year	Statistics	Effect Size	Sample Size
Taiwan	Chin (2001)	ANOVA	0.19 Medium	354
Saudi Arabia	Alsebail (2004)	MANOVA	0.075 Small	256
Israel	Francisa, Katzb, & Jones (2000)	Correlation	0.14 Small	298
South Africa	Burger & Blignaut (2004)	Correlation	0.41 Medium	306

Data Collection Procedure

This study was approved by the dissertation committee at the Frances Payne Bolton School of Nursing, and the Institutional Review Board at Case Western Reserve University. After it had been approved at both levels, the document was submitted to the KSU Academic Dean, and the Dean of the College of Nursing; it was also submitted to the KSU Institutional Review Committee, along with a letter of introduction and an explanation of the purpose of the research written by the researcher.

After formal approval to conduct the research had been received from both universities, the researcher will made plans to begin the data collection process. The researcher met with the dean and the faculty of the College of Nursing at KSU. After they had been informed about the study, the researcher proceeded with data collection.

“In reference to Mr. Osama Samergandi's request to have King Saud University

> approve his proposal and data collection procedure of his dissertation proposal titled "The School of Nursing Students' Attitudes toward Computers at the College of Nursing at King Saud University (KSU)", I would like to inform you that according to our IRB policy and standard operating procedures at KSU, Mr. Samergandi's research proposal falls under the exempt research category. Accordingly, an official approval letter has been issued from the Vice President of the University for Scientific Research and Postgraduate Studies who has the authority to approve any proposal submitted for data collection at the King Saud University or one of its facilities."
>
> (KSU College of Nursing Dean Alnaif approval letter)

Data were collected from students at KSU who volunteered to participate in the study. The process of data collection occurred in the following manner: (a) An open letter that explained the purpose of the research and the specific actions that the researcher would ask the students to take was distributed by campus mail to all students at the KSU College of Nursing; (b) A random selection process was used to determine the classrooms of students who were invited to participate in the research; (c) Once the randomly selected classrooms had been chosen, the researcher approached the faculty member who was responsible for that class to explain the study; then, plans to administer the questionnaires to the volunteer students in the randomly selected classrooms was developed; (d) When the researcher entered the class, he asked if all of the students were volunteering to participate in the study; if there were students who do not wish to participate in the study, they will be asked to leave the room and proceed to a predetermined space within the school until the data collection was over; (e) For all

students who remained in the room—another indication of volunteering to participate—the researcher explained the purpose of the study to the students; (f) The researcher read from a script (appendix C)to ensure that all students were given the same information in each of the classrooms every time data collection occurred; content of the script detailed the actions that were being requested from each of the students; (g) The researcher emphasized that the data collection process was confidential and that no one at the school, or any place else, would have information about their responses to the demographic data form and the CSA questionnaire; (h) The students were informed about their rights to refuse to participate in the study or to withdraw from the study at any time during the process of data collection without reprisals or disapproval; (i) They were also told that there were no foreseeable risks associated with participating in this study and that they would not receive any immediate benefits from their participation. However, the knowledge and information gleaned from the study would help them in the long term as well as their colleagues; (j) The students were specifically instructed not to write their names on the instruments that were used for data collection; (k) When students completed all items on the instruments, they were asked to place the instrument in an 8 x 11envelope that provided by the researcher. Then, they were requested to place their personal envelopes in a locked box located in the back of each classroom. At the end of the session, the researcher removed the data from the locked box and transported the envelopes in a locked steel file portable box to an office where the data were placed in a large three-drawer file cabinet in a locked office; the cabinet was locked, and the door to the room secured.

At the end of each data collection session, all of the students were thanked for

their participation. Finally, at the end of the study, the researcher provided a summary of the research findings for all of the participants. All findings were provided in aggregate data format and presented with bar charts and pie charts. Diagram 1 shows the data collection procedure.

Plan for Data Analysis

Statistical Package for the Social Sciences (SPSS, 18) was used to compute and analyze the data. The study sample was described by mean, median, range, standard deviation, and frequency statistics. Also, missing data were delineated by the numbers 9999. Furthermore, pie charts and bar graphs were created to visually describe the demographic variables and the distribution of the subscales of students' attitudes toward computers.

The following research questions guided this study:

Research Question One

What are the personal demographics (age, gender, socioeconomic status, geographical location, and program level) of the nursing student body at the KSU College of Nursing?

Data Analysis Plan for Question One

Summary measures including descriptive statistics, mean, standard deviation, variance, and frequencies were used to answer this question.

Research Question Two

Does anxiety about computer usage in academic learning vary among males and females at KSU College of Nursing?

Data Analysis Plan for Question Two

Summary measures including mean, standard deviations, and variance along with *t*-tests were used to determine the difference between the two groups (males and females).

Research Question Three

Do length of previous computer experience before enrolling in KSU College of Nursing, access to computers outside of KSU, number of household members who use computers, and the mandatory computer class (Tech 227) predict students' attitudes toward computer usage?

Data Analysis Plan for Question Three

Correlation statistics were used to answer this question. Pearson and Spearman correlations were employed. Step-type (backward, forward, and step-wise) regression analysis was used.

Research Question Four

Do gender, age, GPA, and the mandatory computer class (Tech 227) predict attitudes about computer usage in academic learning among the baccalaureate students at the College of Nursing at KSU?

Data Analysis Plan for Question Four

Multiple regression was used to predict the influence of the independent variables on the dependent variable, computer usage attitude.

Research Question Five

Do gender, age, and socioeconomic status predict attitudes about computer usage in academic learning among the baccalaureate students in the College of Nursing at KSU?

Data Analysis Plan for Question Five

Multiple regression using step-type regression analysis was used to predict the influence of the independent variables on the dependent variable, computer usage attitude.

Limitations of the Study

There were several limitations of this study:

1. The sample for this study was limited to the College of Nursing at KSU, Saudi Arabia.
2. The study sample was selected from the students enrolled in the summer of the academic year 2009, and those who were in attendance on the days that data collection occurred.
3. Students' attitudes toward computers were assessed only by administering the CAS (Loyd & Gressard, 1987).
4. The findings of this study were not generalizable to the entire Saudi Arabian nursing student population.
5. Computer usage is a required activity. Some students might have felt threatened when asked about computer usage as a component of their academic curriculum. These students may have been less likely to voluntarily participate in the study and students may have self-selected as those with a more positive attitude

6. For some nursing students, computer usage might have been considered alien to the Saudi way of life and would have preferred not to use them or take the opportunity to learn about them for use in their work.

Data Organization and Tracking

To help ensure that the data were well organized and managed, data storage, coding and computer entry will began shortly after data collection. Maintaining data integrity during the data-entry phase facilitated by (a) tracking all decisions made during the data collection process and during the coding activities, (b) double-coding the data through an independent process completed by a second individual, (c) checking the data for accuracy as it is entered into the computer, and (d) checking the data for discrepancies and errors. While entering the data, the researcher avoided distractions and limited the data entry time to 2 hours in order to decrease errors (Burns & Grove, 2001). To prevent error of exhaustion, checking data for accuracy occurred on a different day than data entry by the researcher. All activities related to the research was recorded in a Data Log Book and kept in a locked file cabinet that was under the researcher's supervision. This Data Log Book will contain "notes to the researcher" about thoughts, changes, deletions, additions, etc., to the data and general responses to the research experience.

Data Storage and Safety

When data entry had been completed, a back-up of the database was saved on the computer hard drive, a CD, and an external memory device. The computer-entered data was protected by using a complex password that was developed by and known only to the researcher. All essential documents such as the signed consent documents, IRB correspondence, and other related materials was locked in the principal investigators'

office at Frances Payne Bolton School of Nursing at Case Western Reserve University. Access to the data was limited to the researcher and the University's IRB Review Board (if requested), which had the responsibility of protecting human participants as defined by federal law in the United States. The dissertation committee chairperson also had access to the data but at no time was she able to match names and other identifying information with the responses from the study participants. Recall that the participants were specifically instructed not to write their names on the instruments. However, names did appear on the Informed Consent Forms but no one, not even the researcher, was able to match the Informed Consent Forms with the completed instruments in the study.

Implication of Research for Administration, Education, Practice, Research, and Health Policy:

Implications for Administration

The utilization of computers among nursing administration is an intrinsic factor that plays a significant role in health care industry. According to Reiss, nurse administrators anticipate that nurses are enriched with computer literacy and are better able to utilize the information technology that enhance patient care (Reiss, 2006). Health Care Educators and Nurse Administrators in particular agree that nurses should be competent and strengthen their computer skills to enhance their knowledge and contribute to the success of their academic learning and skill achievement (Maag, 2006).

Nurse administrators and educators act together about the future of nursing and health care delivery. According to American Association of Colleges of Nursing, Nurse Educators have the ability to plan the pathway, and educate other nurses to practice locally and internationally (American Association of College of Nursing, 2008).

The Institute of Medicine (IOM) report of the national academies in 2010, indicates that nurses should be given the opportunity to practice based on their knowledge and skills (IOM, 2010). With the tremendous need for computer skills in the workplace, nurse educators need to be well-qualified, aware of and sensitive to the computer based requirements in the health system.

Implications for Education

This study has implications for nursing education in Saudi Arabia. First, this is one of the first studies that have occurred in Saudi Arabia and at KSU that involves nursing students at all levels of their baccalaureate program. Second, this research is being conducted by a Saudi citizen who is a doctoral candidate at a well-known university in the United States. The findings of this study will assist the educators and administrators at KSU to glean a better understanding of the impact that the addition of the new required computer course has on the nursing students across the spectrum of nursing students at KSU. Third, based on the findings of the study, the academic leaders will have some knowledge about the students' sense of self-efficacy about computer usage. This is an important issue because Saudi Arabia is one of the fastest-growing countries in the world. It provides free education for its citizens, who will have to compete in the world community for employment. Moreover, the Saudi government has, as one of its goals, the development of a world-class workforce that comprises Saudi people.

Implications for Practice

As the Saudis experience advances in science and technology, their health care systems and practices will become more technologically sophisticated. Computers are at

the core of the advancement of health care in Saudi Arabia, which mirrors the rest of the world. Patient care, evidence-based practice, outcome measures, and mortality and morbidity are central concepts that are beginning to dominate the Saudi health system landscape. Nurses will need to be proficient in computer usage and be able to communicate across a variety of healthcare-system demands. For example, computers will be used for direct patient care, tracking patient outcomes, determining the extent of evidence-based practice occurring within its institutions, and understanding the impact that it has on Saudi well-being. Furthermore, nurses will need to know how to use computers to communicate with physicians, pharmacists, and other health care providers in the local and global health care systems.

Implications for Research

As Saudi nurses become more educated and informed about the use of computers, they will be able to conduct sophisticated research. Computers can be used for local, national, and international studies. In the foreseeable future, Saudi nurse researchers will be in a position to design studies that include computer technology that involves patients as partners and health providers as collaborators. Computer usage will be essential for statistical work with quantitative and qualitative studies. Researchers will also be able to employ computer-based statistical programs (e.g., SPSS) as well as qualitative data-driven studies (ATLAS.TI) that can also be analyzed by computer programs. At practice institutions such as hospitals and clinics, computers will be used to teach, supervise, demonstrate, and conduct research and educational programs. As computers begin to appear throughout the Saudi nation, new interest in their potential is emerging. This potential brings new expectations for the use of computers among the students at KSU,

who will be the workforce for the future. Their attitudes toward/and self-efficacy in computer usage in nursing and healthcare are essential to the advancement of the health sciences in Saudi Arabia and other countries in the Middle East.

Implications for Health Policy

Health policy should rest on informed decisions that are embedded in authentic data. This study will help to provide the needed information that is essential for decision making regarding computer competency, course requirements, and student opportunities for mastery with computers at KSU. From these data, the students, faculty, and administration will be able to determine the next steps to assist the students in attaining the level of self-efficacy that is required for the Saudi nurse. Based on data, policies can then emerge that are grounded in scientific evidence about the knowledge and skill levels that the students manifest. Program planning and policy making to ensure that the Saudi nurse is proficient and able to practice in the nation and in other world communities can emerge with confidence. In other words, this study will help the KSU College of Nursing to develop a roadmap for computer efficiency for Saudi nurses.

Chapter IV

Data Analysis

The purpose of this study was to examine the attitudes of baccalaureate-degree-seeking student nurses' attitudes toward computer usage in the College of Nursing at King Saud University (KSU), Riyadh, Saudi Arabia. Specifically, the study was designed to investigate the influence of gender, age, socioeconomic status, academic classification, grade point average, and mandatory computer classes on students' attitudes toward computer usage.

The data were collected at KSU during the summer of 2009. All data collection activities were done under the guidance of the researcher and the administrators of KSU. A total of 355 questionnaires were completed (males = 133 and females = 222). Twenty questionnaires were excluded because of missing values (males = 13; females = 7). The actual number of completed and accepted questionnaires was 335 (males = 120 and females = 215). This number reflects more than half of the total student body (n = 600) during the 2009 summer academic semester at the university.

G-Power software calculations were used to determine the sample size with a medium effect size of (0 .15) and 15 predictors. Given these properties, the sample size was calculated to be 199 (males = 64; females = 135), reflecting one-third of the total student body for the 2009 summer semester at KSU. The large sample size produced a smaller effect size of (0.087), to ensure that the findings of the study were robust and reliable.

To ensure that the sample size was adequate and based on the scientific literature, the researcher reviewed the relevant studies that had been conducted in numerous

countries. The name of the country, the author(s) of the study, the year, the statistics used in the study, the effect size, and the sample size are listed in Table 9.

Table 9

Comparison between Previous-Study Statistics, Effect Size, Statistical Tests, and Sample Size,

Country	Author(s), Year	Statistics	Effect Size	Sample Size
Taiwan	Chin (2001)	ANOVA	0.19 Medium	354
Saudi Arabia	Alsebail (2004)	MANOVA	0.075 Small	256
Israel	Francisa, et. al. (2000)	Correlation	0.14 Small	298
South Africa	Burger et. al. (2004)	Correlation	0.41 Medium	306

The researcher also compared Cronbach's alpha values for the previous Arabic studies and the Loyd and Gressard study. The comparisons are presented in Table 10.

Table 10

Comparison between Cronbach's Alpha Values of the Previous Studies (Total and Subscale) and the Current Study.

Study	Country/Language	Cronbach's Alpha Values
Loyd & Gressard, 1987	English	T=0.95, A=0.90, C=0.89,L=0.89, and U=0.82
Alsebail, 2004	Arabic	T=0.78, A=0.77, C=0.73,L=0.71,and U=0.71

Note. T = Total, A = Anxiety, C = Confidence, L = Liking, and U = Usefulness.

Findings

The findings from the current study that was conducted at KSU, Saudi Arabia, are presented in this chapter and are organized around research questions. Each research question is discussed.

Question One: What are the personal demographics (age, gender, socioeconomic status, geographical location, and program level) of the nursing student body at the KSU College of Nursing?

The descriptive statistics highlight the demographic profile of the study sample. Variables such as age, gender, and grade point average are included in the profile. See Table 11 for the complete demographic profile of the sample.

Table 11

Descriptive Statistics of study variables.

	$\bar{X}_M$	$\bar{X}_F$	$\bar{X}_T$	σ_M	σ_F	σ_T	K_M	K_F	K_T	SK_M	SK_F	SK_T
Age	21.98	21.20	21.47	1.93	1.72	1.84	2.47	-.32	1.37	1.29	.36	.79
GPA	3.08	3.38	3.27	.85	.89	.89	2.84	4.54	3.43	-.34	-1.72	-1.35
Family Members	8.24	7.78	7.95	3.81	2.80	3.20	2.28	1.10	2.48	1.20	.516	1.00
Income	8,000-9,999	8,000-9,999	8,000-9,999	4,877.56	5,057.47	4,977.51	-.56	-.77	-.71	.65	.62	.63
Computer Experience	49.86	34.73	40.15	37.90	35.34	36.94	-.56	-.02	-.31	.52	.90	.74
Anxiety Scores	32.97	31.54	32.04	4.44	4.85	4.75	.44	-.27	.77	.22	-.34	-.66
Confidence Score	31.63	30.77	31.08	4.84	4.94	4.88	.58	-.64	-.29	-.21	-.01	-.08
Liking Score	29.28	29.61	29.49	3.82	4.20	4.07	.80	.80	.17	.22	.16	.16
Usefulness Score	33.21	32.87	32.99	3.30	4.25	3.93	-.77	-.43	-.47	-.32	-.47	-.32
Total Score	127.10	124.77	125.60	13.81	15.91	15.21	1.92	-.91	.26	-.45	-.03	-.13

Note. $\bar{X}$ = Mean, σ= Standard Deviation, K= Kurtosis, SK= Skewness, T=Total, M = Male, and F = Female.

Question Two: Does anxiety about computer usage in academic learning vary among males and females at KSU College of Nursing?

To examine this question, an independent *t*-test was used. The results of the *t*-test demonstrated that females were significantly more anxious about computer usage in their academic programs than were their male counterparts ($mean_f = 31.53$ vs. $mean_m = 32.97$). This research helps to support the latter view. However, given the ubiquitous use of computers in health systems and the recent requirement in Saudi Arabia that health records be in electronic format, nurses, regardless of gender, will need to become proficient in computer use. Table 12 depicts the differences in scores between the males and females.

Table 12

Means Difference for gender-male and female.

Gender		*N*	Mean	σ	St. Error Mean
Anxiety Scores	Male	120	32.967	4.436	0.405
	Female	215	31.526	4.854	0.331

Question Three: Do length of previous computer experience before enrolling in KSU College of Nursing, access to computers outside of KSU, number of household members who use computers, and the mandatory computer class (Tech 227) predict students' attitudes toward computer usage?

To address Research Question 3, step-type (backward, forward, and step-wise) regression analysis was used. The optimal regression equation consisted of experience with learning about or working with computers, home or school access, and both home

and school access. 16% (Adjusted *R* square = 0.163, F = 17.3, $p < .0001$) of the variance in the dependent variable (students' attitudes toward computer usage) was explained by the independent variables (experience with learning about or working with computers, home or school access, and both home and school access). All of those independent variables in the optimal regression equation had a significant relationship with the dependent variable (see Table 13).

Table 13

Correlation of Students Attitudes with Independent Variables.

Independent Variable	Estimate	*t*	*p*
Experience with learning about or working with computers in months	0.132	6.178	.000
Home Access	12.984	3.120	.002
School Access	22.628	2.125	.034
Both Home and School Access	16.087	3.765	.000

Question Four: Do gender, age, GPA, and the mandatory computer class (Tech 227) predict attitudes about computer usage in academic learning among the baccalaureate students in the College of Nursing at KSU?

Based on step-type regression analysis, none of the independent variables (gender, age, GPA, and the mandatory computer class) adequately explained the variance in the dependent variable, attitudes about computer usage in academic learning among the baccalaureate students. This finding could be explained by the changing attitudes about traditional male and female roles.

Question Five: Do gender, age, and socioeconomic status predict attitudes about computer usage in academic learning among the baccalaureate students in the College of Nursing at KSU?

Using step-type regression analysis, it was determined that the independent variables (i.e., gender, age, and socioeconomic status) did not significantly explain the variance in the dependent variable (i.e., attitudes about computer usage in academic learning among the baccalaureate students). This result mirrors the findings of the two previous research questions, three and four. When socioeconomic status was added to the regression model, again, the variance could not be explained by the independent variables. This finding could, be explained by the demographic profile of the sample that suggests that age, socioeconomic status, and gender did not have a significant effect on the dependent variable, attitudes about computer usage among males and females at KSU.

Chapter V

Conclusion and Recommendations

This chapter presents a discussion of the research results and a summary of the study of computer use in baccalaureate nursing students in Saudi Arabia. Recommendations and implications for nursing administration, education, practice, policy, and research will also be presented.

The purpose of this research was to identify the attitudes of baccalaureate-degree-seeking nursing students toward computer usage in the College of Nursing at King Saud University (KSU), Riyadh, Saudi Arabia. Specifically, the study was designed to investigate the influence of gender, age, socioeconomic status, academic classification, grade point average, and mandatory computer classes on students' attitudes toward computer usage. Male and female students at the KSU School of Nursing were invited to participate in the study. The findings in this dissertation are briefly summarized, and interpretations of the results are presented. In this study, the following research questions were addressed:

Question One: What are the personal demographics (age, gender, socioeconomic status, geographical location, and program level) of the nursing student body at the KSU College of Nursing?

The participants in the study were young, representing a mean age of 21.5 for males and females. The female students had a slightly higher grade point average than did the male students. From a historical perspective, this is an important finding when consideration is given to the recent trend in Saudi universities in which male and female students are educated at the same university but in different classroom settings. Outdated

notions of women's inability to use computers in the region are beginning to change as other social norms shift and adjustments to gender-defined roles and expectations of women emerge in the society. The findings of this research mirror other studies in which investigators found that male and female perceptions and attitudes toward computers and the Internet were not the same (Colley, 2003; Kadijevich, 2000; Tsai, 2004). These studies suggest that males have more favorable attitudes than do females. Mitra et. al. (2001) examined computer and Internet attitudes among college students and found that both groups had adequate access to computers, but females held less positive views of computers and used them less often than did the males. In Saudi Arabia, women are becoming more educated and, in turn, engaging in politics and other important roles in society. It is anticipated that women will continue to gain prominence and contribute to society in new and novel dimensions including developing positive attitudes towards computer use.

Question Two: Does anxiety about computer usage in academic learning vary among males and females at KSU College of Nursing?

A *t*-test was used to determine the differences between males and females in the study. The findings suggest that the females were more anxious about computer usage than males. Gender has been associated with computer anxiety (King et al., 2002) though, results have been mixed. Whereas some researchers have reported that males have lower levels of anxiety (Colley et al., 1994; Okebukola, 1993) than do females, others posit that females have lower levels of computer anxiety than do males (Loyd et al., 1987; Siann et al., 1990). Still other studies have not reported any gender differences (Colley et al., 1994; Kay, 1992; King et al., 2002). What is clear is that the pervasive

presence of technology, for males and females, is quickly becoming a way of life and, the use of the computer as a communication device dominates the psyche of both males and females (King et al., 2002). Yet there is another perspective. According to Hass et al. (2002), women have traditionally been considered to be less "computer savvy" than men primarily because of the linkage between mathematics and computers. This was an early assumption that existed but appears to be changing. This research helps to support the latter view. However, given the ubiquitous use of computers in health systems and the recent requirement in Saudi Arabia that health records be in electronic format, nurses, regardless of gender, will need to become proficient in computer use.

The results can also be interpreted through the lens of academic expectations within the context of societal norms and the changing roles of women in academic settings (Henrion, 1997; Otomo, 1998). Perhaps if academic learning is delivered using computers at KSU, female students will become less anxious as their computer knowledge and skills increase. Finally, as demands in health-service-delivery systems for computer-literate nurses increase, nurses will, out of necessity, become more proficient with computers in general as well as in their application for the acquisition of knowledge and skills.

Question Three: Do length of previous computer experiences before enrolling in KSU College of Nursing, access to computers outside of KSU, number of household members who use computers, and the mandatory computer class predict students' attitudes toward computer usage?

In one of the few studies conducted about computer usage in Saudi Arabia, Oshan and Khudair (2008) reported that students at KSU who had more Internet experience

displayed more positive feelings about computers, expressed lower anxiety, and conveyed higher confidence about the Internet overall. They also suggested that confidence helped the students to develop a sense of control over their Internet usage (Oshan & Khudair, 2008). These researchers' findings are similar to the results that were reported in the current study.

Question Four: Do gender, age, GPA, and the mandatory computer class (Tech 227) predict attitudes about computer usage in academic learning among the baccalaureate students at the College of Nursing at KSU?

Based on step-type regression analysis, none of the independent variables (gender, age, GPA, and the mandatory computer class) adequately explained the variance in the dependent variable, attitudes about computer usage in academic learning among the baccalaureate students. This finding could be explained by the changing attitudes about traditional male and female roles. For example, according to the Saudi Central Department of Statistics and Information (CDSI), the Saudi workforce comprises 21.3% women. This statistic has changed the profile of the labor force in the country 5.3% within the last 5 years. More upward trends related to women in the workforce are anticipated (Murphy, 2007).

Age is a variable of interest in Saudi Arabia. First, the population is young: more than 54% are 15-64 years of age and, of this group, 48.2% are males (CDSI, 2010). Saudi Arabia's population, when compared to that of the United States, constructs a pyramid that reveals a young and growing population, in contrast to an aging population in the United States. The mean in the sample, the males and females were about equal in age and relatively young (21.5 years old). To further explore the question about gender,

which, in the past, has been a dominant topic in Saudi Arabia, computer anxiety was explored from a psychological perspective.

According to Chu et al. (1991), computer anxiety is "not an inherent emotion." Instead, it is presented as a "state" condition or a "state anxiety" that can be identified and remediated. The approach to the remediation rests with identifying the predictors of computer anxiety and then providing structured methods for reducing and eliminating them. Faculty members, researchers, and clinical supervisors will be better able to structure learning modules to assist students without the deleterious effects of computer anxiety.

Chu's finding does not support previous studies by researchers such as Todman (2000), Broos (2005), and Tsai et al. (2001). These researchers reported that users with longer Internet usage had more positive attitudes toward the technology. That is to say, the longer the students had had experiences with the Internet and computers, the more positive were their attitudes.

The grade point average among the two groups was similar. Since the GPA's were similar for both groups, it appears that traditional roles and expectations of men and women are beginning to be readjusted and renegotiated. Over time, it is anticipated that Saudi women will continue to gain footholds in academic institutions and the workplace. Data suggest that women are entering colleges and universities in the nation and graduating with impressive degrees in the sciences, architecture, education, and a plethora of other disciplines.

Question Five: Do gender, age, and socioeconomic status predict attitudes about computer usage in academic learning among the baccalaureate students at the College of Nursing at KSU?

Using step-type regression analysis, it was determined that the independent variables (i.e., gender, age, and socioeconomic status) did not significantly explain the variance in the dependent variable (i.e., attitudes about computer usage in academic learning among the baccalaureate students). This result mirrors the findings of the two previous research questions, three and four. When socioeconomic status was added to the regression model, again, the variance could not be explained by the independent variables. This finding could be explained by the demographic profile of the sample that suggests that age, socioeconomic status, and gender did not have a significant effect on the dependent variable, attitudes about computer usage among males and females at KSU. In another Middle Eastern country, Iranian students (n=375), Shashaani and Khalili (2001) found that parental education had a stronger effect on the attitudes of the students than other variables such as occupation.

Summary of Research Questions

The purpose of this research was to examine the attitudes of baccalaureate-degree-seeking student nurses' attitudes toward computer usage at the KSU, Riyadh, Saudi Arabia. Specifically, the study was designed to investigate the influence of gender, age, socioeconomic status, grade point average, and mandatory computer classes on students' attitudes toward computer usage

The findings from this study will provide a profile about the students enrolled at the university and could be used to plan future academic programs that include computer-based learning.

The next section of this chapter will present the implications of these findings relative to four nursing dimensions: nursing administration, nursing education, nursing practice, and nursing research.

Implications and Recommendations

Nursing Administration, Implications

The use of computers in nursing administration is and will continue to be a major component of the healthcare industry. From a workplace perspective, nurse administrators are expecting that nurses who join their workforce will be familiar with computer technology and will be able to utilize it for the enhancement of patient care (Reiss, 2006). Educators and nurse administrators share some of the same expectations related to computer technology; nurses should have computer skills that will assist them with academic learning, and knowledge and skills acquisition (Maag, 2006). Throughout their careers, nurses will witness developments in Electronic Health Records (EHR). It is becoming a universal method of transforming data from a paper-based to an electronic medium. EHR allows nurses and other healthcare providers to share vital information across health systems and provides immediate access to clinical data that will reduce and eliminate medical errors, improving the efficiency of healthcare delivery, and advancing well-being for all people (Abdrbo, 2007). Nurse administrators and nurse educators interact with each other about the future of nursing and health care delivery. Through dialogue among professional nursing groups, nurse educators will be better able to plan for and educate nurses to practice in local and global communities (American Association of College of Nursing, 2008). In the United States, the Institute of Medicine Report of the national academies (2010) suggests that nurses be granted the opportunity to practice according to their knowledge and skill levels. This position also supports the need for

nurse educators to be aware of and sensitive to the computer-based needs and requirements in health systems. The ideal scenario would be to have a seamless transition for nurses from academic institutions to healthcare delivery systems.

Nursing Administration, Recommendations

1. Strengthen the capacity for nurse administrators in the practice area and in the School of Nursing to use computer technology as a significant tool for learning. Similarly, the use of computer learning could become an important vehicle for practicing nurses to become more involved in life-long learning, and inculcate new and novel scientific advances into patient care.
2. Embrace computer-based learning for practicing nurses, and develop an expanded awareness of the utility of computers in the overall delivery of health care, including prevention, treatment, and rehabilitation.
3. Assist with the promotion of computer usage across provider systems in healthcare, and help to ensure that all nurses have opportunities to acquire basic competencies for enhanced computer learning.

Nursing Education, Implications

According to the findings of this study, males and females can learn through the use of computers even though females in the College of Nursing at KSU are more anxious than their male counterparts. Giving students access to computers in school would also help with their learning and provide an opportunity to increase their usage time and decrease their anxiety. Nurses who are expected to use computers during their undergraduate learning experiences would be better prepared to utilize computers in their practice and for their continuing learning needs. Given the growing frequency of the use of computers in educational settings and in practice systems, nurses will be expected to

utilize computers for their personal learning and for quality patient care and safety (Kilbridge & Classen, 2008).

Nursing Education, Recommendations

1. Strengthen and continue to build computer knowledge and skills among the students at KSU School of Nursing.
2. Provide opportunities for additional computer-based learning in various segments of the curriculum.
3. Increase public awareness of and support for the use of computer-based learning for advancing nursing knowledge.

Nursing Practice, Implications

The findings of this study can be perceived as contributing to a culture of lifelong learning that can occur through the use of computers in many different settings. Important information about how nurses can be educated and the extent to which the methods that are used in academia can easily be translated to future work environments in health systems are part of an essential and continuous dialogue in nursing. There are implications from this finding for clinical practice. It is hypothesized that nurses who are educated with computers will be able to make a smooth transition to the workplace, where computers are becoming standard equipment. In some countries, health systems are focused on the EHR as a matter of patient safety and enhanced outcomes (Dzenowagis, 2005). Data are available on computers, PDA's, mobile phones, and other electronic media. The intent is to make clinical data accessible, available, accurate, and preserved in safe virtual environments. In the future, computers may have additional functions related to direct patient care (Buch & Janda, 2009). Virtual learning environments that utilize high fidelity patient simulators or venues will allow for teaching

and clinical practice from a variety of severity levels, health conditions, and settings. In the future, the virtual classroom will be a standard feature in nursing practice and education (Bennett & Glover, 2008; Lashley, 2005). Decreasing anxiety toward computers with these tools will enable students to prepare for future practice.

Nursing Practice, Recommendations

1. Explore the use of computer-based learning that goes beyond the single required class. In continuing education for practicing nurses,
2. Engage male and female students in computer learning and help to increase their confidence in using computers in practice through more exposure, coaching, and learning reinforcement in the classroom and clinical settings,
3. Promote consistency of computer-based learning among both genders and across the curriculum at KSU to increase practice based use of computers.

Nursing Research, Implications

Few studies have focused on computer anxiety among KSU nursing students. One study explored learning among (only) females at KSU. The results of the current study provide insight into male and female students' attitudes about computer-based learning and anxiety among nursing students. However, additional studies are needed to help clarify the utility of computer-based learning for nursing students at KSU. For example, both males and females attend the institution; however, they do not attend classes together, and their socialization is limited. The impact of computer-based learning in single-gender and mixed-gender learning could be a beginning point for exploration. Issues around culture and computers could also be explored, and themes such as females having "computer-phobia" could be unraveled and scientifically considered (Bennett &

Glover, 2008). The influence of variables such as Internet experience, years in college, gender, and socioeconomic status, region of the country, professional aspirations, and clinical specialty could provide the gateway for scientific investigation into the attitudes of males and females about computers. These studies should be considered with a sense of urgency.

Nursing Research, Recommendations

1. Enhance research on the relationships among GPA, perceptions about quality patient care, confidentiality issues, competency acquisition, self-efficacy in practice, cultural competency, and simulation-based (computer) learning.
2. Investigate use of computers in edcuation across multiple regions of Saudi Arabia
3. Determine whether computer based-learning at KSU helps to enhance nurses' sense of competency, self-efficacy, and professional empowerment.

Conclusion

Further research is needed, and this study should be replicated at other Saudi universities and in other countries around the world. Additional studies will help to delineate curricular changes that could be made to help ensure that nurses are utilizing available technology for learning the knowledge and skill sets that will be necessary for the delivery of high-quality, safe, and culturally competent care.

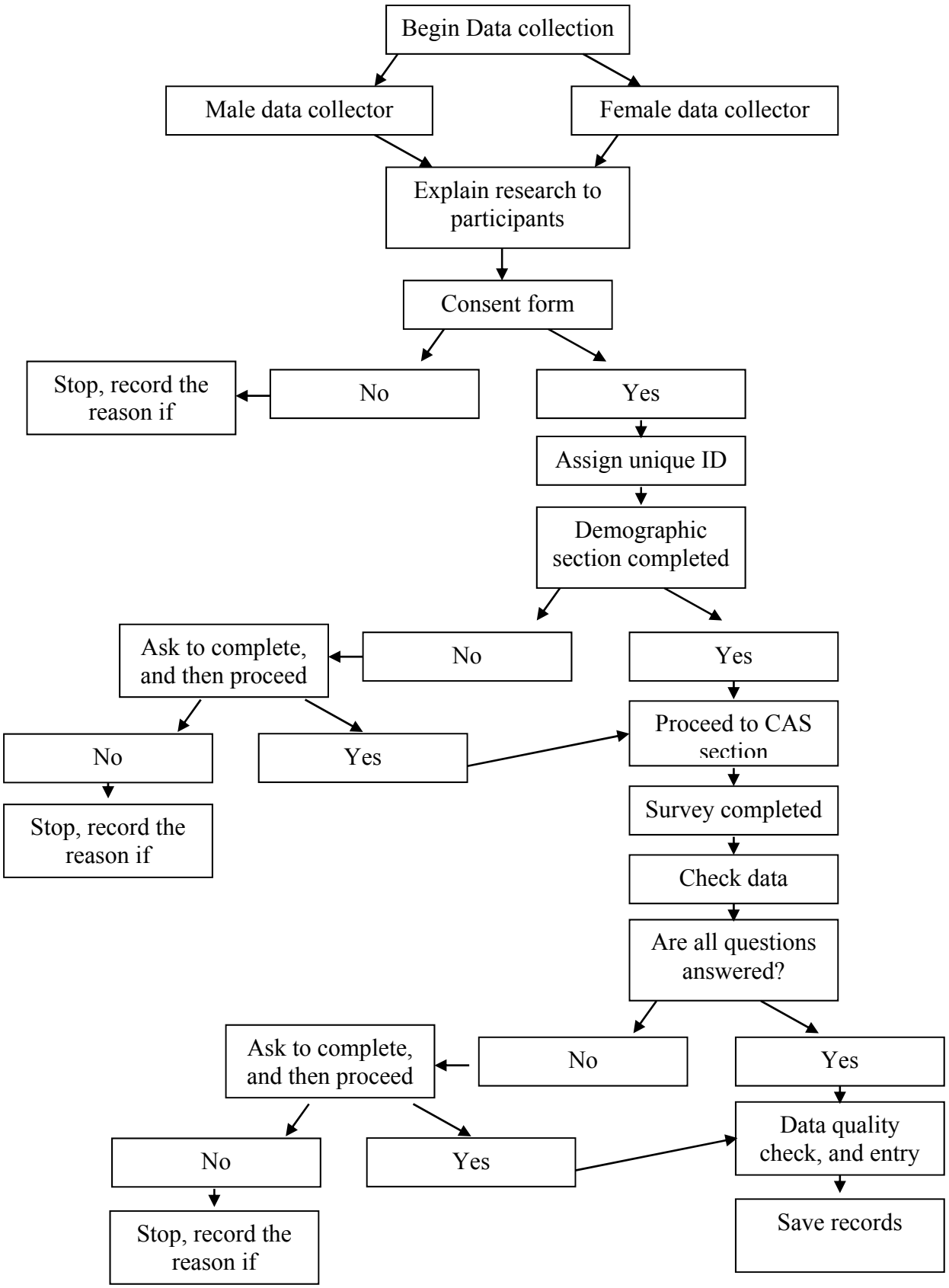
Computers in nursing education and practice will provide vast opportunities for learning and practicing evidence-based nursing care. As mechanisms such as blogs, chat rooms, cell phones, and other electronic computer based programs emerge, these technologies will eventually be integrated into nursing education and practice. Consider, for example, the advantages that imagining has brought to the teaching and learning process, and practice. Clinical cases, images, podcasts, and other approaches will help to assure that patients receive quality patient-centered care that is delivered by well-educated nurses.

The study also raises issues about the possibility of planning intervention studies for future research about computer learning, including the use of simulation-based learning in nursing-education programs and, later, in the workplace. Issues regarding gender, socioeconomic status, age, and other variables need to be systematically investigated (Dannhausen et al., 2007).

Finally, as nursing evolves into a more complex and evidence-based profession, mechanisms should be put in place that will assist the learner with acquiring the necessary knowledge and skills in a variety of settings around the globe (Bennett & Glover, 2008; Lashley, 2005).

Appendix A

Diagram 1, Data collection procedure


Begin Data collection
Male data collector
Female data collector
Explain research to participants
Consent form
No
Stop, record the reason if
Yes
Assign unique ID
Demographic section completed
No
Ask to complete, and then proceed
No
Stop, record the reason if
Yes
Yes
Proceed to CAS section
Survey completed
Check data
Are all questions answered?
No
Ask to complete, and then proceed
No
Stop, record the reason if
Yes
Yes
Data quality check, and entry
Save records

Appendix B

Consent Form

Version 05/2006
CODE _____

INFORMED CONSENT DOCUMENT

The College *of Nursing Students' Attitudes toward Computers at the* College *of Nursing at King Saud University*

You are being asked to participate in a research study about The College of Nursing Students' Attitudes toward Computers at the College of Nursing at King Saud University. You were selected as a possible participant because you expressed interest by responding to the college announcement about a study on the Nursing Students' Attitudes toward Computers at the College of Nursing at King Saud University. Please read this form and ask any questions that you may have before agreeing to be in the research.

Researchers at Case Western Reserve University are conducting this study.

Background Information

The purpose of this research is to examine the attitudes of baccalaureate degree seeking student nurses' attitudes toward computer usage in the College of Nursing at King Saud University (KSU), Riyadh, Saudi Arabia.

Procedures

After the formal approval to conduct this research has been received from both universities, the researcher will make plans to begin the data collection process. The researcher will request to meet with the dean and the faculty of the College of Nursing at KSU. After they have had a chance to ask questions about the research and then voice that they are informed about the study, the researcher will proceed with the data collection activities.

Data will be collected from students at KSU who volunteer to participate in the study. The process for data collection will occur in the following manner. (1) An open letter that explains the purpose of the research and the specific actions that the researcher is asking the students to take will be distributed by campus mail to all students at the KSU College of Nursing; (2) A random selection process will be used to determine the classrooms of students that will be invited to participate in the research; (3) Once the randomly selected classrooms have been chosen, the researcher will approach the faculty member who is responsible for that class at a particular time during the day and schedule a specific time to explain the study and plan to administer the questionnaires to the volunteer students in the randomly selected classrooms; (4) When the researcher enters the class, he will ask if all of the students are volunteering to participate in the study, and then he will explain the purpose of the study to the students; (5) The researcher will read from a script to assure that all students are given the same information in each of the classrooms; the content will detail the actions that are being requested from each of the students; (6) The researcher will emphasize that the data collection process is confidential and that no one at the school or any place else will have information about their responses to the demographic data form and the CSA questionnaire; (7) The students will be informed about their rights to refuse to participate in the study, or to withdraw from the study at any time during the process without reprisals; (8) They will also be told that there are no

foreseeable risks associated with participating in this study, and that they will not receive any immediate benefits from their participation. However, the knowledge and information gleaned from the study will help them in the long term, as well as their fellow colleagues in the future; (9) The students will be specifically instructed not to write their names of the instruments that are used for data collection; (10) When the student completes the measure, he/she will be asked to place the measure in a large 8 x11 envelope that will be provided by the researcher.

Discomforts and Risks:

There are no risks associated with your participation in this research beyond those experienced in everyday life.

Benefits

You should not expect to benefit from your participation in this study. However, by filling out the forms, you will be helping the researcher to expand knowledge that may help further researchers in the future. In this way, your contribution will help the researcher to develop better understanding that's contributes to the body of knowledge related to the nurses' individuals' attitudes toward computer.

Confidentiality

The records of this research will be kept private. In any sort of report we might publish, we will not include any information that will make it possible to identify a participant. Research records will be kept in a locked file, and access will be limited to the researchers, the University review board responsible for protecting human participants, regulatory agencies, and *sponsors* and funding agencies.

Voluntary Nature of the Study

Your participation is voluntary. If you choose not to participate, it will not affect your current or future relations with the University. There is no penalty or loss of benefits for not participating or for discontinuing your participation.

Contacts and Questions

The researchers conducting this study are Dr. Christine A. Hudak, and Osama A. Samarkandi. You may ask any questions you have now. If you have any additional questions, concerns or complaints about the study, you may contact Dr. Christine A. Hudak at 001-216-368-6315 cah16@case.edu or and Osama A. Samarkandi at 001-412-726-7262 oas4@case.edu.

If the researchers cannot be reached, or if you would like to talk to someone other than the researcher(s) about; (1) questions, concerns or complaints regarding this study, (2) research participant rights, (3) research-related injuries, or (4) other human subjects issues, please contact Case Western Reserve University's Institutional Review Board at (216) 368-6925 or write: Case Western Reserve University; Institutional Review Board; 10900 Euclid Ave.; Cleveland, OH 44106-7230.

You will be given a copy of this form for your records.

Statement of Consent

I have read the above information. I have received answers to the questions I have asked. I consent to participate in this research. I am at least 18 years of age.

Print Name of Participant: _____

Signature of Participant:_____ Date:_____

Signature of Person Obtaining Consent [*omit if not applicable*]*:* ___ Date: _____

Appendix C

Consent Form (Arabic Version)

أخي الطالب/أختي الطالبة

تهدف هذه الاستبانة إلى التعرف على إتجاهات طلاب المرحلة الجامعية في كلية التمريض بجامعة الملك سعود بالرياض نحو إستخدام الحاسب الآلي وذلك عن طريق دراسة العلاقة بين بعض المتغيرات . ويعتبر هذا البحث إستكمال لمتطلبات الحصول على درجة الدكتوراه للباحث بجامعة كيس ويسترن ريسرف الأمريكية ، لذا آمل التكرم بإكمال الأستبانة المرفقة والتي تحتوي على 40 سؤال بالإضافة لصفحة المعلومات العامة والإجابة على الأسئلة بكل دقة وصراحة ، وللمعلومية فإنه ليس هنالك أي مخاطر بدنية مصاحبة لمشاركتك التطوعية في هذه الدراسة ، وفي المقابل لن يكون لقرار عدم مشاركتك في البحث أي تأثير على مسيرتك الدراسية بالكلية ، كما أن مشاركتك التطوعية في هذا البحث عن طريق ملء الإستبانة المرفقة ليس لها أي مردود مادي أو مكافاءت تشجيعية ، ولكنها ستُمكن الباحث من توسيع مداركه المعرفية التي ربما قد تخدم الباحثين مستقبلاً في معرفة توجهات طلبة كلية التمريض بجامعة الملك سعود نحو إستخدام الحاسب الآلي بصورة أفضل.

قد تحتاج لحوالي 20-30 دقيقة لتعبئة الإستبانة ، مع العلم بأن المعلومات والبيانات التي ستدلي بها في الإستبانة المرفقة سوف تعامل بسرية تامة ، ولن تستخدم لغير أغراض البحث العلمي ، ولن يطلع عليها سوى فريق البحث و لك الحرية المطلقة في المشاركة في هذا البحث كما يحق لك كذلك الإنسحاب في أي وقت دون ذكر أسباب ، أو عدم الإجابة على أي سؤال قد لا ترغب (ترغبين) في الإجابة عليه.

يمكنك طرح أي سؤال بخصوص هذه الدراسة وسوف يقوم المراقب المختص مباشرة بالإجابة عليه ، وفي حالة رغبتك في الحصول على مزيد من المعلومات عن هذا البحث يمكنك الإتصال الدكتورة كريستن هودك على هاتف 624-9647 (216) وفي حال رغبتك في الإستفسار عن حقوقك كمشارك في هذا البحث يمكنك الإتصال بالسيدة إيزابيل سانشز على هاتف 368-6993 (216) أو مراسلتها على البريد الإلكتروني ias5@case.edu

* ملاحظة: للمشاركة في هذه الدراسة يجب الأ يقل عمر المشارك عن 18 سنة ، ملئك للإستبانة وإرجاعها يعني أنك قرأت المعلومات في هذه الصفحة وأستوعبتها وأنه لامانع لديك في المشاركة.

أشكر لكم تعاونكم ، وأتمنى لكم التوفيق.
الباحث

Appendix D

Measurement Tool (CAS)

SURVEY OF ATTITUDES TOWARD LEARNING ABOUT AND WORKING WITH COMPUTERS

Brenda H. Loyd and Clarice P. Gressard
University of Virginia

The purpose of this survey is to gather information concerning people's attitudes toward learning about and working with computers. It should take about five minutes to complete this survey. All responses are kept confidential. Please return the survey to your instructor when you are finished.

Please check the blank which applies to you.

1. Age: ❑ 22 or less ❑ 23-25 ❑ 26-30
❑ 31-35 ❑ 36-40 ❑ 41-45
❑ 46-50 ❑ 51-55 ❑ 55+

2. College level completed: ❑ 1st year ❑ 2nd year ❑ 3rd year ❑ 4th year
❑ Bachelors ❑ Masters ❑ Doctorate

3. Major area of study:_____

4. Sex: ❑ Male ❑ Female

5. Experience with learning about or working with computers:
❑ 1 week or less ❑ 1 week to 1 month ❑ 1 month to 6 months
❑ 6 months to 1 year ❑ 1 year or more

Briefly state the type of computer experience:
_____

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.

		Strongly Agree	Slightly Agree	Slightly 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 a computer would 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	☐	☐	☐	☐
13.	I feel aggressive and hostile toward computers	☐	☐	☐	☐
14.	I am sure I could do work with computers	☐	☐	☐	☐
15.	Figuring out computer problems does not appeal to me	☐	☐	☐	☐
16.	I'll 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 there is a problem with a computer run 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	☐	☐	☐	☐

		Strongly Agree	Slightly Agree	Slightly Disagree	Strongly Disagree
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 for me	☐	☐	☐	☐
27.	Once I start to work with the computer, I would find it hard to stop	☐	☐	☐	☐
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	☐	☐	☐	☐

Appendix E

Measurement Tool (CAS, Arabic Version)

الجزء الأول: ضع إشارة (√) على الإختيار المناسب لك:

1) هل أنت/انتِ طالب (هـ) في كلية التمريض:
( ) نعم ( ) لا

2) المستوى الدراسي:
( ) السنة الأولى ( ) السنة الثانية ( ) السنة الثالثة
( ) السنة الرابعة ( ) السنة الخامسة ( ) أخرى ، فضلاً حدد (ي) .....

3) المعدل التراكمي: .....

4) الجنس :
( ) ذكر ( ) أنثى

5) السن: .....

6) الحالة الإجتماعية:
( ) أعزب/عزباء ( ) متزوج (هـ) ( ) أخرى ، فضلاً حدد (ي) .....

7) هل أنت/أنتي من سكان مدينة الرياض:
( ) نعم ( ) لا ، فضلاً حدد (ي) ..... (المدينة/المنطقة)

8) متوسط الدخل الشهري للأسرة:
( ) 2,000- 3,999 ريال ( ) 4,000-5,999 ريال ( ) 6,000-7,999 ريال
( ) 8,000-9,999 ريال ( ) 10,000-11,999 ريال ( ) 12,000-13,999 ريال
( ) 14,000-15,999 ريال ( ) 16,000-17,999 ريال ( ) 18,000 ريال فأكثر

9) هل درست/درستي مادة الحاسب الآلي (Tech 227):
( ) نعم ( ) لا

10) عدد سنوات الخبرة في إستخدام الحاسب الآلي
فضلاً حدد (ي) .... (شهر/سنة)

11) أستخدم الكمبيوتر في:
( ) البيت ( ) الجامعة ( ) كلاهما
( ) لايوجد ( ) أخرى ، حدد (ي) ....

12) عدد مستخدمي جهاز الحاسب الآلي في المنزل: ..... شخص من أصل ..... شخص

13) ماهي المواضيع التي ترغب/ترغبين في دراستها ضمن منهج مادة الحاسب الآلي:
( ) برامج معالجة النصوص (مثال: وورد)
( ) برامج جداول البيانات (مثال: إكسل)
( ) برامج قواعد البيانات (مثال: أكسس /فيجول بيسك ...)
( ) برامج عرض الشرائح (مثال: بوربوينت)
( ) برامج برمجة الحاسب الآلي (مثال: C++ ، جافا)
( ) برامج الرسوم والوسائط المتعددة (مثال: فوتوشوب)
( ) برامج تصميم صفحات الإنترنت (مثال: دريم ويفر ، فرنت بيج)
( ) البحث بإستخدام الإنترنت
( ) أخرى ، فضلاً حدد (ي) ....

الجزء الثاني: فيما يلي مجموعة من العبارات ، فضلاً ضع إشارة (√) على الإختيار المناسب لكل عبارة بكل دقة وصراحة ، علماً أنه لايوجد إجابة صحيحة وأخرى خاطئة:

	العبارة	أوافق بشده	أوافق	لا أوافق	لا أوافق بشدة
1	الحاسب الآلى لايخيفني	( )	( )	( )	( )
2	لا أحسن إستخدام الحاسب الآلي	( )	( )	( )	( )
3	أرغب في إستخدام الحاسب الآلي	( )	( )	( )	( )
4	سوف أستخدم الحاسب الآلي بأساليب متعددة في حياتي العملية	( )	( )	( )	( )
5	العمل على الحاسب الآلي يجعلني عصبياً جداً	( )	( )	( )	( )
6	بشكل عام ، أرتاح لمحاولة حل مشاكل جديدة بإستخدام الحاسب الآلي	( )	( )	( )	( )
7	التحدي لحل بعض المسائل بالحاسسب الآلي لايناسبني	( )	( )	( )	( )
8	تعلم الحاسب الآلي مضيعة للوقت	( )	( )	( )	( )
9	لا أنزعج عندما يتحدث الأخرون عن الحاسب الآلي	( )	( )	( )	( )
10	لا أعتقد اني أرعب في إستخدام مهارات الحاسب الآلي المتقدمة	( )	( )	( )	( )
11	أعتقد أن العمل بإستخدام الحاسب الآلي ممتع ومشجع	( )	( )	( )	( )
12	تعلم الحاسب الآلي جدير بالإهتمام	( )	( )	( )	( )
13	أشعر بعدوانية تجاه الحاسب الآلي	( )	( )	( )	( )
14	بكل تأكيد أستطيع أن أقوم بعملي بإستخدام 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	( )	( )	( )	( )
18	لست من النوع الذي يحسن إستخدام 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 إستخدامي للحاسب الآلي قليل في حياتي اليومية	( )	( )	( )	( )
21	الحاسب الآلي يشعرني بعدم الإرتياح	( )	( )	( )	( )
22	بكل تأكيد أستطيع تعلم لغة البرمجة	( )	( )	( )	( )
23	استغرب أن يقضي البعض وقتاً طويلاً بالعمل على الحاسب الآلي ويبدو أنهم يستمتعون بذلك	( )	( )	( )	( )
24	لا أستطيع أن أفكر بأي طريقة لإستخدام الحاسب الآلي في مهنتي	( )	( )	( )	( )
25	أشعر بالراحة في مادة الحاسب الآلي	( )	( )	( )	( )
26	أعتقد بأن إستخدام الحاسب الآلي صعب جداً بالنسبة لي	( )	( )	( )	( )
27	عندما أبد بالعمل على الحاسب الآلي يصعب عليّ التوقف	( )	( )	( )	( )
28	معرفة إستخدام الحاسب الآلي يزيد من إحتمالات حصولي على العمل	( )	( )	( )	( )
29	اشعر بالإحباط أو عدم الطمأنينة عندما أفكر في محاولة إستخدام الحاسب الآلي	( )	( )	( )	( )
30	استطيع الحصول على درجات مرتفعة في مادة الحاسب الآلي	( )	( )	( )	( )
31	سوف أقوم بالحد الأدنى لإستخدام الحاسب الآلي	( )	( )	( )	( )
32	أي شي يمكن أن يقوم به الحاسب الآلي أستطيع القيام به بأي طريقة أخرى	( )	( )	( )	( )
33	أشعر بالإرتياح عند إستخدام الحاسب الآلي	( )	( )	( )	( )
34	لا أعتقد أني أستطيع دراسة مادة الحاسب الآلي	( )	( )	( )	( )
35	إذا لم تُحَل مشكلة في مادة الحاسب الآلي ، فإنني أستمر في التفكير فيها	( )	( )	( )	( )
36	مهم بالنسبة لي أن أحقق مستوى جيد في مادة الحاسب الالي	( )	( )	( )	( )
37	الحاسبات الآلية تجعلني أشعر بقلق وبتشويش الذهن	( )	( )	( )	( )

	العبارة	أوافق بشده	أوافق	لا أوافق	لا أوافق بشدة
38	أشعر بكثير من الثقة بالنفس عند التعامل مع الحاسب الآلي	( )	( )	( )	( )
39	لا أستمتع بالحديث مع الآخرين حول الحاسب الآلي	( )	( )	( )	( )
40	العمل بإستخدام الحاسب الآلي لن يكون مهماً في حياتي العملية	( )	( )	( )	( )

يمكنك/يمكنكِ إضافة المزيد من التعليقات في الجزء التالي: ... ...
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Appendix F

Authors' Husband Permission to Use (CAS)

OSamarkandi

From: "Doug Loyd, IAAS" <del6n@virginia.edu>
Date: Monday, December 25, 2006 7:57 AM
To: <osamarkandi@hotmail.com>
Attach: Survey.doc
Subject: Loyd/Gressard Computer Attitude Scale

Osama,

Thank you for your inquiry about the Computer Attitude Scale.

As you may know, Brenda Loyd, author of the CAS, was President of the National Council on Measurement in Education (NCME) at the time of her death in 1995. Dr. Loyd's co-author, Clarice Gressard, has asked me to handle all requests for permission to use their survey, and to provide the CAS survey and scoring protocol to researchers who wish to use their scale.

Therefore, in response to your inquiry, I am attaching a copy of the Loyd/Gressard survey of attitudes towards computers, in an MSWord document (survey.doc). If you have any problem reading it please let me know. Unfortunately I have no further information about the use of the CAS beyond that provided in this message and the attached document.

The survey is scored according to the following:

For questions 1, 3, 4, 6, 9, 11, 12, 14, 16, 17, 19, 22, 25, 27, 28, 30, 33, 35, 36, 38 (Strongly Agree=4, Slightly Agree=3, Slightly Disagree=2, Strongly Disagree=1).

For questions 2, 5, 7, 8, 10, 13, 15, 18, 20, 21, 23, 24, 26, 29, 31, 32, 34, 37, 39, 40 (Strongly Agree=1, Slightly Agree=2, Slightly Disagree=3, Strongly Disagree=4).

The questions are coded so that the higher the score, the more positive the attitude.

Four subscores can also be obtained from the questions.

Anxiety: 1, 5, 9, 13, 17, 21, 25, 29, 33, 37
Confidence: 2, 6, 10, 14, 18, 22, 26, 30, 34, 38
Liking: 3, 7, 11, 15, 19, 23, 27, 31, 35, 39
Usefulness: 4, 8, 12, 16, 20, 24, 28, 32, 36, 40

Again, higher scores correspond to more positive attitude, e.g., a higher confidence score means more confidence and a higher anxiety score means less anxiety.

Permission is granted for use of this scale. In any publications arising from its use, please be sure to credit the authors, Brenda H. Loyd and Clarice P. Gressard.

Thanks for your interest. Best wishes.

Doug Loyd

Attachment: Survey.doc (MSWord)

--

Doug Loyd, Ph.D. 434-924-0993 FAX 434-982-2858
Office of Institutional Assessment and Studies, UVa

Appendix G

KSU IRB Approval

Kingdom of Saudi Arabia
Ministry of Higher Education
King Saud University
College of Nursing
Dean's Office

بسم الله الرحمن الرحيم

المملكة العربية السعودية
وزارة التعليم العالي
جامعة الملك سعود
كلية التمريض
مكتب العميد

Date.: ..... :التاريخ No.: ..... Date: 5/28/2008 الرقم

To:
Christine Hudak, PhD, RN, M.Ed., CPHIMS
Frances Payne Bolton School of Nursing
Case Western Reserve University
10900 Euclid Avenue,
Cleveland, OH 44106

Re: Agreement to Cooperate in Research Protocol

Dear Dr. Hudak,

The College of Nursing at King Saud University agrees in accordance with King Saud University rules and regulations to cooperate in the research protocol, "The School of Nursing Students' Attitudes toward Computers at the School of Nursing at King Saud University" conducted by Christine A. Hudak, RN, PhD, Responsible Investigator and Osama A Samarkandi, RN, MSN, Co Investigator.

The College of Nursing at King Saud University understands the purpose of this research and agrees to cooperate in its conduct in accordance with King Saud University rules and regulations.

Signed,

Mohammed Al-Naif, PhD
Dean of College of Nursing
King Saud University
Riyadh, Saudi Arabia

P. O. Box 462 Riyadh 11421 Td.: 01-4359963 E-Mail: (nursecol@ksu.edu.sa) ص.ب ٤٦٢ الرياض ١١٤٢١ هاتف: ٤٣٥٩٩٦٣ – ٠١ البريد الإلكتروني:

Kingdom of Saudi Arabia
Ministry of Higher Education
King Saud University
College of Nursing
Dean's Office

بسم الله الرحمن الرحيم

المملكة العربية السعودية
وزارة التعليم العالي
جامعة الملك سعود
كلية التمريض
مكتب العميد

Date.: ١٤٣٠/٣/٢٨ التاريخ: ١٤٣٠/٣/٢٨ No.: ٣/٢٧/٩٣٥٩ الرقم: ٣/٢٧/٩٣٥٩

سعادة الأستاذ الدكتور / وكيل الجامعة للدراسات العليا والبحث العلمي المحترم

السلام عليكم ورحمة الله وبركاته،،،

نفيد سعادتكم بأن الأستاذ/ أسامة عبدالحليم سمرقندي طالب دراسات عليا (مرحلة الدكتوراة) في تخصص نظم معلومات التمريض بجامعة كيس ويسترن ريسرف ولاية أوهايو الأمريكية في مرحلة تجميع معلومات خاصة برسالة الدكتوراة بعنوان " توجهات طلبة كلية التمريض بجامعة الملك سعود نحو إستخدام الحاسب الآلي "

مرفق لسعادتكم نسخة من الاستبانة المستخدمة في جمع البيانات.

نأمل من سعادتكم التكرم بالموافقة والسماح له بجمع البيانات في كلية التمريض.

وتفضلوا بقبول فائق التقدير والاحترام،،،

سعادة عميدة كلية التمريض م/ليمه

مع الموافقة

٤/١

عميد الكلية

د . محمد بن صالح النيف

سعادة الدكتور/ وكيل الجامعة م/ليمه

٤/٥

فواز ـــ ١٤٣٠/٣/٢٧هـ

P.O. BOX ٦٤٢ Riyadh ١١٤٢١ ☎ ٠١-٤٦٩٣٦٣٣ E-Mail: (nurscol@ksu.edu.sa) : ص.ب ٦٤٢ الرياض ١١٤٢١ ☎ ٠١-٤٦٩٣٦٣٣ البريد الالكتروني

Kingdom of Saudi Arabia
Ministry of Higher Education
King Saud University
College of Nursing
Dean's Office

بسم الله الرحمن الرحيم

المملكة العربية السعودية
وزارة التعليم العالي
جامعة الملك سعود
كلية التمريض
مكتب العميد

Date.: ..... التاريخ: No.: ..... الرقم:

May 2nd, 2009

To Whom It May Concern

In reference to Mr. Osama Samergandi's request to have King Saud University approve his proposal and data collection procedure of his dissertation proposal titled " The School of Nursing Students' Attitudes toward Computers at the College of Nursing at King Saud University (KSU), I would like to inform you that according to our IRB policy and standard operating procedures at KSU, Mr. Samergandi's research proposal falls under the exempt research category. Accordingly, an official approval letter has been issued from the Vice president of the University for Scientific Research and Postgraduate Studies who has the authority to approve any proposal submitted for data collection at the King Saud University or one of its facilities.

If you have any question or concern, do not hesitate to contact me. Thank you for your considerations.

Sincerely yours

Mohammed S. Alnaif, Ph D.
Dean of the College of Nursing
King Saud University
P.O. Box # 10219
Riyadh, 11433
Phone # 9661-4693681
Fax # 9661-4693633
alnaif@ksu.edu.sa

Appendix H

CWRU IRB Approval

OSamarkandi

From: "Osama Samarkandi" <oas4@case.edu>
Date: Tuesday, December 08, 2009 2:44 PM
To: <osamarkandi@hotmail.com>
Subject: Fwd: Notice of Exemption for IRB Protocol Number: 20090424

From: **Isabel Sanchez** <ias5@case.edu>
Date: Tue, May 5, 2009 at 4:54 PM
Subject: Notice of Exemption for IRB Protocol Number: 20090424
To: cah16@case.edu, oas4@case.edu
Cc: Margaret Roudebush <mmr8@case.edu>

Case Western Reserve University
Institutional Review Board

NOTICE OF EXEMPTION (#2)

Research involving the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures or observation of public behavior

If this protocol changes, the RI and/or CI must fully complete and submit an addendum request.
PLEASE BE CERTAIN TO DESTROY EMAILS OR ANYTHING ELSE THAT COULD POSSIBLY LINK DATA WITH PARTICIPANT

Responsible Investigator: **Christine Hudak**
Department: **Nursing - General**
IRB Protocol Number: **20090424**
Title: ***The College of Nursing Students' Attitudes toward Computers at the College of Nursing at King Saud University (KSU)***
Exemption Date: May 5, 2009

The Institutional Review Board (IRB) has deemed the above protocol EXEMPT under 45 Code of Federal Regulations (CFR) part 46.101(b)(2). The IRB will not conduct subsequent reviews of this protocol.

Any changes to the protocol that put it under the purview of the IRB would require a formal application to, and approval of, the IRB prior to implementation of the change IRB applications are available at the CWRU IRB Pages, or from the Office of Research Compliance (ORC) at Sears Library Building, #660.

Questions? Please visit our website: http://ora.ra.cwru.edu/orc_humansubjects_CWRU_IRB.asp
OR

contact our administrative office...

Isabel Sanchez, IRB Director
216.368.6993
Maureen Dore-Arshenovitz, IRB Assistant
216.368.6925
Fax: 216.368.3737

CASE Institutional Review Board
Office of Research Compliance
Sears Building 657
Cleveland, OH 44106-7230

Appendix I

Codebook

File Information

Variable Information

Variable	Position	Label	Measurement Level	Column Width	Alignment	Print Format	Write Format
Case_ID	1	Case ID (for identification purpose)	Nominal	8	Right	F4	F3.2
Nursing	2	Are you nursing student?	Nominal	4	Right	F4	F8.2
Col_Level	3	College level	Ordinal	6	Right	F4	F2.1
GPA	4	What is you GPA	Scale	6	Right	F4.2	F8.2
Gender	5	Gender	Nominal	6	Right	F4	F2.1
Age	6	Age	Scale	3	Right	F4	F4
Mar_Stat	7	What is your Marital Status?	Nominal	5	Right	F4	F2.1
Residency	8	Do you live in Riyadh?	Nominal	3	Right	F4	F8.2
Region	9	Where you live?	Nominal	6	Right	F4	F8.2
Income	10	What is your family monthly income?	Ordinal	5	Right	F4	F8.2
Tech_227	11	Did you take the computer course (Tech 227) yet?	Nominal	8	Right	F4	F2.1
Comp_Exp	12	Do you have previous computer experience?	Nominal	8	Right	F4	F2.1
Exp	13	Experience with learning about or working with computers in months	Scale	8	Right	F4	F2.1
Comp_Acc	14	I have computer access at	Nominal	8	Right	F4	F2.1
Comp_User	15	How many person use computer in the family?	Scale	9	Right	F4	F8.2
Family_Mem	16	Number of family members	Scale	4	Right	F4	F8.2
WP	17	Word processer	Nominal	3	Right	F4	F8.2
WS	18	Work Sheet	Nominal	3	Right	F4	F8.2
DB	19	Database	Nominal	2	Right	F4	F8.2
PP	20	PowerPoint Presentations	Nominal	2	Right	F4	F8.2
PG	21	Computer Programming	Nominal	2	Right	F4	F8.2
MM	22	Multimedia	Nominal	2	Right	F4	F8.2
WD	23	Web Designing	Nominal	2	Right	F4	F8.2
IS	24	Internet Searching	Nominal	2	Right	F4	F8.2
OT	25	Others	Nominal	2	Right	F4	F8.2
Others	26	Other Programs	Nominal	8	Left	A9999	A9999

Variable	Position	Label	Measurement Level	Column Width	Alignment	Print Format	Write Format
Others	26	Other Programs	Nominal	8	Left	A9999	A9999
Q1	27	Computers do not scare me at all	Ordinal	1	Right	F4	F2.1
Q2	28	I'm no good with computers.	Ordinal	1	Right	F4	F2.1
Q3	29	I would like working with computers	Ordinal	1	Right	F4	F2.1
Q4	30	I will use computers many ways in my life.	Ordinal	1	Right	F4	F2.1
Q5	31	Working with a computer would make me very nervious	Ordinal	1	Right	F4	F2.1
Q6	32	Generally, I would feel OK about trying a new problem on the computer.	Ordinal	1	Right	F4	F2.1
Q7	33	The challenge of solving problems with computers does not appeal to me	Ordinal	1	Right	F4	F2.1
Q8	34	Learning about computers is a waste of time	Ordinal	1	Right	F4	F2.1
Q9	35	I do not feel threatened when others talk about computers	Ordinal	1	Right	F4	F2.1
Q10	36	I don't think I would do advanced computer work	Ordinal	2	Right	F4	F2.1
Q11	37	I think working with computers would be enjoyable and stimulating	Ordinal	2	Right	F4	F2.1
Q12	38	Learning about computers is worthwhile	Ordinal	2	Right	F4	F2.1
Q13	39	I feel aggressive and hostile toward computers	Ordinal	2	Right	F4	F2.1
Q14	40	I am sure I could do work with computers	Ordinal	2	Right	F4	F2.1
Q15	41	Figuring out computer problems does not appeal to me	Ordinal	2	Right	F4	F2.1
Q16	42	I'll need a firm mastery of computers for my future work	Ordinal	2	Right	F4	F2.1
Q17	43	It wouldn't bother me at all to take computer course	Ordinal	2	Right	F4	F2.1
Q18	44	I'm not the type to do well with computers.	Ordinal	2	Right	F4	F2.1
Q19	45	When there is a problem with a computer run that I can't immediately solve, I would stick with it until I have the answer	Ordinal	2	Right	F4	F2.1
Q20	46	I expect to have little use for computers in my daily life	Ordinal	2	Right	F4	F2.1
Q21	47	Computers make me feel uncomfortable	Ordinal	2	Right	F4	F2.1
Q22	48	I am sure I could learn a computer language	Ordinal	2	Right	F4	F2.1
Q23	49	I don't understand how some people can spend so much time working with computers and seem to enjoy it	Ordinal	2	Right	F4	F2.1
Q24	50	I can't think of any way that I will use computers in my career	Ordinal	2	Right	F4	F2.1
Q25	51	I would feel at ease in a computer class	Ordinal	2	Right	F4	F2.1
Q26	52	I think using a computer would be very hard for me	Ordinal	2	Right	F4	F2.1
Q27	53	Once I start to work with the computer, I would find it hard to stop	Ordinal	2	Right	F4	F2.1
Q28	54	Knowing how to work with computers will increase my job possibilities	Ordinal	2	Right	F4	F2.1
Q29	55	I get a simking feeling when I think of trying to use a computer	Ordinal	2	Right	F4	F2.1
Q30	56	I could get good grades in computer courses	Ordinal	2	Right	F4	F2.1

Variable	Position	Label	Measurement Level	Column Width	Alignment	Print Format	Write Format
Q31	57	I will do as little work with computers as possible	Ordinal	2	Right	F4	F2.1
Q32	58	Anything that a computer can be used for, I can do just as well some other way	Ordinal	2	Right	F4	F2.1
Q33	59	I would feel comfortable working with a computer	Ordinal	2	Right	F4	F2.1
Q34	60	I do not think I could handle a computer course.	Ordinal	2	Right	F4	F2.1
Q35	61	If a problem is left unsolved in a computer class, I would continue to think about it afterward.	Ordinal	2	Right	F4	F2.1
Q36	62	It is important to me to do well in computer classes	Ordinal	2	Right	F4	F2.1
Q37	63	Computers make me feel uneasy and confused	Ordinal	2	Right	F4	F2.1
Q38	64	I have a lot of self-confidence when it comes to working with computers.	Ordinal	2	Right	F4	F2.1
Q39	65	I do not enjoy talking with others about computers.	Ordinal	2	Right	F4	F2.1
Q40	66	Working with computers will not be important to me in my life's work.	Ordinal	2	Right	F4	F2.1
Comments	67	Students Comments	Nominal	28	Left	A9999	A9999

Variables in the working file

Variable Values

Value		Label
Nursing	0	No
	1	Yes
	9999	Missing
Col_Level	1	First Year
	2	Second Year
	3	Third Year
	4	Fourth Year
	5	Fifth Year
	6	Others
	9999	Missing
GPA	9999	Missing
Gender	0	Male
	1	Female
	9999	Missing
Age	9999	Missing
Mar_Stat	1	Single
	2	Married
	3	Others
	9999	Missing
Residency	0	No
	1	Yes
	9999	Missing
Region	1	East Region
	2	West Region
	3	Central Region
	4	North Region
	5	South Region
	9999	Missing
Income	1	2,000-3,999
	2	4,000-5,999
	3	6,000-7,999
	4	8,000-9,999
	5	10,000-11,999
	6	12,000-13,999
	7	14,000-15,999
	8	16,000-17,999
	9	>18000
	9999	Missing

Tech_227	0	No
	1	Yes
	9999	Missing
Comp_Exp	0	No
	1	Yes
	9999	Missing
Exp	9999	Missing
Comp_Acc	1	Home
	2	School
	3	Both
	4	Others
	9999	Missing
Comp_User	9999	Missing
Family_Mem	9999	Missing
WP	0	No
	1	Yes
	9999	Missing
WS	0	No
	1	Yes
	9999	Missing
DB	0	No
	1	Yes
	9999	Missing
PP	0	No
	1	Yes
	9999	Missing
PG	0	No
	1	Yes
	9999	Missing
MM	0	No
	1	Yes
	9999	Missing
WD	0	No
	1	Yes
	9999	Missing
IS	0	No
	1	Yes
	9999	Missing
OT	0	No
	1	Yes
	9999	Missing

Q1	1	Strongly Disagree
	2	Slightly Disagree
	3	Slightly Agree
	4	Strongly Agree
	9999	Missing
Q2	1	Strongly Agree
	2	Slightly Agree
	3	Slightly Disagree
	4	Strongly Disagree
	9999	Missing
Q3	1	Strongly Disagree
	2	Slightly Disagree
	3	Slightly Agree
	4	Strongly Agree
	9999	Missing
Q4	1	Strongly Disagree
	2	Slightly Disagree
	3	Slightly Agree
	4	Strongly Agree
	9999	Missing
Q5	1	Strongly Agree
	2	Slightly Agree
	3	Slightly Disagree
	4	Strongly Disagree
	9999	Missing
Q6	1	Strongly Disagree
	2	Slightly Disagree
	3	Slightly Agree
	4	Strongly Agree
	9999	Missing
Q7	1	Strongly Agree
	2	Slightly Agree
	3	Slightly Disagree
	4	Strongly Disagree
	9999	Missing
Q8	1	Strongly Agree
	2	Slightly Agree
	3	Slightly Disagree
	4	Strongly Disagree
	9999	Missing

Q9	1	Strongly Disagree
	2	Slightly Disagree
	3	Slightly Agree
	4	Strongly Agree
	9999	Missing
Q10	1	Strongly Agree
	2	Slightly Agree
	3	Slightly Disagree
	4	Strongly Disagree
	9999	Missing
Q11	1	Strongly Disagree
	2	Slightly Disagree
	3	Slightly Agree
	4	Strongly Agree
	9999	Missing
Q12	1	Strongly Disagree
	2	Slightly Disagree
	3	Slightly Agree
	4	Strongly Agree
	9999	Missing
Q13	1	Strongly Agree
	2	Slightly Agree
	3	Slightly Disagree
	4	Strongly Disagree
	9999	Missing
Q14	1	Strongly Disagree
	2	Slightly Disagree
	3	Slightly Agree
	4	Strongly Agree
	9999	Missing
Q15	1	Strongly Agree
	2	Slightly Agree
	3	Slightly Disagree
	4	Strongly Disagree
	9999	Missing
Q16	1	Strongly Disagree
	2	Slightly Disagree
	3	Slightly Agree
	4	Strongly Agree
	9999	Missing

Q17	1	Strongly Disagree
	2	Slightly Disagree
	3	Slightly Agree
	4	Strongly Agree
	9999	Missing
Q18	1	Strongly Agree
	2	Slightly Agree
	3	Slightly Disagree
	4	Strongly Disagree
	9999	Missing
Q19	1	Strongly Agree
	2	Slightly Agree
	3	Slightly Disagree
	4	Strongly Disagree
	9999	Missing
Q20	1	Strongly Agree
	2	Slightly Agree
	3	Slightly Disagree
	4	Strongly Disagree
	9999	Missing
Q21	1	Strongly Agree
	2	Slightly Agree
	3	Slightly Disagree
	4	Strongly Disagree
	9999	Missing
Q22	1	Strongly Disagree
	2	Slightly Disagree
	3	Slightly Agree
	4	Strongly Agree
	9999	Missing
Q23	1	Strongly Agree
	2	Slightly Agree
	3	Slightly Disagree
	4	Strongly Disagree
	9999	Missing
Q24	1	Strongly Agree
	2	Slightly Agree
	3	Slightly Disagree
	4	Strongly Disagree
	9999	Missing

Q25	1	Strongly Disagree
	2	Slightly Disagree
	3	Slightly Agree
	4	Strongly Agree
	9999	Missing
Q26	1	Strongly Agree
	2	Slightly Agree
	3	Slightly Disagree
	4	Strongly Disagree
	9999	Missing
Q27	1	Strongly Disagree
	2	Slightly Disagree
	3	Slightly Agree
	4	Strongly Agree
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Q28	1	Strongly Disagree
	2	Slightly Disagree
	3	Slightly Agree
	4	Strongly Agree
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Q29	1	Strongly Agree
	2	Slightly Agree
	3	Slightly Disagree
	4	Strongly Disagree
	9999	Missing
Q30	1	Strongly Disagree
	2	Slightly Disagree
	3	Slightly Agree
	4	Strongly Agree
	9999	Missing
Q31	1	Strongly Agree
	2	Slightly Agree
	3	Slightly Disagree
	4	Strongly Disagree
	9999	Missing
Q32	1	Strongly Agree
	2	Slightly Agree
	3	Slightly Disagree
	4	Strongly Disagree
	9999	Missing

Q33	1	Strongly Disagree
	2	Slightly Disagree
	3	Slightly Agree
	4	Strongly Agree
	9999	Missing
Q34	1	Strongly Agree
	2	Slightly Agree
	3	Slightly Disagree
	4	Strongly Disagree
	9999	Missing
Q35	1	Strongly Disagree
	2	Slightly Disagree
	3	Slightly Agree
	4	Strongly Agree
	9999	Missing
Q36	1	Strongly Disagree
	2	Slightly Disagree
	3	Slightly Agree
	4	Strongly Agree
	9999	Missing
Q37	1	Strongly Agree
	2	Slightly Agree
	3	Slightly Disagree
	4	Strongly Disagree
	9999	Missing
Q38	1	Strongly Disagree
	2	Slightly Disagree
	3	Slightly Agree
	4	Strongly Agree
	9999	Missing
Q39	1	Strongly Agree
	2	Slightly Agree
	3	Slightly Disagree
	4	Strongly Disagree
	9999	Missing
Q40	1	Strongly Agree
	2	Slightly Agree
	3	Slightly Disagree
	4	Strongly Disagree
	9999	Missing

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