Effects of Instructional Technology Integration Strategies in Orientation Programs on Nurse Retention in Magnet and Non-Magnet Hospitals

by
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Approval Page

This applied dissertation was submitted by Sharon D. Hancharik under the direction of the persons listed below. It was submitted to the Fischler School of Education and Human Services and approved in partial fulfillment of the requirements for the degree of Doctor of Education at Nova Southeastern University.

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Abstract

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This applied dissertation study was designed to learn if the increased use of instructional technology integration strategies in nursing orientation programs resulted in an increased retention of new nurses. The study attempted to uncover the current retention rate and use of technology at the participating hospitals. The data obtained from Magnet and non-Magnet hospitals was compared.

Schaefer's Integration of Computer-Assisted Instruction Questionnaire was adapted in order to survey the hospitals. The list of 151 hospitals used in the study was found by combining the 50 best hospital lists from *The U.S. News and World Report of Best Hospitals 2006, AARP 50 Top Hospitals Chart* (2003), *HealthGrades America's 50 Best Hospitals Report* (2007), and *Leapfrog Top Hospitals 2006.* It was then determined which of the hospitals were Magnet® designated. Each of the hospital sites was sent the Instructional Technology Integration survey.

Of the 151 surveys that were mailed, 63 were returned for a response rate of about 23%. The data were analyzed to reveal if there were any significant differences between the responses of the Magnet and non-Magnet hospitals in regard to the use of instructional technology in nursing orientation programs and if the use of instructional technology in nursing orientation affected the rate of nurse retention. It was found that there was little difference in the retention of nurses in the Magnet and non-Magnet hospitals, but it was postulated that this could have been a result of the method of hospital selection from the 4 best hospital lists. All of the hospitals surveyed were judged superior by their evaluating agencies. There was also little difference in the use of instructional technology during nursing orientation except for the use of e-mail, which was used more often in Magnet hospitals.

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Chapter 1: Introduction

There are many opportunities for instruction in schools, colleges, businesses, industry, and military settings, such as workplace orientation. An instructional design or development model is a blueprint for the educator and instructional designer to use when designing instruction. Instructional development (ID) models are designed to break down this complex process into manageable parts. ID models contain the guiding principles for analyzing, producing, and revising learning. Gustafson and Branch (1997, 2002) described a taxonomy of ID models that are classroom oriented, product oriented, or system oriented.

Systems ID models include the Dick, Carey, and Carey (2001) model, the Smith and Ragan (1999) model, and the Branson (1975) model. These systems-oriented models are used for developing one or more courses or an entire curriculum (Gustafson & Branch, 1997, 2002). Even though a model is placed in one part of the taxonomy, it is up to the educator or instructional designer to decide when it would be appropriate to use each model. The use of ID models when designing instruction requires the educator or designer to assess the learner as the first step. Assessing the learner's motivation to learn is essential when designing instruction.

The systems approach to training resulted from the need to drastically increase the effectiveness and efficiency of instruction in the workplace (Gagne & Medsker, 1996). Systems models such as the Dick and Carey (as cited in Dick et al., 2001) model are used in the health-care field because large numbers of learners must be trained, a long lifetime is expected for the program, standard training requirements must be maintained, high mastery levels are required because of criticality such as safety or high cost of errors, economic value is placed on learners' time, and training is valued in the organizational

culture (Gagne & Medsker). Each of these conditions is met in nursing orientation.

Motivation is one of the most important concerns in how and why people learn (Efklides, Kuhl, & Sorrentino, 2001; Keller, 1979, 1983; Wlodkowski, 1985, 1999). If the instruction is too easy or too hard, learning suffers (Brophy, 1983; Curless, 2000). The ARCS model of motivation design may be used to integrate motivational strategies into workplace training. The model is not intended to stand alone but in conjunction with other instructional design models (Gagne & Medsker, 1996). Wlodkowski's (1985, 1999) motivational framework for culturally responsive teaching is based on the theories of intrinsic motivation (Wlodkowski & Ginsberg, 1995).

Background and Significance of the Problem

Organizations have been scrutinizing their orientation programs in an effort to prepare their newly hired workers to be productive in the workplace. One study compared individual computer-based orientation with a group social-based orientation session and found increased organizational commitment and job satisfaction in the social session (Wesson & Gogus, 2005). New employee orientation in health-care organizations prior to unit orientation focuses on patient safety and employee introduction to the organization. A primary purpose of this initial orientation is to ensure that policies and procedures for patient safety are understood. There are many mandatory topics, and one challenge is to present the information in a creative and engaging way (Lott, 2006).

Good instructional design is essential in developing an effective orientation-learning program. Instructional technology has been used in providing learning for many decades. Trends have run the gamut from teaching machines, computer-assisted instruction, and Web-based learning to hybrid blended courses. Instructional designers and educators need to select the most appropriate instructional, technological, and

motivational methods to improve learning (Gabrielle, 2005).

Today there is a shortage of nurses in our country's hospitals. It is estimated that the shortage will reach its peak just as the demand for nursing services will be the greatest, in other words, after 2010 (Berliner & Ginzberg, 2002). The average age of nurses in the United States is 46.8 years. Hospitals are competing for the small supply of new graduates. One method to attract these fledgling nurses is to offer a quality nursing orientation program. Health-care facilities need to support the education of new nurses (Aiken, 2006). Experienced nurses returning to work, new to the area, or looking for a career change also seek out health-care facilities with superior orientation programs. In the health-care industry, hospitals are looking at the effectiveness of their nursing orientation programs in an effort to attract and retain nurses.

In order to raise their chances of attracting new nurses and to keep the nurses they have, hospitals are looking at acquiring accreditation as a Magnet®-designated health-care facility. Magnet hospitals are accredited by the American Nurses Credentialing Center. Research on Magnet hospitals revealed that orientation is positively related to the recruitment and retention of new nurses (McClure & Hinshaw, 2002). Nurse retention refers to the new nurse remaining employed by the hiring organization for a specific period after being hired. The nurse may be employed in another capacity or department. This study's Instructional Technology Integration Survey asks what the rate of nurse retention is in the study hospitals.

Purpose of the Study

This study surveyed the nursing orientation programs in 151 health-care facilities throughout the United States. The purpose was to determine if the increased use of instructional technology integration strategies in nursing orientation had a positive impact

on nurse retention. The survey results of Magnet and non-Magnet hospitals were compared to see if there were any significant differences.

Research Questions

The following research questions were used to guide this applied dissertation project:

1. What is the relationship between the use of instructional technologies in the nursing orientation program and the rate of retention for new nurses?

2. What is the rate of retention of new nurses in Magnet and non-Magnet hospitals?

3. What is the difference in the use of instructional technology integration strategies in nursing orientation programs at Magnet and non-Magnet hospitals?

The independent variables were the use of the 19 instructional technology integration strategies in the orientation program and Magnet accreditation. The two dependent variables were the rate of nurse retention and the use of instructional technology. In this study, instructional technology was both an independent and a dependent variable. In Research Question 1, it was an independent variable and in Research Question 3, it was a dependent variable. The study was designed to answer the question of whether instructional technology use and retention differ for Magnet versus non-Magnet hospitals and if this use of technology in nursing orientation had a bearing on nurse retention.

Confounding variables found in the literature included adequate nurse staffing, autonomy, clinical competence, control over nursing practice, education, job satisfaction, nurse effectiveness, nurse-patient ratios, nurse-physician relationship, patient outcomes, professional development, and supervisory and management support (McClure &

Hinshaw, 2002). It was decided not to include these variables because there is sufficient research available that addresses each of these issues.

Justification for the Study

A shortage of nurses is associated with an increase in poor patient outcomes such as pneumonia, shock, cardiac arrest, and urinary tract infections (Agency for Healthcare Research and Quality, 2007; Stanton, 2004). The shortage of nurses impacts several areas related to patient care, including delayed response to pages or calls, staff communication problems, patients' complaints about nursing care, reduced number of available beds, patients' wait time for surgery or tests, delayed discharges, workload on physicians, and discontinued or closed patient care programs (Buerhaus, Donelan, Ulrich, DesRoches, & Dittus, 2007). As the shortage of nurses increases worldwide, research to find ways to attract and retain nurses is paramount. With an increase in the demand for health care, only increasing the number of employed nurses will improve the situation (Coomber & Barriball, 2007).

The literature identified three separate but related reasons for the current nurse shortage: a declining number of new nurses entering the workforce, attracting new nurses to stay in hospitals, and nurses retiring or leaving the workforce early (Berliner & Ginzberg, 2002). The cost of failing to retain one nurse is estimated at $62,100 to $67,100 or 1.2 to 1.3 times the salary of a registered nurse (Jones, 2005). Nurses must be available to care for hospitalized patients. It is predicted that hospital nurse vacancies will reach 800,000 or 29% by 2020 at the same time that demand for nursing care is expected to increase by 40% (Health Resources and Services Administration, Bureau of Health Professions, National Center for Health Workforce Analysis, n.d.; Stanton, 2004).

The justification for this study was to provide data that may increase the use of

instructional technology integration strategies in new employee orientation programs as a means to increase its effectiveness. In this study, effectiveness was measured by correlating the use of incorporating instructional technology integration strategies in orientation with the rate of nurse retention in both Magnet and non-Magnet hospitals. Subsequently, the results of the Magnet and non-Magnet hospitals were compared to see if there was a significant difference in the findings between the two groups. This study may provide useful data to be considered by organizations in the creation and delivery of their new employee orientation programs.

The literature review revealed that there is no length of time given to the term *nurse retention.* If Hospital A reports a 95% retention rate and Hospital B reports a 75% retention rate, it matters if the former hospital uses 6 months as their retention time frame and the latter uses 12 months. Hospital A may only retain 50% of their new nurses at the 12-month point, but may not use 12-month statistics in their calculations. As hospitals customize their retention records to suit their individual needs, a hospital may keep track of retention for just 6 months. The American Nurses Credentialing Center (ANCC) factors in each hospital's own time period of nurse retention when it evaluates a health-care facility's application for Magnet accreditation. This study adds to the knowledge base by using one year as the measure of retention for new nurses so that the term refers to the same time frame at each of the study's hospital sites. The use of the same time measure for retention makes the rate of retention more meaningful to all stakeholders, including the health-care consumer. The time period used to calculate nurse retention is an area for further research.

Definition of Terms

Educator refers to any person who presents nursing content during the nursing

staff orientation.

Instructional technology "is the theory and practice of design, development, utilization, management and evaluation of processes and resources for learning" (Seels & Richey, 1994, p. 9).

Integration strategies refer to the strategies used to integrate instructional technology into the learning process in order to increase the productivity and effectiveness of the course.

Nursing orientation is the section of new nursing staff orientation that delivers nursing content; it does not pertain to organization-wide general orientation programs such as customer service or to subsequent unit-based orientation.

Nurse retention refers to the new nurse being employed by the hiring health-care facility, either in the initial position or elsewhere, for a specific period after hire.

Chapter 2: Review of the Related Literature

Introduction and Purpose

The literature review included four areas: (a) the theories used as a foundation for this study, instructional design and motivation, (b) strategies to integrate instructional technology into learning, (c) the role of orientation as a means to retain employees, and (d) research on Magnet hospitals pertaining to nurse recruitment and retention.

Theories Used as a Foundation for This Study

A theory is a set of related propositions that explains why a phenomenon occurs and how it is a predictor of events (Thompson, Simonson, & Hargrave, 1996). Theories are important because they provide a direction to research and provide direction to the practice of a profession.

Instructional Design

Research on technology in education has been conducted for nearly 90 years (Simonson, 2003). According to Seels and Richey (1994), "Instructional technology is the theory and practice of design, development, utilization, management and evaluation of processes and resources for learning" (p. 9). Research and experience are the basis for the body of instructional technology knowledge. Procedural models, which connect theory and practice, are used in instructional technology to describe how to perform a task. Instructional design is a systematic process that includes analysis, design, development, implementation, and evaluation in order for learners to meet the learning objectives (Dick et al., 2001). This study used the Dick and Carey model of instruction as a source of the 19 instructional technology integration strategies used in the survey instrument. For the purposes of this study, the terms *instructional technology, educational technology,* and *computer-assisted instruction* will be used interchangeably.

Instructors and instructional designers have used the Dick and Carey model since its inception in 1968. The model was modified in 1996 to reflect the inclusions of the concepts of performance technology, content analysis, multilevel evaluation models, and total quality management (Dick, 1996). The literature included several discussions of the evolution of this model and its place in today's learning environment (Carlton, Kicklighter, Jonnalagadda, & Shoffner, 2000; Deubel, 2003; Dick). The model has been used to design instruction for training and education in the business, industry, government, and military training (Dick et al., 2001; Gustafson & Branch, 1997).

Instructional design was fundamental to this study because the use of instructional technology in nursing orientation programs was being surveyed. Workplace orientation is essential to all businesses and in all industries. Orientation refers to the time period when employees are enmeshed in the corporate culture and learn the essential skills and principles necessary to carry out their job functions. In this time of a nursing shortage, it is crucial to health-care organizations and to the public that qualified functioning nurses are ready as expediently as possible. The use of instructional technology in a well-designed orientation program may be one answer to this worldwide problem. Instructional technologies have the benefit of being able to offer customized training to experienced or inexperienced nurses. Their use involves more learner-centered learning, which enables the orientees to work at their own pace, saving time for themselves and their instructors, a time and cost saver. One aspect of the Dick and Carey model incorporates academic motivation.

Motivation

A review of motivational research in education from 1941 to 1990 traced the research as it evolved from Young's content of need and activity level and degree of

motivation to Weiner's emphasis on cognitions, individual differences, and environmental determinants (Weiner, 1990). There are many instructors who consider the motivational level of learners as the most important factor in successful instruction (Dick et al., 2001; Driscoll, 2000; Morrison, Ross, & Kemp, 2004).

Educators cannot assume that learners are interested in the topic, find it relevant, feel confident that they can learn it, or will be satisfied when they do. As technology evolves, motivational research continues. There is a large gap in the research of motivation in multimedia learning (Deimann & Keller, 2006). Researchers in education and instructional design have conducted studies to find effective interventions to increase and sustain learning motivation (Huang, Huang, Diefes-Dux, & Imbrie, 2006). A study to validate the Instructional Material Motivational Survey as an instrument for measuring motivational level with the support of empirical data resulted in a recommendation for further research on how the survey instrument adapts to variations of learner characteristics and instructional program features (Huang et al.). This points the way for more research on nursing orientation that looks at the new nurse orientees as subjects.

It is necessary to distinguish between intrinsic and extrinsic motivation in the discussion of learner motivation. Intrinsic motivation relates to factors inherent in the learner, such as the need to be competent, while extrinsic motivation refers to external rewards such as pay increases and praise (Gagne & Medsker, 1996). Intrinsic motivation cannot be measured directly (Curless, 2000). One method is to use an index of motivation, such as Pintrich and Schunk's (1996) four indices of motivation: choice of tasks, effort, persistence, and achievement. Choice of tasks does not apply in nursing orientation because all new nurses are expected to participate in the training. The new nurses are also expected to put forth effort to learn the material presented and to be

persistent until it is learned. Achievement in nursing orientation is also an expected outcome. All new nurses are expected to pass all of the competencies included in the training. Extra help is available for those who need it. Learner motivation is very important in nursing orientation programs because the hiring agency wants the new nurse to learn the skills presented and to demonstrate commitment to the hospital and patient care. If the orientee is not motivated to learn the required content and principles, the new nurse may make errors affecting patient health and safety. In designing nursing orientation programs, clinical nurse educators must incorporate the principles of learner motivation in order to increase learning of the material.

Extrinsic motivation measures are easier to assess. In the United States, extrinsic rewards such as grades, eligibility, and money dominate learning (Wlodkowski, 1999). The literature contained many examples of the use of Keller's Instructional Materials Motivational Checklist and Course Interest Survey and others to measure external motivation (Curless, 2000; Huang et al., 2006; Small, 2000). New nurses need to be motivated to complete nursing orientation and move on to unit orientation. The sooner the nurse has completed orientation, the sooner he or she receives differential and holiday pay, an example of external motivation.

The Dick and Carey model requires the assessment of the learner as an initial step before designing and delivering instruction. Because the nature of workplace orientation requires that orientation presenters have the instruction ready and designed in order to meet regulatory requirements, the question arises, "How can training educators ensure that the instruction is interesting, relevant, learnable, and satisfying?" One way is to compare the instruction with the components of a motivation model.

There are two main motivational design models acknowledged in the literature:

Wlodkowski's (1985) time continuum model and Keller's (1987a, 1987b) ARCS model (Curless, 2000; Song & Keller, 2001). The motivational framework for culturally responsive teaching is a guide to identify the elements that support intrinsic motivation (Wlodkowski, 1999). Its purpose is to form the basis for a discussion and confirm what is working to foster the four motivational conditions (Wlodkowski, 1999). The four motivational conditions are used in the learning experience to establish inclusion, develop a positive attitude, enhance meaning, and engender competence. Establishing inclusion refers to developing a community of learners who feel respected and connected to one another. Developing a positive attitude pertains to offering meaningful choices and promoting personal relevance; enhancing meaning relates to engaging the learners in challenging learning; and engendering competence refers to creating an understanding that learners are becoming more effective in learning what they value and perceive as authentic to their real-world experience (Wlodkowski, 1999).

All of these aspects of increasing intrinsic motivation are relevant to nursing orientation. This model posits that when students believe that what they are learning makes sense, their intrinsic motivation is strengthened (Wlodkowski & Ginsberg, 1995). By addressing each of these issues in designing nursing orientation, it is more likely that the learner's interest in the learning material will be aroused and sustained. Cultural diversity is one of the topics covered in nursing orientation. Nurses are expected to be culturally aware of their patients' responses to their illness, treatments, and pain as well as their food and social customs and preferences. This researcher did not find any reference in the literature to educators being culturally aware of the diversity in their new nurse orientees. Hospitals are recruiting foreign-born nurses and the nursing profession is actively recruiting minorities and men. The use of the motivational framework for

culturally responsive teaching would ensure that nurse educators are incorporating motivation techniques, which are appropriate for their learners, into orientation. Addressing the cultural diversity of new nurses in orientation is another opportunity for research.

Keller's ARCS model of motivational design has been used in many different educational settings. The ARCS model is a process by which the educator incorporates four areas into instructional design, attention, relevance, confidence, and satisfaction, in order to stimulate the students' motivation to learn (Keller, 1987a). The integration of the ARCS motivational design and instructional design began early in Keller's work with the Dick and Carey instructional development model (Keller, 1987b). The three steps in the ARCS model, generation, selection, and integration, begin after the instructional content and methods have been determined. Research supported the use of the ARCS model in the classroom, computer-based instruction, and distance education (Small, 2000; Song & Keller, 2001; Visser, Plomp, & Kuiper, 1999). Nursing orientation may incorporate each of these venues.

Keller's ARCS model was chosen as a foundational theory for this study because it directly relates to the Dick and Carey instructional design model and the literature supported its inclusion (Curless, 2000; Dick et al., 2001; Keller, 1987b). There has been abundant research conducted on the effectiveness of the ARCS model to ensure that measures to ensure learner motivation are included in the design of instruction. The ARCS model of motivation is relevant to this study because it has a direct bearing on each major component of instruction: preinstruction, presentation, participation, testing, and follow-through (Dick et al.). Motivating learners includes informing them of what they will learn and ensuring them that they have the prerequisite knowledge to begin the

instruction (Dick et al.). These strategies deal with the intrinsic motivation of the learner as the instruction is being designed and the instructional technologies being selected. The ARCS model of motivational design incorporates intrinsic and extrinsic motivation in the satisfaction aspect of the model (Small, 2000). By incorporating aspects of the ARCS model into their instructional technology integration strategies, nurse educators may strengthen the effectiveness of their nursing programs.

Integration Strategies

Integration strategies are defined as the skillful planning and management of instruction by the teacher in ways that increase the overall effectiveness of the instructional course (Schaefer, 2006). It is necessary for educators to recognize the need to integrate computer-assisted learning experiences into their instruction, and then learn how to do it (Thede, 1999). It is important to remember that technology integration means more than placing computers in classrooms; the technology must go beyond information retrieval to problem solving (Earle, 2002). The educational technology that makes the biggest difference in learning is not the hardware but the process of designing effective instruction (Wagner, 1992). Computer-assisted instruction must provide a solution to an identified problem in a learning environment to be effective (English, 2003). It is essential that teachers know how to teach content more effectively and to use a variety of technological tools. Technologies are important resources when integrated into teaching practices, learning experiences, and the curriculum (Earle). The question is no longer if students learn better with technology, but how should educators integrate technology into classrooms in a way to benefit students (Galowich, 1999).

There is no research on instructional technology integration into general nursing orientation; thus, related research is being examined. Researchers have studied

technology integration into university classrooms. One recent study by Brill and Galloway (2007) looked at university instructors' use of and attitude towards classroom-based teaching technologies. The study found that the six technologies currently being used at the state university study site in descending order are the overhead projector, the VCR, a slide projector, the Internet, a large-screen video data display, and an instructor computer workstation. In addition, the study found that the instructors have the greatest interest in wanting to use the following technologies, again in descending order: the Internet, a CD-ROM, an instructor workstation, a video disc player, a large-screen video data display, DVD video, and student computer workstations (Brill & Galloway). The study also showed that e-mail is used as a technology to enhance instructor-student interaction. It also pointed the way for the following topics to further research:

1. Does the use of e-mail during nurse orientation enable the new nurses to obtain more interaction with the instructor?

2. Does the use of e-mail increase the socialization of the new nurses with their peers?

This study was included because it is a timely update on what technologies are currently being used in university classrooms, as there is no research on what technologies are currently being used in nursing orientation. The six technologies used in Brill and Galloway's (2007) study have been incorporated into this proposed study's Instructional Technology Integration Survey.

Technology integration does not always focus on what the latest technologies are and how to best integrate them into the classroom. Access to the Internet differs in schools worldwide. In the United States, the percentage of kindergarten through Grade 12

schools with Internet access is 98%, but the rate is 11% in Cyprus and 4% in Russian lower secondary schools (Kozma, 2003). A study done to examine how information and communication technology was used to support innovative classroom practices in 28 countries uncovered that it was not the type of technology used that made the difference but the innovative use of even simple technology that made a huge difference in the classroom (Kozma). Applying this knowledge to nursing orientation, it would be beneficial if nurse educators were studied to see what innovative ways they are using the technologies that they have in delivering nursing orientation instruction. This is another opportunity for future research.

The literature reported a shift from an earlier emphasis on technology that focused on instruction between the student and the computer with drills, games, and tutorials. The use of the computer has shifted from this software-based drill and practice instruction to communication facilitated through curriculum-based learning activities (Palak, Walls, & Wells, 2006). Technology is used as a tool to solve problems in the learning process as opposed to being used as a delivery device (Lowther & Morrison, 2003). Web-based multimedia education can improve the quality and efficiency of teaching at a time when resources are limited (Belcher & Vonderhaar, 2005). Recent research on the human brain and constructivist activities has shown the benefit of creating knowledge with learner-centered activities that engage students with authentic and project-based challenges (Palak et al.). This knowledge applies to nursing orientation because it would be advantageous to customize learning activities to each individual new nurse. To be able to address the learning needs of nurses hired into different nursing units that require specific skill sets such as psychiatric, critical care, and neonatal ICU at the same time would be an efficient use of instructional technologies.

Integration is the combination of instruction and construction in appropriate conditions; it is the realm of the instructional designer (Cronjé, 2006). The Dick and Carey model includes instructional technology integration strategies in its eighth step that includes the selection of media and delivery systems. Instructional strategies include preinstruction, midinstruction, or postinstruction strategies that the instructor uses in integrating computer-assisted instruction into the learning (Bates, 1995). The Dick and Carey model contains the 19 integration strategies included in Schaefer's Integration of CAI Questionnaire, although Schaefer stated that she used Morrison et al.'s (2004) model. This study, adapted from Schaefer's survey instrument, investigated the use of these 19 integration strategies by nurse educators in their nursing orientation programs. Schaefer (2006) surveyed nursing higher education settings to learn how computer-assisted instruction was being used to teach clinical decision making. This study surveyed health-care facilities to learn the effects of integrating instructional technology into nursing orientation programs on increasing new nurse retention and comparing retention rates in Magnet and non-Magnet hospitals.

Research on Employee Orientation Programs

The ARCS model has been used in many different settings. When used to train employees hired to give shopping mall demonstrations, it was found that by incorporating the principles of attention-relevance-confidence-satisfaction into the trainees' training, the motivational strategies used for sales purposes apply to the act of selling instruction to the trainees (Kopp, 1988).

In 1998, the American Society for Training and Development (ASTD) reported on the state of the training industry in relation to how much training business organizations provide, who provides the training, how it is delivered, what training and

work practices organizations use, and what is the relationship between training and performance (Bassi & Van Buren, 1998). The ASTD found that all business organizations spent the most on new employee orientation and that the leading-edge firms provided more training and spent more money on the training than the average company. The ASTD defined learning technologies as the use of electronic technologies to deliver information and facilitate the development of skills and knowledge (Bassi & Van Buren). Their report found that the leading-edge firms used more learning technologies in their training delivery and were most concerned with the impact of such technologies on their training.

The industries that comprised the leading-edge firms included pharmaceuticals, computer, and communications manufacturers; biological and physical researchers; software designers; power, water, and gas utilities; trucking and warehousing companies; and telephone companies. Not included in this list was the health-care industry, which reportedly trains a large number of employees. Health-care organizations do not spend much on employee training, seldom use delivery technologies for training, use nontraining employees for training, and as a result, they have experienced performance problems (Bassi & Van Buren, 1998). This study provides information to the health-care industry on the use of instructional technology in employee training, specifically orientation. It may also provide useful information on employee retention, a serious concern in today's health-care field.

When computer-based training and organizational socialization in employee orientation was investigated, supervisors rated the individual computer-based orientation participation lower in socialization skills than the group social-based orientation session (Wesson & Gogus, 2005). Although this research did not address motivation or the

instructional design of the computer-based training, the researchers concluded that the computer-based training was inferior to classroom orientation sessions. Motivation to learn and course outcomes with groups of college business students was examined and it was found that more learning occurred in blended learning groups rather than classroom instruction (Klein, Noe, & Wang, 2006). The researchers stressed that motivation to learn and knowing how to use technology in delivering instruction impacts training effectiveness, an important aspect of employee orientation. There has been an increase in the use of blended learning in nursing orientation. It is now customary to offer universal mandatory training, such as hazardous waste disposal and confidentiality, on the computer.

Nursing Orientation

Poor training is one of the main reasons nurses give for leaving during their first year (Patrick, 2000). The preliminary review revealed that research concerning new nurse orientation has not been systematic or comprehensive, nor is there a theoretical framework to approach the study of nursing orientation (Connelly & Hoffart, 1998). This is expensive to the hiring organization because it takes new nurses in an organization up to 6 months to become fully functional (Naude & McCabe, 2005). Studies have concentrated on turnover rates, participant satisfaction, and hours spent on orientation.

A study to determine if orientation affected retention looked at seven different types of orientation received such as completing orientation classes, not completing them, partially completing them, and starting on the unit before attending them, and found that there was no significant difference in relation to the orientation type received (McKee, 1994). In contrast, a study on the use of a structured, progressive orientation program found that its orientation program, which focused on critical-thinking skills, patient care

management, and enhancement of self-esteem, had a positive effect on retention (Marcum & West, 2004). Retention rates improved when the design and content of the nursing orientation programs were strengthened. Recent studies have centered on looking at the organization in which the nursing orientation occurs and the value of the nurse preceptor or mentor once the orientee is orienting on the nursing unit.

Although nursing orientation programs are critical to the success of health-care organizations, cost containment activities have caused staff development directors to prove the worth of their nursing orientation programs. In addition, they stated that there is little research that is specific to orientation programs (Connelly & Hoffart, 1998). Related research showed that although 25% of nursing schools offered Web-based instruction, nurses' use of Web-based learning in health-care workplace settings is minimal (Smith, 2005).

The literature contained few studies involving the use of instructional technologies in traditional nursing orientation programs, and the research that does exist pertains to unit-based orientation or continuing education that occur after the initial hospital-wide orientation program. Because of the current nursing shortage, many health-care institutions hire temporary and per diem nurses to fill critical or short-term positions to maintain safe staffing levels (Smith, 2005). Web-based learning or e-orientation is one way to offer just-in-time ongoing orientation for temporary and per diem nurses (Smith). In addition, e-orientation is a way to decrease the use of hospital nurse educators in biweekly orientation offerings so that they are free to engage in other activities for hospital staff development such as continuing education and training on new products and procedures.

Researchers have found that it is a continuous challenge to orient new staff with

different learning needs such as that of a new graduate, a nurse with 2 years general medical or surgical experience, and a nurse with 7 years critical care experience (Rashotte & Thomas, 2002). The use of instructional technologies may be one way that these diverse needs can be met during nursing orientation.

Health-care organizations are beginning to realize the need for quality new employee orientation programs as a means to recruit and retain employees (Lott, 2006). Meyer and Meyer (2000) found a direct correlation exists between nursing orientation and nurse retention. Lott detailed the redesign of a nursing services orientation program that resulted in increased employee satisfaction. Initially, the community hospital delivered orientation every other week following human resources orientation and prior to unit orientation. The orientation consisted of 2 days of computer training, 1 day for performance-based development system baseline assessment, and 1 day of policy review consisting of a lecture and a series of self-studies. This research addressed the format and content of nursing orientation but did not look at educational technologies as a vehicle for delivering the learning.

Nurse Recruitment

The three main reasons that there is a growing nursing shortage are declining enrollments in nursing schools, an aging workforce, and competition from other industries for this pool of talent (Lambert, 2003). This decrease in available nurses has caused many hospitals to rely on agency or contractual nurses to fill their vacancies. The University of Michigan Health System reported that it was spending $6,000,000 annually in the form of outside labor to cope with chronic open positions and turnover (Baggot, Dawson, Valdes, & Zaim, 2005). National recruitment efforts uncovered that most nurses are motivated by more than money (Lambert). The Children's National Medical Center

learned that they needed to address the quality of life issues of Generation X (those born between 1965 and the late 1970s) if they were going to recruit this age group of registered nurses (Thorgrimson & Robinson, 2005). Recruitment efforts that emphasize improved compensation and quality of life initiatives have proven to be more successful (Thorgrimson & Robinson). In addition, strategies to market hospitals, such as Nurse Shadow programs that allow individuals to spend time in a patient care area observing what nurses do, and by extending nurse orientation programs as in offering nurse extern programs, have resulted in increased recruitment of registered nurses (RNs) and a drop in nurse turnover (Baggot et al., 2005). This study deals with nursing orientation, only one factor in the recruitment process. In order to gain information about whether the health-care organization's orientation program was a factor in recruiting newly hired nurses, it would be necessary to ask newly hired nurses this question during their initial orientation program. That would be an area for further research.

To be selected as a Magnet hospital, a health-care facility must have a reputation for quality patient care, be considered a good place to work, and meet the criteria of nursing retention (Kramer & Schmalenberg, 1988). Research over the past 20 years has shown that Magnet hospitals are able to retain nurses during times of severe nursing shortages because nurses rate them as having favorable practice environments and delivering excellent patient care (Upenieks, 2003). Research pointed out that there still is minimal comparison research between Magnet and non-Magnet hospitals and suggested that more research be done today with the current nursing shortage (Upenieks). This study added data on Magnet and non-Magnet hospitals to the research base.

Nurses want to have autonomy or some control over their practice environments and to be appreciated for their professional knowledge and skills (Havens & Aiken,

1999). At the same time that several comparison studies were conducted to compare the job satisfaction rate of nurses in Magnet and non-Magnet hospitals, it was found that the job satisfaction rate of nurses in Magnet hospitals was significantly higher and was linked to nurse retention (Buchan, 1999; Havens & Aiken). Magnet hospitals have a strong emphasis on education and staff development, which factors into nurses' job satisfaction. Staff development starts with orientation and is considered to have a strong influence on retention (McClure & Hinshaw, 2002). Hospitals' support for nursing education and professional staff development also improve nurse satisfaction and retention (Meyers, 2007).

Nurse Retention

One of the main obstacles to managing nurse retention is to learn why nurses leave. A review of the literature showed that there are inconsistencies within the literature regarding turnover and may be attributable to uncertainty surrounding both its definition and measurement (Cavanagh, 1989). Exit interviews are used by health-care organizations in an effort to learn why their nurses resign. However, it has been found that nurses do not always give the true reasons for leaving, usually citing money as a nonthreatening response to their employer (Duke, 2000). In order to turn the tide on nurse retention, good and accurate data on retention and turnover are necessary. A review of the literature suggested that personal and professional reasons constitute the two main categories of factors influencing nurse turnover (Fottler, Crawford, Quintana, & White, 1995). The employer can control only work-related reasons; therefore, it is essential for employers to know what they are. Some of the identified work-related reasons are dissatisfaction with pay, working conditions, and promotional opportunities (Cotton & Tuttle, 1986; Fottler et al.).

Job satisfaction has been identified as the key factor in nurses' turnover, and recruitment and retention of nurses are persistent problems associated with job satisfaction (Lu, While, & Barriball, 2005). This study was concerned with the effects of integrating instructional technology into the nursing orientation program on nurse retention.

William M. Mercer, a human resources consulting firm, surveyed hospitals and health organizations and found that the respondents listed escalating demand for RNs, workload and staffing issues, and better pay elsewhere as the reasons for nurses leaving. However, the Mercer researchers theorized that the real reason that nurses leave is dissatisfaction with their jobs, supervisors, or career prospects (Duke, 2000). Mercer's survey revealed the reasons employers gave for not being able to retain nurses were increased market demand, heavy workload and inadequate staffing, better pay elsewhere, more flexible scheduling elsewhere, better career and development opportunities elsewhere, inadequate managerial skills, physician relationships, and better employer reputation elsewhere (Duke). This study sought to determine the rate of nurse retention at the study hospitals and whether including instructional technology integration strategies into nursing orientation resulted in increased nurse retention.

Redesign of the exit interview and the use of a nurse attitude survey may give employers valuable insight as to opportunities for improvement to retain more nurses (Fottler et al., 1995). Yet there are others who feel that exit interviews are backwards and that staff should be asked why they stay on the job instead of why they are leaving (Hill, 2002; Penny, 2005). This presence or incremental interview may gather information relevant to retaining current employees (Penny). In order to learn the true impact of nursing orientation on nurse retention, it would be necessary to ask specific questions

about nursing orientation and its delivery in exit interviews or at a set time after orientation. A study at a long-term care facility uncovered that they had to reinvent their recruiting, orientation, training, and performance-management systems in order to increase their employee retention (Larsen, 2000). They found out that by having a high number of employees complete their required training, their turnover rates decreased by 20%. As instructional technologies continue to evolve and become more common, it is predictable that the use of instructional technologies to deliver orientation programs will be given a closer look. This study is one attempt to address this problem.

Nurse retention is considered by many to be one of the responsibilities of the unit nurse manager (Anthony et al., 2005; Force, 2005). The nurse manager is responsible for recruiting, interviewing, orienting, and insuring staff competencies, and ultimately, nurse retention. One of the most important attributes of the nurse leader is the ability to recruit and retain nurses (Kerfoot, 2001). One trend in the employment of new nurses is that a very large proportion of the total employment growth of registered nurses in recent years has been RNs over the age of 50 years. This age group is the fastest growing component of the RN workforce, having increased 11% annually over the past 4 years (Buerhaus, Auerbach, & Staiger, 2007).

Research at four American acute care hospitals found the cost of nurse turnover to be between $5.9 million to $6.4 million during the 2002 study period. The study revealed that vacancy, orientation and training, lower productivity of newly hired RNs, and advertising and recruiting costs accounted for more than 90% of these costs (Jones, 2005). It is imperative for health-care organizations to retain their nurses for a better bottom line as well as better patient outcomes. With the possible increase in the use of instructional technologies in the delivery of nursing orientation, unit nurse managers need

to look at this group of older nurses and assess their comfort and experience with the use of computers for learning. Some older nurses are very comfortable with computers, but others may lack experience with this technology. Because hospitals have turned to computer documentation and the use of other technologies in the delivery of patient care, it may be necessary for the older worker to be oriented to technology during the period of nurse orientation. The increased use of instructional technologies in presenting orientation topics is one way to address this need.

Magnet Hospitals and Nurse Recruitment and Retention

Magnet hospitals are known for their ability to attract and retain nurses (Meyers, 2007). In the early 1980s, the American Academy of Nursing conducted a study to identify which hospitals attracted and retained nurses during a period of a severe nursing shortage (Aiken, Havens, & Sloane, 2000). In the 1990s, the American Nurses Association, through the American Nurses Credentialing Center (ANCC), established a program to acknowledge excellence in nursing services, the Magnet Nursing Services Recognition Program. Although there are several lists of best hospitals, 80% of the polled public stated that they want to know how to evaluate the quality of hospital care (National Coalition on Health Care, 1997). A study was done to compare the original Magnet hospitals with ones that met the criteria for accreditation as Magnet hospitals by the ANCC. It was found that the ANCC-designated Magnet hospitals had lower nurse burnout rates, higher levels of job satisfaction, and a higher rating of quality care than the original American Academy of Nursing Magnet hospitals (Aiken et al.). Magnet hospitals generally provide more of what nurses want in their professional lives, including the opportunity for professional development, which includes orientation and opportunities for staff development and formal education opportunities (Kramer & Schmalenberg,

1991).

Education is the key to creating a Magnet culture (Schlag, 2005). Everyone in the Magnet hospital realizes the importance of education and professional development. A highly skilled and knowledgeable staff starts with the new staff orientation. Research shows that Magnet hospitals have a higher nurse retention rate, higher nurse job satisfaction, and better patient outcomes because of the emphasis placed on education and staff development (Kramer & Schmalenberg, 2004; Scott, Sochalski, & Aiken, 1999; Upenieks, 2003). Magnet hospitals are advancing health-care quality through nursing excellence in today's challenging health-care environment (Lundmark & Hickey, 2006).

To provide the best patient care possible, hospitals must recruit and retain the best health-care providers (Newhouse, Hoffman, Suflita, & Hairston, 2007). The recruitment and retention of nurses is an international concern (Coomber & Barriball, 2007). A study in Germany uncovered that a lack of continuity in the nursing staff compromises the quality of care, raises costs considerably, and leads to loss of confidence in the health-care facility (Peltier, Nill, & Schibrowsky, 2003). The label *magnet hospitals* was originally given to a group of American hospitals that were able to recruit and retain registered nurses during a national nursing shortage in the early 1980s (Buchan, 1999; Havens & Aiken, 1999; Hunter, 2007; Lundmark & Hickey, 2006; Scott et al., 1999; Upenieks, 2003). In today's climate of an impending critical nursing shortage, hospitals are again looking for ways to recruit new nurses to fill their vacancies and to retain the nurses that they have (Upenieks). New nurse graduates are more likely to leave their first job. Between 35% and 60% of new nursing graduates quit their first hospital position during their first year and account for more than 50% of total nurse turnover in some hospitals (Newhouse et al., 2007). In the 1980s, it was learned that the turnover rate for

professional nurses was 9% in Magnet hospitals and 18% in non-Magnet hospitals (Kramer, 1990).

Summary and Conclusions

The literature review offered dire statistics regarding an ever-growing nursing shortage. The combination of a shortage of nurses and an increasing aging population will make the shortage severe by 2010. Research substantiates the need to focus on nurse recruitment and retention as the supply of nurses dwindles and the need for nurses increases. Individual hospitals are competing for the short supply of new graduate nurses and seeking ways to lure experienced nurses from their competitors as well as retain their current nurse employees. Research showed that if hospitals could retain the nurses that they have, it would result in better patient care and a tremendous cost savings.

Nurses rate the quality of nursing orientation as one of their measures of job satisfaction. An organization's orientation is the gateway for the employee to become embroiled in the corporate culture and to learn the necessary skills to be successful on the job. Given the importance of orientation in retaining employees, it is necessary to look at the instructional design of nursing orientation and the use of instructional technologies in delivering it. This study obtained data in order to answer the question "Is there a relationship between the use of instructional technologies in the nursing orientation program and the rate of retention for new nurses?"

Magnet hospitals have a proven record of attracting and retaining nurses because they offer quality patient care and better working conditions. One way for hospitals to attract and retain nurses is to earn Magnet hospital accreditation, which places a high value on nursing staff development beginning with new nurse orientation. This study sought to answer the question "Is there a significant difference in the rate of retention of

new nurses in Magnet and non-Magnet hospitals?" In addition, this study looked at the integration of instructional technology into the nurse orientation process of Magnet and non-Magnet hospitals. It was an attempt to learn if there were differences in the use of instructional technologies in nursing orientation in Magnet and non-Magnet hospitals.

Chapter 3: Methodology

Survey research designs are used to describe trends in the data and to learn more about a population (Creswell, 2005). A survey design was selected because it was the best way for this investigator to obtain data to answer the research questions from the 151 participants located throughout the United States. The survey design was cross-sectional, it was used to collect data about current practices, and it compared current practices in two groups, Magnet and non-Magnet hospitals.

Participants

The study participants were nursing education directors or other nursing orientation presenters at 151 health-care facilities, both Magnet and non-Magnet. The geographic area was the United States. The list of 230 Magnet-designated hospitals was available on the ANCC Web site. Because there are so many hospitals in the United States, several methods to obtain a list of non-Magnet hospitals were used. Initially it was decided to select a region in the United States for the study so that the health-care facilities surveyed would be a more manageable number. The Midwest was chosen because the principal investigator lives in that area. This approach resulted in 50 Magnet hospitals and 661 Joint Commission on Accreditation of Healthcare Organizations (JCAHO; now called The Joint Commission) accredited hospitals, which included both children's and adult hospitals. An attempt to limit the JCAHO hospitals to the Midwest resulted in a list of 59 adult hospitals that did not include children's hospitals as the Magnet list did.

Next, an Internet search for the 50 best hospitals in the United States resulted in four lists--*The U.S. News and World Report Best Hospitals 2006, The AARP 50 Top Hospitals Chart* (2003), *HealthGrades America's 50 Best Hospitals Report* (2007), and

Leapfrog Top Hospitals 2006.

Each agency had different criteria that were used to compile their lists. The *U.S. News and World Report of Best Hospitals 2006* list ranked hospitals according to mortality, nursing index, technology, patient and community services, and whether or not they have a trauma center. In 2007, the organization changed how they reported their best hospitals list. They listed the hospitals in each category, such as cardiac care centers and orthopedic hospitals. They also included one list of the 17 best hospitals. This 2007 list of 17 was checked against the previous year's 50 best hospitals and one more hospital was added, increasing the list of total hospitals from 150 to 151. Leapfrog's (2006) criteria for inclusion in their list of best hospitals included intensive care unit physician staffing, Leapfrog's safe practices score, and full implementation of computerized physician order entry. In addition, the hospitals must meet Leapfrog's standards for two or more of their specified high-risk procedures or conditions. February 2007 marked HealthGrades' first report of America's 50 best hospitals report. The HealthGrades' list contained hospitals that demonstrated sustained superior clinical quality over a 7-year time period, based upon an analysis of tens of millions of Medicare patient records from 1999 through 2005. The American Association of Retired Persons (AARP, 2003) designation of 50 top hospitals gauged hospitals by their medical and surgical mortality scores, percentage of physicians who rated the hospital very good or excellent, their JCAHO score, and finally, their overall score.

The list was checked for duplicate listings of the same hospitals and then was divided into current Magnet and non-Magnet health-care facilities. The revised list contained the names of 151 hospitals, of which 49 were Magnet accredited. As all of the hospitals selected for this study were considered superior by various criteria, it is

unknown if their nursing orientation programs were good or poor. It is known that Magnet-designated hospitals place an emphasis on staff education, including nursing orientation, and therefore an accreditation agency, the ANCC, determined that their nursing orientation programs are good. Because the AARP criteria included medical and surgical mortality, physicians' ratings, JCAHO accreditation score, and overall score, it is unknown how the hospitals on its list would score on the quality of their nursing education programs. Nursing education, including nursing orientation programs, are not considered on the other three lists of best hospitals either. This does not mean that those hospitals do not have a nursing education department, only that it was not one of the factors examined in qualifying for list selection.

This study examined 19 instructional technology integration strategies to learn which were more effective in retaining new nurses. As the pilot test revealed that there is no consensus of what is meant by good retention, the questionnaire gathered the nurse retention rate for a one-year period. The survey results of Magnet and non-Magnet hospitals were compared to see if there were any significant differences. The list of the 150 best hospitals was checked to see how many of them were Magnet accredited. This criterion was selected because the literature review revealed that Magnet hospitals have a higher nurse retention rate than non-Magnet hospitals. This study looked at Magnet and non-Magnet hospitals to learn if there was a difference in the use of instructional technology in delivering nursing orientation. In addition, three of the hospitals within 40 miles of the principal investigator were initiating the Magnet accreditation process. An additional hospital in that area had been rejected twice. The nursing education departments at the 151 study hospitals were sent the study survey questionnaire in order to obtain data regarding the study research questions.

Instruments

The survey instrument used in this study was the Instructional Technology Integration Survey (see Appendix A), which was used to measure the use of the instructional technology integration strategies employed at each of the study sites. This survey instrument was adapted from Schaefer's (2006) Integration of CAI Questionnaire. Schaefer's permission was obtained to use or adapt her questionnaire. The survey instrument was also adapted to glean information on nurse retention at the study sites.

The questionnaire addressed the three research questions. The questionnaires were initially intended to be e-mailed to the nursing education director at each study facility. Originally it was proposed that the survey would be sent out electronically by Zoomerang. The survey was loaded into Zoomerang's database in preparation to be e-mailed to study participants. Each of the 151 hospitals was contacted in order to learn the names, phone numbers, and e-mail addresses of their nursing education directors. The researcher soon learned that, in most incidences, it was extremely difficult to learn the name and phone number and especially the e-mail address of the person responsible for conducting nursing orientation. One nurse said to "just mail the survey" since "your e-mail would most likely be considered spam by the hospital's spam filter." Some e-mail addresses were obtained, but the researcher learned that some e-mail messages were deleted without being read. As it was not possible to send the survey electronically to all potential survey participants, a decision was made to mail the surveys.

Contacting each facility to learn the name and address of the person responsible for nursing orientation was also a daunting task. In the end, the procedure was to call the main number and ask if the hospital had a nursing education department, or if not, to ask for the person who was responsible for nursing orientation. Usually this consisted of

being transferred to several extensions until the caller was asked to leave a voicemail message. Although most of the hospitals on the list were called and a message left, only two people returned the call. A few did provide the requested information, the name and mailing address of the nursing orientation coordinator. If it was not possible to find out the intended party's name, the survey was addressed to the nursing education director or nursing orientation coordinator, whichever the researcher learned from calling the hospital.

Prior to sending the surveys, it was unknown if the study participants at each of the study sites had access to the information about nurse retention. An informal random telephone call to several hospitals revealed that it was the nurse recruiter or someone else in the human resources department who was usually responsible for tracking nurse retention. However, the nurse educator at one of the piloted sites had access to that information. Therefore, the researcher planned to inform the nurse education director in a prenotification message that the nurse retention information would be requested in order to make completing the survey as easy as possible for the participants. Prenotification is a strategy to increase the survey completion rate. However, Nova Southeastern University's Institutional Review Board informed the writer that it was not permissible to send out prenotification messages that contained any information about the intended study. Therefore, the prenotification messages were not sent out.

Research Questions

The following research questions guided this applied dissertation study:

1. What is the relationship between the use of instructional technologies in the nursing orientation program and the rate of retention for new nurses?

2. What is the difference in the rate of retention of new nurses in Magnet and

non-Magnet hospitals?

3. What is the difference in the use of instructional technology integration strategies in nursing orientation programs at Magnet and non-Magnet hospitals?

Dependent and Independent Variables

The independent variables were the use of the 19 instructional technology integration strategies in the orientation program and Magnet accreditation. The two dependent variables were the rate of nurse retention and the use of instructional technology. In this study, the use of instructional technology was both an independent and a dependent variable. In Research Question 1, it was an independent variable, and in Research Question 3, it was a dependent variable. The study was designed to answer the question of whether instructional technology use and retention differ for Magnet versus non-Magnet hospitals and if this use of technology in nursing orientation had a bearing on nurse retention.

Hypotheses

The hypotheses were the following:

1. The increased use of the integration of instructional technologies into the nursing orientation program results in an increase in the rate of the retention of new nurses.

2. Magnet hospitals will have a higher rate of nurse retention than non-Magnet hospitals.

3. Magnet hospitals will have a higher use of instructional technology in nursing orientation than non-Magnet hospitals.

Procedures

Changes were made, and after concept paper approval, the initial three survey

instruments, Instructional Technology Integration Survey, Nurse Readiness Survey, and Nurse Retention Survey, were pilot tested. They were sent out to nurse educators at several different hospitals, nursing college faculty, an ITDE student, ITDE graduates and professors, and instructional technology professionals.

A cover letter accompanied the surveys that explained the purpose of the proposed study and ensured the participants that their participation would be completely anonymous and voluntary (see Appendix B). It asked respondents to mark any problems on the survey, such as poorly worded questions or responses that did not make sense, or to say if it took too long to complete the instruments (Creswell, 2005). The survey questionnaires were revised to incorporate the recommended changes. The major revision was eliminating the Nurse Readiness Survey and incorporating the Nurse Retention Survey into the Instructional Technology Integration Survey for ease of administration. Pilot testers also recommended eliminating unfamiliar terms and jargon such as Instructional Technology-Mediated Instruction and its acronym ITMI. Some preferred the terms *computer-assisted instruction* or *computer-assisted training* instead. The recommendation to eliminate unfamiliar acronyms and jargon is consistent with recommendations from survey construction textbooks.

Measures

One survey instrument was used to gather information to answer the research questions. The independent variables were the use of the 19 strategies to integrate instructional strategies into nursing orientation and Magnet accreditation. The Instructional Technology Integration Questionnaire listed the 19 strategies and the participant checked off how often each one was used at their site using the following rating scale, *very often, occasionally, rarely,* and *never.* Demographic information was

gathered regarding the participants, such as their role at the health-care organization, job title, gender, age, and educational background. Other questions contained Likert scales requesting information such as "Teachers at your facility were able to effectively integrate the following types of software into the orientation courses they taught."

Analyzing and Interpreting Quantitative Data

The data were analyzed to address each one of the research questions and hypotheses. Descriptive statistics was used to indicate general tendencies in the data and the spread of scores. Inferential statistics were used to analyze data from a sample to draw conclusions about an unknown population. Inferential statistics were used to relate the two variables, the use of instructional technology and Magnet status, to nurse retention. Inferential statistics were also used to test the hypotheses.

The hypothesis testing procedure used in this study contained the following five steps:

1. Identify a null and alternative hypothesis.
2. Set the level of significance or alpha level for rejecting the null hypothesis.
3. Collect data.
4. Compute the sample statistic, typically using a computer program.
5. Make a decision about rejecting or failing to reject the null hypothesis (Creswell, 2005).

The null hypotheses included the following:

1. The increased use of the integration of instructional technologies in orientation has no effect on the rate of new nurse retention.
2. There is no difference between the rate of new nurse retention in Magnet and non-Magnet hospitals.

3. There is no difference between the use of instructional technology in nursing orientation programs at Magnet and non-Magnet hospitals.

The alternative hypotheses included the following:

1. The use of the integration of instructional technologies in orientation has an effect on nurse retention.

2. Magnet hospitals will have a higher rate of nurse retention than non-Magnet hospitals.

3. Magnet hospitals will have a greater use of instructional technology in their nursing orientation programs than non-Magnet hospitals.

This study used statistical analysis to determine if the null hypotheses were not true. The significance level was set at .05. A one-tailed test of significance was used to test the null hypothesis. The types of statistical analysis used in this study are outlined below. Confidence intervals were determined to help decide the magnitude of differences in mean scores, especially if the null hypothesis was rejected; to determine how large the difference actually might be; and to estimate a range of acceptable values. The effect size was determined to identify the strength of conclusions about group differences or about the relationship among variables in a quantitative study. The standard effect size, 0.5 (or one half of a standard deviation) or above, is often used when examining the mean scores for two groups (Creswell, 2005).

The results section includes tables that summarize statistical data, figures (charts) that portray variables and their relationships, and detailed explanations about the statistical results. The presentation of the results explains the central results of each statistical test and presents the information using acceptable research terminology. The major findings are summarized and broader implications of the research for distinct

audiences are given. General conclusions state whether the hypotheses were rejected or whether the research questions were supported or not (Creswell, 2005).

Statistical Analysis

Research Question 1. A Pearson's correlation coefficient (i.e., Pearson's *r*), was used to relate the increased use of instructional technology and the increased rate of nurse retention. The Instructional Technology Integration Survey was scored by summing the responses to the 19 instructional technology integration strategies. The yielded score reflects the extent to which orientation training sessions implemented instructional technology. Pearson's correlation is appropriate for identifying a trend between two variables that are scored on a numeric scale. Hypothesis 1 predicted a positive correlation. A positive correlation indicates that higher use of instructional technology is associated with higher nurse retention rates; however, the reverse is also true, such that low use of technology will be associated with lower retention rates. Inferential statistical tests were conducted on the correlation in order to determine whether it could have occurred because of chance.

Research Question 2. An independent *t* test was used to determine whether Magnet and non-Magnet hospitals differ in their nurse retention rates. The independent *t* test is used to compare the means on a numeric dependent variable (the average nurse retention rates) for two groups defined by a nominal (i.e., categorical) independent variable (Magnet versus non-Magnet hospital). Hypothesis 2 predicted that the average nurse retention rating would be higher in Magnet hospitals than in non-Magnet hospitals. Inferential statistical tests were conducted on the *t* test in order to determine whether the mean difference could have occurred because of chance.

Research Question 3. An independent *t* test was used to determine whether

Magnet and non-Magnet hospitals differ in their use of instructional technology in their nursing orientation programs. As described above, the independent *t* test is used to compare the means on a numeric dependent variable (the average nurse retention rates) for two groups defined by a nominal (i.e., categorical) independent variable (magnet versus non-magnet hospital). Hypothesis 3 predicted that the use of instructional technology in nursing orientation will be higher in Magnet hospitals than in non-Magnet hospitals. Inferential statistical tests were conducted on the *t* test in order to determine whether the mean difference could have occurred because of chance.

Chapter 4: Results

This study investigated the effects of instructional technology integration strategies in orientation programs on nurse retention in Magnet and non-Magnet hospitals. A total of 151 surveys were mailed out and 63 were returned. This chapter describes the results of the data analysis from the 63 survey participants.

Before conducting the statistical analysis, the data were visually screened for typographical errors and logical inconsistencies in the responses (Creswell, 2005). Errors occur when participants provide scores outside the range for requested variables or wrong numbers are entered into the data grid (Creswell). A few participants entered responses that did not give the information requested; for example, in answer to Question 3, which asked for the percentage of nursing orientation presenters who use instructional technology to teach nursing orientation, one respondent wrote "1 – who teaches on line documentation + med admin Rx." This response was left blank because there was no information given for the total number of presenters so that a percentage could be determined. A small number of typographical errors were found, and these were corrected by cross-referencing the database error with the paper copies of the survey instrument.

In the demographics section of the survey, Question 2 asked, "What is your job title?" The purpose of the question was to determine if the survey participant was a nurse or other health-care provider. Several respondents checked off "Other" and entered the role requested in Question 1, such as "Manager of Learning Center." As this person checked off "Master of Science in Nursing" in demographic Question 5, Question 2 was corrected to "Nurse." Each time that a respondent checked off "Other" in demographic Question 2 and also indicated a degree in Nursing in Question 5, Question 2 was

corrected to “Nurse.” In Question 1 of Part I, “Your facility,” the question asked participants what the new nurse retention rate was at their hospital. Several respondents entered their turnover rate, such as “our turnover rate is 3%.” Each time that a respondent entered their turnover rate, that rate was subtracted from 100% in order to determine the retention rate.

There were a total of 151 surveys mailed out on September 15, 2007. The first mailing resulted in 36 surveys being returned, one blank, leaving 35 surveys with useable data. One of the largest problems was learning the name and mailing address of the person responsible for nursing orientation. After the surveys were returned from the first mailing, the remaining hospitals on the list were again called in order to ascertain the correct name and mailing address of the potential survey participant. Several hospitals have a mail stop address that could not have been learned any other way. A few surveys were returned in the mail as “undeliverable.” Each of these survey sites was called in an effort to learn the correct mailing address. One hospital stated that they do not give out employee names and addresses to anyone outside of the hospital. The second mailing on October 15, 2007, resulted in 28 surveys being returned. The last survey was returned in the mail on towards the end of November 2007. This made a total of 63 returned surveys with useable data.

One problem with the surveys was missing data. For example, on the 19 Instructional Technology Computer Assisted Instruction (CAI) questions, 3 respondents failed to answer one or two questions. Similarly, 2 respondents omitted one of the 15 technology (TECH) questions. As per the recommendations of Roth, Switzer, and Switzer (1999), in situations where individual survey items were omitted, the missing item was replaced with the mean of that individual’s available responses. For example,

the individual who omitted two of the CAI questions had an average response of 2.59 across the 17 items that she did respond to. This average was substituted for her two missing questions. A similar strategy was taken on the 15 TECH questions as well. Missing data were also a problem on a number of other survey questions. Most notably, 17 of the 63 surveys (27%) were missing responses to the nurse retention rate question, which was one of the key questions of interest in this study. The answer was left blank or else people wrote in such comments as "?," "unknown to me," "we are not privy to this info.," and "info not available." When the question was left blank, presumably the respondent who filled out the survey either did not have access to this information or may have refused to provide the information out of privacy concerns for hospital records. The survey question that requested the respondent's age was also missing at a relatively high rate, as 6 of the 63 participants (9.5%) failed to respond. Attempts were made to follow up and obtain the missing nurse retention rates and respondents' ages, but the missing information could not be recovered. It may have increased the response rate to the demographic age question by having the respondents check off an age range rather than write in their age. The age question was asked in order to determine if the age of the respondent was related to the use of instructional technology. However, as this was not part of the study, it should have been eliminated.

Because most of the surveys with missing data had a very small number of questions that were missing (e.g., two or three questions, at the most), it was very wasteful to discard these responses. Instead, each analysis was conducted using all of the available responses on a particular variable or pair of variables. For example, the third research question was concerned with whether Magnet and non-Magnet hospitals differed with respect to their use of instructional technology. All 63 of the surveys had useable

data on these variables (after the missing CAI questions were replaced with the mean), so this research question was addressed using the entire data set. In contrast, the two research questions that involved nurse retention rates were analyzed using the 46 surveys (73%) that provided the retention rate information. The strategy of using different subsamples of respondents for different analyses is referred to as pairwise deletion, and it is a strategy that is superior to eliminating the responses with missing values. In other words, it is more powerful because it retains a larger proportion of the data.

Description of Respondents

Virtually all of the respondents (62 of 63, or 98.4%) reported "nurse" as their job title, and 90.5% of the respondents (57 of 63) were involved in nursing education in some capacity, either as staff development directors or as nursing education instructors. The majority of the respondents were female (54 of 63, or 85.7%), with an average age of 50.28 (*SD* = 7.91). The education level of the respondents was quite high, as 47 of the 63 respondents (74.6%) reported having a master's degree in nursing or some other field, and 9 of the 63 respondents (14.3%) had a PhD.

Out of the 63 returned surveys, 23 surveys (36.5%) came from Magnet hospitals. Taken across the 46 hospitals that provided data, the average retention rate for new nurses was 88.35%. Overall, the mean percentage of nursing orientation presenters who used instructional technology or computer-assisted instruction to teach nursing orientation was 55.76%, even though approximately 91.00% of the hospitals reported that computers were accessible for use during orientation.

Psychometric Properties of Questionnaire Items

The survey instrument was comprised of three different sets of questionnaire items (i.e., scales). As described previously, 19 of the questionnaire items asked the

respondent to report the frequency that a number of different technology integration strategies (referred to as CAI) were used during nursing orientation. In addition, 15 questions asked about the use of specific technologies (e.g., simulations, tutorials, virtual reality), and 3 questions asked about the use of specific types of software programs (e.g., commercially purchased, teacher authored). The reliability of these three question sets (i.e., scales) was assessed using the coefficient alpha statistic. Alpha ranged between 0 (no reliability) and 1 (perfect reliability) and was based on the correlations among the questions and on the number of questions (e.g., questionnaires with highly correlated responses and more questions are more reliable). It is generally suggested that coefficient alpha values that exceed .80 are adequate for research purposes (Nunnally & Bernstein, 1994).

The reliability of the 19-question CAI scale was high, with a coefficient alpha value of .94. The reliability of the 15 questions of the TECH scale was also adequate, with alpha of .80. The reliability of the three-question scale that measured the use of different software programs was somewhat low at .59. The CAI and TECH questionnaires were comprised of items that measured a common theme (e.g., the use of technology), whereas the three questions that asked about software programs did not. Based on the high reliability statistics, it was useful to compute a single summary score by averaging the CAI and TECH questions.

The resulting scale scores ranged between 1 (*never*) and 4 (*very often*) and provide a single-number summary of the responses on the two sets of survey items. The subsequent analyses were based on the scale scores and on the individual items. However, the low reliability of the three questions that asked about the use of specific computer programs implies that these questions should be analyzed individually and

should not be averaged into a single summary score.

Table 1

Means and Standard Deviations of CAI Questionnaire Items

Questionnaire item	*M*	*SD*
1. Pretest learners to assess that they are adequately prepared to learn the CAI	2.05	1.16
2. Explain the objectives of the CAI to learners beforehand	3.27	1.19
3. Explain how to use the CAI to learners beforehand	3.27	1.15
4. Motivate learners by explaining the values of learning the CAI content	3.12	1.06
5. Illustrate the relationships between topics in order to integrate the CAI topic	3.29	1.05
6. Assign the CAI as self-paced individualized learning experiences	3.16	1.08
7. Use CAI for small-group learning activities	2.56	1.16
8. Use CAI in the classroom as part of a whole-class learning activity	2.97	1.21
9. Ensure technical support is available for CAI learners who need it	3.46	0.96
10. Ensure instructional support is available for CAI learners who need it	3.44	0.98
11. Conduct post-CAI instruction discussion or critiques as reinforcement	2.73	1.11
12. Use follow-up activities to ensure students use what they learned in the CAI	2.87	1.04
13. Make completion of the CAI part of the orientation requirements	3.49	1.00
14. Assign the CAI as an optional learning experience	2.22	1.02
15. Include the content or skills learned from the CAI on the orientation exams	2.65	1.18
16. Include scores earned on tests embedded in the CAI as part of the orientation	2.25	1.31
17. Use the CAI in place of some other method of teaching the content	3.01	0.95
18. Provide alternative methods of restudying if learners failed objectives	2.65	1.14
19. Conduct summative evaluations of student learning	2.75	1.24

Note. CAI scale (average of 19 CAI items) was $M = 2.91$, $SD = 0.76$. CAI = computer-assisted instruction.

Descriptive Statistics

The descriptive statistics for the 19 CAI questionnaire items are given in Table 1. In order to facilitate interpretation, the item responses were recoded such that higher

scores reflected more frequent use (1 = *never,* 4 = *very often*). As seen in Table 1, there were a number of facets of CAI training that produced very high responses. For example, making CAI training completion a mandatory requirement (Question 13) produced the highest response among the respondents (*M* = 3.49). High ratings were also assigned to questions that pertained to CAI support given to learners (e.g., Questions 2 and 3 had mean ratings of 3.27, and Questions 9 and 10 had mean ratings of 3.46 and 3.44, respectively). A number of strategies also produced relatively low ratings. For example, respondents reported that pretests and small-group activities were used relatively infrequently (*M* = 2.05 and 2.56, respectively).

The descriptive statistics for the 15 TECH questionnaire items are given in Table 2. Again, the item responses were recoded such that higher scores reflected more frequent use (1 = *never,* 4 = *very often*). As seen in Table 2, the technologies that were used most frequently include instructor computer workstations and learner computer workstations (*M* = 3.24 and 3.32, respectively), DVD videos and CD-ROMs (*M* = 3.37 and 3.05, respectively), and large-screen video data displays (*M* = 3.10). There were a number of technologies that were used relatively infrequently such as tutorials, games, e-mail, overhead projectors, and video cassettes and had average ratings that ranged between approximately 2.25 and 2.75. Finally, virtual reality and slide projectors were given very low ratings (*M* = 1.76 and 1.63), which indicates that these technologies are rarely, if ever, used.

Finally, the three survey questions that asked about the types of programs that were used (commercially-available, software produced on-site, and teacher-authored software) received comparable ratings. Commercial software had the lowest mean rating of *M* = 2.95, and on-site and teacher-authored software packages were used at nearly the

same frequency (*M* = 3.21 and 3.27, respectively). Again, these questions were rated on a 4-point scale where high scores represented frequent use (1 = *never,* 4 = *very often*).

Table 2

Means and Standards Deviations of TECH Questionnaire Items

Questionnaire item	*M*	*SD*
Simulations	2.87	0.98
Tutorials	2.73	1.11
Virtual reality	1.76	1.00
Drill and practice	2.83	1.13
Games	2.57	1.04
E-mail	2.33	1.23
Overhead projector	2.25	1.06
Slide projector	1.63	0.90
Internet	2.98	1.04
Large-screen video data display	3.10	1.06
Instructor computer workstation	3.24	1.03
Learner computer workstation	3.32	0.98
DVD video	3.37	0.68
Video cassette	2.54	1.10
CD-ROM	3.05	0.97

Note. TECH scale (average of 15 TECH items) was *M* = 2.70, *SD* = 0.53.
TECH = technology.

Finally, the three survey questions that asked about the types of programs that

were used (commercially-available, software produced on-site, and teacher-authored software) received comparable ratings. Commercial software had the lowest mean rating of $M = 2.95$, and on-site and teacher-authored software packages were used at nearly the same frequency ($M = 3.21$ and 3.27, respectively). Again, these questions were rated on a 4-point scale where high scores represented frequent use (1 = *never,* 4 = *very often*).

Research Question 1

The first research question was, "What is the relationship between the use of instructional technologies in the nursing orientation program and the rate of retention for new nurses?" Correlation coefficients (Pearson's r) were used to address this question. Specifically, correlations were estimated between the retention rate variable and each of the questions on the CAI and TECH scales. In addition, a correlation was estimated between retention rates and the survey question that asked about the percentage of instructors who use CAI (another indicator of technology adoption at the hospital level). Pearson's r ranged between 0 and 1 (in both a positive and negative direction) such that values closer to plus or minus 1 represented stronger relationships. A positive correlation was hypothesized such that an increased use of instructional technologies would be associated with higher retention rates of new nurses. Because Hypothesis 1 involved a specific prediction (a positive correlation), one-tailed significance tests were conducted. Note that the correlation analyses were computed using the responses from the 46 surveys that provided retention rate data.

Table 3 gives the correlations between the CAI questionnaire items and nurse retention rates. Overall, the average of the 19 CAI questions was correlated with retention at $r = .17$. This is a small correlation according to the effect size guidelines provided by Cohen (1988). The correlation was in the expected positive direction, meaning that higher

retention rates were associated with higher technology adoption. However, this correlation was not statistically significant (p = .07), meaning that a correlation of .17 could have reasonably occurred due to random chance with a sample size of 46.

Table 3

Correlations Between Nurse Retention and CAI

Questionnaire item	*r*
1. Pretest learners to assess that they are adequately prepared to learn the CAI	0.15
2. Explain the objectives of the CAI to learners beforehand	0.12
3. Explain how to use the CAI to learners beforehand	0.19
4. Motivate learners by explaining the values of learning the CAI content	0.03
5. Illustrate the relationships between topics in order to integrate the CAI topic	0.06
6. Assign the CAI as self-paced individualized learning experiences	0.18
7. Use CAI for small-group learning activities	0.11
8. Use CAI in the classroom as part of a whole-class learning activity	0.17
9. Ensure technical support is available for CAI learners who need it	0.34*
10. Ensure instructional support is available for CAI learners who need it	0.36*
11. Conduct post-CAI instruction discussion or critiques as reinforcement	0.02
12. Use follow-up activities to ensure students use what they learned in the CAI	0.21
13. Make completion of the CAI part of the orientation requirements	0.12
14. Assign the CAI as an optional learning experience	-0.04
15. Include the content or skills learned from the CAI on the orientation exams	-0.06
16. Include scores earned on tests embedded in the CAI as part of the orientation	0.17
17. Use the CAI in place of some other method of teaching the content	-0.02
18. Provide alternative methods of restudying if learners failed objectives	0.07
19. Conduct summative evaluations of student learning	0.02

Note. Percentage of instructors using technology = 0.075. CAI scale (average of 19 CAI items) was r = 0.17. CAI = computer-assisted instruction. *$p < .05$.

The correlations between retention and individual CAI survey questions were generally in the positive direction, but only two of the correlations were statistically significant at $p < .05$. As seen in Table 3, Question 9 (Ensure technical support is available for CAI learners who need it) was correlated with retention at $r = .34$, and Question 10 (Ensure instructional support is available for CAI learners who need it) was correlated with retention at $r = .36$. Correlations in the range of .30 have been characterized as moderate in magnitude (Cohen, 1988). Both correlations were significant, meaning that it is highly unlikely that these relationships were a result of random chance. Also, note that the direction of the relationships was positive, which is consistent with Hypothesis 1. Specifically, hospitals that reported higher levels of instructional support were characterized by higher retention rates.

Table 4 gives the correlations between the 15 TECH questionnaire items and nurse retention rates. Overall, the average of the 15 TECH questions was correlated with retention at $r = .18$. This can be characterized as a small correlation (Cohen, 1988). The correlation was positive, meaning that higher retention rates were associated with higher technology adoption. However, this correlation was not statistically significant ($p = .06$), meaning that a correlation of .18 could possibly result from random chance.

Like the CAI questions, the TECH survey questions were generally positively correlated with retention rates. However, only two of the survey questions produced statistically significant correlations. The use of tutorials and e-mail were both positively correlated with retention rates ($r = .25$ and .31, respectively). A correlation of .25 can be viewed as a small correlation, and a correlation of .31 is a moderate correlation (Cohen, 1988). Both of these relationships were statistically significant, and unlikely to be a result of random chance. These correlations are consistent with Hypothesis 1 and indicate that

hospitals placing a heavy reliance on tutorials and e-mail have higher retention rates.

Table 4

Correlations Between Nurse Retention and TECH Items

Questionnaire item	*r*
Simulations	0.09
Tutorials	0.25*
Virtual reality	0.03
Drill and practice	0.11
Games	-0.02
E-mail	0.31*
Overhead projector	-0.20
Slide projector	0.03
Internet	0.15
Large-screen video data display	-0.05
Instructor computer workstation	0.21
Learner computer workstation	0.04
DVD video	0.03
Video cassette	0.16
CD-ROM	0.05

Note. TECH scale (average of 15 TECH items) was $r = 0.18$. TECH = technology. *$p < .05$.

Research Question 2

The second research question was, "What is the difference in the rate of retention of new nurses in Magnet and non-Magnet hospitals?" This question was addressed using an independent samples *t* test. In the *t* test, the hospital type (Magnet versus non-Magnet) was the independent variable and retention rate was the dependent variable. The purpose of the *t* test was to determine whether the average retention rates in the two types of hospitals differed beyond what would be expected due to random chance or sampling error. Because Hypothesis 2 made a specific prediction (Magnet hospitals would have higher retention rates), a one-tailed test was used. Finally, note that this research question was also addressed using the 46 surveys that provided nurse retention data.

The average retention rate for Magnet hospitals was $M = 89.27$ ($SD = 4.13$) and the mean retention rate for non-Magnet hospitals was $M = 87.64$ ($SD = 8.61$). The retention rates differed by 1.63 percentage points. Expressed relative to the standard deviation, this mean difference was .23 (i.e., the two groups differed by approximately one-fifth of a standard deviation). Cohen (1988) characterized this as a small mean difference, with the difference between groups being rather subtle. Although the means differed in the predicted direction (i.e., Magnet hospitals had a higher retention rate), the *t* test indicated that the difference was not statistically significant, $t(44) = .78$, $p = .11$. This means that random chance cannot be ruled out as an explanation for these results.

Research Question 3

The third research question was, "What is the difference in the use of instructional technology integration strategies in nursing orientation programs at Magnet and non-Magnet hospitals?" This question was addressed using a series of independent samples *t* tests. In the *t* test, the hospital type (Magnet versus non-Magnet) was the

independent variable and the technology use survey questions (i.e., the CAI and TECH questions) were outcome variables. As described previously, the purpose of the *t* test was to determine whether technology use in the two types of hospitals differed beyond what would be expected due to random chance or sampling error. Because Hypothesis 3 made a specific prediction (Magnet hospitals would have higher technology use), a one-tailed test was used. Finally, note that this research question was addressed using the entire set of 63 surveys.

Magnet and non-Magnet hospitals were compared to see whether they differed in the percentage of nursing orientation presenters who used CAI to teach nursing orientation. The Magnet hospitals reported that 59.32% (SD = 37.21) of the instructors used CAI, on average, whereas non-Magnet hospitals reported an average of 53.76% (SD = 41.32). The large standard deviations reflected the fact that the percentage of instructors who used CAI varied rather dramatically across hospitals (e.g., Magnet hospitals were rather different in their percentages, as were non-Magnet hospitals). When expressed relative to the standard deviation, the magnitude of this mean difference was actually relatively small (i.e., the groups differed by approximate .14 standard deviation units). This mean difference is small according to Cohen's (1988) effect size benchmarks. An independent *t* test indicated that the mean difference was not statistically significant, $t(59) = -.54$, $p = .15$. Thus, although the mean difference was in the predicted direction (i.e., Magnet hospitals had a higher percentage), the difference could have resulted simply due to sampling error or random chance. Table 5 gives the means of the CAI items for Magnet and non-Magnet hospitals and the value of the independent *t*-test statistic. For comparison purposes, the value of the *t* test must exceed a value of -1.67 in order to be statistically significant for a one-tailed test at the .05 significance level. The

negative value reflects the fact that the Magnet mean should be higher than the non-Magnet mean and is a function of the SPSS computer package computed the *t* statistic.

Table 5

Comparison of Magnet and Non-Magnet Hospitals on CAI Questionnaire Items

	Mag	Non	
Questionnaire item	*M*	*M*	*t*
1. Pretest learners to assess that they are adequately prepared to learn the CAI	2.09	2.03	-0.20
2. Explain the objectives of the CAI to learners beforehand	3.39	3.20	-0.61
3. Explain how to use the CAI to learners beforehand	3.39	3.20	-0.63
4. Motivate learners by explaining the values of learning the CAI content	3.09	3.14	0.17
5. Illustrate the relationships between topics in order to integrate the CAI topic	3.17	3.35	0.64
6. Assign the CAI as self-paced individualized learning experiences	3.35	3.05	-1.05
7. Use CAI for small-group learning activities	2.26	2.73	1.54
8. Use CAI in the classroom as part of a whole-class learning activity	2.70	3.14	1.39
9. Ensure technical support is available for CAI learners who need it	3.48	3.45	-0.11
10. Ensure instructional support is available for CAI learners who need it	3.48	3.43	-0.21
11. Conduct post-CAI instruction discussion or critiques as reinforcement	2.65	2.78	0.42
12. Use follow-up activities to ensure students use what they learned in the CAI	2.91	2.85	-0.23
13. Make completion of the CAI part of the orientation requirements	3.61	3.43	-0.70
14. Assign the CAI as an optional learning experience	2.26	2.20	-0.24
15. Include the content or skills learned from the CAI on the orientation exams	2.74	2.60	-0.45
16. Include scores earned on tests embedded in the CAI as part of the orientation	2.39	2.18	-0.63
17. Use the CAI in place of some other method of teaching the content	3.09	2.96	-0.52
18. Provide alternative methods of restudying if learners failed objectives	2.52	2.73	0.68
19. Conduct summative evaluations of student learning	2.61	2.83	0.66

Note. CAI scale (average of 19 CAI items) was *M* (Magnet) = 2.90, *M* (non-Magnet) = 2.91, *t* = 0.01. CAI = computer-assisted instruction, Mag = Magnet hospital, Non = non-Magnet hospital.

As seen in Table 5, the Magnet hospitals had the higher mean in 12 of the 20 CAI questionnaire items, and non-Magnet hospitals had a higher mean in the remaining cases. Most of the mean differences in the table were small in magnitude (i.e., the means differed by less than one-fifth of a standard deviation; Cohen, 1988), and none of the *t* tests produced significant differences. Collectively, these results indicated that there is no difference between Magnet and non-Magnet hospitals with respect to technology adoption. As such, the results in Table 5 are inconsistent with Hypothesis 3.

Table 6 displays the means of the TECH items for Magnet and non-Magnet hospitals as well as the value of the independent *t*-test statistic. As before, the value of the *t* test must exceed a value of -1.67 in order to be statistically significant for a one-tailed test at the .05 significance level. Again, a negative *t* value would result when the Magnet hospital mean is larger than that of the non-Magnet hospital, so positive *t* values are inconsistent with Hypothesis 3.

As seen in Table 6, Magnet hospitals had higher means on 14 of the 16 TECH-related outcomes. Consistent with the CAI results, the magnitude of the mean differences was generally consistent with what Cohen (1988) characterized as a small difference (i.e., the groups differed by approximately one-fifth of a standard deviation). The two hospital types were significantly different on only one of the technology-related questions in Table 6, the use of e-mail. As seen in Table 6, Magnet hospitals had a mean of 2.70, as compared to a mean of 2.13 for non-Magnet hospitals. The independent *t*-test was statistically significant, $t(61) = -1.80$, $p = .02$, meaning that the mean difference of .57 was unlikely to occur due to sampling error or random chance. Because the Magnet hospitals had the higher mean, this particular test was consistent with the predictions from Hypothesis 3. However, this was the only test that supported the hypothesis.

Table 6

Comparison of Magnet and Non-Magnet Hospitals on TECH Questionnaire Items

	Magnet	Non-Magnet	
Questionnaire item	*M*	*M*	*t*
Simulations	2.94	2.83	-0.46
Tutorials	2.91	2.63	-0.99
Virtual reality	1.83	1.73	-0.39
Drill and practice	2.96	2.75	-0.70
Games	2.83	2.43	-1.48
E-mail	2.70	2.13	-1.80
Overhead projector	2.13	2.33	0.70
Slide projector	1.83	1.53	-1.28
Internet	3.22	2.85	-1.36
Large-screen video data display	3.30	2.98	-1.19
Instructor computer workstation	3.48	3.10	-1.42
Learner computer workstation	3.57	3.18	-1.54
DVD video	3.39	3.35	-0.23
Video cassette	2.43	2.60	0.57
CD-ROM	3.17	2.98	-0.78

Note. TECH scale (average of 15 TECH items) was *M* (Magnet) = 2.85, *M* (non-Magnet) = 2.62, *t* = -1.63. TECH = technology.

Chapter 5: Discussion

Overview of Applied Dissertation

This study surveyed the nursing orientation programs at 151 health-care facilities throughout the United States. The purpose was to determine if the increased use of instructional technology integration strategies in nursing orientation had a positive impact on nurse retention. The survey results of Magnet and non-Magnet hospitals were compared to see if there were any significant differences. This chapter reports on the results of the study in regard to each research question, limitations of the study, and recommendations for further research.

Implications of Findings

The survey instrument revealed a number of different aspects of technology that were used with high frequency, and a number of tools that were used relatively infrequently. Hospitals appeared to make instructional technology CAI training completion a mandatory requirement, and this question produced the highest average rating ($M = 3.49$). High importance was also placed on providing learners with adequate instructional technology CAI technical support. The survey also revealed a number of technology-related activities that were used relatively infrequently such as small groups and pretests.

The survey instrument also examined specific technologies that were implemented in nursing orientation programs. The technologies that were used most frequently included instructor and learner computer workstations ($M = 3.24$ and 3.32, respectively), DVDs and CD-ROM ($M = 3.37$ and 3.05, respectively), and large-screen video data displays ($M = 3.10$). A number of other technologies were used relatively infrequently (e.g., tutorials, games, e-mail, overhead projectors, video cassettes) and had

average ratings that ranged between approximately 2.25 and 2.75. Finally, virtual reality and slide projectors were given very low ratings (M = 1.76 and 1.63), which indicates that these technologies were rarely, if ever, used.

Research Question 1. What is the relationship between the use of instructional technologies in the nursing orientation program and the rate of retention for new nurses? This research question was addressed by running correlations between the survey questions and nursing retention rates. Positive correlations were hypothesized such that higher retention rates would be expected for hospitals that used technology. As seen in Tables 3 and 4, the correlations were generally in the positive direction, which is consistent with Hypothesis 1. However, the magnitude of the correlations was generally low, which likely resulted in low power. As such, only four of the correlations were found to be significant. Two questions that addressed the use of technology support for learners were significantly and positively correlated with retention rates (r = .34 and .36), as were the correlations between retention and the use of e-mail and tutorials (r = .31 and .25, respectively). The positive correlations indicated that higher implementation of technology support was associated with higher retention rates and more frequent use of e-mail and tutorials were also associated with higher retention rates.

Research Question 2. What is the difference in the rate of retention of new nurses in Magnet and non-Magnet hospitals? This question was addressed using an independent samples t test to compare Magnet and non-Magnet hospitals on their respective retention rates. Prior to the study, it was hypothesized that Magnet hospitals would have higher retention rates. The average retention rate for Magnet hospitals was M = 89.27, and the mean retention rate for non-Magnet hospitals was M = 87.64. The mean difference was consistent with Hypothesis 2 (Magnet hospitals were higher), but the t-test results

indicated that this difference was not significant and could have occurred simply due to chance.

Research Question 3. What is the difference in the use of instructional technology integration strategies in nursing orientation programs at Magnet and non-Magnet hospitals? This research question was addressed by using an independent samples *t* test to compare Magnet and non-Magnet hospitals on the survey questions that addressed technology implementation. The hypothesis for this question stated that Magnet hospitals would have higher rates of technology use in their training programs. The results of these comparisons were somewhat variable. For example, Magnet hospitals reported higher averages on some survey questions, and non-Magnet hospitals reported higher responses on other questions. In general, the pattern of results could not support the hypothesis that Magnet hospitals had higher rates of technology implementation (see Tables 5 and 6). There was only one question that produced a significant difference in the hypothesized direction: the use of e-mail. Magnet hospitals had a mean of $M = 2.70$ on a 4-point scale, as compared to a mean of $M = 2.13$ for non-Magnet hospitals (higher scores reflected more frequent use). This mean difference was significant, meaning that the difference was unlikely to have occurred simply due to chance. Again, this was the only *t* test that supported the third hypothesis.

Integrating the Current Study With Previous Studies

Research Question 1. What is the relationship between the use of instructional technologies in the nursing orientation program and the rate of retention for new nurses? This study found that the use of instructional technology, technology support, the use of e-mail, and tutorials were important correlates. As stated in the literature review, there has not been much research on nursing orientation, particularly on the initial orientation

that the new nurse employee receives prior to orienting on the assigned unit. No other studies could be found that looked at the effects of instructional technology integration strategies in nursing orientation on new nurse retention. Studies that dealt with nurse retention revealed inconsistencies in the literature surrounding both its definition and measurement (Cavanagh, 1989). Nurses have been known to leave their positions because of personal and professional reasons (Fottler et al., 1995); dissatisfaction with pay, working conditions, and promotional opportunities (Cotton & Tuttle, 1986; Fottler et al.); and lack of job satisfaction (Duke, 2000; Lu et al., 2005).

Researchers who have examined nursing orientation found a direct correlation between nursing orientation and nurse retention (Meyer & Meyer, 2000), found no significant difference in retention based on completing orientation classes or not (McKee, 1994), and found retention rates improved when the design and content of the nursing orientation programs were strengthened (Marcum & West, 2004). Lott (2006) addressed the format and content of nursing orientation and found that redesigning a nursing services orientation program resulted in increased employee satisfaction and a subsequent increase in the hospital's nurse retention rate. Smith (2005) advocated the use of Web-based learning as a way to provide just-in-time ongoing orientation to experienced temporary and per diem nurses. None of these studies looked at educational technologies as a method for delivering the instruction during traditional nursing orientation programs offered to new hospital orientees. Therefore, other fields were examined where instructional technology is used for learning.

Brill and Galloway (2007) found that at their study's state university site, instructors currently used six technologies listed in order from most to least used: the overhead projector, the VCR, a slide projector, the Internet, a large-screen video data

display, and an instructor computer workstation. The study also found that the instructors wanted to use the following technologies in order of interest: the Internet, a CD-ROM, an instructor workstation, a video disc player, a large-screen video data display, DVD video, and student computer workstations. The study also showed that e-mail was used as a technology to enhance instructor-student interaction. In regard to the six technologies utilized in Brill and Galloway's study, this applied dissertation study found that the technologies used most often in nursing orientation included instructor and learner computer workstations, DVD videos, CD-ROMS, and large-screen video data displays. Overhead projectors and VCRs were used infrequently, and slide projectors were rarely used. E-mail use in Magnet hospitals was also significant as in Brill and Galloway's study.

Most of the research has been focused on the use of instructional technology in academic nursing programs. Schaefer (2006) reported that there has been a trend toward the increased use of CAI over the past 30 years in academic nursing education. Schaefer developed the Integration of CAI Questionnaire as an on-line electronic survey to investigate the strategies that academic nurse educators used to integrate CAI designed to teach clinical decision making into their courses. Schaefer wanted to learn how effective participants perceived the strategies were for increasing student learning and decreasing course costs, students' time, and the teachers' time. The researcher compared the responses of educators at three different types of nursing schools: diploma schools, associate's degree programs, and bachelor's degree programs. Schaefer found that in the academic settings, significant correlations were found for the following integration strategies: explaining CAI, explaining objectives, motivation, integration, individual mode, course exam, and follow-up. Technical and instructional support were the two

most frequently used and deemed effective for decreasing students' and teachers' time but not costs. This applied dissertation study differed from Schaefer's in that the purpose of the survey was to learn which of the integration strategies were used in nursing orientation programs in Magnet and non-Magnet hospitals and if there was any effect on nursing retention with their use.

Research Question 2. What is the difference in the rate of retention of new nurses in Magnet and non-Magnet hospitals? In the 1980s, the nurse retention rate for professional nurses was 91% in Magnet hospitals and 82% in non-Magnet hospitals (Kramer, 1990). Subsequent research also showed that Magnet hospitals had a higher nurse retention rate than non-Magnet hospitals (Kramer & Schmalenberg, 2004; Scott et al., 1999; Upenieks, 2003). This applied dissertation study did not show a significant difference in the rate of retention of nurses between Magnet and non-Magnet hospitals, but this may have been caused by the homogeneousness of the survey participants, who all worked at hospitals on best hospital lists.

Research Question 3. What is the difference in the use of instructional technology integration strategies in nursing orientation programs at Magnet and non-Magnet hospitals? Magnet hospitals reported higher averages on some survey questions and non-Magnet hospitals reported higher responses on other questions in the Instructional Technology Integration Strategy section of the survey; therefore the pattern of results did not show that Magnet hospitals had higher rates of technology implementation. The only significant difference was in the use of e-mail, with Magnet hospitals using this tool significantly more frequently.

Halfer (2007) reported on a revised 1-year orientation program for new nurses in a pediatric Magnet hospital in Chicago. The orientation program included classroom

learning, mentoring, precepting, clinical exchanges, and Web-based pediatrics courses. The mentoring program included mentors who did not work on the same unit as the new nurses as a means to ensure objectivity. Some of these relationships did not succeed because the mentor and mentee could not find a convenient time to meet (Halfer). Perhaps the use of e-mail would have been one way to use technology to grow the mentor relationship.

Limitations of the Study

A number of limitations need to be noted when interpreting this study's results. The limitations include possible low reliability of the measuring instruments, the restriction of the research study to the sample of 151 hospitals that were taken from four best hospital lists, and the low response rate to the nursing survey.

The literature revealed that no single response rate is considered standard (Educational Benchmarking Administrator, 2005). Leedy and Ormrod (2001) stated that the average response rate is 50% or less, and that 70% is quite high. Creswell (2005) reported that many survey studies in leading educational journals report a response rate of 50% or better (p. 367). Salant and Dillman (1994) stated, "depending on who is surveyed and what method is used, anything under 60-70 percent should be a red flag" (p. 22). As this study's response rate was 41.7%, it is considered a low response rate.

The fact that each of the hospital participants was a member of one of four best hospital lists, *The U.S. News and World Report of Best Hospitals 2006, The AARP Top Hospitals Chart* (2003), *HealthGrades America's 50 Best Hospitals Report* (2007), and *Leapfrog Top Hospitals 2006,* could mean that they may have been more homogeneous than participants chosen through a random sampling of all American hospitals.

There was a relatively low response rate to the nursing survey. Of the 151 surveys

that were sent out, 63 surveys (41.7%) were returned with usable data. There are two concerns with the low response rate. First, it is possible that the hospitals that failed to respond were systematically different from the hospitals that did return surveys. Response bias occurs when the survey responses do not accurately reflect the views of the sample and the population (Creswell, 2005). For example, it could be the case that the hospitals that failed to respond had lower nurse retention rates or used technology to a greater or lesser extent than the responding hospitals.

All that was known about the nonresponding hospitals was their address and main phone number and whether or not they were Magnet hospitals at the time the surveys were mailed and returned. The participating hospitals were checked for Magnet status initially when the best hospital list was compiled and also when the surveys were returned. It was necessary to recheck Magnet status at the time of survey return because more hospitals were given Magnet designation by the credentialing agency during that time and to verify that none of the initial Magnet hospitals had lost their designation during the study period. Surveys were returned for 23 out of 49 these Magnet hospitals (47%) compared with 40 surveys (39%) returned from the total of 102 non-Magnet hospitals. In other words, surveys were not returned for 26 Magnet hospitals and 62 were not returned for non-Magnet hospitals. Geographically, the list of best hospitals, which included the survey participants, had hospitals located in Alabama, Arizona, California, Colorado, Connecticut, Delaware, Florida, Georgia, Illinois, Indianapolis, Iowa, Kentucky, Maine, Maryland, Massachusetts, Michigan, Minnesota, Missouri, Nebraska, New Jersey, New York, North Carolina, Ohio, Oregon, Pennsylvania, Rhode Island, Tennessee, Texas, Utah, Virginia, Washington, Washington DC, and Wisconsin.

The possibility that the responding hospitals were not representative of the

general population is not the only problem with a low response rate. The magnitude of the relationships observed in this study were generally consistent with what is considered to be a small effect size (Cohen, 1988). Effect size is a statistic that is calculated in order to determine the practical significance of the results yielded by experimental methods. An effect size can be used to determine if participants in one group show superior performance compared to a comparison group that receives no treatment (Gall, Gall, & Borg, 2005). Effect size measures the strength of the difference between two means or variables (Creswell, 2005). In situations where the relationships among variables are relatively small, much larger sample sizes are needed to detect significant effects. Therefore, the statistical tests used in this study likely suffered from low power. For example, approximately 153 subjects would be needed to have a power of 80% to detect a correlation of $r = .20$ (a value that is relatively representative of the correlations in the tables). Similarly, approximately 270 subjects would be required to have 80% power with a *t* test and a small effect size (e.g., a mean difference of .30 standard deviations, which again was relatively typical).

In summary, the low response rate could have greatly contributed to the lack of significant findings in this study, and the intended sample size of 151 would have provided high levels of power. Extensive efforts were made to increase the response rate using follow-up contacts, but these efforts did little to improve the situation.

The questionnaire that was used in this study was pilot tested by members of the target population and was subjected to external review by experts in the field of technology. However, it appeared that the final survey may have contained acronyms or terminology that was somewhat vague or unfamiliar to study respondents. For example, nursing orientation presenters in the pilot study felt that *CAI* was a more universally

understood term than *instructional technology.* Feedback from the survey participants uncovered confusion with the term *CAI* after *instructional technology* in Part II of the survey instrument. In the original questionnaire developed by Schaefer, Schaefer used the term *CAI.* One of the survey participants stated that "it would have been helpful to put Part III [which contained examples of instructional technology] ahead of Part II in the survey." Two e-mail messages were received that requested clarification of "instructional technology." The cover letter with the second mailing (see Appendix C) was an attempt to clear up the confusion by explaining that the term *instructional technology* included educational technologies other than CAI, which was just one example.

Another problem was the lack of definitions in the final survey instrument. Originally, the survey did include a list of definitions of terms, as in Schaefer's original questionnaire. When adapting the survey instrument to fit Zoomerang's electronic format, the definition of terms was dropped because the format did not allow them to be included. Unfortunately, when the decision was made to go to a paper format and mailing of the survey, the definition of terms section was left out. It is strongly recommended that future use of this survey instrument place the section entitled "Part III, Use of Instructional Technologies" ahead of "Part II, Instructional Technology (CAI) Integration Strategies," and that a definition of terms section be included. Another recommendation is to replace Question 4 in the demographics section, "What is your age?," with an age-range format such as in Schaefer's original survey. The nurse educators who were in the pilot test did not state any objection to being asked their age, although 6 of the survey participants left this question blank. This question had no relevance to the study and should have been omitted. In addition, Schaefer's survey did not include "Part III, Use of Specific Instructional Technologies." In the future this section could be removed from the survey

and sent as a separate survey.

In addition, it was noted that it took almost 2-3 weeks in most cases for the survey to be delivered to the contact person. When the surveys were received by the hospitals, they were delivered to the hospital's mail room where the mail is sorted and then hand-delivered to the various departments. This was a very time-consuming process. It increased the time it took to get the surveys to the participants and for the surveys to be mailed back once they were picked up by the mailroom personnel. Normally, 6 weeks is given for a survey to be mailed and returned, a second mailing, and perhaps a reminder postcard to be sent. Each of these three stages usually takes 2 weeks each, for a total of 6 weeks (Creswell, 2005). In this study, the first mailing of surveys went out on September 15 and the second on October 10, and the last survey was received in the mail on December 29, after the study had been concluded.

Generalizability is always a concern with studies such as this and should be taken into account when interpreting the results. The generalizability concerns related to response rates were addressed above. However, it is also the case that the sampling frame that was used to select hospitals for inclusion in this study produced a sample that was not fully representative of the larger population of hospitals in the United States. The sample of hospitals included in the study was derived from four lists of best hospitals in the United States. This inclusion criterion would make the hospitals more homogenous just for the fact that they have been judged superior by the listing organization. Although different criteria were used by each of the agencies, *U.S. News and World Report,* the AARP, Leapfrog, and HealthGrades, each of the organizations used criteria resulting in a list of hospitals that stood out from the other hospitals in the United States. The resulting list of 151 hospitals separated these hospitals from the remaining 6,200 hospitals in the

United States.

Finally, this study used a correlational (i.e., observational) design. The hallmark of an observational study is that there is no intervention administered (no treatment and control group); instead, data are collected in a naturalistic environment with no experimental manipulation. Correlational research shows an association between two or more variables; it does not prove a relationship (Creswell, 2005). It is inappropriate to establish causal statements with observational studies, and this needs to be taken into account when interpreting the results of the study. For example, in the few cases where technology was found to be related to nurse retention rate, it is incorrect to say that the use of technology was the factor that led to the higher retention rates.

Recommendations

There are several recommendations for further study:

1. Find a way to get the correct contact information for those responsible for conducting nursing orientation.

2. Use random sampling of hospitals.

3. Conduct separate research studies for the retention effects of nursing orientation on new nurses and experienced nurses.

4. Examine the use of PDAs or other hand-held technologies used in nursing orientation.

5. Inspect the role of motivation and engagement in the successful completion of orientation and the retention of employees.

The most difficult part of this study was in learning the contact information of those responsible for conducting nursing orientation and then distributing the study materials (cover letter, informed consent document, survey, and return self-addressed

stamped envelope) to them. In the future, it may be advantageous to work with several health-care corporations in order to have access to a larger number of participants. It may be possible to work with 2 or 3 corporations. Since health-care corporations may have a listserv of all nurse educators in their organization, such as Trinity Health in Michigan, future research may be done within a corporation that encompasses many hospitals across the United States. It would be helpful for corporate educators and administrators to know what is being practiced in nursing orientation programs in their facilities and how this affects nurse retention. However, corporate hospitals may be even more homogeneous than the sample used in this study.

In 1998, The Informatics Task force of the National Nursing Staff Development Organization sent out surveys to its then approximately 3,000 members in order to solicit information about computer use in staff development (McDaniel, Maitlin, Elmer, Paul, & Monastiere, 1998). This organization included the surveys, designed to be folded into a self-addressed return envelope, with the organization's bimonthly newsletter, *Trendlines*. Perhaps this task force or a similar one would be interested in conducting a survey to learn the current state of the use of instructional technology integration strategies in nursing orientation or other topics suggested by this research. The National Nursing Staff Development Organization now has over 6,000 members and contact information including e-mail addresses.

It would be a better research study to randomly choose hospitals for a study in order to increase the sample size and also to eliminate the bias caused by only including hospitals that have made a best hospital list. The challenge is to find a list of the over 6,200 American hospitals containing their contact information. Unless one is working with a grant or other monies for this purpose, this would be a very expensive and

time-consuming undertaking. This most likely would need to be done with employer approval in order to have access to the contact list supplied by a health-care organization such as the American Hospital Association. The American Hospital Association's 2008 edition hospital mailing list is available online for $665.00. This mailing list contains the contact information of chief hospital executives for 6,283 American hospitals. Perhaps by contacting the chief executives it would be possible to obtain the contact information for the personnel responsible for providing nursing orientation at their institutions.

It would have been ideal to have been able to use an electronic survey sent through a third party such as Zoomerang. This would have helped to ensure anonymity. With Web-based surveys, automatic reminders are sent to potential participants. It would definitely have cut down on the time it took for surveys to reach the participants and for them to be returned. Unfortunately this study showed how difficult it is to learn the correct contact information, including workplace e-mail addresses of potential survey participants. Many participants stated that an e-mail message to them would not pass through their institution's SPAM filters. Ways to overcome this obstacle could be studied. Initially, it was thought that the nursing education director at each site would be the correct contact person. It was learned that not all hospitals have a person in this position or have a department dedicated to nursing education. Perhaps sending the initial contact letter to the chief nursing officer or chief executive officer of the hospital would have resulted in the surveys getting to the appropriate person at each site.

Research showed that the turnover rate for new nurses is higher than for experienced nurses. Poor training is one of the main reasons new nurses give for leaving during their first year (Patrick, 2000). It was found that between 35% and 60% of new nursing graduates quit their first hospital position during their first year and account for

more than 50% of total nurse turnover in some hospitals (Newhouse et al., 2007). More research should be done with the design and implementation of nursing orientation for new nurses. Because of the increased use of instructional technology in the delivery of academic nursing programs, it is expected that new nurses would be more familiar with and comfortable with the use of technology in their orientation programs. More research involving the effectiveness of educational technologies used during nursing orientation and the resulting effect on nurse retention is needed.

Another recommendation for future research would be to look at the impact that handheld technology, particularly personal digital assistants (PDAs), has on nursing education. Gabrielle (2005) studied the impact that technology-mediated instructional strategies had on motivation, performance, and self-directed learning in a public military school in Florida. She found that students who used these strategies had a higher level of academic performance and that new technology such as the PDA can effectively be used to deliver learning. A project conducted between 2004 and 2005 to loan PDAs to nurse refresher students resulted in a positive outcome of helping nurses who had been out of the field for more than 5 years to become comfortable with current technology. The medical librarian worked with the nurse education department to order the PDAs and select the software to be installed. This project resulted in the nurse refresher students being more comfortable with technology and using the medical library (Colevins, Bond, & Clark, 2006). Future research in the use of PDAs in the clinical setting would be advantageous.

Studying the motivation of new nurses to learn during the orientation process would also be beneficial to the nursing profession and their health-care organizations. There are instruments to measure motivation in learning. These instruments, such as

Keller's Course Interest Survey and Instructional Materials Motivation Survey, are best used when applied to specific content. They could be used during nursing orientation to compare the motivation of new nurses to learn the material if the nurses or orientation classes were divided so that there would be control and experimental groups. The experimental group could be given a technology-rich orientation program. A study could be done to see if there is a correlation between the retention of new nurses and their level of learner motivation during their initial hospital-based orientation.

A broader look at employee motivation is found in the new reemphasis on employee engagement. Ketter (2008) explained that *engagement* is the new term for motivation, passion, and commitment. Employers are looking at engagement as it affects all aspects in the organization, including how engagement matters to the learning function (Paradise, 2008). The 2007 ASTD Employee Engagement Survey found that the quality of training and learning opportunities was rated greater by more highly engaged employees than more disengaged employees (Paradise). Learner motivation and engagement continue to be important concerns in the workplace and represent topics for further research.

There are still research questions that need to be answered that were not addressed by this study. Currently there is little research into what instructional technologies are being used in hospitals, either Magnet or non-Magnet, during nursing orientation. There is mention of computerized modules used for yearly staff development and one article recommends the use of "e-orientation" for experienced and per diem nurses. Although several studies have been conducted to ascertain what instructional technologies are being used in nursing education programs in colleges and universities, little attention has been focused on nursing orientation in the clinical setting. Current research on nursing

orientation has focused on unit orientation, the role of preceptors, and internships, but there is a lack of research on initial new nurse orientation which is conducted monthly or twice monthly in most hospitals. It is recommended that this initial orientation be given a closer look by health-care facilities in order to cut down on their expenses related to high nursing turnover and patient care issues caused by inadequately trained staff. There is a need for more research to be undertaken to develop separate orientation programs for experienced nurses and new graduates.

Another suggestion would be to do a treatment instead of sending a survey. Perhaps two or more sites could be compared using a technology-rich orientation as the treatment and having a control group of the usual orientation. Orientations are usually delivered twice a month. Perhaps the first one could be traditionally delivered and the second one could be technology-rich. Three months of data could be statistically analyzed, and the retention of the new nurses could be compared after a set period such as one year.

Summary

If this study were to be repeated, certain changes could increase the significance of its findings. The most important improvement would be to find an effective way to access the contact information of the intended participants, those who are responsible for nursing orientation. Contact information would include names, phone numbers, e-mail addresses, and mailing addresses. It may be helpful to send e-mail or mailed prenotification letters. The survey instrument could be reworked to include a definition of terms list. The content in Part III, Use of Specific Instructional Technologies, could be switched with Part II, Instructional Technology (CAI) Integration Strategies, for ease of understanding. Age ranges in the demographic sections could be substituted for asking

participants their ages. Ideally, the survey could be sent electronically through a nursing organization or a commercial electronic survey company like Zoomerang.

In summary, this study investigated the use of instructional technology in nursing orientation programs and examined specific factors that were related to nurse retention rates and differences between Magnet and non-Magnet hospitals. Correlation analyses indicated that hospitals with higher use of technology generally had higher retention rates, although the magnitude of these correlations was relatively small (correlations ranged between .10 and .20). Technology support, e-mail, and the use of tutorials were significantly associated with high retention of new nurses. The comparison of Magnet and non-Magnet hospitals produced results that were more ambiguous. Magnet hospitals had slightly higher retention rates than non-Magnet hospitals, but this difference was not significant. Magnet hospitals generally did not differ from non-Magnet hospitals on technology implementation, and the use of e-mail was the only factor that differentiated these two types of hospitals (Magnet hospitals reported higher use of e-mail in their nursing orientation programs). It is important to remember that all hospitals in this study were taken from one of four best hospitals lists. This fact alone or the low response rate may have skewed the study results. Future studies should attempt to further explore the associations between technology and nurse retention rates, especially the retention rate of new nurse graduates.

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Appendix A

Instructional Technology Integration Survey

Integration of Instructional Technology (Computer-Assisted Instruction) in Nursing Orientation Questionnaire

Part I: Your facility

1. What is your new nurse retention rate for the past fiscal year (July 1, 2006 – June 30, 2007)? _____

2. Does each new nurse have access to a computer during nursing orientation? Yes _____ or No _____? (Check one)

3. What percentage of your nursing orientation presenters use Instructional Technology (Computer-Assisted Instruction) to teach nursing orientation? _____

Part II: Instructional Technology (CAI) Integration Strategies
Check how often each strategy is used to teach nursing orientation. One box per strategy.

Instructional Technology (CAI) Integration Strategy	**Very Often**	**Occasionally**	**Rarely**	**Never**
1. Pretest learners to assess that they are adequately prepared to learn the CAI				
2. Explain the objectives of the CAI to learners beforehand				
3. Explain how to use the CAI to learners beforehand				
4. Motivate learners by explaining the values of learning the CAI content				
5. Illustrate the relationships between topics in order to integrate the CAI topic with the rest of the orientation program				
6. Assign the CAI as self-paced, individualized learning experiences				
7. Use CAI for small-group learning activities				
8. Use CAI in the classroom as part of a whole-class learning activity				
9. Ensure technical support is available for CAI learners who need it				
10. Ensure instructional support is available for CAI learners who need it				
11. Conduct post-CAI instruction discussion or critiques as reinforcement and to correct misunderstandings				

12. Use follow-up activities to ensure students use what they learned in the CAI				
13. Make completion of the CAI part of the orientation requirements				
14. Assign the CAI as an optional learning experience				
15. Include the content or skills learned from the CAI on the orientation exams				
16. Include scores earned on tests embedded in the CAI as part of the orientation grade				
17. Use the CAI in place of some other method of teaching the content				
18. Provide alternative methods of restudying if results of tests indicate learners failed to meet CAI objectives				
19. Conduct summative evaluations of student learning to test the effectiveness of the CAI in meeting orientation objectives				

Part III: Use of Specific Instructional Technologies

How often did presenters in your nursing orientation program use the following specific instructional technology to deliver content? Check only one for each.

Instructional Technology	Very Often	Occasionally	Rarely	Never
1. Simulations				
2. Tutorials				
3. Virtual Reality				
4. Drill and Practice				
5. Games				
6. E-mail				
7. Overhead Projector				
8. Slide Projector				
9. Internet				
10. Large Screen Video Data Display				
11. Instructor Computer Workstation				
12. Learner Computer Workstation				
13. DVD Video				
14. Video Cassette				
15. CD-ROM				

Part IV: Types of Programs
How often were the following types of programs used to deliver the Instructional Technology (Computer-Assisted Instruction) in your nursing orientation program?

Program Type	Very Often	Occasionally	Rarely	Never
1. Commercially Purchased				
2. Customized Produced On-site				
3. Teacher-authored				

Part V: Demographics
1. What is your role at your health-care organization?

Role	Check One
1. Nursing Education/Staff Development Director	
2. Nursing Education Instructor	
3. Presenter from another department	
4. Computer lab employee	
5. Other, please specify: _____	

2. What is your job title?

Job Title	Check One
1. Nurse	
2. Other Health-Care Provider	
3. Computer/Media Specialist	
4. Other, please specify: _____	

3. What is your gender?

Gender	Check One
Female	
Male	

4. What is your age? _____

5. What is your educational background?

Educational Background	Check all that apply
Bachelor of Science in Nursing	
Bachelor's degree in another field	
Master of Science in Nursing	

Master's degree in another field	
Doctorate in Nursing	
Doctorate in another field	
Other, please specify: _____	

Part VI: Optional comments about this study or your participation.

Thank you for completing this survey!

Appendix B

Survey Cover Letter

September 15, 2007

Dear Nursing Education Director,

I am a graduate student at Nova Southeastern University working on an EdD in Instructional Technology and Distance Education.

My research study relates to instructional technology usage by nurse educators in hospital nursing orientation programs. Enclosed is a three page survey that should take about 5-10 minutes to complete. In addition, this mailing contains my university's IRB approval/ participation letter. I realize that your time is valuable and I appreciate your participation in this research study.

The survey is confidential and anonymous. Please do not put any identifiable data on the survey. Should you decide not to participate, please return the blank survey in the enclosed envelope. A stamped, addressed envelope is enclosed for your convenience. My goal is to have the surveys mailed back to me by September 21st (or soon thereafter).

If someone else in your organization would be better able to answer the survey questions regarding the use of instructional technology in the delivery of nursing orientation at your health-care facility, please forward this survey package to that person.

Thank you for your assistance.

Sincerely,

Sharon D. Hancharik, RN, Med
Primary Investigator/Doctoral Candidate
Nova Southeastern University
Fischler School of Education and Human Services

Appendix C

Second Mailing Survey Cover Letter

October 10, 2007

Dear Nursing Orientation Educator,

"Staff development starts with orientation and (is) considered a strong influence on retention."—Margaret L. McClure and Ada Sue Hinshaw, 2002

I am a graduate student at Nova Southeastern University, working on an EdD in Instructional Technology and Distance Education. It would be a tremendous help if you or someone at your site would complete the enclosed survey and return it to me.

My research study relates to instructional technology usage by educators in a hospital nursing orientation programs. Enclosed is a three page confidential and anonymous survey that should take about 5-10 minutes to complete. In addition, this mailing contains my university's IRB approval/participation letter and a SASE. Your health-care organization was selected because it is included on a "Best Hospitals" list. Your site's participation is essential in order to have ample surveys so that my research results are worthwhile.

Survey completer: In Part II regarding "Instructional Technology (CAI) Integration Strategies," it would have been clearer if I did not include "CAI" since computer-assisted instruction is only one form of instructional technology. Some examples of instructional technologies are listed in Part III of the survey: videos, DVDs, CD-ROMs. Any technology used for instruction such as PowerPoint presentations would be included. The list in the survey contains some examples only. There are many more. Please keep this in mind when completing Part II of the survey.

In order for me to have good survey results, it is important that all questions be answered. If you have any questions regarding the survey or this research, please e-mail me at hanchari@nova.edu or call me at home at XXX-XXX-XXXX. I would be happy to hear from you.

Your generous response in the next two weeks would be splendid. If you prefer not to participate, please forward this survey package to any interested Nursing Orientation presenter in your organization.

Thank you for your assistance!

Sincerely,

Sharon D. Hancharik, RN, Med
Primary Investigator/Doctoral Candidate
Nova Southeastern University
Fischler School of Education and Human Services