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Knowledge and attitudes of nurse educators toward computer use for hospital inservice education

Jocelyn A. Barrera
San Jose State University

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**KNOWLEDGE AND ATTITUDES OF NURSE EDUCATORS
TOWARD COMPUTER USE FOR HOSPITAL INSERVICE EDUCATION**

A Thesis

Presented to

The Faculty of the School of Nursing

San Jose State University

In Partial Fulfillment

of the Requirements for the Degree

Master of Science

by

Jocelyn A. Barrera

August, 1995

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APPROVED FOR THE SCHOOL OF NURSING

Sharon Wahl

Sharon Wahl, R.N., Ed.D.

Susan Murphy

Susan Murphy, R.N., D.N.Sc.

Christine Bolwell

Christine Bolwell, R.N., M.S.

APPROVED FOR THE UNIVERSITY

Serena H. Stanford

ABSTRACT

KNOWLEDGE AND ATTITUDES OF NURSE EDUCATORS TOWARD COMPUTER USE FOR HOSPITAL INSERVICE EDUCATION

by Jocelyn Barrera

This exploratory study was designed primarily to determine hospital nurse educators' knowledge about and attitudes toward computers. A sample of 53 nurse educators responded to a questionnaire on demographic background information, an 8-question computer knowledge quiz, and a 20-question computer attitudinal survey. Findings were as follows: (a) The average score on knowledge of computers among the sample was 4.132, with a standard deviation of 1.801; and (b) the average score on the attitudinal survey was 5.87, with a standard deviation of .0169. The knowledge scores obtained by the subjects were considered low, while the attitude scores were high.

It appears that although nurse educators do not have adequate knowledge about computers, they do feel very positive about computer use. The nurse educators' years of computer experience did not appear to influence knowledge scores. Most of the participants had more than 3 years of computing experience and a few had 9-14 years, but their average scores on the knowledge quiz were only a mean 4.1 out of a possible 8. Overall, the more years of computer experience an educator had, the higher the attitude score. In terms of nurse educators' educational backgrounds, it was revealed that those who had attained a higher educational level tended to have a higher knowledge score and achieved a higher attitude score.

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To my sons, Paul and Jason, in loving gratitude for
their patience and understanding in allowing
their mother's dream to become a reality,
and to my parents who have been
my perpetual inspiration.

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Chapter 1

INTRODUCTION

The use of computerized technology has been well established in this century and will continue to grow and develop into the next. Business and industry are utilizing computers in many different ways. According to Protti (1988), a major revolution, similar to the industrial revolution, has occurred in society in less than 200 years. He calls it the "electronic" or "informational revolution." Computer technology has also affected the health care industry. The greatest evidence of computer utilization has been in hospitals where technology is used in all aspects of patient care. For example, electronic devices have been refined in monitoring cardiopulmonary functions of patients; and turnaround time for laboratory results is faster due to the efficiency of computer systems. The rapid adoption of computer technology in health care has improved the overall delivery of patient care (Protti).

Regardless of the technological advances to which nurses have been exposed in the hospital, the profession has been slow to acknowledge the increased educational responsibilities that accompany these innovations in technology. In nursing, there are very few practicing nurses and nurse educators who have been formally instructed in the use of computers. As a result, they are not able to utilize computer technology fully as an effective tool in practice and education. The need to educate nurses about computers has been recognized since the 1960s and has been widely advocated (Eaton, 1991).

Purpose of the Study

The purpose of this study was to describe the knowledge and attitudes of hospital nurse educators regarding computers to determine if they would be willing to use computers as a teaching tool in continuing education. Computer-assisted instruction is becoming a part of education in many schools of nursing today. There is no longer a question of whether computers should be included in educating students, but what computer programs are available to fit the educational needs of the students. Several authors have described how many schools of nursing across the United States have gradually integrated computer-assisted modules into their curriculum (Eaton, 1991; Felton & Brown, 1988; Hodson, Hanson, & Bigham, 1988; Thiele, 1988). Some nursing students are taught the basic skills in using the computer and running programs. Faculty utilize and incorporate computer-assisted instruction (CAI) as part of their teaching. Studies have shown that CAI influences greater achievement, improves skills, and saves study time for students (Mahr & Radner, 1984). In undergraduate nursing education, CAI has been shown to be as effective as traditional methods of teaching students (Belfry & Winne, 1988; Gaston, 1988; Huckaby, Anderson, Holm, & Lee, 1979).

Unfortunately, computers as a component of continuing education for nurses in hospitals have not experienced the same popularity. The current state of computer literacy among hospital inservice instructors is unclear. Only a few studies have been conducted to determine the extent of CAI usage in inservice education.

Statement of Problem

Nursing professionals working in hospitals are exposed to computer technology in their everyday practice. The use of computers in the hospital has been focused primarily on activities relating to patient care, such as charting, ordering and retrieving laboratory and x-ray results, and requesting supplies. Even though knowledge of computers is important for hospital educators and clinical nurse specialists who are directly responsible for continuing education of nurses, the use of computers in continuing education and staff development has lagged in its utilization as an effective educational tool (Whiteside, McCulloch, & Whiteside, 1991). Hannah and Osis (1988) state that nurses involved in inservice education are lacking in the knowledge of computers and the use of computers as effective instructional tools in teaching/learning situations. An acute need to expand teaching methods in nursing inservice education exists and justifies this study. There are numerous ways that computers can be utilized by nurse educators in the teaching of new technological developments.

The lack of knowledge and use of computers in inservice education suggest that there is a computer crisis in nursing; thus the need for inclusion of computers becomes more urgent. Hospital nurse educators need to equip themselves and their learners with the necessary resources to access, manage, absorb, and apply the information in practice. Utilizing computer technology, acquisition of vast amounts of knowledge can now take place more easily and quickly. The learner is allowed to actively participate in the learning process which can improve performance in a shorter learning period. Computers offer a wide variety of learning and instruction: Drill and practice, simulation,

tutorials, and decision-making scenarios are all available features in computer learning (Lassan, 1989; Quinn, 1986; Thompson, 1986).

Computer-assisted instruction helps learners gain new knowledge and review previously learned concepts through repetition, variability of examples, and duplicating real life clinical situations which assist in the decision-making process. Positive contributions of CAI to the teaching/learning process include (a) one-on-one contact between the learner and computer, (b) immediate feedback, (c) analysis of learners' "weak" areas and provision for remediation, (d) option for the learner to stop the program at any time and return to it later, and (e) effective use of educator's time (Bolwell, 1990; Lassan, 1989; Quinn, 1986). Major disadvantages include (a) highly individualized instruction, making group teaching difficult; (b) diminished teacher-student interaction; and (c) need for highly knowledgeable and committed educators who can aid students in utilizing the computer to its fullest capacity (Armstrong, 1988; Curl, Hoehn, & Thiele, 1988; Lassan, 1989).

Recent changes in health care policy have resulted in the tightening of available financial resources in hospitals. Because of this, nurse educators' knowledge of computers and their willingness to include cost saving education programs, such as those offered by computers in continuing education, is essential. Hospital educators must be able to negotiate for funds in order to provide the training and education of nurses and to document the cost effectiveness of proposed teaching methods. According to Bolwell (1988), the cost to deliver a course to 300 staff nurses using CAI is \$15,960, while it costs \$24,300 to deliver the same program to the same number of nurses using traditional lecture methods.

Included in these expenses are the substitute staff that are required to cover for those nurses who must spend time away from the bedside in order to complete their continuing education units (CEUs), and the cost for development and delivery of a continuing education (CE) program: planning, developing, researching, and conceptualizing the content, setting up and assembling handouts, arranging for snacks and lunch, and testing. CAI programs used in continuing education decrease development and delivery costs and are different than those of traditional classes. There is only a one-time cost for researching, reviewing, planning, and developing handouts for the student to learn its use with CAI. However, most hospitals already have computers in place so that the cost of purchasing software is all that is necessary. The most expensive item in using a CAI program is paying staff nurses' salaries while taking time off the job to complete a CE computer program. By using CAI, the nurses' time off on the job decreases because the use of CAI decreases learning time by 30-50%. Thus, what a staff nurse learns in a 4-hour structured, traditional lecture CE class, he/she can learn in 1-2 hours by using CAI (Bolwell, 1990). Computers have been shown to be cost-effective, especially when self-paced learning and costs for paying staff nurses' educational leave and travel time are considered (Belfry & Winne, 1988; Bolwell, 1988, 1990; Whiteside, McCulloch, & Whiteside, 1991).

There is a computer learning challenge in nursing education. Educators would do well to accept that challenge by actively learning how to use computers and to integrate them into their curricula (Floyd, 1983). According to Whiteside, McCulloch, and Whiteside (1991), learning information regarding the use of computers as a tool for instruction is vital for hospital

educators and clinical nurse specialists. Whiteside et al. (1991) also cite two researchers—Hale (1988) who states that “inservice education nurses are most in need of instruction” (p. 113) and Armstrong (1987) who adds that a computer literate nurse educator must come before a computer instructional information system is started.

Hospital nurse educators' burden of responsibility providing education and development of staff is increasing. The rapid development of scientific knowledge and clinical applications is phenomenal and requires finding more efficient and cost-effective ways of delivering the educational needs of staff, such as found in CAI. Little research has been done to assess the computer knowledge and attitudes of those who are responsible for educational programs of nurses. A baseline understanding of the knowledge and attitudes of hospital nurse educators is necessary before one can explore the exciting educational possibilities offered by CAI.

Research Questions

The research questions formulated to guide this study are:

1. What is the level of knowledge of hospital nurse educators about computers?
2. What are the attitudes of hospital nurse educators toward the use of computers for instruction?

Definitions

The following terms will be used frequently in this study. The definition of each term is provided to ensure clear understanding of the terms.

1. Attitudes toward computers are the opinions that one holds about the applications of computer technology in the society and the future

development of computers as measured by an instrument developed by Carruthers (1990).

2. Computer is an electronic device that has the ability to "process, store, retrieve, and deliver data and information efficiently" (Athney & Zamud, 1986, p. 10).

3. Computer-Assisted Instruction (CAI) is "the process whereby written and visual information is presented in a logical sequence by a computer. The student learns by reading the material or showing and observing graphic information displayed on the screen" (Mahr & Radner, 1984, p. 366).

4. Computer-literacy is "the ability to use a computer as a tool to enrich one's professional and personal life" (Athney & Zamud, 1986, p. 8).

5. Computer knowledge is the state of an individual's awareness of computers and competency in using computers as measured by a quiz adapted from CLECA by Cheng, Plake, and Stevens (1985) (cited in Carruthers, 1990).

6. Instruction refers to "the arrangement of external events in a learning situation in order to facilitate learning, retention, and transfer" (LeFrancois, 1991, p. 404).

Significance of the Study

Very few studies have been conducted to explore the extent of the utilization of computers in hospital inservice, even though computer use in practice and in schools of nursing has been widely documented. In 1988, 441 National League for Nursing (NLN)-accredited baccalaureate nursing programs in the United States were surveyed by Hebda (1988) to determine how much CAI was being utilized in schools of nursing. Of the 339 who responded, 164

(48.4%) indicated they were using CAI; 56 (16.5%) indicated its use as a prerequisite prior to nursing; and 151 (44.5%) said that they had used computers as part of their nursing courses. Other surveys have indicated that there is continued expansion in the use of CAI for nursing education in schools of nursing (Belfry & Winne, 1988; Perciful, 1992; Thompson, 1986).

Compared to the numerous studies done with nursing school educators, very few studies have been conducted with hospital inservice educators regarding use of CAI. Whiteside, McCulloch, and Whiteside (1991) conducted a study in which hospital educators and clinical nurse specialists were given instruction on developing skills to evaluate, develop, and implement instructional software. The result showed that the participants of the workshop increased their knowledge on computers while maintaining a positive attitude toward computers. There have been no studies that have surveyed the baseline attitudes and knowledge of hospital educators on computers.

Computers can save money and time and help to provide efficient patient care. Nurses are challenged and will continue to be challenged with increased computerized technology in the workplace. Nurse educators involved in staff development are partly responsible for the success of practicing nurses in providing patient care. Current and updated knowledge is essential; with limited time, money, and qualified teaching personnel to instruct nursing professionals, computers can be an especially valuable adjunct to instruction. Computer-Assisted Instruction (CAI) is not meant to replace teachers but will, rather, "re-place" them to become facilitators, moderators, and coordinators of learning (Hannah & Osis, 1988, p. 323).

In order to take advantage of the benefits offered by computer technology, one needs to explore the knowledge and attitudes of hospital nurse educators to utilize computers as instructional tools. By gaining this baseline information, specific recommendations can be formed so that nursing can move ahead with utilizing technology to better educate nurses.

Chapter 2

LITERATURE REVIEW AND CONCEPTUAL FRAMEWORK

Literature Review

Hospital nurse educators perform many varied tasks in preparation for their teaching. They frequently update course content to help practicing nurses stay abreast of the latest scientific knowledge and changes in technology. Nurse educators continually evaluate new equipment and supplies introduced into the market affecting the delivery of patient care. Regardless of the task, the traditional methods of teaching, such as lecture-discussion, comprise the predominant strategy currently used in staff development. Computers, although widely used in nursing practice, are not used as often as a teaching tool in inservice education.

A review of the literature reveals numerous studies which have attempted to determine the effects of computers in learning. Resistance toward the use of computers by nurses has been documented in various studies. According to Shrvirian, Malone, Stone, Nunley, and Francisco (1989), several studies indicate that a person's attitude toward computers is positively influenced by a computer literacy course if the emphasis is on responsibility and the relevance of computers to one's work. According to Dombro (1986), recruiting support from administrators in the use of personal computers for education is essential. With support solicited from administration, nurse educators will be more inclined to utilize computers based on their affiliation and support from upper management.

According to a study by Mikan (1990), there are several reasons why resistance to computers among educators exists. Factors contributing to resistance are (a) resistance/anxiety related to learning something new, (b) lack of incentive for computer involvement, and (c) time and budget constraints related to use of computers. She suggests ways to motivate colleagues to become more involved in the use of computers. Included among those suggestions to combat resistance are providing incentives, such as granting promotions and tenure to those educators; giving recognition to those who involve themselves in innovative computer-related activities; and allowing educators the academic freedom to incorporate teaching alternatives, such as those offered by computers, that would stimulate both personal and academic growth.

Other investigators, such as Elmore (1991) and Delaney (1989) (cited in Wahl, 1991) and Thiele (1988), indicate that educators must become involved in the process of making the decision to include computers in the curriculum. The educators' initial involvement would begin with learning how to use computers themselves. After this has taken place, educators will be more inclined to include computers in their teaching curriculum, attitudes toward computer learning will change, and fear of computers will diminish.

Knowledge about Computers

Quinn (1986) cites past studies demonstrating that knowledge which students gained was the same or slightly improved through the use of computers. Students' aptitude scores also increased with the utilization of computers in the classroom. A similar study conducted by Bitzer and Boudreaux (1969) revealed that computers helped students cut learning hours

on a specific concept by 34%. Other studies have upheld Bitzer and Boudreaux's conclusions comparing CAI and another form of instruction with nursing students (Belfry & Winne, 1988; Day & Payne, 1987; Gaston, 1988; Mahr & Radner, 1984). The results of these studies showed that nursing students who received CAI fared better in achievement tests than did those who received instruction by the traditional method, especially in cases where CAI was used to supplement the traditional methods. The results of an achievement study conducted by Belfry and Winne (1988) showed an increase of 10% in the students' overall average scores, indicating that students who were taught by the traditional method scored an average of 58% on the test, and those taught by CAI scored an average of 68%.

Attitudes on Computers

Nursing students' attitudes about computers have also been studied and were found to be generally positive (Belfry & Winne, 1988; Gaston, 1988; Kirchoff & Holzemer, 1979). Kirchoff and Holzemer (1979) found that nursing students who had prior exposure to the computer had more positive attitudes toward CAI. Nursing students who had used CAI in the past seemed to want to use it more and had a more positive attitude toward it than those who had not used CAI or those who had been instructed in the traditional method. In a more recent study by Whiteside, Lang, and Whiteside (1989), medical students' attitudes toward use of computers in medical education were evaluated. Most students surveyed felt that computers helped them learn and were effective in improving their learning levels.

The study's findings revealed positive attitudes of students toward computers and their willingness to use them. However, one study showed that

regardless of their positive attitudes and willingness, some students felt that they did not enjoy using computers because it was too complicated and time consuming to learn how to use them effectively. In the study conducted by Whiteside, Lang, and Whiteside (1989), it was discovered that medical students were willing to learn about computers because they felt it would help them in their education. The results of a follow-up study conducted by Whiteside, Tysinger, and Pierce (1993) revealed that 93% of medical residents surveyed felt that computers helped them in improving the quality of their past medical school training and education; a lesser percentage of those surveyed (68%) felt that CAI could help them with their level of learning. Of those surveyed, 75% stated that they would use computers to help them learn diagnoses and treatment of their patients using simulation instruction by computer.

Scarpa, Smeltzer, and Jasion (1992) replicated a study by Stronge and Brodt (cited in Scarpa et al.) on attitudes of nurses toward computerization. The study revealed that nurses' attitudes toward computers were generally favorable, especially when they had been previously exposed to computer use.

In summary, the review of the literature documents the cost effectiveness of computers and the influence they have on enhancing learning. Studies discussed focused primarily on knowledge of and attitudes toward computers from nursing students, medical students, and practicing bedside nurses. There have been no studies obtaining baseline information on knowledge and attitudes of hospital nurse educators toward computers. There is generally a positive attitude toward computer use in education among those who have been studied. There is, however, some resistance to its use. The

concept of motivation and its influence toward the use of computers in education will be discussed.

Conceptual Framework

The concept of motivation, developed by cognitive theorists David Ausubel and Floyd Robinson (1969) (cited in Bigge & Hunt, 1980), provided the theoretical framework for this study. Cognitive learning theorists view human motivation as very significant in facilitating learning. According to their theory, there are internal and external motivational factors within a learner that influence meaningful learning. These motivational factors influence retention beyond recognition and recall. A person learns through motivation by directing his/her energies toward success rather than failure. Human motivation toward achievement is composed of three basic components—cognitive drive, ego enhancement, and affiliative motivation.

Cognitive Drive Motivation

Cognitive drive motivation is one's internal need for knowledge acquisition and problem solving as an end unto itself. It is simply the need to gain knowledge about something. This basic component is what makes a person fulfill the need for academic achievement which he/she is seeking to acquire. It is purely task oriented, and one's reward for it is the attainment of knowledge and completion of a task as it becomes satisfying to one's underlying motive. An individual's need to understand, gain, and master knowledge, as well as to formulate and solve problems, are factors that influence this type of motivation.

As discussed in the review of literature section, knowledge appears to be a major motivating factor in the utilization of computers in education.

Those students who know how to use computers are more open toward their use. In the same light, by gaining knowledge about computers, educators untrained in computers will gain knowledge through cognitive drive motivation. Their need for acquiring knowledge on computers to keep abreast of the latest technology becomes the driving force.

Ego Enhancement Motivation

This is an external motivational force that is directed toward attainment of one's academic and career goals. It is non-task-oriented and has to do with achieving status and prestige. A significant portion of this type of motivation is anxiety. Anxiety drives one to learn in order to deal with potential threats to one's self-esteem. Ego enhancement is the one factor which accounts for high levels of aspiration (Bigge & Hunt, 1980).

The widespread use of computers in nursing practice has forced most nurses to learn how to use them in one form or another. Nurses in practice have different levels of expertise on computers, but most have at least some knowledge of computer use in the work environment. The anxiety-provoking situation brought about by the initial installation of computers has been the motivating force for nurses to learn about computers. The same ego enhancement motivational force applies to hospital nurse educators in learning about and utilizing computers in their teaching. By incorporating CAI into teaching, educators will find that learners will not only acquire new knowledge, but they will also achieve this in less time and with significant cost savings. Prestige and status are gained when administration and management personnel recognize the cost and time savings facilitated by the educator through CAI.

Affiliative Motivation

Affiliative motivation is concerned with achievement of goals because of approval from superordinate persons or groups for whom an individual holds a high regard or respect. Acceptance by these respected persons or groups assures prestige and status. Although this type of motivation is more prominent in childhood when a child seeks approval from his or her parents, it is also a motivating component in adult behavior (Bigge & Hunt, 1980).

Educators' knowledge in computer use and confidence in their ability to evaluate, design, and run a program allows them to be considered experts by their superordinates. The driving motivational force in this instance is concerned with approval and recognition from those persons whom the educators consider with very high regard. They may also be rewarded for their efforts in terms of an increase in monetary compensation or a job promotion. When this is accomplished, the motivating component brings continued efforts toward improving and seeking greater challenges in computer knowledge and skills in order to maintain the acceptance and approval from the superordinates.

Summary

The review of literature examines and discusses research conducted on the knowledge, attitudes, and motivation associated with the use of computers. This research is based on the assumption that nurse educators who are motivated toward computer use will be more likely to seek out and acquire the knowledge necessary to use computers effectively, will develop more positive attitudes toward them, and will be more inclined to utilize them as a teaching tool.

Nursing education for nurses in the hospitals may be more effective and beneficial if hospital nurse educators are motivated to include computer-assisted instruction as one of their teaching strategies. In order to accomplish this, baseline information is necessary to assess their attitudes and knowledge on computers.

Chapter 3
METHODOLOGY

Design

The purpose of the study was to determine hospital educators' knowledge of and attitudes toward computers as instructional tools. This exploratory study obtained descriptive information using a survey questionnaire. Demographic data were collected along with data concerning attitudes toward computers and knowledge of computers.

Setting and Subjects

The setting for this study was in the San Francisco Bay Area and its vicinity in Northern California. The study was conducted in acute care hospitals having a 200 or more bed capacity. The acute care hospitals included both profit and non profit, university (teaching) and community, and public and private hospitals.

All participants in the study volunteered to be included. An attempt was made to obtain a broad, heterogeneous convenience sample of hospital nurse educators. A total of 100 surveys was mailed to nurse educators employed at various acute care hospitals in Northern California. Out of the total number of nurses surveyed, 53 responded (53%). There is no information from those who chose not to participate, so it is not known whether the nonrespondents differ from those who participated.

Human Subjects Approval

Approval for use of human subjects in research is filed in Appendix B. Subjects who were asked to participate in research received a cover letter

attached to the questionnaire informing them of the purpose of the study and their rights as participants (see Appendix C). Participation in the research was voluntary and subjects were assumed to consent to the research by filling out the questionnaires and returning them to the researcher.

Data Collection

The data for this study were collected during July and August of 1994. The questionnaires were sent to hospital nurse educators, some of whose names were obtained from the National Hospital Blue Book. If an educator's name was not included, a telephone call was made to the institution to obtain the name(s) of their educators. A cover letter was attached to each questionnaire which explained the study and assured anonymity and confidentiality. One hundred questionnaires were mailed directly to each individual educator. Attached to the cover letter was a self-addressed stamped envelope to expedite the return of the completed questionnaire. Of the 100 questionnaires which were mailed, 53 were returned.

Instrument

The data collection instrument was a self-administrated questionnaire (see Appendix A). The instrument consisted of three parts: (a) demographic data, (b) 20 questions on computer attitudes, and (c) 10 questions on computer knowledge. The questionnaire on attitudes was used with permission from its author, Dr. William Carruthers (1990), and consisted of 20 questions with Likert-style items for measuring teachers' attitudes toward computers. The attitudinal questionnaire developed by Dr. Carruthers was evaluated by him for reliability and validity. According to the reported results of his measurement, the alpha coefficient was .91 and test-retest reliabilities were .90 and .78 over

2-week and 5-month intervals, respectively. Other attitudinal questionnaires were explored, but the scale adapted appeared most appropriate for measuring computer attitudes of educators for this study. The attitudinal questionnaire was divided into two sections. The first section asked the respondents to answer statements which described their feelings toward computers and to rate them as “strongly disagree,” “disagree,” or “slightly disagree,” “undecided,” “strongly agree,” “agree,” “slightly agree.”

Utilizing Carruther’s (1990) scale, the second section on the attitudinal questionnaire asked the respondents to answer the statements that best described their beliefs about computers. The demographic section requested data on years of nursing experience, years of experience with computers, educational preparation, age, and area of specialty.

The third section of the instrument was a knowledge quiz on computers in which the educators were asked 10 questions about computers designed to measure their knowledge of them. All of the knowledge questions focused entirely on the technical aspects of computer use and none on its application. The computer knowledge quiz was adapted from CLECA by Cheng, Plake, and Stevens (1985) (cited in Carruthers, 1990).

Carruthers (1990) documents the reliability and validity of his tool as follows:

Content validity for the measure was demonstrated and construct validity was supported by factor analysis, differences in the attitudes of computer users and non users, and convergent/discriminant relationship of the scale with two other measures of computer attitudes. Concurrent and predictive criterion related validities were significant in 5 out of 6

variables. It was also shown to be sensitive to changes in attitudes during an inservice program. (p. 1)

Data Analysis

Each questionnaire was tallied, hand corrected, and scored by the researcher. The scored questionnaires were double checked to verify accuracy. Each subject had a knowledge score based on the number of correct responses, as well as an attitude score based on the number of positive and negative responses. All items in the attitudinal survey were placed in a continuum, with positive responses given a high score and negative responses given a low score. An average score was then taken across the sample by calculating means and standard deviation on knowledge and attitude. Tables were used to illustrate the results.

Summary

This study was designed as a descriptive survey. The data gathered from the questionnaires were superficial in nature and did not allow for complex findings. Since this is a survey study, it allowed no manipulation of variables and did not infer relationships, differences, or causes and effects. The instrument used was a questionnaire. The attitudinal questionnaire was adapted with written permission from William Carruthers (see Appendix D) and the computer knowledge quiz adapted from Cheng, Plake, and Stevens (1985) (cited in Carruthers, 1990). Due to the limitation of the design and instrument, no generalizations can be made beyond the sample size of the study and the geographical location in which the study was conducted.

Chapter 4

FINDINGS AND INTERPRETATION

The data from this study were analyzed to determine nurse educators' knowledge of and attitudes toward computers. Demographic characteristics of the sample respondents are also described.

Description of the Sample

Data were collected from a convenience sample of nurse educators in the San Francisco Bay Area and its vicinity. Of the 100 questionnaires distributed, 53 nurse educators responded, a return rate of 53%. The survey questionnaires were mailed directly to the subjects.

The participants were asked general demographic questions, including years of nursing experience, years of computer experience, educational preparation, age, and area of specialty. Nurse educators were asked to answer 20 questions regarding their attitudes toward computers and 8 questions on their knowledge about computers.

Years of Nursing Experience

Out of the total sample of 53 nurse educators, the majority had 16-20 years of nursing experience (32.1%) and 21-25 years of nursing experience (20.7%). A smaller number had 5 or fewer years in practice (5.6%) (see Table 1).

Years of Computing Experience

The majority of RNs participating in this study had between 3-5 years of computer experience (49%). Of those who responded, 5.7% declared that

they had between 12-14 years of computer experience. Of the entire sample, 16.9% had 2 years or less of computer experience (see Table 1).

Educational Preparation

As indicated in Table 1, the majority of the respondents had a masters degree (67.9%) and 20.7% had a baccalaureate degree. There were no nurses with doctorates in the sample population, and there were equal numbers of diploma graduates and associate degree graduates at 5.7% each (see Table 1).

Age

Most of the participants of the study were in the 36-45 age group (52.8%). Of those responding, 32% belonged to the 46 and above age group, and 15.1% were from the 25-45 year age group (see Table 1).

Table 1.

Descriptive Statistics on Knowledge of and Attitudes toward Computers by Nurse Educators

Educator Background Characteristics	N	%	Knowledge Score		Attitude Score	
			M	SD	M	SD
Years of Nursing Experience						
0-5	3	5.7	3.00	1.63	5.90	.49
6-10	5	9.5	3.20	2.03	5.42	.60
11-1	8	15.1	3.75	1.08	5.75	.34
16-20	17	32.1	4.70	1.96	6.17	.39
21-25	11	20.7	3.70	1.05	5.62	.72
26+	9	16.9	4.60	1.56	5.96	.69
Years of Computing Experience						
0-2	9	16.9	3.88	1.52	5.17	.83
3-5	26	49.0	3.53	1.75	5.86	.64
6-8	8	15.1	5.50	1.50	6.07	.36
9-11	7	13.3	4.80	1.24	6.05	.71
12-14	3	5.7	4.60	2.05	6.10	.16
Educational Preparation						
Diploma	3	5.7	4.00	1.22	5.66	.69
Associate	3	5.7	4.00	1.58	5.45	.59
Baccalaureate	11	20.7	3.50	1.16	6.03	.52
Master	36	67.9	4.30	1.90	5.90	.60
Age						
25-35	8	15.1	3.25	1.19	5.74	.37
36-45	28	52.8	3.80	2.02	5.86	.58
46+	17	32.1	4.70	1.56	5.88	.72

Findings from the Computer Knowledge Quiz

There were eight multiple choice items on the computer knowledge quiz that related to knowledge on computer systems. Each question presented five possible choices that included an “I don’t know” response to each question. There was a possible score of 8: the higher the score, the more knowledge subjects had about computers. The mean score for the sample in this study was 4.13, and the standard deviation was 1.80. The highest score achieved was a perfect score of 8 ($n = 1$), and the lowest score obtained was 0 ($n = 2$). The following results describe the educators’ background characteristics and corresponding knowledge scores (see Table 1).

Years of Nursing Experience

The highest score on the knowledge quiz was achieved by nurses having between 16-20 years of nursing experience obtaining an average score of 4.7, with a standard deviation of 1.96. The lowest score was achieved by nurse educators having the least amount of nursing experience (0-5 years), achieving a knowledge score of 3.0 with a standard deviation of 1.63.

Years of Computing Experience

Nurse educators declaring 6-8 years of computing experience received the highest knowledge score of 5.5, with a standard deviation of 1.5, while the subjects who had 3-5 years of computing experience had the lowest score of 3.53, with a standard deviation of 1.75.

Educational Preparation

Master-prepared educators received the highest average score of 4.3, with a standard deviation of 1.9. Baccalaureate-prepared nurses received the lowest score of 3.5, with a standard deviation of 1.16. Diploma and associate

degree nurse educators tied with knowledge scores of 4.0 and standard deviations of 1.22 and 1.58, respectively.

Age

The oldest subjects of the sample (age 46 and over) achieved the highest score of 4.7, with a standard deviation of 1.56, while the youngest subjects (ages 25-35) scored the lowest score of 3.25, with a standard deviation of 1.19.

The findings of this study described the current state of computer literacy among the hospital inservice instructors who were subjects in this study. These findings are comparable to the findings in studies done by Whiteside, McCullough, and Whiteside (1991) and Hannah and Osis (1988), showing that nurses involved in inservice education are lacking in the knowledge of computers. It further supports Hale's (1988) statement that "inservice education nurses are most in need of [computer] instruction" (cited in Whiteside, McCullough, & Whiteside, 1991, p. 113).

Findings from Attitudes Toward Computers

The 20-question attitudinal questionnaire was tallied, scored, and analyzed for each respondent (see Table 2). An attitude score was assigned to each subject based on a continuum of most negative to most positive responses. For questions written in the affirmative, a scale of 1-7 was used, with the most positive responses given a high score, and the most negative responses given a low score. A reverse score was given for questions written in the negative. An average score was also calculated from the responses for each respondent, as well as an average score calculated across the sample. The highest possible score on the scale was 7. The highest attitudinal score achieved was 7 ($\underline{n} = 1$) and the lowest attitudinal score was 4.1 ($\underline{n} = 2$). The

mean attitudinal score was 5.87, with a standard deviation of .0169. Means and standard deviations on attitudes toward computers by nurse educators' background characteristics are summarized in Table 1.

Overall, the respondents' feelings toward computers were positive. Of those tested, 66% ($n = 35$) said that they felt positive about computers, and 77.6% ($n = 41$) said that they would enjoy using a computer in their work. Forty-nine percent ($n = 26$) found computers to be exciting and fascinating, and 64.2% ($n = 34$) felt excited to see what one could do with a computer. Most agreed in varying degrees that computers were efficient tools and helped them reduce time on paper work, solve difficult problems, and store, save, and recall information. An overwhelming number of subjects (69.8%) felt that computers provided benefits that outweighed their cost.

Only one person (1.8%) indicated being uncomfortable with computer use and feeling nervous about using computers. None of the respondents felt that computers were an added stress to their work activities. Even though respondents felt positively toward computers, there was almost an even distribution of respondents feeling varying degrees of intimidation by computers (see Table 3). Of those questioned, 32% ($n = 17$) felt adequate about using computers, while 26.4% ($n = 14$) felt inadequate. The educators' feelings of intimidation by computers and their feelings of inadequacy toward computers did not necessarily make them feel afraid of appearing foolish around computers. Thirty-eight percent ($n = 20$) denied that computers made them feel uncomfortable and nervous.

The findings of this study described the attitudes of these nurse educators toward computers as being positive. The educators who had the

least number of years in nursing (0-5 years) and the most number of years (26+ years) in practice achieved the highest mean attitudinal scores (means of 5.90 and 5.96, respectively). The attitudinal scores were very similar across the different background characteristics of the educators (see Table 1). It supports the study by Scarpa, Smeltzer, and Jasion (1992) that attitudes toward computers are more positive when one has had previous experience with their use. Master-prepared and baccalaureate-prepared graduates had the highest attitudinal scores (5.9 and 6.03, respectively), and the nurse educators in the age group of 46 and over felt most positive about computers.

Table 2.

Nurse Educators' Attitudes Toward Computers: Responses to Positive Questions

Question	Strongly Disagree		Disagree		Slightly Disagree		Undecided		Slightly Agree		Agree		Strongly Agree	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
1. Would enjoy using a computer in my work.	0	0.0	0	0.0	0	0.0	2	3.7	2	3.7	8	15.0	41	77.6
2. Enjoys using computers.	0	0.0	0	0.0	1	1.8	2	3.9	2	3.9	17	32.0	31	58.4
3. Finds computers exciting and fascinating.	0	0.0	3	5.7	0	0.0	1	1.8	7	13.4	16	30.1	26	49.0
4. Excited to see what one could do with a computer.	0	0.0	2	3.9	0	0.0	0	0.0	5	9.4	12	22.5	34	64.2
5. Like using a computer.	1	1.8	0	0.0	0	0.0	1	1.8	1	1.8	13	24.5	37	69.8
6. Positive overall feeling about computers.	0	0.0	0	0.0	0	0.0	2	3.9	1	1.8	15	28.2	35	65.0
7. Believe that computers solve many difficult problems easily.	0	0.0	3	5.7	3	5.7	7	13.4	11	20.7	15	28.2	14	26.4
8. Computers are efficient.	0	0.0	2	3.9	0	0.0	1	1.8	3	5.7	22	41.5	25	47.0
9. Computers reduce time on paper work.	0	0.0	3	5.7	3	5.7	3	5.7	9	16.9	9	16.9	26	49.0

Table 2 (Cont.)

Question	Strongly Disagree		Disagree		Slightly Disagree		Undecided		Slightly Agree		Agree		Strongly Agree	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
10. Computers replace time spent on routine tasks.	0	0.0	1	1.8	5	9.4	1	1.8	11	20.7	12	22.5	23	43.7
11. Computers make it easier to save and recall information	0	0.0	0	0.0	0	0.0	0	0.0	2	3.9	7	13.4	44	82.7
12. Computers improve storage of information	0	0.0	0	0.0	0	0.0	0	0.0	1	1.8	7	13.4	45	84.8
13. Benefits of computers outweigh cost.	0	0.0	0	0.0	0	0.0	3	5.7	2	3.9	11	20.7	37	69.7
14. Computers are suited for repetitive and monotonous tasks.	0	0.0	2	3.9	1	1.8	2	3.9	5	9.4	20	37.7	23	43.3

Table 3.

Nurse Educators' Attitudes Toward Computers: Responses to Negative Questions

Question	Strongly Disagree		Disagree		Slightly Disagree		Undecided		Slightly Agree		Agree		Strongly Agree	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
1. Afraid of appearing foolish around computers.	14	26.6	18	33.9	2	3.9	1	1.8	12	22.6	5	9.4	1	1.8
2. Computers can make me feel nervous and uncomfortable.	20	37.7	11	20.7	6	11.3	5	9.4	5	9.4	5	9.4	1	1.8
3. Feel intimidated by computers.	11	20.7	12	22.6	1	1.8	1	1.8	15	28.2	11	20.7	2	3.9
4. Feel inadequate about using a computer.	13	24.5	17	32.0	0	0.0	0	0.0	14	26.4	8	15.0	1	1.8
5. Computers are an added stress.	17	32.9	17	32.9	3	4.8	3	4.8	8	15.0	5	9.4	0	0.0
6. Computers often fail to run properly.	6	11.3	22	41.5	9	16.9	5	9.4	6	11.3	5	9.4	0	0.0

Chapter 5

DISCUSSION

This chapter summarizes the study. The conclusions, scope and limitations, and recommendations are presented.

Summary of the Study

This descriptive study was conducted on nurse educators in the San Francisco Bay Area. The purpose was to determine the knowledge and attitudes of hospital nurse educators toward computers. The research questions asked were, “What is the level of computer knowledge of hospital nurse educators?” and “What are their attitudes toward the use of computers?”

A survey questionnaire consisted of 10 computer knowledge questions and 20 questions on computer attitudes. The attitudinal questionnaire was adapted from Carruthers (1990), and the knowledge questionnaire was adapted from CLECA by Cheng, Flake, and Stevens (1985) (cited in Carruthers, 1990). A total of 53 nurse educators participated in the survey. Hospital nurse educators’ attitudes and knowledge are not well documented in the literature thus justifying the pursuit of this study.

Conclusions

The nurse educators’ ages were between 25-46+ years, with nursing experiences between 2-26 years. They were primarily masters prepared nurses. The majority of them had 3-5 years of computer experience. The findings suggest that even though nurse educators did not achieve high scores on the knowledge test, they generally felt positive toward their use and the benefits the computers provided in their work.

Because this study only sought to describe the knowledge and attitudes of nurse educators toward computers and computer use in hospital inservice education, no specific relationships can be drawn. It was noted that knowledge scores were low (mean 4.1 out of a possible 8), even though most of the participants had more than 3 years of computing experience, and a few had 9-14 years. However, the attitude scores tended to be higher as the number of years of experience with computers increased. For example, educators who fell in the 3-5 years of computer experience category had a mean score of 5.6 on the attitude survey, while those with 12-14 years of experience had a 6.1 mean attitudinal score. This relates to the concept in literature that nurses' attitudes toward computers are generally favorable when they have been exposed previously to computer use (Scarpa, Smeltzer, & Jasion, 1992).

It was also noted that the educators in this study with baccalaureate and masters degrees had higher mean attitudinal scores (mean 6.03 and 5.9, respectively) than those with diploma and associate degrees (mean 5.66 and 5.45, respectively). Perhaps nurse educators who have spent more years in school may have had more exposure to computers, or perhaps they are more open to new experience.

The conceptual framework of this study was derived from the concept of motivational theory as applied in nursing education and was based on the premise that internal and external motivational factors within an individual influence meaningful learning. This study did not contribute new information in support of this framework. It is hoped that as nurse educators become more knowledgeable about and feel more positive toward computers, they will become more open to using CAI in their educational offerings.

Scope and Limitations

The study focused on hospital educators' knowledge and attitudes toward computers as instructional tools. Although there are many factors that contribute toward hospital nurse educators' knowledge and attitudes toward computers, data concerning other factors in the environment, job setting, or human makeup were not explored.

The limitations of this study relate to the sample size, the type of sample, and the instrument. First, the convenience sample was small and may not be representative of the target population. The target population consisted of all hospital educators employed in hospitals where computers are being utilized in practice, but many different kinds of computers in the market exist, and the degree of sophistication and comfort with computer use were not taken into consideration in this study. Second, the study did not evaluate whether the educators had any formal education in computers; thus, actual knowledge could not be fairly measured. Third, the tool utilized in the survey may have been inadequate in terms of measuring actual knowledge and ability to use computers. The knowledge tool consisted primarily of technical questions which were difficult to answer unless one had formal, specialized training on computers. The answer key to the knowledge quiz was also difficult to obtain; therefore, a computer expert was consulted to aid the researcher in correcting the questions. Another appropriate tool to measure computer knowledge was not found.

No tool was found which looked at both attitudes and how educators would use computers in their teaching. Most tools evaluated for the study

proved to be inadequate for measuring what the researcher had intended, so the best one available was selected.

Recommendations

It is recommended that this study be replicated using a tool that more effectively measures computer knowledge regarding use of a computer rather than just technical terminology. If such a tool does not exist, it is recommended it be developed for this population of hospital educators. In addition, the study can be redesigned so that the data are organized in a way which allows statistical analysis of comparisons between knowledge and attitudes and among the demographic variables.

It is further recommended that another study be done to evaluate attitudes of educators toward the use of CAI in inservice education and continuing education of practicing nurses. Finally, several geographic areas should be included in future studies to obtain a larger sample and to determine any variance according to demographic characteristics and teaching activities related to computers.

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APPENDIX A
Questionnaire

ATTITUDES TOWARD COMPUTERS

This survey* is designed to measure some of your feelings and beliefs toward desk-top computers such as APPLE, COMMODORE, and IBM models that educators and students may use in schools. Use of this survey is approved by the Department of Graduate Studies at San Jose State University for research purposes. Your participation is confidential. Please respond to each statement according to your personal attitude. There are no right or wrong answers.

A. Listed below are some statements that describe *feelings toward* computers. Fill in the circle that best describes how you *usually feel* . . . without regard to you actual computer experience.

Question	Strongly Disagree	Disagree	Slightly Disagree	Undecided	Slightly Agree	Agree	Strongly Agree
I would enjoy using a computer in my work.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It is exciting to see what I could do with a computer.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I'm afraid of appearing foolish around computers.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Computers can make me feel nervous and uncomfortable.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I would like to use a computer.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Computers are an added stress to me.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I find computers exciting and fascinating.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I sometimes feel intimidated about using a computer.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel inadequate about using a computer.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I enjoy using computers.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My overall feeling about computers is favorable.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

*Note: This survey (Parts A & B) was adapted courtesy of William Carruthers, Ph.D.

Computer Knowledge Quiz

KNOWLEDGE ABOUT COMPUTER SYSTEMS

Please make your best choice and fill in the circle for each question.

1. Which unit below is responsible for displaying the results of a computer program?
 - Logic unit.
 - Central processing unit.
 - Input unit.
 - Output unit.
 - "Don't know."

2. How does a computer solve a problem?
 - It recalls answers from memory.
 - It thinks just like a human being.
 - It follows instructions to do what it is programmed to do.
 - It makes decisions based upon its knowledge.
 - "Don't know."

3. What information does a computer require in order to solve a problem?
 - The data related to the problem.
 - The instructions given to the computer.
 - The data and the answer.
 - The data and the instructions.
 - "Don't know."

4. Which statement below describes a computer program correctly?
 - It is programmed by a computer operator.
 - It is written in ordinary language.
 - It is loaded in RAM through an output device.
 - It is written to solve a specific problem.
 - "Don't know."

5. What are the major components of a computer system?
 - Arithmetic unit and input devices.
 - Keyboard and monitor.
 - CRT language card and printer.
 - Input, output devices, and CPU.
 - "Don't know."

6. Which of the following accepts instructions and data accessed from the disk?
 - Permanent Memory.
 - Random Access Memory.
 - Read Only Memory.
 - General Memory.
 - "Don't know."

7. Which one below represents the correct *sequence* of computer development?
- Vacuum tube, integrated circuit, transistor, microprocessor.
 - Integrated circuit, microprocessor, transistor, vacuum tube.
 - Microprocessor, vacuum tube, transistor, integrated circuit.
 - Vacuum tube, transistor, integrated circuit, microprocessor.
 - "Don't know."
8. Which language will be understood by computers without being compiled or translated?
- BASIC language.
 - FORTRAN language.
 - Machine language.
 - COBOL language.
 - "Don't know."

EDUCATOR BACKGROUND

Please circle the correct answer or fill in answer where appropriate.

1. Total years of professional (nursing) experience.
- | | |
|----------|----------|
| a. 0-5 | d. 16-20 |
| b. 6-10 | e. 21-25 |
| c. 11-15 | f. 26+ |
2. Total years of computer experience _____ .
3. Educational Preparation.
- | | |
|--------------|-----------------|
| a. None | d. Master |
| b. Associate | e. Specialist |
| c. Bachelor | f. Ph.D., Ed.D. |
| | g. Other _____ |
4. Age.
- a. 25-35
 - b. 36-45
 - c. 46+

APPENDIX B
Human Subjects Approval

Office of the Academic Vice President • Associate Academic Vice President • Graduate Studies and Research
One Washington Square • San Jose, California 95192-0025 • 408/924-2480

TO: Jocelyn Barrera
28590 Barn Rock Dr.
Hayward, CA 94542

FROM: Serena W. Stanford, Ph.D. *Serena W. Stanford*
AAVP, Graduate Studies and Research

DATE: June 24, 1994

The Human Subjects-Institutional Review Board has approved your request to use human subjects in the study entitled:

"Computer Education in Nursing"

This approval is contingent upon the subjects participating in your research project being appropriately protected from risk. This includes the protection of the anonymity of the subjects' identity when they participate in your research projects, and with regard to any and all data that may be collected from the subjects. The Board's approval includes continued monitoring of your research by the Board to assure that the subjects are being adequately and properly protected from such risks. If at any time a subject becomes injured or complains of injury, you must notify Dr. Serena Stanford immediately. Injury includes but is not limited to bodily harm, psychological trauma and release of potentially damaging personal information.

Please also be advised that each subject needs to be fully informed and aware that their participation in your research projects is voluntary, and that he or she may withdraw from the project at anytime. Further, a subject's participation, refusal to participate or withdrawal will not affect any services the subject is receiving or will receive at the institution in which the research is being conducted. If you have questions, please contact me at (408) 924-2480.

APPENDIX C
Cover Letter to Participants

College of Applied Sciences and Arts • School of Nursing
One Washington Square • San Jose, California 95192-0057 • 408/924-3130 • Fax 408/924-3135

Dear Nurse Educator,

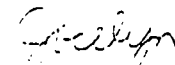
I am conducting a research project to determine existing knowledge and attitudes of nursing educators in the Bay Area toward the use of computers as an instructional tool. This project is being conducted through San Jose State University as a Masters thesis. It is designed to gain information about the willingness of nurse educators to learn about and to use computers as part of their instruction. The information gained from this research project will hopefully help nurse educators plan and prepare for the impact of computer technology in the future of nursing education.

Attached is a 33 item questionnaire which should take no more than 30 minutes to complete. I have enclosed a stamped self addressed envelope to facilitate return of the completed survey. I would appreciate having the questionnaire returned within one week of receipt. Participation in the study presents no anticipated risks to you as well as no discernible benefits; however, the results of the study may benefit the future of nursing education. If the results of this study become published, any information from this study that can be identified with you will remain confidential and will only be disclosed with your permission.

I am hopeful that you will find the time to fill out the questionnaire and return it to me as soon as it is completed. I assure the strictest confidentiality of all information revealed from this questionnaire. If you have further questions, please don't hesitate to call me at home. My telephone number is (510) 538-7432. You may also call Dr. Bobbye Gorenberg, Chairman for the Department of Nursing for complaints about the research at (408) 924-3130. Questions or complaints about research, subjects' rights, or research related injury, may be presented to Serena Stanford, Ph.D., Associate Vice President of Graduate Studies and Research at (408) 924-2480.

Thank you in advance for your time and participation. By returning the enclosed questionnaire, it is assumed that you voluntarily consent to participate in the study. I look forward to receiving your completed surveys in the mail.

Sincerely,


Jocelyn A. Barrera, RN

APPENDIX D
Correspondence with Researcher

Jocelyn A. Barrera
28590 Barn Rock Drive
Hayward, CA 94542

William Carruthers, Ph.D.
2503 Cravenridge Rd.
Garner, North Carolina 27529

Dear Dr. Carruthers,

I am a graduate student at California State University in San Jose, California pursuing a masters degree in nursing. I am very interested in writing my thesis on computers in nursing education. I have reviewed the doctoral dissertation you completed in 1990 in which you developed and evaluated a tool to measure educators' attitudes toward computers. With your permission, I would very much like to utilize your tool to determine nurse educators' knowledge and attitudes toward computer use in nursing education.

I would be very delighted to hear from you and speak with you further regarding my study. You may reach me at home at (510) 538-7432 or at work at (415) 725-8184. I am looking forward to hearing from you soon.

Sincerely,

Jocelyn A. Barrera, RN