FROM FACULTY DEVELOPMENT TO THE CLASSROOM: A QUALITATIVE STUDY OF HOW NURSE EDUCATORS TURN FACULTY DEVELOPMENT INTO ACTION

BY

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ABSTRACT

The purpose of this qualitative study was to better understand the transfer of learning by uncovering how various factors supported the integration of knowledge and skills gleaned from the Faculty Development: Integrated Technology into Nursing Education and Practice Initiative (ITNEP) programs into nursing education curricula. Through interviews with 20 participants from four ITNEP programs, this study confirmed the importance of learner characteristics, program design elements, and factors in the work environment for supporting successful transfer of learning and supports a variety of other transfer of learning research findings. New or seldom discussed supportive individual characteristics were found, including: leadership abilities, lifelong learning, ability to recognize limitations, persistence, creativity, and risk-taking. Study findings suggest that proactive personality may support transfer of learning. Participants maintained motivation from pre-training through post-training at a high enough level to successfully transfer learning. The importance of networking opportunities, a diversity of perspectives, post conference support, and teams in programs designs were found to positively influence transfer and were discussed in relation to social influence. The variety of supportive factors in the participants' work environments, including strategic alignment, strengthens the assertions that transfer may be individually context dependent. Barriers to transfer efforts in the work environment were also addressed. Additionally, while patterns of specific characteristics emerged, interacting findings were found threaded throughout.

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"In the pursuit of knowledge, we recognize that none of us move ahead alone."

unknown

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CHAPTER ONE: INTRODUCTION

In today's era of exponential information growth, harnessing information for productive use has unlimited potential. Information technology (IT) is a tool that can facilitate information access, manipulation, and organization to generate new knowledge. Although the healthcare field has been slower than other industries to take advantage of the power of technology, provider investments are increasing (MedPAC, 2004). Peterson (2006) observed that it would be hard to locate a healthcare facility without IT.

As the largest group of healthcare providers in the United States, making up 55 percent of the healthcare workforce, practicing registered nurses spend more time with patients than other providers (Nurses, 2009). The rapid integration of IT into healthcare requires nurses with the necessary knowledge and skills to use the technology (Connors, 2010; McDowell & Ma, 2007). IT use can be described as the use of technologies from computing, electronics, and telecommunications to create, store, process, transfer, and distribute data and information (University of Washington, 2012). Developing IT competency is one of nursing's most pressing concerns (Connors, 2010; Fetter, Graduating, 2009). New nursing graduates are beginning their first nursing positions confronted with the challenge of demonstrating competence in health IT as well as nursing skill (Peterson, 2006). Healthcare institutions are demanding that education keep up with what McBride (2005) identified as a "revolutionary movement in health care." However, Fetter notes that "The nursing profession is missing critical opportunities to realize the full potential of health IT because the faculty lack the skill and the funding to advance health IT competency integration" (p.83, 2009).

The need to integrate health IT into nursing education has been apparent for some time, even before 2004 when Health and Human Services Secretary Thompson declared a "Decade of Health Information Technology" and President Bush mandated that every American would have

an electronic health record (EHR) by 2014. Previously published reports from the Institute of Medicine (IOM), *To err is human* (Kohn, Corrigan, & Donaldson, 2000) and *Crossing the quality chasm* (Committee, 2001) addressed serious quality and safety issues in health care and outlined an agenda for restructuring health care delivery. These two reports were followed by a third, *Health professions education: A bridge to quality* (Greiner & Knebel, 2003), which mandated education reform and called for all health professional education to address five core competencies: patient-centered care, interdisciplinary teamwork, evidence-based practice, quality improvement, and informatics, which is the use of information and technology to communicate, manage knowledge, mitigate error, and support decision making (Robert Woods Johnson Foundation, 2012). Because the delivery of quality healthcare depends on the integration of complex information from a variety of sources, health IT was identified as an essential tool for addressing these competencies and transforming health care. Since protocols and clinical evidence and knowledge about patient conditions are modified regularly, information changes continually. Health information technology, which is the application of computer hardware and software, can store, integrate, and update this information base to improve communication among providers and with patients, support clinical decisions, and promote quality and safety in healthcare (Office of the National Coordinator for Health Information Technology, 2011).

Subsequent to the IOM's reports, the Robert Woods Johnson Foundation (RWJ) funded the Quality and Safety in Nursing Education Project (QSEN) to promote the development and integration of innovative curriculum strategies to incorporate the IOM's competencies and safety in nursing education (Robert Woods Johnson Foundation, 2012). Numerous other workgroups within and outside of nursing have been created to advance the national healthcare IT agenda and support health profession education reform, including the Technology Informatics Guiding

Education Reform Initiative and the American Medical Informatics Association 10 x 10 program. In February 2009, as part of the American Recovery and Reinvestment Act, President Obama authorized the Health Information Technology for Economic and Clinical Health Act (HITECH). This bill provides $19 billion of funding for infrastructure and incentive payments for the adoption and use of health IT by health care providers.

Professional Development

Continuing professional development extends the education of professional practitioners throughout their careers and focuses on particular technical and professional skills and with changes in one's profession (p. 375, Queeny, 2000). It provides an avenue to enhance faculty knowledge and skill in the use of IT in order to expand the capacity of schools to prepare students for 21st century healthcare practice (Connors, 2010). However, the need for quality professional development programs has been documented in the Institute of Medicine's report: *Redesigning Continuing Education in the Health Professions* (Committee, 2009), which identified inconsistencies in healthcare professional development as significantly contributing to healthcare quality and patient safety issues. The report asserted that: "There are major flaws in the way continuing education is conducted, financed, regulated, and evaluated…The science underpinning continuing education is fragmented and underdeveloped" (pp. 2-3). The report calls for a comprehensive and well-integrated system of continuing professional development for health care professionals and a research agenda that advances the science of continuing professional development, including the identification of: theoretical frameworks, proven and innovative professional development methods and contexts, outcome measures, and influence on learning.

Continuing professional education to support the inherent complexities of teaching in today's world is especially critical in nursing where an aging nursing faculty has already produced a shortage of nursing educators (American Association of Colleges of Nursing, 2010) and an increased reliance on part-time faculty (Creech, 2008), who are often new to the teaching role (Forbes, Hickey, & White, 2010). Moreover, this shortage is projected to worsen with the expected wave of retirements over the next ten years (American Association of Colleges of Nursing). A recent report from the Robert Woods Johnson & Institute of Medicine (Committee, 2010), *The Future of Nursing: Leading Change, Advancing Health*, addresses the profound need to transform nursing education in order to increase the capacity of institutions to produce more nurses and develop a workforce with the skill set to practice in a significantly and perpetually changing health care environment. Faculty development programs in nursing are critical to develop new faculty into skilled educators and provide veteran faculty with opportunities to develop and strengthen skills, and initiate needed changes in nursing education as knowledge, technology, and healthcare evolve.

Despite ongoing attention and focus by the various government entities, Institute of Medicine, Robert Woods Johnson Foundation, National League for Nursing and others on the importance of restructuring health professional education to include IT, nursing education has been slow to respond. Nursing faculty have been cited as the largest barrier to greater IT use because they lack the knowledge and skills about new technologies and their potential (Committee, 2011). However, recent federal initiatives to coordinate efforts for the implementation and use of the most advanced health information technologies have included support for nursing faculty development for the use and integration of information and other technologies in nursing education. The Health Resource and Services Administration (HRSA)

has offered grant funding through the Faculty Development: Integrated Technology into Nursing Education and Practice Initiative (ITNEP) for nursing collaborative partnerships to establish innovative faculty development plans.

The purpose of ITNEP is to enhance nursing faculty knowledge and skills in the use of simulated learning, informatics, telehealth, and eLearning in order to integrate information and other technologies into nursing education and practice and prepare students for 21st century health care practice. Program awards of about $1,500,000 are made to multi-institution collaboratives over five years that have collective expertise in health information technologies. The design of each program varies but all are based on a 12-month format and participants in each program are from multiple institutions. The programs are required to include participation from a minimum of 30-50 nursing faculty per year and may draw from across one state, a region or nationwide. To date, nine institutions have been funded for this professional development initiative: Duke University and the University of Wisconsin-Madison in 2006, the Universities of Pittsburgh and Kansas in 2007, Drexel University and the University of Washington 2008, Vanderbilt University in 2009, and the University of South Florida and Hunter College of the City University of New York in 2010.

Statement of the Problem

Professional development programs for faculty provide an opportunity to prepare new faculty for the educator role, create sustained change in the skills and behaviors of participants, facilitate curriculum development, and encourage leadership, collaboration, and innovation. Faculty development has both narrow and broad connotations in that the overall purpose is to enhance individual faculty expertise to improve student learning (Aleste, 2000). The transfer of learning; the application of new knowledge into practice, is at the heart of effective faculty

development (Lawler & King, 2000). However, Merriam and Leahy (2005) note that: "The transfer of learning from the classroom to the workplace has challenged educators and trainers for decades (p.1)."

Significant organizational investments of money, time, and resources for employee training and development to increase efficiency, quality, and integrate changes in technology are made each year (Arthur et al., 2003). The American Society for Training and Development (2010) estimates that in 2009 US organizations spent nearly 126 billion dollars in employee learning and development. However, **r**esearch attempts to measure performance change as a result of training and development programs suggest that less that 20% of learning investments by organizations actually result in work performance change (Holton & Baldwin, 2003; Leimbach, 2010; Merriam & Leahy, 2005).

A substantial share of the training and development costs is attributable to continuing education for health care professionals. In 2009, more than 1.7 billion dollars was spent on continuing medical education (CME) alone (Accreditation Council for Continuing Medical Education, 2010). Despite these considerable investments, the research that examines successful application of learning to professional practice is limited (Doherty-Restrepo, Hughes, Del Rossi, & Pitney, 2009; Committee, 2009). Furthermore, the existing research provides mixed evidence of participant performance change. While Davis (1998) found a high percentage of published CME studies that indicated a change in physician behavior as a result of attending a program, Mansouri and Lockyer's meta-analysis of CME outcome literature (2007) found a small effect size between CME and change in physician performance. Griscti and Jocono's (2006) review of the nursing continuing education literature found few US empirical studies that showed how programs affect practice. Additionally, assessment methods used to measure continuing

education efforts are often focused on participant satisfaction and largely considered superficial assessments of program effectiveness (Chism & Szabo, 1997; Hines, 2007). Satisfaction does not necessarily correspond to learning (Carter, Prostko, Urbano, 2009; Ramalanjaona, 2003) let alone to the transfer of learning. In order to leverage investments and maximize professional development efforts to meet the need to prepare nurse educators to teach 21st century skills, a better understanding of how the transfer of learning is facilitated is required.

Research Questions

The broad aim of this study was to understand how the transfer of learning was facilitated for participants in faculty development programs pertaining to the use of health IT in nursing education. This study explored the experiences of ITNEP participants who had successfully integrated newly acquired program knowledge and skills into the curricula at their home institutions to investigate the larger phenomenon of learning transfer. An interpretive qualitative analysis of 20 participants from four faculty development programs with a common purpose articulated and compared participant experiences to address the need to identify effective professional development methods and contexts, participant characteristics best suited to particular programs, and aspects of work environments that positively influenced the transfer of learning. In this study, successful transfer of learning was defined as the application of knowledge and skills from the ITNEP programs into nursing education practice at participants' home institutions.

This study addressed the following research questions:

> From the perspective of participants, how did their respective ITNEP programs, individual characteristics, and work environments facilitate transfer of their learning? Specifically, from the participant's perspective, I am interested in how:

a. their ITNEP program facilitated the integration of health information technology or informatics into the curriculum at the participant's home institutions.
b. their individual characteristics facilitated the integration of health information technology or informatics into the curriculum at participant's home institutions.
c. their work environment facilitated the integration of health information technology or informatics into the curriculum at participant's home institutions.

Conceptual Framework

This study was grounded within the transfer of learning literature. An extensive body of literature addresses the transfer of learning, often referred to as the transfer of training. A plethora of research studies, reviews, and meta-analyses have examined transfer of learning and identified research gaps, and proposed new research approaches to better understand learning transfer (Aguinis and Kraiger, 2009; Alvarez, Salas, & Garofano, 2004; Barnett & Ceci, 2002; Blume, Ford, Baldwin, Huang, 2010; Brown, 2005; Burke & Hutchins, 2007; Cheng & Hampson, 2008; Clark, 2002; Colquitt, LePine, & Noe, 2000; Ford & Weissbein, 1997; Kontoghiorghes, 2001, 2002, 2004; Lim, & Morris, 2006; Merriam & Leahy, 2004; Scaduto , Lindsay, & Chiaburu, 2008; Velada, Caetano, Michel, Lyons, & Kavanagh, 2007). While there are some inconsistencies in the findings in the literature, there was support for qualitative investigations of transfer of learning, approaches that holistically examine all aspects of the training-transfer process, and research that examines transfer of learning after the transfer has occurred.

A foundational model (see Figure 1) for understanding the process of learning transfer, which was developed by Baldwin and Ford (1988), provided the conceptual framework for this study. Derived from their review of empirical studies on transfer issues from the organizational–training literature and the research referenced in that literature, they conceptualized a system of influences that affect transfer. Transfer was defined as "the degree to which trainees effectively apply the knowledge, skills, and attitudes gained in a training context to the job… and learned behavior must be generalized and maintained" (p.63). They identified three sets of input factors that influence transfer: trainee characteristics, including ability, personality, and motivation; training design, including principles of learning, sequencing, and appropriate content; and the work environment, including support (supervisory or peer) and opportunity to use new skills and knowledge. The influence of training design on transfer is mediated through learning and retention. Trainee characteristics and work environment influence transfer both directly and indirectly through learning and retention. Transfer requires generalization of new knowledge and skills to the job context and maintenance on the job over a period of time.

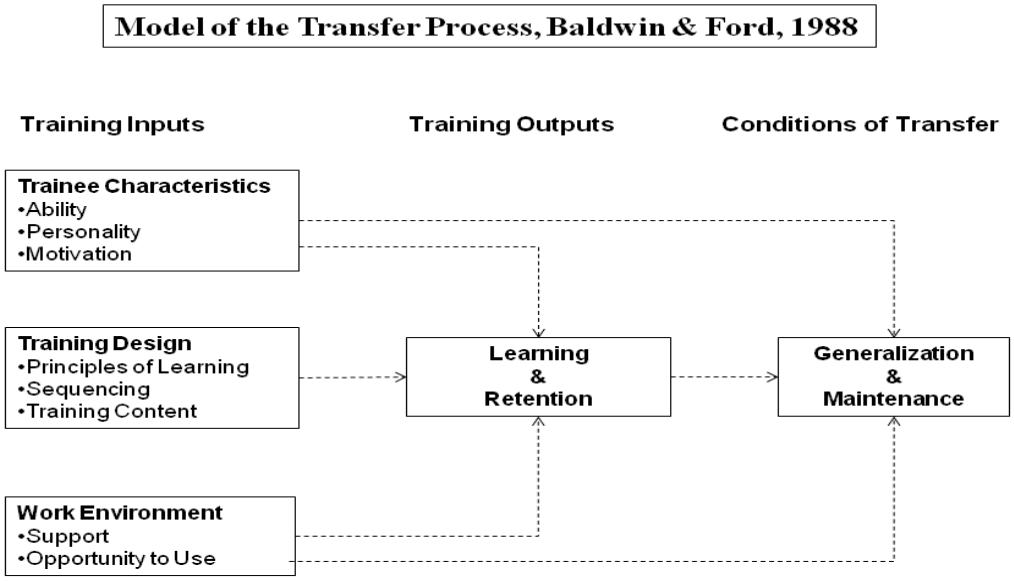

Figure 1

Study Description

This was an interpretive qualitative study that focused on the experiences of program participants from four ITNEP programs. Purposeful sampling was used. In order to maximize the probability of a participant sample that had adequate time to transfer program learning, the first six ITNEP programs that were funded were invited to join the study; Drexel and Duke Universities and the Universities of Kansas, Pittsburgh, Washington, and Wisconsin-Madison. Interviews with the ITNEP principal investigators participants (or designee with major program responsibility) and documentation (websites, program descriptions, grant applications) provided background information about each ITNEP program. Each ITNEP principal investigator that was interviewed was asked to identify successful program graduates who had successfully integrated program knowledge and skills into their home institution's curriculum as potential candidates for this study. Participation was sought from identified candidates. The primary data source was from interviews with ITNEP participants who completed the program and who demonstrated

transfer of learning through the successful integration of IT knowledge and skills into their home institution's curriculum.

This study was guided by the three long-standing categories that have been acknowledged as primary influences on the transfer of learning; characteristics of the program, the participant, and the work environment (Baldwin & Ford, 1988). This broad framework was used to examine the perspectives of ITNEP programs participants who had successfully transferred their learning in order to better understand the complexity and dynamic aspects of learning transfer. While Baldwin and Ford's model provides a basic taxonomy for the transfer system, the three categories have been customized by researchers to include an expansive list of dimensions within each factor (Burke & Hutchins, 2007; Ford & Weissbein, 1997; Merriam & Leahy, 2005). This study used an open approach to explore category dimensions. Since research on the individual factors of influence was inconsistent and fragmented by examination in isolation, a more holistic approach that examined learning transfer experiences from descriptions of participants was warranted (Merriam & Leahy). While many studies have been based on intention to transfer learning premature to the transfer itself, learning does not end with continuing education programs, but continues with the integration of newly acquired knowledge and skills into practice. Research that focuses on the factors that facilitated transfer of learning after the transfer has been accomplished and that examines the interaction of those factors from the participant viewpoint provides a unique perspective that adds to the understanding of learning transfer.

Significance of the Study

This study is important because examination of participant perspectives from four multi-institution faculty development programs with a common purpose serves as a foundation for

future transfer of learning and for professional development research. From a general scope, findings from this study help identify how program design elements contributed to the transfer of learning so that continuing education and training program developers can create more effective programs. This study helps identify how particular participant characteristics positively influence the transfer of learning so that program developers, funders, and employers can target the most appropriate audiences and maximize the selection of training cohorts. This study helps identify how elements in the work environment support the transfer of learning so that organizations can work to facilitate transfer and remove barriers. The majority of transfer of learning studies has focused on learning transfer at a single organization. This study sheds light on the common and unique facilitators of learning transfer at numerous higher education institutions for participants from the same or similar faculty development programs. And, considering the importance of technology integration in health professional education, this study provides particular evidence of the factors that support the transfer of technology knowledge for educators.

Transfer usually has been assessed on short, one time interventions and typically soon after the program, which does not address the generalization or maintenance of transfer outcomes (Blume, et al., 2010). This study examined transfer from the perspective of participants who had successfully completed longer term programs and demonstrated generalization and maintenance of their learning by the adaptive integration and continued use of IT in their educator roles. The majority of studies in the literature have examined transfer of learning from a quantitative perspective; consequently the richness of participants' perceptions has been overlooked. Furthermore, this study examined the experience of program participants to uncover the complexity of variable interactions that operate among the program, the participant, and the participants' work environment dimensions to support the transfer of learning.

More specifically, the investigation of individual, interpersonal, and organizational outcomes that the participants described as a result of learning from the ITNEP programs expanded our understanding of how learning gained from a faculty development program translated into meaningful nursing education practice. Continuing professional education programs are costly endeavors but are essential to prepare faculty to teach 21st century skills. However, they are only effective if participants transfer their learning to their practices. This research provides evidence of the enablers and barriers to transfer so that programs, audiences, and work environments can be modified to encourage successful transfer.

Definitions

For the purposes of this study, the following definitions were used:

Transfer of learning-the effective and continuing application of knowledge and skills gained through ITNEP program participation by the ITNEP participants to their education practice in their faculty roles

Successful transfer of learning-the integration of an information technology into their nursing education practice by the ITNEP participant at their home institution

Health Information Technology- technology used to create, transmit, store and manage individuals' health data

Nursing Informatics- "[A] specialty that integrates nursing science, computer science, and information science to manage and communicate data, information, knowledge, and wisdom in nursing practice. Nursing informatics supports consumers, patients, nurses, and other providers in their decision-making in all roles and settings. This support is accomplished through the use of information structures, information processes, and information technology" (American Nurses Association, 2008, p.1).

Program design-the degree to which the ITNEP program has been designed and delivered such that it provides participants the ability to transfer learning back to their faculty roles

Participant Characteristics-individual ability or skill, demographics, personality traits, motivational factors of ITNEP participants

Work environmental characteristics-aspects, features, or conditions in the ITNEP participants home institution

Generalization-the adaptation of skills and knowledge learned in the ITNEP program used to integrate a health information technology into education practice

Maintenance-the ongoing use of the integrated health information technology in education practice by the ITNEP participant

Chapter Summary and Guide for the Remaining Chapters

Chapter one introduced the phenomenon of transfer of learning as the focus of this study. The need to integrate health IT in professional nursing education and issues with professional development were explained as background information for this study and included a brief overview of the ITNEP programs. A statement of the problem was presented that provided the rationale for the study. This was followed by the research questions. Baldwin and Ford's (1988) model of the Transfer Process was identified as the framework for the study. The chapter concluded with a discussion of the significance of the study and definitions that were used.

This chapter is followed by four more chapters. Chapter two describes the relevant research in the literature review on transfer of learning, faculty development in nursing, and IT and informatics integration in nursing education. Chapter three outlines the methodology used in this study and includes descriptions of the study participants. Chapter four presents the results of

the study. Chapter five explains the conclusions drawn from study findings and how they fit within the relevant literature, and provides a discussion of the implications of the study.

CHAPTER TWO: LITERATURE REVIEW

This chapter provides a summary of the literature that was reviewed for this study. The chapter is arranged in three major sections. The first section reviews the relevant literature related to the focus of this study, transfer of learning. Because the topic is broad and has been studied extensively, this section begins with an overview of the transfer of learning research. The remainder of the section is organized around Baldwin and Ford's (1988) conceptual framework that was discussed in Chapter One and accordingly, is structured by research related to the program design, the participant, and work/organizational categories.

The next two major chapter sections are provided to lay a foundation for what is known about nursing faculty development and the integration of IT and informatics in nursing education. The second section addresses the recent research on faculty development for nursing educators. The third section describes the research on IT and informatics integration in nursing education. These sections are relevant to the study because a nursing faculty development program focused on information technology integration in nursing education provides the context for this investigation of learning transfer.

Transfer of Learning

Overview

Since the transfer of learning is an inherent goal of most educational efforts (Alexander & Murphy, 1999; Lawler & King, 2000; McKeough, Lupart, & Marini, 1995), research on transfer of learning has been implemented by a variety of fields and the subsequent literature related to this abstract phenomenon is vast (Burk & Hutchins, 2007). Scholars from an array of disciplines, including: psychology, human resource development, linguistics, education, and human computer interaction have produced a variety of definitions. However, generally, the transfer of

learning can be described as occurring when learning in one context impacts performance in another context (Perkins & Salomon, 1992). Put another way, transfer of learning is the ability to apply knowledge or skills from one domain into a different one (Marini & Genereux, 1995, Mestre, 2002).

Although the transfer of learning research can be traced at least as far back as the early 20th century when Thorndike and Woodworth investigated how student learning in one subject could influence learning in another area (Beach, 1999; Perkins & Salomon, 1992), a large portion of recent publications in the education literature relating to the transfer of learning is normative in nature. In fact, in their review of the research since 1990, Merriam and Leahy (2005) state that "learning transfer has been ignored or has been assumed to be implicit in the adult education and program planning literature" (p. 14). There is some research from the educational technology literature that provides a basis for understanding the effectiveness of technology tools in a learning environment. There is also a plethora of empirical research that comes from the human resource development and psychology literature and focuses on the transfer skills and knowledge from employee training to job performance.

Attempts to better understand and facilitate the transfer of training have resulted in an extensive array of theoretical models and conceptual frameworks (see for example: Baldwin & Ford, 1988; Broad & Newstrom, 1992; Caffarella, 2002; Holton, Bates, Ruona, 2000; Milheim, 1994; Ottoson, 1995; Yelon, 1992). Variables are depicted as having a direct, mediated, and both direct and mediated influence on transfer. Types of transfer, such as lateral and vertical, near and far, high and low road, and positive and negative transfer have been distinguished and studied as well as variables of influence. However, despite these efforts, there is disagreement regarding the

nature and mechanisms that support learning transfer (Barnett & Ceci, 2002; Blume, et al., 2010; Burke & Hutchins, 2007; Cheng & Hampson, 2008; Merriam & Leahy, 2005).

Loabato's (2006) summary of alternative perspectives on the transfer of learning research compares a number of approaches to understanding transfer and argues that the lack of accord stems from differences in how transfer of learning is conceptualized, defined, and measured. For example, in the classical approach transfer occurs to the extent that the learning environment and transfer environment share like elements, what will transfer is predetermined and measured by improved performance. In contrast, using ethnography to measure transfer, the actor-oriented approach examines activity to discern the influence from previous activity and considers how learning generalizes from one situation to another (Lobato, 2003). In the situative perspective, transfer is dependent on the extent to which participation in one activity affects one's capacity to participate in a different situation (Greeno, 1998). Finally, the consequential approach to transfer is understood as the continuity and transformation in knowledge, skills, and identity that occur as learners and social organizations recursively interact (Beach, 1999).

Few of the studies in this literature review describe a conceptual approach or provide the definition of transfer of learning that guided the research approach. Measurements of transfer vary. Some conclusions are drawn based on less than strong correlations. A majority of the research has assessed transfer immediately preceding training as a prediction or directly after training activities before the actual application of learning. Several meta-analyses and qualitative literature reviews that have attempted to integrate the burgeoning literature and address these issues are discussed below.

Three meta-analyses provide evidence of program, individual, and work environment characteristics that support transfer of learning. Arthur, Bennett, Edens, and Bell's (2003) meta-

analysis of the training literature from 1960 to 2000 estimated the effectiveness of training and examined the relationship between training evaluation effectiveness measures (reaction, learning, behavior, and results) and types of needs assessment used, training content characteristics and training program delivery match. Results of the study indicated a medium to large effect for organizational training regardless of evaluation type. No clear pattern of effectiveness for differences in needs assessments was identified for the six percent of the studies that reported using one. Few studies included in the analysis used a single training method, however the use of lecture alone or in combination with another strategy was found to be favorable. The analysis also revealed that the effectiveness of training varied as a function of the delivery methods, the skill or task being trained, and the criterion used to operationalize effectiveness. The investigators suggest that future research should attempt to examine effectiveness and the match between instructional attributes of a particular method and the content.

While the aforementioned study examined program features that supported transfer, Colquitt, et. al. (2000) conducted a meta-analysis of 106 empirical studies that had been published after 1975 in the psychology, business management, and education literature to better understand training motivation. They tested individual and organizational characteristics as predictors of training motivation and training outcomes (declarative knowledge, skill acquisition, and transfer) that had been associated with training effectiveness. Individual variables included locus of control, anxiety, conscientiousness, achievement motivation, self-efficacy, valiance, age, and cognitive ability. Results showed that locus of control and cognitive ability were strongly related to motivation to learn, declarative knowledge, and transfer of learning while anxiety had a strong negative relationship with every training outcome examined. Their analysis indicated that individuals with an internal locus have higher motivation while those with an external locus

demonstrate more learning and higher transfer levels. All other individual variables were found to be moderately related to motivation to learn, and all but conscientiousness were found to be related to all learning outcome variables (declarative knowledge, skill acquisition, post-training self-efficacy, and reactions). Work environment characteristics that were found to be strongly related to motivation to learn and transfer included supervisory and peer support and climate. Job/career variables including job involvement, organizational commitment, career planning, and career exploration were related also to training outcomes.

Colquitt et al. (2000) also compared two hypothetical models with path analysis: one, where individual and situational characteristics and motivation were fully mediated by self-efficacy, valence, and job/career variables and one where they are partially mediated. Results demonstrated that in most cases the more distal variables, individual and work environment characteristics, explained at least one third of the total variance and supported a partially mediated model for training motivation in which the distal variables operate at each stage of the model. The investigators noted that few personality variables had been studied and that future research was needed to examine a wider range of personality variables, such as trait goal orientation, "big five" personality traits, and affectivity, so that training needs assessments can address them. They also observed that studies that examined both work environment and career/job variables were limited and demanded more attention. While meta analysis is often used to enhance the data from smaller studies, it should be noted that few studies and small sample sizes were used to generate some findings Colquitt, et al.'s study, which limits the implications.

In a more recent study, Blume et al. (2010) conducted a meta-analysis of 89 studies that were published between 1988 and 2008 and examined individual characteristics and work

environment variables that were thought to be predictive of transfer of learning. Findings revealed a number of variables that had a moderate relationship with transfer and included: cognitive ability, conscientiousness, and voluntary participation, neuroticism, pre-training self-efficacy, motivation, transfer climate, support (supervisor and peer combined), post-training self-efficacy and post-training knowledge. Moderator analyses revealed that the source and timing of transfer measurements and the type of skills training, open or closed, influenced the relationship between predictor variables and transfer. Blume et al. also observed that individual characteristics and work environment variables roughly predicted transfer at the same level. They concluded that the evidence to support particular transfer strategies is not convincing and suggest that a possible explanation is the short duration of most of the training programs that have been studied. Training programs included in their meta-analysis ranged in length from 30 minutes to four hours, with most lasting two hours or less.

Two recent literature reviews have qualitatively synthesized the transfer research to establish what has been studied and identify gaps in the research. Merriam and Leahy's (2005) review of empirical studies from the adult education and human resource development literature published between 1990 and 2002 used a taxonomy based on Baldwin and Ford's (1988) model to examine three categories of variables affecting transfer of learning: participant characteristics, program content and design, and the larger environment or context of the transfer. They identify weaknesses in the research, noting that many of the studies had focused on one or two independent, isolated, and pre-determined variables to study transfer and argue that the transfer of learning is a multifaceted phenomenon, suggesting future research using in-depth interviews with stakeholders to investigate complexities and variable interactions. These authors also found consistencies in the research that supported the influence of particular factors for increasing the

likelihood of transfer and suggest strategies to enhance training transfer, including "chunking" content to balance cognitive load, use a of active learning methods, and tactics that engender a positive transfer climate.

Interestingly, the suggestions made by Merriam and Leahy (2005) are areas identified by Burke and Hutchins (2007) for which minimal research exists or research is needed to clarify findings. Their integrative literature review was not limited to a time or publication range and emphasized meta-analyses to examine the transfer research across multiple disciplines. They also employed the same basic taxonomy developed by Baldwin and Ford (1988) but expanded categories to include dimensions from other models including Alvarez, Salas, and Garofano (2004); Ford and Weissbein, (1997); Salas, Cannon-Bowers, Rhodenzier, and Bowers (1999). The primary factors: learner characteristics, educational/training program features, and facets of the organizational/work environment were used to organize variables that had been substantiated in the literature. This review included work environment dimensions from both the transfer climate as well as the larger organizational context. Learner characteristics included cognitive ability, self-efficacy, motivational components, anxiety/negative affectivity, conscientiousness, openness to experience, extraversion, perceived utility, career/job variables, organizational commitment and locus of control. Program features were identified as needs analysis, learning goals, content relevance, practice and feedback, cognitive overload, active learning, behavioral modeling, error-based examples, self-management strategies, and technological support. Work environment variables consisted of strategic link, transfer climate, supervisor support, peer support, opportunity to perform, and accountability. In addition to active learning, cognitive load, and transfer climate, Burke and Hutchins identified technology support, extraversion, and accountability as dimensions needing more research. They concluded that many studies assess

intention to transfer learning or motivation to transfer learning "leaving only speculation as to whether these variables really contribute to sustained performance" (p. 286).

Transfer studies have employed a variety of research designs that include investigations of single and of multiple dimensions of the transfer phenomenon. However, both Merriam and Leahy (2005) and Burke and Hutchins (2007) argued that transfer is multidimensional. And, there is extensive support in the literature for transfer research based on a system of influences as conceptualized by Baldwin and Ford (1988) that include the individual participant, program design, and the organizational categorical elements, which are identified as vital for understanding the interaction of dimensions (Alvarez et al., 2004; Ceci & Barnett, 2002; Ford & Weissbein, 1997; Holton et al., 2000; Kontoghiorghes, 2002, 2004; Merriam & Leahy). Using Baldwin and Ford's categories as a guide, the following sub-sections on the transfer literature provide a review of a variety of other investigations, with particular attention to what is known about the dimensions that Merriam and Leahy identified as potential facilitators of transfer and that Burke and Hutchins identified as needing more research.

Participant Characteristics

Individual learners have varied attitudes, backgrounds, personalities, motivations, knowledge, and skill sets which influence the learning process, the meanings constructed in learning environments, and the application of new knowledge and skills (Bransford, Brown, & Cocking, 1999; Burke & Hutchins, 2007). Understanding participant characteristics may allow for the design of personality-congruent training (Rowold, 2007). However, Blume, et. al's (2010) previously discussed meta-analysis found few consistently strong individual participant characteristics as predictors and contend that "there are no magic bullets for leveraging transfer" and suggested that "the most promising avenue seems to be a proactive selection of training

cohorts" (p. 1096). Studies that have investigated a variety of individual characteristics are discussed below.

Goal orientation has been examined from an individual trait orientation perspective as well as a training design manipulation. Several studies conclude that learning goals and learning trait orientation foster learning and transfer performance. For example, Kozlowski, Gully, Brown, Salas, and Nason (2001) studied the effects of mastery (learning) and performance training goals and goal trait orientation on training outcomes including declarative knowledge, knowledge structure coherence, training performance, self-efficacy and adaptation of training performance. Following assessment of individual trait differences with 60 undergraduate student participants, researchers manipulated computer training. Participants were assigned to one of two conditions; participants were told that the purpose was to learn or that the purpose was to perform at their maximum and minimize errors during the training. Training consisted of four study periods and practice sessions, between which goal commitment was repeatedly assessed. Declarative knowledge, knowledge structure, self-efficacy, and performance were assessed at the end of the training. Results of the study support the notion that learning goals and learning trait orientation significantly influence the development of coherent knowledge structures, self-efficacy, and training made contributions to performance, independent of differences in individual ability.

In another study related to both training design and goal orientation, Kozlowski and Bell (2006) manipulated a computer-based simulation to study the effects of three training design factors; goal frame (learning or performance), goal content (learning or performance), and goal proximity (proximal or distal) with 524 trainees to examine the interaction of achievement orientation and goal setting on self-regulatory processes during learning. Results indicate that all

three of the design factors significantly influence self-regulation. Goal content was found to be a stronger predictor than either goal frame or goal proximity. Investigators suggest that a learning goal orientation is more important for participant self-regulation during training and is more important than alignment between frame and content. Furthermore, findings also indicate that alignment between goal frame and goal content mutually reinforces self-regulatory processes. Therefore, investigators advocate for a training design frame and content focused on a learning outcome. However, they note that it is not always possible to provide learning goal driven training programs.

Studies that examined aspects of motivation and transfer also have included the affect of goal orientation. For instance, Chiaburu and Marinova (2005) studied goal orientation as a predictor of pre-training motivation and skill transfer as measured at the beginning and at the end of the a corporate informational training program with 186 employees. A mastery (learning) was found to be significantly related to pre-training motivation. Using a longitudinal approach, Chiaburu and Tekeleab (2005) examined performance goal orientation as a moderator of the relationship between transfer motivation and training effectiveness. Researchers based their study on the study participants' expectation of post-training testing and on the work of Farr and Middlebrooks (1990) which suggests that individuals with a performance goal orientation have a desire to demonstrate competence and be positively evaluated by others. The investigators hypothesized that high performance goal orientation would interact with training motivation to positively influence post-training declarative knowledge. Data were collected at the beginning and end of the training courses and again six to twelve weeks post-training. Contrary to expectations, researchers found that training motivation interacted with performance goal orientation such that high performance goal orientation and high training motivation resulted in

diminished transfer, while low performance goal orientation and high training motivation resulted in a higher level of transfer.

In contrast with the results of studies related to goal orientation and motivation discussed thus far, Taylor, Russ-Eft, and Chan's (2005) meta-analysis of behavior modeling training found that transfer of outcomes were greatest when trainees were instructed to set goals, trainees' superiors were trained, and rewards and sanctions for use or nonuse of newly learned skills were present. This implies that performance goals may have influenced transfer of learning either directly or indirectly through motivation to learn or motivation to transfer.

Although there are mixed research findings for the effect of goal type (mastery or performance) on motivation and transfer outcomes, the importance of having a goal has been evidenced by Mesmer-Magnus and Veswevaran's (2010) meta-analysis. They examined the influence of pre-training interventions on learning from studies that had analyzed the effect of specific mastery or performance goals or had compared the two on learning outcomes. Results indicate that trainees with a specific goal, mastery or performance, prior to training, on average learned more than those without a goal for all types of learning (i.e., cognitive, skill, and affective). Investigators also noted that the studies that compared the effect of mastery and performance goals consistently reported higher learning with mastery goals. However, Yamkovenko and Holton (2010) developed a model to test the relationship between individual dispositional traits and the intent to transfer training to the job as centrally mediated a by a learning goal orientation. Among other findings, their results indicated that a learning goal orientation had no relationship with intent to transfer. Investigators suggest that dispositional influences may play a smaller role in the system of influences as compared to social norms or bio-data constructs.

While there is abundant research that examines affect of extroverted personalities on job performance (Barrick, Mount, & Judge, 2001), there is limited research with mixed results that has examined the affect on training transfer (Burke and Hutchins, 2007). However, Barrick and Mount's (1991) meta-analysis of 117 studies of personality and occupations provides some evidence of the influence of extraversion on training. They investigated the relationship of five personality traits, including extraversion, to three job performance criteria; job proficiency, training proficiency, and personnel data for five occupational groups. Results of their research showed that extraversion was a valid predictor of training proficiency, but note that most of the training programs included in the analysis were highly interactive and required high energy from participants, such as police academy training and on the job training for sales and flight attendants.

Another study that included extraversion as a variable examined program participant characteristics as mediated through or by motivation. Naquin and Holton (2002) examined the effect of various dimensions of personality, affectivity, and work commitment on motivation to improve work through learning. They administered a survey to 247 employees at a health insurance organization at the start of internal training programs. Of the four personality dimensions that were antecedents to motivation to improve work through learning, two, extraversion and positive affectivity, were a direct influence and two, agreeableness and conscientiousness were mediated by work commitment. Researchers found that 57 percent of the variance in motivation to improve work through learning was explained by positive affectivity, work commitment, and extraversion suggesting that individuals have a dispositional profile that affects motivation to improve work through learning. Although the path between extraversion and motivation was not significant, investigators postulate that since extraverts are highly social

they may be more likely to assume they can improve work with information or skills they acquire outside of training.

Using a slightly different perspective than the above discussed study, Rowold (2007) examined the influence of the "big five" personality traits (i.e., openness, conscientiousness, extraversion, agreeableness, and neuroticism) on the motivation to learn and motivation to transfer with employees from a call center. Contrary to Naquin and Holton's (2002) findings, results indicated that motivation to learn was predicted by extraversion and agreeableness; transfer motivation was predicted by motivation to learn, extraversion, and emotional stability; and motivation to learn partially mediated the impact of extroversion on transfer motivation. Rowold commented that these findings may be explained by the nature of the work in call centers, which often requires talkative, outgoing, assertive individuals.

Program Characteristics

A plethora of studies have attempted to measure the influence of various training program designs on the transfer of learning. Research has drawn attention to an assortment of program characteristics such as length or frequency, instructional strategies such as behavior modeling or error management, and delivery methods such as face-to-face or via the Internet. The literature is replete with articles that describe a training program and the use of a particular instructional strategy such as reflection or behavior modeling, but do not measure how the particular activities influence the effect of training (Bell & Kozlowski, 2008). Studies that typify these research difficulties as well as studies that advance our knowledge about program design are addressed below.

Broad support of a relationship between program design and transfer has been established by the businesses and organizations across the globe that have measured the influence of

program design on transfer with the Learning Transfer System Inventory (LTSI) (Bates & Khasawneh, 2005; Chen, 2003; Chen, Holton, & Bates, 2005; Kirwan & Birchall, 2006; Weldy, 2007; Yamnill & McLean, 2005). The LTSI is most commonly used as a diagnostic tool to assess the transfer system for training interventions (Holton, 2005). Based on empirical research, the instrument was originally created by Holton et al. (2000) and was developed from Holton's (1996) HRD Research and Development Model, which posited that human resource development outcomes are a function of ability, motivation, and environmental influences at three outcome levels: learning, individual performance, and organizational performance.

The LTSI uses 16 constructs that influence learning transfer, including one for transfer design that has four items to measure the degree to which training programs have been designed and delivered and matches job requirements to enhance transfer. However, the LTSI does not identify any particular training design, activities, or methods. This can be problematic, especially when used to measure a range of programs within an organization or across a profession. For example, Velada et al. (2007) surveyed employees from nine stores in a grocery chain in Portugal who participated in a variety of training programs to measure predictors of transfer of training. Investigators used the items from the LTSI to measure transfer design, performance self-efficacy, supervisory support, and performance feedback and specially created measures for training retention. To assess an effective design, items in the LTSI asked if the training sessions provided examples relating training to the job, if there were teaching and activities regarding how to apply learning, and if trainees understood the trainers. Results of their study indicated that transfer design was significantly related to transfer of training. While the findings of this study provide evidence that the training design is important, findings do not illuminate the particular aspects of the design that contribute to the transfer of training.

Another example that supports the positive influence of program design generally, but provides little insight to the influence of particular program design elements that support transfer is Machin and Fogarty's (2003) study. Using a pre-test/post-test survey, they measured how trainees' perceptions of in-training transfer-enhancing activities, including: overlearning, fidelity, stimulus variability, principles-meaningfulness, self-management strategies, relapse prevention, and goal setting explained the variance in three post-training outcomes; self-efficacy, learning, and transfer intentions. Survey questions that addressed the transfer-enhancing activities were framed around participants' perceptions that the activities were present in the training and data related to the activities were treated as a composite variable representing a single construct. Primary results showed that post-training self-efficacy and transfer-enhancing activities predicted transfer implementation intentions. The investigators also examined the correlations of the individual activities with post-training self-efficacy and transfer intentions. Except for overlearning, results indicated that perception of the presence of each training activity was positively related to post-training self-efficacy and transfer intentions. Machin and Fogarty stated that this was suggestive of the overall quality of the training program.

A specific program design approach includes active learning tactics. Over the past three decades, extensive research on learning has entrenched the use of active learning strategies in effective education (Bransford et al., 1999). Active learning strategies have been found to promote both analogical as well as adaptive learning transfer (Keith, Richter, Naumann, 2010). However, despite the attention to active learning strategies in the science of learning literature, Burke and Hutchins (2007) claim that few empirical studies have been completed to demonstrate the impact of active learning strategies on transfer of learning and warrant further investigation.

Three transfer studies provide some evidence of the importance of active learning strategies in program design. Burke et al.'s (2006) meta-analysis, examined the relative effectiveness of different methods of employee safety and health training on safety knowledge, safety performance, and safety and health outcomes. The investigators found that on average the more engaging the learning activities the greater training knowledge acquisition and the better the safety outcomes. Most engaging methods included behavior modeling, hands-on practice, and dialogue.

The other two studies related to the use of active learning in program design provide evidence that promotes the use of exploratory instructional program designs to support both analogical and adaptive transfer. Bell and Kozlowski (2008) manipulated a complex, computer-based simulation with 359 undergraduate students to test exploratory instruction versus proceduralized instruction, error-encouragement framing versus error-avoidance framing, and emotion-control strategy versus no emotion-control strategy. Results revealed that participants in the exploratory instruction groups exhibited higher levels of analogical and adaptive transfer than participants in the proceduralized instruction. The error-encouragement framing participants also showed higher levels of adaptive transfer.

In two separate experiments using manipulation of computer training, Keith et al. (2010) tested exploratory versus guided (proceduralized) instruction. No difference in analogical transfer tasks between participants of the two instructional groups was found in either experiment. However, the participants in the exploratory instructional groups outperformed the participants in the guided instructional groups on adaptive transfer tasks in both experiments. Additionally, results from the second experiment showed that cognitive ability effected transfer

performance for participants in the guided instruction group but not for those in the exploratory group.

Bell and Kozlowski (2008) also found that while exploratory activities prompted metacognitive activity, lower ability participants had similar levels of metacognitive activity regardless of instructional method while higher ability participants in the exploratory groups had significantly higher metacognitive activity. They suggest that this indicates a need to consider participant abilities in the design of program activities. Conversely, Keith et al. (2010) found that exploratory methods enhanced transfer, regardless of cognitive ability. They argued that exploratory activities during training for lower ability learners provided self-regulatory practice opportunities and helped reduce cognitive demands during transfer. These investigators suggest that exploratory designs minimize the influence of differences in cognitive abilities on transfer and the use of either guided or exploratory instructional designs is only appropriate for high ability learners.

Research on the effect of cognitive load on learning has influenced instructional design strategies since the 1980s (Kirschner, Ayres, Chandler, 2011). These studies are based on cognitive load theory which postulates that three types of cognitive processes are used during learning: extraneous, which distracts learners from the learning objectives; intrinsic, which allows for content comprehension; and germane, which allows learners to mentally organize and relate material for a deeper understanding (DeLeeuw & Mayer, 2008). Van Merrienboer and Sweller (2010) argue that intrinsic cognitive load can be controlled by the arrangement of learning from simple to complex and germane load can be managed for optimal learning through increasing variability, applying contextual interference, and evoking self-explanation. Investigators have examined how a variety of methods, such as information redundancy, worked

examples, multimodal instruction, or dual coding affect extraneous, intrinsic, or germane cognitive load and the consequences on learning and performance (Kirschner et al.). For example, information redundancy is thought to increase extraneous cognitive load and thereby diminish learning and performance, accordingly redundancy reduction is often used as a strategy to decrease extraneous load (Van Merrienboer & Sweller).

Van Merrienboer, Schuurman, de Croock, and Paas (2002) investigated the reduction of extraneous load with 26 college students who were randomly assigned to groups with three different formats for learning an introductory module in computer programming. The formats provided participants different types of assignments, including: conventional problems which were problem statements with no answer, or completion problems which were problem statements with a partial solution, or a learner-controlled condition which allowed learners to switch between conventional and completion problems. Results indicated that perceived mental effort by participants in the conventional group was significantly higher than for participants in the completion group however, no significant difference was found on the transfer test. The learner-control group perceived cognitive load, although both lower than the conventional group and higher than the completion group, was not statistically significantly different. However, on the transfer test, the learner-control group outperformed either of the other two groups with significantly higher results compared to the conventional group. Researchers concluded that it is possible to reduce extraneous load during training and that providing learner control during training may give learners an opportunity to optimize their learning by allowing them to re-invest freed-up cognitive processing from reduced extraneous load for more germane processing.

Based on earlier research, Van Merrienboer, Kester, and Pass (2006) proposed a training design approach aimed at transfer of learning of complex tasks, such as the integration of

knowledge, skills, and attitudes for effective professional performance. The model uses a two-stage approach. First, learning general knowledge is sequenced using increasing interactivity. The second stage uses high variability of practice and limited guidance and feedback to provide specific knowledge. The authors suggest that their training model makes it possible to design educational experiences that take into account differences between individual learners and balance the cognitive load appropriately.

Berthold, Roder, Knorzer, Kessler, and Renkl (2011) studied how the use of explanation prompts in an e-learning module on tax law affects conceptual and procedural knowledge, learning processes, and intrinsic and extraneous cognitive load with 40 tax-law university students. Following a test on prior knowledge, participants worked in an e-learning module with conceptually-oriented explanation prompts or to a module with no prompts. After work in the modules, participants completed a knowledge test that included conceptual and procedural questions. The investigators found that the participants who used e-learning with explanation prompts demonstrated higher conceptual learning on the knowledge test but lower procedural knowledge. Researchers surmised that focus on conceptual knowledge hindered participants demonstration of procedural learning because of the time spent providing more detailed elaborations on the test prevented learners from considering how to perform calculations. Berthold et al. concluded that the effective use of instructional procedures designed to heighten germane load such as prompts might depend on the level of intrinsic load and that highly complex content may overload intrinsic capacity and therefore interfere with germane load cognitive activity.

The use of technology tools as a means to transform education and training is well recognized (Bakia, Mitchell, & Yang, 200; Barone, German, Katz, Long, & Walsh, 2000;

Johnson, Levine, Smith, & Stone, 2010; Schwartz, 2008). Aguinis and Kraigers' (2009) review of the training literature concluded that recent research is supportive of technology enhanced training but state that use should be tempered by adaptive guidance. Technology tools allow individuals "to search for and retrieve information, organize and present knowledge, develop and practice skills in safe environments, and communicate and collaborate with others" (Schwartz, 2008, p. 391). However, in order to realize the potential of technology, use must facilitate educational goals and objectives (Means, Toyaman, Murphy, Bakia, & Jones, 2010).

A great deal of the research related to technology use and transfer of learning has come from the education field. For example, Kuh and Hu (2001) found support for the use of technology in higher education. They used data from the College Student Experience Questionnaire completed in 1998/99 by over 18,000 undergraduates to examine how college experiences were related to students' overall use of computers and IT. Findings showed that students' use of computers and other IT was positively related to student learning and personal development and that the students who benefitted the most were more advanced and frequent users.

Other research that examines the effectiveness of technology tools on learning outcomes covers a range of methods including: the use of multimedia such as allowing learner options for audio, video, and text formats; alternative discussion group environments; and varied course delivery options. For instance, Zhang (2005) studied learner performance and satisfaction with undergraduate college students in three conditions of learner-content interaction: a lecture-based classroom, online content without learner control of content, and online content with learner control of sequencing and variable multi-media options. Results from two experiments indicated

that the multi-media e-learning environment increased learner performance and satisfaction. Zhang attributes these finding to learner control that offers more learner-content interaction.

Campbell, Gibson, Hall, Richards, and Callery's (2008) also studied the influence of media format with discussion groups for nurse midwifery students in research methods courses. Students participated in either synchronous face-to-face discussion groups or asynchronous online discussion groups with all other content online. Results of their study indicated that while the pass rate for student groups was not significantly different, students who participated in the online discussion groups received significantly higher grades. Partially consistent with Zhang's (2005) results, findings from the data in the student tracking feature also indicated that the students who accessed course materials most frequently earned higher grades.

On the other hand, Granger and Levine's (2010) results do not support Zhang's (2005) conclusions. Using an experimental design study with undergraduate students, they tested four conditions of web-based training with varying degrees of learner control and training complexity: low control-complex, high control-complex, low control-simple, and high control-simple. Findings indicated that when training was simple, learner control was insignificant, but that with complex training, a high degree learner control was detrimental to the transfer of training. These results are supportive of the previously discussed conclusions drawn by Berthold et al. (2011) related to the interference of highly complex content and cognitive load.

Comparisons of program content delivery alternatives have been the focus of several meta-analyses. Sitzmann, Ely, and Wisher (2008) identified 76 studies from the education and training literature that included nearly 12,000 trainees across 155 adult work-related courses at universities or organization to investigate the relative effectiveness of Web-based courses compared with classroom instruction. Findings from their meta-analysis indicated that regardless

of delivery medium or whether or not trainees were college students or employees, when instructional strategies were similar there was no difference in declarative knowledge. However, Web-based courses that included active learning strategies were found to be 11 percent more effective than classroom based programs.

Cook et al.'s (2008) results support Sitzmann et al.'s (2008) findings. Their meta-analysis examined studies of student physicians and other health care professionals from 1992 to 2008 to compare Internet-based, non Internet-based and a combination of Internet-based and non Internet-based instructional methods across a variety of educational outcomes. Results indicated that effect sizes were mixed but small when comparing Internet-based and non Internet-based methods.

The US Department of Education (Means et al., 2010) found slightly different results in their investigation. They reviewed over 1,000 studies in the published research literature from 1996 through July 2008 to pinpoint those that contrasted an online to a face-to-face condition, measured learning outcomes, used a rigorous research design, and provided enough information to calculate an effect size. As a result 50 studies were included in their meta-analysis. Results indicated that on average, students in online learning conditions performed modestly better than those receiving face-to-face instruction. Additionally, as compared with face-to-face alone, supplementing face-to-face instruction with online instruction was found to enhance learning.

Technology has expanded the use of simulation as an instructional strategy (Hahn, 2010). Simulations are "artificial representation of a situation, environment, or event that provides an experience for the purposes of learning, evaluation, or research" (Lammars, 2007). Traceable to aeronautics instruction in the 1920s, the use of simulation in training has broadened to a variety of military and civilian workforce development activities (Hahn). Hahn notes that simulation is

more commonly used as a supplement to other training than as a standalone activity. Recent advancements in technology such as high-fidelity patient mannequins and virtual realities allow simulation activities that provide learners with the opportunity to practice skills in low-risk environments with increased levels of realism (Antonacci & Modaress, 2008; Hahn). While empirical evidence supports the use of simulations to enhance the transfer of training, research demonstrates that low-fidelity technology is equal to or more beneficial than high-fidelity (Hahn).

Work/Organizational Characteristics

The complexity and multitude of interrelated organizational factors that influence attitudes and behavior have led researchers to investigate both individual and aggregated aspects of the work environment (Burke & Hutchins, 2007; Ford & Weissbein, 1997; Kontoghiorghes, 2002, 2004; Merriam & Leahy, 2005). A commonly aggregated variable in studies of the work environment is the climate for transfer. Conditions in environment, such as the opportunity to use newly learned skills and knowledge, peer or supervisory support for transfer, or an organizational culture of learning, can provide encouragement for application of learning and knowledge gained in training to the job (Burke & Hutchins; Ford & Weissbein; Kontoghiorghes, Merriam & Leahy,.

Early transfer studies that investigated work environment characteristics focused on variables that were thought to influence the climate for transfer of training to the job, particularly supervisory support for the use of new skills and application of knowledge (Baldwin & Ford, 1988). However, over the last few decades, increasing recognition of the interaction between individual behavior and the work environment has encouraged transfer research with a broadened scope of work environment variables that includes organizational characteristics as

well as the climatic influences on the job (Burke & Hutchins, 2007; Ford & Weissbein, 1997; Kontoghiorghes, 2002, 2004; Merriam & Leahy, 2005). For instance, Seyler, Holton, Bates, Burnett, and Carvalho (1998) studied factors affecting motivation to transfer training with participants from compliance training for Occupational Safety and Health Administration regulations at a large petrochemical company. Their research measured intent to use and perceived performance utility as evidence of motivation to transfer. Researchers found that environmental factors including perceived opportunity to use, peer support, supervisory support, and supervisory sanctions explained a large amount of variance in pre-training motivation to transfer. Researchers concluded that environmental factors influence pre-training motivation to transfer as well as post-training behaviors.

The opportunity to use training and social support dimensions included in Baldwin and Ford's model also have been investigated from a post-training perspective. In a rare qualitative approach to studying transfer, Clarke (2002) interviewed 14 employees from a UK social service agency six months after they had participated in a two day training program to examine work environment factors that influenced the transfer of training. Results of the study indicate that heavy workloads, time pressures, lack of reinforcement of training, and an absence of feedback on performance impeded transfer of training. These findings expand and collectively demonstrated the importance of the transfer climate construct.

With the inclusion of sociotechnical and quality management dimensions that are perceived in the work environment, Kontoghiorghes (2002, 2004) developed a new model (see Figure 2) to illustrate a systematic approach to explain the learning transfer phenomenon. The model combines earlier conceptual frameworks for learning transfer research with concepts from expectancy theory (Vroom, 1964). As applied to transfer, expectancy theory suggests that

motivation for employees to attend and apply learning from training is based upon an individual's expectancy that effort in learning will increase job performance, and that the increased performance will lead to a desired outcome. Kontoghiorghes' reconceptualization of the transfer system shows that training transfer and non-training-related work environment factors directly influence job performance. The model considers that factors in the organizational environment mediate to transfer from two paths. One path includes variables as part of the transfer climate that mediate through motivation to learn and motivation to transfer. The other path shows the non-training-related work environment variables that mediate through motivation to learn and motivation to transfer.

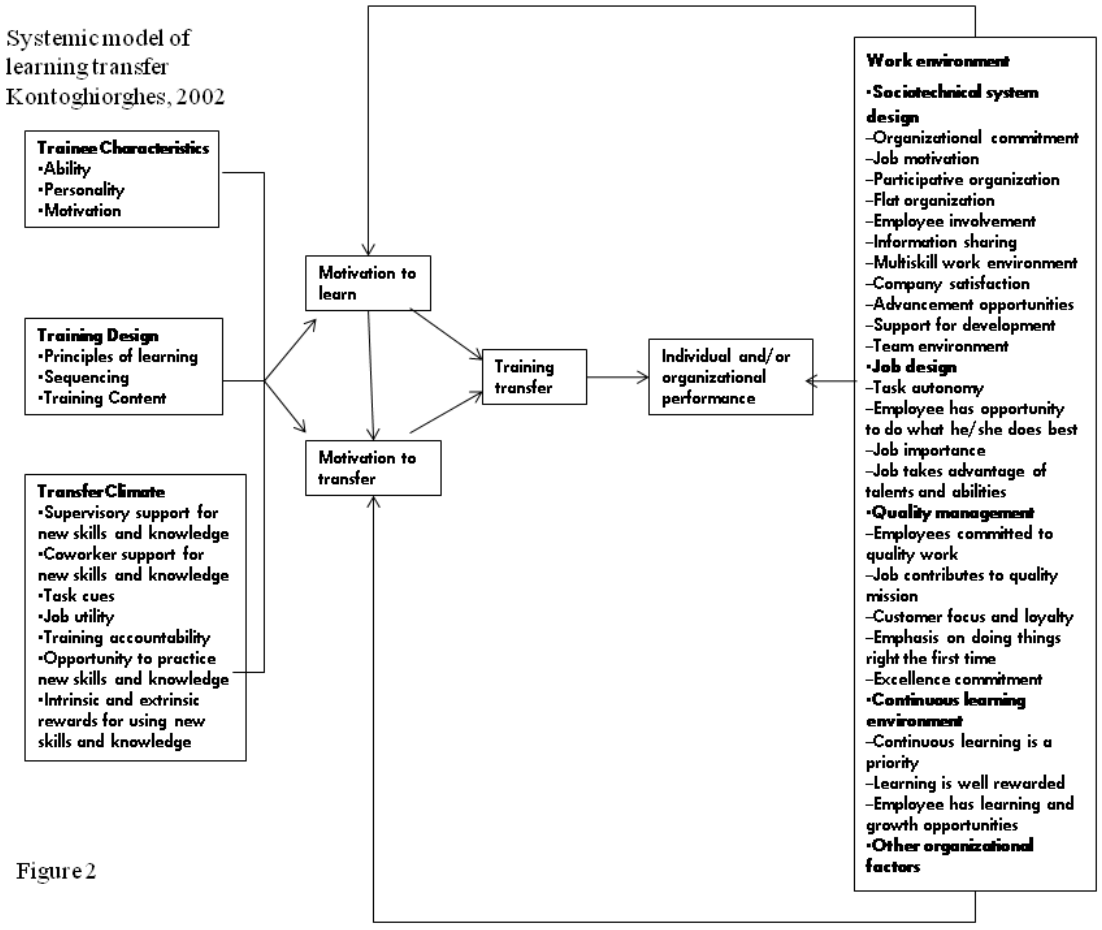

Figure 2

Using this alternative model, Kontoghiorghes (2002) examined the key predictors of motivation to learn and motivation to transfer learning back to the job and the relationship between the variables within an organizational context with employees in a health care insurance corporation. Organizational commitment, task cues, and co-worker commitment of quality work were the strongest predictors of motivation to learn. Motivation to learn, holding a motivating job, and expectations to use new skills and knowledge on the job were the strongest predictors of motivation to transfer. Kontoghiorghes (2004) replicated the earlier study with employees in the IT division of a large US automaker. Results of this research provided validation of the previous findings and model. Kontoghiorghes argues that the collective variables within the organizational culture influence motivation to learn and to transfer and cannot be ignored in transfer studies.

Lim and Morris (2006) assessed the influence of trainee characteristics, instructional satisfaction, and organizational factors on perceived learning and transfer of learning with 81 international professionals. Participants were employed by a Korean conglomerate and participated in a business finance planning course. Using factor analysis, researchers found that variables in the organizational environment; responsiveness to change, education support, transfer opportunities, and peer and supervisor support loaded onto the same scale. They argued that this supports the notion that multiple variables in work environment serve as a single construct for transfer climate.

Since research finding have been inconsistent, support from peers and supervisors continues to be a topic investigated in transfer studies. Four studies previously discussed in this literature review also examined the influence of support in the work environment on transfer-related issues and demonstrate these conflicting findings. Colquitt et al.'s (2000) meta-analysis found that the transfer climate and supervisor and peer support were shown to be important for

motivation to learn, declarative knowledge, and transfer. Chiaburu and Marinova's (2005) investigation revealed a significant relationship between peer support and pre-training transfer motivation and between peer support and skill transfer, while supervisory support had no relationship to either. The investigators suggest that the employees in the focal organization depended more on team support than on supervisor support. On the other hand, Chiaburu and Tekeleab's (2005) study found a direct effect between a perceived organizational culture of continuous learning and supervisor support on training motivation but noted that supervisory support was a stronger predictor. Theses researchers surmise that this is because subordinates see supervisors as a representative of the larger organizational culture. Velada et al.'s (2007) study found that performance feedback was significantly related to transfer of training, while supervisory support was not significantly related. These investigators hypothesized that their results may be attributable to the study design, which only measured post-training supervisory support, such as feedback and meetings, and did not include measures of pre-training supervisory support.

Other studies also have examined supervisor, organizational and peer support with mixed findings. Scaduto et al. (2008) analyzed survey data from 495 employees at a large US organization who had attended professional development courses to investigate the extent to which supervisors influence skill transfer, maintenance, and generalization. Investigators found that the training experience, including training motivation, outcome expectations, and transfer of training, is directly influenced by trainees' perceptions of their relationships with their supervisor.

Chiaburu, Van Dam, and Hutchins' (2010) study explicated the supervisor-employee relationship in more detail. They conducted a longitudinal field study to examine how

supervisory support and perceived organizational support affect trainee self-efficacy, learning goal orientation, and motivation to transfer and the influence on training transfer. Investigators collected data from trainees in a large US organization regarding the social context and individual factors during a training program. Researchers found that both supervisory and perceived organization support were positively related to trainee self-efficacy and motivation to transfer. Results also showed that only supervisory support was positively related to a learning goal orientation. Investigators suggest that this finding indicates that even when employees perceive support for training transfer at an organizational level, they may need direct or additional support from their supervisor. Chiaburu et al. note that this study did not differentiate organizational support by any divisional levels which may not match how employees conceptualize "organizational" support and since support can come from any level of an organization, there are implications for future research that considers the influence of support by work unit or peers on training transfer.

In another longitudinal study, Chiaburu (2010) examined the influence of organizational, supervisory, and peer support on 441 employees who participated in professional development training at an organization in the US. Results indicated that peer support was more important than supervisory or organizational support for training transfer and maintenance. The investigator suggests that co-workers may be a more proximal and thus a more easily accessible and influential source of support.

Although rarely studied, another component of the transfer climate is accountability. Participants may view degrees of accountability as supportive or non-supportive. Cheramie and Simmering (2008) studied the interaction of aspects of the work environment and individual characteristics by examining the relationship between perceptions of accountability and

perceived training legitimacy and employee conscientiousness with 117 insurance company employees enrolled in an on-site software training program. Among other results, findings revealed that perceptions of accountability were related to higher learning outcomes for individuals with low conscientiousness. The investigators contend that this finding demonstrates the interactive nature of the organizational context and individual factors related to learning in training programs. Furthermore, they suggest that it provides a rationale for the development of motivational strategies that can stimulate higher levels of learning for particular groups of employees.

Summary of Transfer of Learning Literature

Transfer research has investigated the effect of assorted individual characteristics, including self-efficacy, positive affectivity, age, openness, and training instrumentality. Goal orientation has been found to be related to various aspects of the transfer system, including training outcomes (Kozlowski et al., 2001), motivation to learn and learning (Colquitt et al.; Klein et al., 2006), self-regulation (Kozlowski & Bell, 2006), pre-training motivation (Chiaburu & Marinova, 2005), motivation to transfer (Chiaburu & Tekeleab, 2005), rewards and sanctions (Taylor et al., 2005) and transfer outcomes (Blume et al., 2010). Goal orientation is believed to influence expectations, acceptance of learning objectives, practice, and persistence (Mesmer-Magnus & Viswesvaran, 2010). Although the research is somewhat mixed, a learning goal orientation seems to be more supportive of transfer. More specifically, research suggests that a learning goal orientation has been shown to influence how participants approach learning and allocate their time (Klein, et al., 2006). Findings show that extraversion is related to training proficiency (Barrick & Mount, 1991) and motivation to improve work through training (Naquin & Holton, 2002). Research results are contradictory as to the relationship between motivation to

learn or motivation to transfer and extraversion (Naquin et al., 2007). Finally, although Colquitt et al. (2000) found that locus of control was related to motivation to learn, declarative knowledge, and transfer, there is little other research on the effect of locus of control on transfer.

Since training is one of the most pervasive means used to improve individual productivity and thus organizational productivity, it is import for researchers and trainers to understand the relationship between program design and effectiveness (Arthur et al., 2003). Research cited in this review provides evidence of the importance of the relationship between program design and transfer (Machin & Fogarty, 2003; Velada et al., 2007). Findings of studies also suggest that active learning methods such as behavior modeling, practice, dialogue (Burke et al., 2006), error encouragement (Bell & Kozlowski, 2008) and exploratory learning (Bell & Kozlowski; Keith et al., 2010) foster learning thus enabling transfer. Other research stresses the importance of reducing extraneous cognitive load, balancing intrinsic and germane load to increase learning transfer (Berthold et al., 2011; van Merrienboer, et al., 2002). Providing learner control of interactions with content was identified as a means to allow learners to balance their own cognitive load; however the research on providing learner-control in a technology enhanced environment is mixed. Recommendations for a match between program methods and content, especially with the use of technology was emphasized as an important program design strategy. Research demonstrates a positive relationship between learning and IT use (Kuh & Hu, 2001). Findings also support the incorporation of multimedia (Zhang, 2005) and online discussion groups (Campbell et al., 2008). While there is support for programs that blend Web-based and non web-based activities (Means et al., 2010), research is inconclusive regarding the effectiveness of one method over the other. In sum, despite research focused on improving program design, Blume et al. (2010) contend that there is a "lack of consistent support for any

particular intervention" (p.1096) and the health professional community continues to issue appeals for more research on effective strategies and proven continuing education method (Committee, 2009).

Evidence of the influence of particular dimensions in the work environment on transfer of learning provides a foundation for the development of strategies that can be used to enhance training effectiveness and transfer. Research indicates that perceived opportunity to use, peer support, supervisory support, and supervisory sanctions affect motivation to transfer (Seyler et al., 1998); heavy workloads, time pressures, lack of reinforcement of training, and an absence of feedback on performance impede transfer of training (Clark, 2002); motivation to learn, holding a motivating job, and expectations of transfer predicted motivation to transfer (Kontoghiorghes, 2002, 2004); and the perceived training utility and training effectiveness support transfer (Lim & Morris, 2006). The research confirms the positive effect of support from individuals at work (Chiaburu, 2010; Chiaburu et al., 2010; Chiaburu & Tekeleab, 2005; Colquitt et al., 2000; Scaduto et al., 2008) and a supportive climate (Chiaburu et al., 2010; Colquitt et al., 2000; Lim & Morris; 2006), and the positive effect of perceptions of accountability on less conscientious employees and the recognition of the interaction between variables in the work environment and individual characteristics (Cheramie & Simmering, 2008).

The wide array of research included in this literature review has uncovered a multitude of influences on the transfer of learning. It demonstrates the complex and dynamic nature of transfer. Yet, gaps in the literature remain and provide the rationale for further study of transfer. Only a few studies have examined transfer after training program learning has been generalized into the work setting and maintain over time. To better understand all of the factors that influence successful transfer, studies that investigate the completed sequence of transfer of

learning are necessary. Moreover, since the research is almost exclusively quantitative with predetermined variables that have produced conflicting findings, qualitative studies are warranted. Informed by participant experiences, qualitative investigations are needed to provide an understanding of how a multitude of interacting dimensions influence transfer of learning so that providers of education and training can make the best possible decisions to facilitate knowledge transfer, organizations will continue to invest in continuing education, and society will benefit from a better educated populous.

Professional Development for Nurse Educators

Overview of Faculty Development

Historically, faculty development efforts and structures have developed and evolved in response to changes in the internal and external higher education environments, including shifts in stakeholder expectations and approaches to teaching and learning (Oulette, 2010; Sorcinelli, Austin, Eddy, & Beach, 2006; Tiberius, 2002). The roots of faculty development can be traced to 1810 when Harvard authorized sabbatical leave (Elbe & McKeachie, 1985). By the late 1800s, the program of sabbaticals adopted by Harvard for faculty renewal began to spread to other American colleges and universities (Eells, 1962; Kang & Miller, 1991). Sabbatical leave and support for research endeavors remained the primary mode of professional development until after World War II (Fletcher & Patrick, 1998). However, the political, economic and societal influences that evolved during the 1960s (Fletcher & Patrick; Hines, 2007) and the seminal faculty development publications by Gaff (1975) and Bergquist and Philips (1975) initiated a significant shift in faculty development from scholarly-related activities to more comprehensive models that included instructional and personal development (Murray, 2002).

Tiberius (2002) argues that the history of faculty development can be characterized by four belief systems about teaching which dictate the type of development programs that are supported. Funding for sabbatical leave, travel to professional meetings, or for research are indicative of the belief that faculty should be content experts. Programs, books and journals that help faculty develop the talent to transfer information to students typify a belief system that teaching is a skilled performance. Development programs that focus on understanding learners illustrate a belief in the third system, teaching as facilitation of learning, which stems from the growth in popularity of constructivism in the late 1970s. The fourth belief system focuses on the teacher-student relationship as a vehicle for learning.

In a similar fashion, Sorcinelli et al. (2006) describe the evolution of faculty development efforts across five eras beginning with the Age of Scholar (1950s-mid 1960s) when the focus was aimed at improving scholarly competence. During the Age of the Teacher (late 1960a-1970s), teacher skill competence was at the center of development efforts. The Age of the Developer (1980s) was differentiated by a swing in faculty development research efforts from participation and program type to usefulness and outcome measures. The Age of the Learner (1990s) saw a paradigm shift from a teacher–centered to a learner–centered focus, the use of new technologies, and an expansion of faculty roles. The current era, the Age of the Network, which began with the dawn of the millennium, is thought to require increased collaboration between and among all higher education stakeholders to meet the heightened expectations and pressures to perform.

Today's environment of constant and ubiquitous change has significant implications for teaching and learning. The escalating complexities in the higher education environments, including an increased demand for accountability to a diversity of stakeholders, dwindling

resources, and the growth of competition require new approaches to faculty development and support for faculty development (Sorcinelli et al., 2006). However, most higher education faculty still begin their careers as educators with no teaching experience or pedagogical training (Buckley, 2002; Foley et al., 2003). This is especially true in health professional education where educators frequently come from clinical practice. In order to prepare students for 21st century health care practice, faculty must be able to address the increasing growth in knowledge generation and technological progress, amid ever-evolving models of healthcare delivery and new teaching paradigms. This requires that we provide learning opportunities that allow faculty to respond to the changing context of higher education and health care.

Nursing Faculty Development Research

Even though faculty development programs are described in the literature (Matthew-Maich et al., 2007; Steinert et al., 2009), there is limited research on assessment and effectiveness of these programs (Hines, 2007, Matthew-Maich et al; Ramalanjaona, 2003; Steinert et al., 2006). The research that has been conducted is focused on medical faculty development programs, not nursing (Matthew-Maich et al, Ramalanjaona, 2003). Additionally, many of the studies that examine program effectiveness use cursory analysis, concentrating on participant satisfaction surveys (Hines, 2007).

Faculty development programs do not always target particular teaching strategies for nurse educators at a specific institution. For example, as part of a strategy to increase satisfaction with the faculty role and recruit and retain qualified nursing faculty, a task force at the University of North Carolina School of Nursing was appointed to assess faculty development needs (Foley et al., 2003). Following a literature search and an investigation of 24 schools of nursing and two medical schools in the US to examine faculty development models, the task force concluded that

most schools do not offer a formal, systematic approach to faculty development. The majority of the faculty development programs that were described were either institution-wide offerings or department-specific orientations for new faculty.

An example of this type of a program was the focus of Baker, Reeves, Egan-Lee, Leslie, & Silver's (2010) study, which describes a professional development program that was designed to orient new nursing faculty to the academic role with the goal of increasing job satisfaction and retention. The year-long program was planned around seminar topics based on results of an initial needs assessment, including student issues and the faculty evaluation process. Evaluation of the program by participants was favorable and data indicated that three years after the program was initiated ten of 11 (91%) of the participants remained employed at the college.

On the other hand, there is evidence of development efforts that focus on specific teaching objectives, pertinent to a given nursing program. Loving and Wilson (2000) describe a faculty development program that spanned two years with a four phased model to infuse critical thinking into the nursing education curriculum at a particular institution. In the first and second phases, a task force was appointed to create a definition for critical thinking, define expected levels of student mastery across the curriculum, and make subsequent changes to course expectations to assure progression of critical thinking ability. The third phase included informal and formal faculty seminars and workshops to help faculty design and implement teaching and learning strategies that would foster students' critical thinking skills and the development of standard assessments to evaluate student learning. The final phase evaluated program outcomes with an examination of courses for the inclusion of critical thinking activities, pre/post testing of students using standardized critical thinking tests, and faculty discussion groups. Loving and Wilson found that after the faculty development program, ten of 12 courses included more

critical thinking activities and grading of those activities, but only one third of the courses used standardized assessments to evaluate student critical thinking. The investigators concluded that students and some faculty were resistant to changes in the curriculum and that in order to sustain changes in an educational program systematic and ongoing faculty development is required.

Consistent with findings from medical faculty development program research (Baker, Reeves, Egan-Lee, Leslie, & Silver, 2010; Gruppen, Frohna, Anderson, Lowe, 2003; Levine, Caruso, Vanderschmidt, Silliman, & Barry, 2005; Williams et al., 2007) several nursing faculty development program studies also have shown that building collegiality and communities of learners facilitated program outcomes and continuing education. A case in point is Matthew-Maich et al.'s (2007) qualitative study, which sought to explore the meaning and experiences of participants in a collaborative faculty development program from three regional institutions in Ontario, Canada. The purpose of the year-long program was to develop and enhance teaching strategies related to problem-based learning in nursing education and establish a common culture among the faculty from the three schools. Faculty attended a five day workshop and course orientation sessions, participated in a mentorship program, and were invited to participate in activities at each of the schools. Researchers analyzed data collected from several participant focus group discussions and found five emergent themes: becoming certain in the midst of uncertainty, development of collegial trust and community, embracing problem-based learning, valuing faculty development activities, and evolving as a nurse educator in problem-base learning. The investigators contend that the engagement of participants was a significant factor in the successful development of a supportive community of learners. Matthew-Maich et al. also note that the "qualitative data truly captured the richness of the experience of the participants… an area missing in faculty development research" (p. 81).

Curran (2008) also described a faculty development initiative that enhanced collegiality. The purpose of the program was to embed informatics content and point-of-care technologies in undergraduate nursing education at The Ohio State University College of Nursing. A core group of faculty and several hospital-based practicing nurses selected informatics competencies that they believed graduating nurses should have mastered. Discussion facilitated consensus on competencies that were identified as outcomes for the undergraduate nursing program and integration into a revised curriculum. Curran notes that the informatics knowledge that faculty gained through the analysis and ongoing dialogue about the competencies was a part of the faculty development plan. While the curriculum was being revised, an EHR and handheld devices were introduced to the faculty and students. Integration of these tools into the curriculum was achieved with hands on practice, one-on-one coaching, technical staff support, group activities, and expert led formal faculty development session. Teaching and learning activities were developed using the EHR and handheld devices and other technology, such as high fidelity simulators, incorporating informatics competencies. Curran concluded that having a core group of faculty learning together built a community of learning.

Summary of Nursing Faculty Development

The research addressed in this review provided favorable evidence for development programs that oriented new nursing faculty to increase job retention (Baker, et al., 2010), targeted the infusion of critical thinking (Loving & Wilson, 2000) and problem-based learning (Matthew-Maich et al., 2007) into the curriculum, and established a community of learners among faculty (Matthew-Maich et al.; Curran, 2008). However, there is a paucity of empirical research that has investigated faculty development efforts for nurse educators. The available literature that addresses nursing faculty development initiatives is largely descriptive. Research

that investigates nursing faculty development programs and helps to illuminate participant, program, and work environment characteristics that are most like to facilitate the transfer of 21st century health care practice skills and knowledge into nursing education is clearly needed.

IT and Informatics in Nursing Education

Overview

IT skill has been identified as critical for improving the access, safety and quality of health care and as a core competency for all health professionals; and education is a vital component for changing the culture of health care practices (Committee on Planning, 2009; Committee on Quality, 2000; Greiner & Knebel, 2003; Kohn, Corrigan, & Donaldson, 2000; McNeil et al., 2003, 2006; MedPac, 2004; National League for Nursing, 2008; Skiba, Connors, & Jeffries, 2008). However, there is a dearth of research on faculty competence to teach IT, faculty development approaches, or strategies to facilitate the adoption of educational innovations for IT integration. Skiba et al. note that even though there is a great deal of literature about infusing informatics in nursing education, there is very little integration of informatics content in the nursing curricula. Peterson (2006) comments that "nursing faculty are faced with the challenge of preparing students for the increased use of IT by integrating those skills into nursing education. If faculty are unfamiliar with the IT currently being used, then they are most likely not prepared to teach it to their students" (p. 103).

Staggers, Gassert, and Curran (2001) completed a comprehensive review of the literature from 1986 to 1998 to examine the integration of IT in nursing curricula and develop a comprehensive set of nursing informatics competencies. The majority of the research they found was related to basic computer competence and there were no empirical studies related to nursing informatics knowledge and skill. This literature review will build upon those findings by

examining recent nursing education literature that goes beyond assessing computer literacy skills and were not included in their review.

IT and Informatics in Nursing Education Research

Research indicates that employers believe that in order for new graduates to be successful in their nursing positions, they must be proficient with IT and informatics. For instance, McCannon and O'Neal (2003) administered a survey to 2000 randomly selected members of the American Organization of Nurse Executives to establish the IT skills nurse administrators believed vital for new nurses. Responses from 752 participants reflected that nurse administrators considered IT skills critical for new nurses and included the ability to: search databases for medical information, use nurse-specific software, such as bedside charting and computer activated medication dispensers; search the Internet, and use email.

New nursing graduates also recognized the importance of IT for successful employment. Peterson (2006) examined new graduate perceptions of the use of IT in their daily work as registered nurses (RNs) to confirm what skills need to be integrated in nursing education programs. The investigator surveyed recent nursing school graduates with 0-3 years of experience to ascertain which IT skills they thought were: important for their jobs as RNs, were taught in their nursing education programs, and were essential to learn during nursing education. Study results indicated that the new nurses believed most general and hospital IT skills were essential to their work and should be taught during nursing education programs, but about half of the skills were not included in their education programs. Peterson recommended that nursing education programs enhance and expand IT instruction.

The need for the inclusion of more IT in nursing education also was demonstrated by Li and Kenward's (2006) effort to provide evidenced-based information for nursing education

regulation. Their study included data from 410 nursing education programs and nearly 7500 nurse graduates. Among other findings, investigators found that only 62.1 percent of graduates reported that their nursing program adequately prepared them to use IT to enhance patient care.

While the need for more IT and informatics content in nursing education was made apparent by nursing employers and nurse graduates, barriers to advancing IT use and informatics content in nursing education including a lack of qualified faculty and resources and an apparent lack of perceived need was established with analysis data from an online evaluation. McNeil , Elfrink, Beyea, Pierce, and Bickford's (2003) developed a survey to assess what specific IT competencies were currently being taught in nursing education programs, the extent to which faculty were prepared to teach IT knowledge and skills, and the perceived current and future uses of IT tools for practicing nurses. Two hundred sixty-six programs with representation from every state and Puerto Rico participated, including 172 participants from nursing program administrations and 74 nursing educators. Study findings indicated that nursing programs were more focused on computer literacy skills than information literacy competencies and that there were low expectations of student technology skill at entry to the program. Even though 41 percent of participants expected the need for nurses with IT skills to increase greatly and 40 percent expected the need to increase somewhat over the future three years, 57 percent of the programs rated faculty at the novice or advanced beginner level in teaching and using IT and 46 percent had no plans or knowledge of plans to offer faculty development in this area.

Illumination of specific issues related to IT and informatics integration in nursing education was revealed by McNeil and colleagues (2006) qualitative analysis of the above described study. Nine open-ended follow-up questions included in the survey were examined for study clarification purposes. Findings indicated that there was a significant lack of understanding

about the differences between computer competence and informatics content and between information literacy and computer literacy. For example, respondents identified the need for computer skills when asked about informatics content and information literacy when asked about computer competencies. Results also indicated that other than dedicated informatics programs, informatics content was not integrated into nursing curricula with about half of the respondents reporting that there was no informatics education in the region.

In 2006, in response to the growing demand for nurses to have the knowledge and skills required for practice in a technology-rich health care environment, the National League for Nursing (2008) sponsored a national survey of educational administrators and faculty to assess informatics requirements in nursing curricula. Participants included 1557 faculty and 540 administrators. Among other results, the survey revealed that: information literacy assignments were the most common example of informatics in courses; the use of PDAs, electronic care plans, and clinical information systems was scarce; faculty knowledge of informatics was mostly self-taught; and the misconception that teaching online courses constituted informatics was pervasive. Conclusions from the survey indicated that even though advancements had been made, there were significant gaps in student informatics education and that faculty development was necessary to prepare educators to teach nursing informatics content.

In order to identify the extent of beginning nurse informatics competencies (as identified by Staggers et al., 2001) included in an undergraduate nursing program, Ornes and Gassert (2007) developed a tool to evaluate course syllabi for informatics content. While evidence related to computer skill competence was found, little evidence of informatics knowledge content was included in the syllabi. Researchers found that there was no evidence of content practice related to the use of administrative applications for patient management, for structured

data entry, or for electronic care plan documentation, patient care documentation, or patient education. Ornes and Gassert concluded that faculty are the greatest obstacle to incorporating IT into the curriculum and that increasing faculty skill and knowledge of computerized systems and knowledge and understanding of beginning nursing informatics competencies was needed to encourage faculty to change the way that they teach.

The lack of faculty skill and teaching expertise about IT and informatics also was evidenced by student experiences. McDowell and Ma (2007) investigated self-reported nursing informatics competence of 411 baccalaureate nursing students at an East Coast university at admission and graduation in the years from 1997 to 2005. Findings indicated a significant increase in reported experience with word processing, email, and the Web at admission and graduation over the eight years. However, results also showed that experience with spreadsheets, databases, and statistical programs, which are beginning nurse informatics competencies (American Nurses Association, 2008), did not significantly increase over the eight years.

Nurse employers also reported dissatisfaction with student learning. Hospital nursing staffs consist of more than ten percent new nurses with less than one year experience (Berkow, Virkstis, Stewart, & Conway, 2008). In 2007, the Nurse Executive Center surveyed 53,000 practicing frontline nurse leaders to assess perceptions of new nurse graduates proficiency across 36 nursing competencies regarded as critical for safe and effective nursing practice (Berkow et al.). Slightly more than half of respondents, only 53 percent were satisfied with new graduates' use of information technologies (Berkow et al.).

With a clear need to better integrate IT and informatics content into nursing education, changes began to be made. Fetter (Curriculum, 2009; Graduating, 2009) reported on a multi-phased project at a mid-Atlantic university to assess and enhance student IT competencies using

standardized informatics and information literacy competencies. In the first phase, faculty rated students' technology skills at a moderate level with nursing-specific informatics abilities rated lowest. Students' self assessment of IT skills mirrored that of faculty. Faculty reported widely varying IT policies, practices, documentation, and requirements in courses. A survey of agencies used for student clinical experiences was completed and revealed a wide range of IT integration and policies for student and faculty access. The second phase of the project is underway and includes the development of a curriculum map incorporating informatics competencies, a competency documentation tool and policy recommendations, and a plan for IT modules that incorporate all of the competencies with an evaluation plan. However, project progress has slowed due to financial and time limitations. Fetter notes that the "project's process and outcomes substantiates expert concerns that nursing faculty are a barrier to improving IT competencies in nursing education" (p. 82).

Faculty development initiatives not only provide the opportunity for knowledge and skill development, but in some instances may magnify participants' awareness of what they do not know about a given topic. For example, Gallagher-Lepack, Scheibel, and Gibson (2009) described a faculty development program aimed at infusing telehealth content into the nursing curriculum. Telehealth is the delivery of health care services using telecommunication technology and has been identified as a means to improve patient care and access to health care providers (US Health and Human Services, 2007). The year-long multi-institution collaborative primarily used distance learning activities and a three day hands-on conference to train teams of faculty from each institution. The teams were then responsible for disseminating information to the other faculty at their respective institutions. Analysis of data gathered from a pre/post assessment of faculty informatics and computer competence demonstrated an overall gain in

scores. However, the researchers noted that several participants had lower scores post program and suggested that the professional development activities may have made these participants more conscious of the broad scope of the content and caused them to downgrade their competence level.

Summary of IT and Informatics in Nursing Education Research

There have been several recent studies to assess the integration of IT in nursing education, the expected IT competence of new nurses, and what should be taught in nursing education. Investigators have surveyed nurse executives, new graduates of nursing programs, nursing faculty, and nursing students regarding technology skill and informatics knowledge, and evaluated syllabi and mapped curriculum for nursing informatics content. And while the value of incorporating IT knowledge and skill in nursing education is well documented, programs are still struggling with integrating IT and informatics competencies (Gallagher-Lepack et al., 2009; McBride, 2005; McCannon & O'Neal, 2003; McDowell & Ma, 2007; McNeil et al, 2003, 2006; NLN, 2008; Skiba et al., 2008; U.S. Department of Health and Human Services 2007). Faculty development that targets these areas is clearly warranted. However, in order to justify the investment in faculty development programs, clear evidence of their impact must be made available. Unfortunately, a review of the literature concerning the evaluation of nursing faculty development programs demonstrates that there are few comprehensive assessments of these programs. Empirical research that investigates faculty development related to IT integration for nurse educators is needed. Studies that focus on the facilitators to successful transfer of program learning will help guide future professional development initiatives.

CHAPTER THREE: RESEARCH METHODOLOGY

The purpose of this study was to understand how the transfer of learning was facilitated for participants in faculty development programs pertaining to the use of IT and informatics in nursing education. This study explored the experiences of ITNEP participants who successfully integrated newly acquired program knowledge and skills into the curricula at their home institutions to explore the larger phenomenon of learning transfer. Understanding how people experience and interact with their social world and the meaning it has for them is considered an interpretive qualitative approach (Merriam & Associates, 2002, p. 4). A basic interpretive qualitative analysis was used to answer the following research questions:

From the perspective of participants, how did their respective ITNEP programs, individual characteristics, and work environments facilitate transfer of their learning? Specifically, from the participant's perspective, I am interested in how:

a. their ITNEP program facilitated the integration of health information technology or informatics into the curriculum at the participant's home institutions.
b. their individual characteristics facilitated the integration of health information technology or informatics into the curriculum at participant's home institutions.
c. their work environment facilitated the integration of health information technology or informatics into the curriculum at participant's home institutions.

This chapter describes the research methods used in this investigation, beginning with descriptions of the research design and rationale, my role as the researcher, human subject approval, the sampling methods, data collection, data analysis, validity and reliability, and study limitations. This is followed a summary description of the study participants and a table that

allows for comparison of individual participant data, and summary descriptions of participant ITNEP programs and their work environments. The chapter concludes with a summary.

Research Design

This study used an interpretive qualitative research approach to better understand the phenomenon of learning transfer. Qualitative research has roots in the social sciences (Creswell, 1994) and is "focused on discovery, insight, and understanding from the perspectives of those being studied" (Merriam, 2009, p. 1). Qualitative inquiry allows a naturalistic approach to make sense of or interpret a phenomenon, situation, or process in terms of the meanings people bring to them (Denzin & Lincoln, 2005, Merriam); it centers on understanding meaning in context and rich description (Merriam; Yin, 2011). Data gathered from interviews, observations, and documents are analyzed for recurrent patterns (Creswell, 2007; Merriam). Qualitative research is emergent, evolving and interpretive (Bradley, 1993; Rossman & Rallis, 2003, Yin). With the goal of learning about some aspect of the social world through the researcher as the key instrument of the study, understanding is largely the result of induction (Bradley; Creswell; Yin). Qualitative approaches allow for the uniqueness of individual differences to be examined and for a complex and detailed understanding of issues and interactions to be identified, interpreted, and presented (Creswell, Merriam).

Qualitative research was appropriate for this study for several reasons. First, a qualitative approach provided an opportunity to understand transfer of learning from the voices of those who have actually transferred their learning. Second, while there was an abundance of quantitative research that had focused on transfer, there was a dearth of studies that have used a qualitative approach, limiting our knowledge to prescribed procedures and measures. A qualitative approach allowed for the identification of unanticipated influences on learning

transfer which were meaningful to study participants. Third, learning transfer has been identified as a dynamic and complex phenomenon and is highly subject to contextual effects (Baldwin and Ford, 1988; Kontoghiorghes, 2002, 2004; Merriam & Leahy, 2005). A qualitative approach provided a lens with which to focus on the dimensions that support learning transfer from the perspective of program participants in their unique circumstances. And finally, a qualitative approach provided the opportunity to holistically explore the distinct and common dimensions of faculty development programs, personal and higher education environmental characteristics, and dimension interactions that effectuated transfer of learning.

This research study was guided by a constructivist paradigm. Constructivists hold that truth is relative and dependent on one's perspective and that knowledge is constructed based on a learner's existing understanding and through their interactions with the environment (Baxter & Jack, 2008). Constructivism is built on the notion of a socially constructed reality, which assumes multiple realities that are subject to continuous revision through experiences (Guba & Lincoln, 1994). Through a constructivist philosophy, the qualitative study method of investigation allowed multiple perspectives to illuminate the complexity and multi-layers of learning transfer.

Researcher's Role

Guba and Lincoln (1994) contend that under the constructivist paradigm "the investigator and the object of investigation are assumed to be interactively linked so that findings are literally created as the investigation proceeds" (p. 111). As the primary instrument of the research, the subjective nature of the investigator's role is a limitation and requires systematic reflection throughout the research study, recognition of their personal history, identity, and biases, and acknowledgement of how these influence the study (Rossman and Rallis, 2003).

Prior to beginning this investigation, I had lengthy employment experience with an Academic Affairs division of a School of Nursing in higher education as the Director of Administration. In the past two years, I have worked at the same institution in a researcher role, initially in the School of Nursing and afterward in the Center for Healthcare Informatics. In these positions, I worked closely with faculty and administrators on academic issues. I participated in faculty development initiatives in both planning and presenter roles. I also had an established relationship with the Health Information Technology Scholars (HITS) program personnel. These experiences provided me with an understanding of faculty development and the context of higher education. They also provided preconceived notions about the process and outcomes and required caution against arbitrary interpretation.

Given the rapid pace of change, I think it is nearly impossible for individuals to independently stay abreast of all advancements that may impact their professions. Therefore, I believe faculty development programs are critical to the quality of higher education. But, program value lies in the transfer of learning. The faculties with whom I have worked are dedicated to their profession and careers and most attend development programs. However, I have witnessed enthusiastic faculty development program participation that has been followed by a lack of transfer. While the multiple responsibilities of a nurse educator limit the time required to implement change, some faculty members have successfully transferred their learning. I recognize that programs vary, faculty participants are unique, and support in work environments differ and believe that it is a dynamic interaction of particular factors that supports the successful transfer of learning.

Human Subjects Approval

For this study, I obtained approval from the Human Subjects Committee (HSC) from the University of Kansas (see Appendices A and B). Subsequent to HSC approval I sent an overview of the study and invited PIs of six identified ITNEP programs to participate in the study (see Appendix C). Following identification of the potential faculty participants, I sent an overview of the study and invited participation in the study (see Appendix D). I secured all participants' informed consents for their participation prior to conducting data collection. Participation in all or any part of the study was voluntary. Individuals were allowed to answer all, none, or only selected questions in the interview. Individual interview responses were confidential and pseudonyms have been used in place of participant's names.

Pilot Test

Pilot testing can assist with refining aspects of the final study, such as for data collection plans (Yin, 2011). Pilot test interviews not only provide practice for the researcher, they help identify appropriate or problematic questions and facilitate conceptual clarification (Maxwell, 2005). Criteria for selection of pilot participants can be based on convenience (Yin, 2009). Since I had familiarity with the HITS program personnel, faculty for the pilot were identified without difficulty. In May 2011, the participant interview guide questions were pilot tested with a faculty participant from the first year of the HITS program who was not a study participant. The interview questions were tested to determine if they are easily understood, answerable, and elicit they type of response data that will be useful for answering the research questions. Modifications to the interview guide were made as needed. For example, in addition to the original technology the interviewee integrated into the curriculum post-program, she spoke of other program learning and transfer. Question revision was made to prompt for this information. Additionally, a broad

summary question was added to provide the interviewee with an opportunity to discuss pertinent information not yet covered during the interview.

Study Sampling Plan

Maxwell (2005) states that purposeful sampling in a qualitative study should achieve a particular goal, including: representation of the typical case, representation that captures the range of variation, cases that are critical to examine a theory, or cases that are important for comparison purposes. A purposive sample selection based on maximum variation increases the probability that findings will represent differences in perspectives and is often recommended for qualitative study (Creswell, 2007; Fossey, Harvey, McDermott, & Davidson, 2002; Merriam, 2009). And, maximum variation sampling allows understanding to develop about one phenomenon, while enabling variation of other potential moderating variables to emerge (Flyvbjerg, 2001). Furthermore, maximum representation of an array of perspectives can help challenge the researcher's own biases (Eisenhardt; Fossey, et al.). A purposeful sample of ITNEP program participants based on a maximum variation strategy was used in this study.

ITNEP Programs. The ITNEP initiative is funded and administered by a partnership between the Health Resources and Human Services' (HRSA) Bureau of Health Professions and Office of Health Information Technology divisions of the US Department of Health and Human Services. The purpose of the initiative is to provide support for professional development for nurse educators in the use of simulated learning, informatics, telehealth, and eLearning in order to integrate information and other technologies into nursing education and practice and prepare students for 21st century health care practice. After discussion with HRSA Bureau of Health Professions leadership, it was determined that the Division of Nursing at HRSA would send a letter to the grantees to let them know that the study would be conducted; however, the

grantees were informed that: 1) the Division of Nursing and HRSA would not endorse or facilitate the study, and 2) that the researcher would contact them directly about participating in the study. It also was made clear that the Freedom of Information Act would allow me access to the grantees' submitted grants and the original guidance written for the Funding Announcement.

Since the first six ITNEP grantees that were funded have had the most time to establish a program design, make modifications, and offer training, they were identified as the programs from which to invite study participants. These programs include: Duke University and the University of Wisconsin-Madison, funded in 2006, the Universities of Pittsburgh and Kansas, funded in 2007, and Drexel University and the University of Washington, funded in 2008. It was likely that these six programs would have had the greatest number of program graduates who also would have had more time to integrate technology into their education practice. The principle investigators (PIs) from each of the six ITNEP programs was invited to participate in the study. A brief description of each program, based on information from program websites and publications, is provided below.

Wisconsin Integrated Technology into Nursing Education and Practice Initiative (https://research.son.wisc.edu/tecne/index.html). Five nursing programs within the University of Wisconsin system collaborated to provide faculty development focused on informatics, telehealth, and technologies topics over the five year grant period (University of Wisconsin, 2010). The programs are facilitated by leadership, collaboration, and communication and include specific strategies to integrate technology and informatics into the nursing curriculum. Based on available campus expertise for a given area, each of the five institutions leads the faculty development for one year, responsible for training and resources. An identified faculty leader and five other faculty scholars from each campus participate in the faculty development

programs, agree to integrate a topic-related assignment into a nursing course, and are expected to disseminate information from the programs at their respective institutions. Audio conferences, emails, video conferences, face-to-face conferences, a Website with topic content, discussion threads, announcements, and meeting minutes support learning and communication.

Technology Integration Program for Nursing Education and Practice (http://www.tip-nep.org). Prompted by nursing faculties' slow adoption of teaching strategies that integrated educational technology (Turner & Paden, 2009), Duke University collaborated with Western Carolina University and Fayetteville State University to develop the Technology Integration Program for Nursing Education and Practice (TIP-NEP). The purpose of the TIP-NEP program is to offer faculty development related to educational and clinical technologies to nurse educators. The TIP-NEP program offers online Technology Modules to advance faculty familiarity and knowledge related to the variety of educational technologies available, a four-day symposium focused on the integration of technology innovations in nursing education, and web site with resources that support technology integration (Duke University, 2012). Turner and Paden estimate that over 4500 nursing students and faculty have been impacted by the technology integration projects supported by the TIP-NEP program.

Emerging Learning and Integrated Technology Education (http://www.nursing.pitt.edu/elite/index.jsp). The University of Pittsburgh School of Nursing collaborated with the Winter Institute for Simulation Education and Research, West Virginia University School of Nursing, St. Francis University, and the University of Hawaii to create the Emerging Learning and Integrated Technology Education (ELITE) faculty development program (Burns & Courtney, 2009). The purpose of the program is to enhance the knowledge, skills, and abilities of nursing faculty in health IT and informatics applications and support nursing faculty

with IT integration into the curriculum. The ELITE program offers face-to-face introductory and advanced continuing education workshops in learning technologies, distance education, informatics, telehealth technologies, and high fidelity simulation (University of Pittsburgh, 2012). Except for the simulation workshop, all of the workshops are being converted to a web-based format. Although formal evaluation to determine the impact of the ELITE program remains to be completed, Burns and Courtney report that response and feedback has been positive

Health Information Technology Scholars (http://www.hits-colab.org).The University of Kansas collaborated with the Schools of Nursing at the University of Colorado Denver, Johns Hopkins University, Indiana University, and the National League for Nursing (NLN) to partner in the (HITS) program designed to provide needed faculty development (University of Kansas, 2012). The goal of the project is to "produce a cadre of well-qualified faculty (Scholars) with knowledge and skills in applied informatics and technology-supported education so they can transform nursing education at their respective institutions and better prepare students with the competencies required to practice in an information/technology driven complex healthcare system" (Connors, 2006). This initiative provides faculty support for the development, implementation, and evaluation of a technology integrated project at their respective institutions. Nursing faculty members from institutions across the country are selected from a large applicant pool to join a cohort group for one year. During the twelve months, they participate in: web-based modules and online discussion groups, a three day immersion workshop, webinars designed to produce advanced learning in health informatics, and learning communities to facilitate the integration of projects in their curriculum. The program is built around the Robert Woods Johnson Foundation's (RWJ) Quality & Safety Education for Nurses (QSEN) framework

and uses Rogers' Diffusion of Innovation (2003) model to encourage the nation-wide diffusion of innovative strategies for IT integration in nursing education by using a train-the-trainer concept (Fetter, 2009).

Pennsylvania and District of Columbia Nursing Education Technology Collaboration (http://www.facebook.com/pages/PADCNETC/116333975063707?v=info). Drexel University collaborated with the Community College of Philadelphia, Bloomsburg University of Pennsylvania, and Howard University to develop the Pennsylvania and District of Columbia Nursing Education Technology Collaboration (PADCNETC) (Drexel University, 2012). As the lead institution, Drexel trains nursing faculty from collaborating institutions to ensure competence with selected technology for curriculum integration and teaching, including: the use of Personal Digital Assistants, Simulation, and Web based courseware. PADCNETC also supports a shared repository for a variety of interactive learning modules, case scenarios, and online course templates for use by the collaborating institutions. In addition to the dissemination of project information nationally through conferences and publications, each of the collaborating institutions is responsible to propagate their learning to a wider academic sector; Bloomsburg faculty disseminates to the Pennsylvania's state university system, Community College of Philadelphia disseminates to the community college sector, and Howard University disseminates to the Historically Black Colleges and Universities.

Interprofessional Collaboration for Innovative Technologies in Education (http://collaborate.uw.edu/sites/default/files/files/INACSL_poster.pdf). The Interprofessional Collaboration for Innovative Technologies in Education (InCITE) program was created as a five state regional collaborative between schools of nursing in Washington, Wyoming, Alaska, Montana, and Idaho (WWAMI) to develop pedagogical frameworks for teaching with

technology, processes for integrating technology tools into nursing education, competency standards for teaching the use of technology, and state-of-the-art training centers (University of Washington, 2012). The program includes annual conferences that teach the use of technologies to nurse educators in the WWAMI region. InCITE also has a website that houses technology training modules, examples of how to use various types of technology, and suggested strategies for technology integration that was developed by expert WWAMI faculty. The goal of the program is to train key personnel who can serve as mentors to their colleagues through direct training and access to the website resources.

ITNEP participant graduates. PIs who agreed to participate in the study were asked to identify at least six of their program graduates who had integrated information technology or informatics into education practice at their home institution as potential study participants. Aimed at the inclusion of a diverse study participant group for maximum variation, the PIs were asked to name ITNEP participants using particular criteria. These criteria included a diversity of ITNEP participants from institutions with array geographic locations, sizes and levels, from varying cohorts of ITNEP program participation, and who had integrated a range of information technologies into their education practice.

Qualitative sample sizes are not fixed but the data gathered should provide sufficient information to describe the phenomenon of interest in depth (Creswell, 2007; Fossey et al. 2002, Merriam, 2009). The use of maximum variation in this study increases the complexity of the research in that contextual influences are likely to be unique for each participant. This study sought a sample of approximately 16-20 ITNEP program graduates for participation so that important details were not lost in massive amounts of data (Miles & Huberman, 1994).

Data Collection

Triangulated data including multiple sources and types of data are often collected in qualitative research, such as data from documentation and artifacts, interviews, questionnaires, and observations (Creswell, 2007; Maxwell, 2005; Merriam, 2009; Yin, 2011). Multiple sources of and types of data were collected in this study, including through interviews and through scrutiny of documentation and Websites. The PIs from the participating ITNEP programs and faculty participants from those programs were interviewed. While PIs were interviewed to ensure a thorough understanding of the ITNEP programs, the primary data source to understand the phenomenon of learning transfer was from interviews with ITNEP faculty participants. Data gleaned from documentation and the Web was used to complement interviews, for clarification and corroboration of information. A chain of evidence was maintained throughout data collection.

Interviews. Qualitative approaches have the advantage of allowing for more diversity in responses as well as the capacity to adapt to new developments or issues during the research process itself. Interviews that are open-ended, rather than structured, allow a natural flow of conversation to develop (Rubin & Rubin, 2005). This study used a semi-structured interview with a question set as a guide. Rubin and Rubin suggest that questions be designed to allow depth, detail, and evoke vivid responses. Accordingly, the first interview question was a broad and general question to allow follow up questions and spontaneous probing to encourage detail, seeking depth in explanation, and vividness in description.

After each interview, I spent time reflecting and journaling my role in the interview process to examine personal biases, assumptions, and values that might have affected data

collection. The reflective process was used throughout data analysis. Interview guides that were used for the ITNEP PIs and the INTEP participants are included in Appendices E and F.

PI interviews. As previously discussed, the PIs from the six ITNEP programs were invited to participate in this study with a letter sent via email. Five PIs responded and agreed to interviews with themselves or a designated representative. The primary purpose of the interview was to identify potential faculty participants for this study. To ensure a thorough understanding of the ITNEP programs, PIs also were interviewed to gain background information regarding the ITNEP program design, implementation, and outcome information. Interview data collected from the PIs were available for clarification during data analysis regarding the ITNEP program.

Individual telephone interviews were conducted with three ITNEP PIs and two designated representatives. On average, the interviews lasted approximately 45 minutes. One of the PIs declined to provide faculty contact information because the program collaboration was conducting an investigation of their own ITNEP program and research participant fatigue was a concern. Four PIs provided access to program graduates for potential participation in this study.

Three of the ITNEP program of the four PIs who were interviewed agreed to provide contact information for potential participants. The contact information for potential participants that was provided directly by PIs was compared with faculty information on institutional Web pages and via Web searches. In several instances, contact information was no longer valid. Potential study candidates, with valid contact information, were solicited through a letter and an informed consent sent via email. The letter explained the purpose of the study and requested that willing candidates reply with a convenient time for an interview and a signed informed consent. Rather than providing candidate contact information to the investigator of this study, the fourth PI opted to send the study invitation and the informed consent directly to potential participants.

Due to an initially poor response rate, the PIs were asked to provide additional contacts. Three of the PIs provided additional contact information for potential study candidates.

Participant interviews. In order to find out how participants described dimensions that supported their transfer of learning from the ITNEP programs, selected study participants were invited to take part in individual interviews with the study investigator. The first three interview questions were intended to elicit general background information about participants. The fourth interview question was aimed at understanding the participant's informatics and information technology learning goals, motivations for program attendance, and program expectations prior to participation in the ITNEP program. The remaining questions were framed to obtain a more complete picture of individual perspectives regarding the ITNEP program and perceptions about how particular personal and environmental characteristics supported the integration of an information technology into their education practice. For example, interviewees were asked: "Are there particular personal dimensions/characteristics that supported your learning and the integration of information technology into your education practice? If so, how?" Participants were asked about their perceptions of reactions to the technology integration. "How has your technology integration been received by students, faculty and administration?" Participants also were asked to explain the influence technology integration has had on students, other faculty, and nursing education. Data from the faculty participant interviews were used to answer all research questions.

Some faculty declined or did not respond to the invitation. A total of 20 faculty were interviewed across a six month period. Participant interviews occurred four months to three years post ITNEP program participation. Participant interviews were approximately 53 minutes long, ranging from approximately 26 minutes to 84 minutes.

Table 1: Study Sample Summary			
Programs	**PI's Interviewed**	**Faculty Names Provided /Contacted**	**Participants Interviewed**
1	PI	19	5
2	PI	18	9
3	Designee	Unknown	1
4	Designee	8	5
5	PI	None	0
6	No response	N/A	N/A
Total	5		20
Av. Length of Interview	45 minutes		53 minutes

Documentation. In addition to data collected from interviews, documentation and artifacts related to the ITNEP programs and transfer of learning for faculty were collected and reviewed. PIs were asked to identify and provide access to documentation or artifacts related to the ITNEP program, including but not limited to grant applications, meeting minutes, announcements, published and unpublished articles, program agendas and brochures, program content and to any Websites that would facilitate a better understanding of the ITNEP program. Prior to conducting interviews with faculty participants, I conducted a review of documents and artifacts to become familiar with the program objectives, designs, content, and time frames.

Faculty participants also were asked to identify and provide access to documents or artifacts or including: Web-sites, meeting notes, faculty communications, presentation abstracts, syllabi, or course assignments that would help in describe or explain how ITNEP program features, personal characteristics, or their home institution's environment supported the integration of the information technology or how they went about integrating the information technology into their education practice. These documents were used for corroboration purposes.

Data Analysis

Data collection and simultaneous data analysis are recommended in qualitative research, which affords flexibility for fine-tuning of collection methods (Baxter & Jack, 2008; Coffey & Atkinson, 1996; Eisenhardt, 1989; Merriam, 2009). Using this strategy, interview notes were recorded on a laptop computer or manually by the investigator and then transcribed. In addition, all interviews were audio recorded as permitted by participants and transcribed. Following completion of each interview, a copy of the typed interview transcripts was emailed to the individual participants for verification of accuracy and to ensure it embodied their perspectives. This process is known as member checking (Creswell, 2007; Merriam). Requested changes were noted in the data set. All notes, reflections, and transcripts were combined to create a comprehensive database for analysis.

Qualitative data analysis is inductive and comparative (Merriam, 2009). By constant comparison and critical analysis of each piece of data to find similarities and disparities the researcher can begin to draw new meanings. Yin (2011) suggests that qualitative data analysis is nonlinear, recursive, and iterative and explains the process as a five-phased cycle with movement back and forth between phases. The first phase includes compiling and organizing data. In the second phase, disassembling, the investigator breaks down the data into small fragments, which can be label and coded. The next phase involves reassembling the data so that it can be reorganized. Throughout the movement between disassembly and reassembly, the researcher should be looking for data patterns and themes. During the fourth phase, the researcher is interpreting or reinterpreting to make meaning of the patterns and themes. In the final phase, conclusions are drawn that are related to the interpretation of the other four phases. Throughout each phase the researcher should make constant comparisons, be alert to negative instances,

develop rival explanations, and continuously pose questions about the data and the analytic process (Yin).

As recommended for qualitative studies by Merriam (2009) and Yin (2009), a two-stage analysis process was used. Yin's five-phased cycle was used for each stage. Stage one was a comprehensive analysis that was completed on each individual so that I could learn as much as possible about the contextual variables that might have influenced each individual faculty member. I compared and analyzed each piece of data with multiple readings of each transcript to break down the data and create an individual record of answers to the interview questions. I scrutinized each piece of data and each response to understand how transfer of learning was facilitated for each individual. Stage two began after all individual cases had been analyzed and compared and contrast individual findings to examine similarities and differences. The purpose of the cross-case analysis was to deepen understanding and explanation of the phenomenon under investigation, transfer of learning (Yin, 2011). Data were labeled and grouped into themes and analyzed for unique and divergent areas related to the participants' experiences in the ITNEP programs, personal characteristics, and environment dimensions. The process was iterative and recursive as I moved back and forth between transcripts, individual participant and collective responses to interview questions. I also created concept models to examine interactions. A description of how various dimensions enhanced learning transfer was compiled and common and divergent themes were identified.

Validity and Reliability

A rigorous and well designed research plan should include mechanisms to ensure validity and reliability in every step (Creswell, 2009). Validity refers to the accuracy of findings (Yin, 2011) and "how to rule out specific plausible alternatives and threats to study interpretations and

findings" (p. 107, Maxwell, 2005). Creswell (2009) suggests eight strategies that can be implemented to address threats to validity, including: triangulation, member checking, rich thick description, clarification of researcher bias, negative case testing, prolonged time in the field, peer debriefing, and external audits. In addition to these tactics, Maxwell also suggests using quasi-statistics and comparison of results across settings, groups, or events. Merriam (2009) notes that the use of maximum variation sampling is another measure that will address validity issues. It is recommended that a researcher employ at least two of these strategies in their study to deal with validity issues (Creswell. 2007). To address potential threats to validity, this study used triangulation of data sources and types, member checks, and negative case analysis. The negative cases were represented by two study participants who claimed to have not transferred ITNEP program learning but inadvertently were included in the study sample. I developed and maintained an audit trail throughout the study and kept a personal journal for critical self reflection. Furthermore, the use of maximum variation sampling was employed by requesting that PIs provide contact information for study participants who represented the widest range of characteristics possible.

In qualitative research reliability is the extent to which results are consistent with findings (Merriam, 2002). Triangulation, peer examination, and investigator reflection are strategies to ensure consistency (Merriam, 2009). Assuring the accuracy of data by scrutiny of notes and transcriptions, comparison of recordings and transcriptions, member checks, and coding precision are activities that can enhance reliability (Taylor, Gibbs, & Lewin, 2005). Other measures include careful documentation of each step used in the conduct of the research which can be used to produce an audit trails (Merriam, 2009) and the use of a database to maintain data integrity (Yin, 2011). In this study, reliability issues were addressed by triangulation of data.

Interviews were audio recorded and later transcribe verbatim. Immediately after each interview, I wrote about my feelings and impressions of the interview. Usually the day after the interview, I listened to the recording and made notes prior to transcription to focus on how participants expressed themselves. The self-reflections and notes were reviewed during data analysis. Completed transcripts sent to participants for member checking and participant changes were recorded to the data files.

Study Limitations

The primary limitation for this study is the role of the researcher as the instrument of data collection. I attempted to build rapport with participants by being sensitive and respectful, asking good questions, and listening without judgment (Creswell, 2003; Merriam, 2009; Yin, 2003). I also tried to eliminate biases by writing immediate post-interview reflections of how I felt and using those reflections during data analysis to root out prejudicial inferences. Additionally, my limited experience with qualitative study is a limitation in this study.

The primary data source for this study is from ITNEP participant interviews. In order to gain access ITNEP participants, I had to rely on the cooperation and judgments of the ITNEP PIs. Reliance on others for access to suitable study participants was a limitation in this study. Furthermore, data were contingent on the participants' abilities to be introspective, reflectively discern aspects of their own experiences, and effectively communicate those insights (Polkinghorne, 2005). Therefore, dependence on self-reports was a limitation in this study. However, these limitations were offset by the methodology used in this study which is consistent with the established standards of qualitative research.

Summary Description of Study Participants

Twenty nurse educators participated in my study. There were 19 female participants and one male participant. Many of the participants included in this study have had lengthy careers teaching nursing students. Nine participants had been teaching nursing students for more than 20 years and the average number of years was nearly 17, while the number of years individual participants have worked as nurse educators ranged from three to 40. This group of nurse educators also appears to stay put, with over 16 years on average at their current institutions. The range of years at their current institutions was from one to 33 years. Two participants were born, raised, and completed baccalaureate and master's degrees in foreign countries and immigrated to the United States where they have completed doctorates. Ten participants have earned doctoral degrees; four of the other 10 participants who have master's degrees are currently enrolled in doctoral programs. Participants teach at a variety of educational levels from pre-nursing up to and including doctoral courses. The courses that participants teach represent a wide range of required and elective topics. Several participants teach courses with interdisciplinary enrollments. All participants have full-time faculty appointments at their institutions and a few also work in practice settings. Six of the study participants were part of a team that participated in an ITNEP program together; two of those six were teammates. Other study participants attended with co-workers but not as a team. A table that provides individual participant information is included below.

Table 2: Participant Demographics, Work Environment Support, and Transfer Evidence							
Name	**Yrs Nurs. Ed.**	**Yrs at Inst.**	**Highest Degree**	**Teaching Program Assignment**	**Prior Experience with Technology & Informatics**	**Work Environment Support**	**Transfer Evidence**
Anne	20	7	MSN	Associate	Comfortable with technology	Inst. and dept. admin., peers, other depts., alignment with inst. mission and goals	Developed software to support an online tool with a feedback loop
Barbara	20	20	MSN, Enrolled in doctoral program	Associate	Experienced with eLearning as a student, simulation, limited informatics, no telehealth	Inst. and dept. admin., unofficial release time (limited committee work), peers, fit with institution strategies	Developed an informatics course
Cindy	20	29	PhD	Associate	Experienced with eLearning, simulation, and telehealth, some informatics	Dept admin, other depts.	Developed an informatics course
Dana	6	6	MSN, Enrolled in doctoral program	Undergraduate	Experienced with simulation, no telehealth, eLearning and informatics experience as a student	Inst., and dept. admin., peers, other depts., aligns with inst. mission	Integration of simulation throughout curriculum, use guidelines for simulation and EHRs, PDA integration
Ellen	6	5	PhD	Undergraduate, Doctoral	Limited experience with technology	Faculty size, faculty resistance	Clickers
Fran	32	11	PhD	Undergraduate, Master's	Very experienced with distance education and informatics, no telehealth or simulation	Release time, resource access	Integrating informatics across courses
Grace	5	5	PhD	Undergraduate	Comfortable with technology	Inst. and dept. admin., students, faculty resistance	Integration of simulation throughout curriculum

Table 2: Participant Demographics, Work Environment Support, and Transfer Evidence							
Name	**Yrs Nurs. Ed.**	**Yrs at Inst.**	**Highest Degree**	**Teaching Program Assignment**	**Prior Experience with Technology & Informatics**	**Work Environment Support**	**Transfer Evidence**
Helen	7	2	PhD	Undergraduate	Very experienced	Dept. admin., fit with inst. goals, faculty resistance	Changes in online program, grant for more technology integration, mentoring faculty
Ivy	5	3	MSN, Enrolled in doctoral program	Associate	Very experience	Hospitals, dept. admin. and staff, peers, other depts. students	Changes in simulation including a clinical final using simulation
Julie	3	1	PhD	Undergraduate, Master's, Doctoral	Comfortable with technology	Financial, other depts., peers	Embedding new tools in online courses
Kelly	15	15	MSN	Undergraduate	Very experienced	Inst. and dept. admin., other depts., students, faculty resistance	Instituted use of standardized patients
Lisa	11	11	MSN	Undergraduate	Simulation and eLearning experience	Dept. admin., half of peers	Changes to simulation including inclusion of standardized patients, working on curriculum redesign and interdisciplinary collaboration
Mary	13	5	MSN	Undergraduate	Some simulation but little else	Dept. admin., core-group of peers	Added new assessment tools, made changes simulations and communication techniques

Table 2: Participant Demographics, Work Environment Support, and Transfer Evidence							
Name	**Yrs Nurs. Ed.**	**Yrs at Inst.**	**Highest Degree**	**Teaching Program Assignment**	**Prior Experience with Technology & Informatics**	**Work Environment Support**	**Transfer Evidence**
Nancy	7	7	MSN, Enrolled in doctoral program	Associate, Undergraduate	Basic computer skills, limited experience with simulation and telehealth	Dept. admin., aligns with inst. goals	New strategies in online course to improve interaction
Oliver	26	5	PhD	Master's, Doctoral	Very experienced but never taught online	Dept. admin., peer support, students	Structured part of course around a blog
Peggy	34	20	DNSc	Master's, Doctoral	Began integrating eLearning tools10 yrs ago, no telehealth, informatics, or simulation experience	Some peers with expertise will give advice	Made basic technology-related changes to a course
Quinn	30		MSN	Undergraduate	Advanced beginner	Dept. admin., other depts., faculty resistance	Changes to simulations, developed simulation participation outcomes tool
Rachael	40	33	PhD	Undergraduate, Doctoral	Modestly experienced	Culture of innovation, dept commitment to meet student needs, relationship with clinical partners	Moved course to online format, indirectly through fundraising for simulation lab
Sarah	7	8	PhD	Undergraduate, Master's, Doctoral	Very experienced but no simulation	Some peers with expertise will give advice	None
Theresa	24	24	MSN	Undergraduate	Familiar with simulation, no informatics or telehealth	State, inst. and dept., peers	Incorporated simulation tools, scenarios, and faculty development workshops

Summary Description of Study Participants' ITNEP Programs

Even though all programs responded to the same Request for Proposal, ITNEP programs were unique and from year-to-year, individual programs often varied significantly. Thus, it is difficult to describe each program in detail without revealing identifying information. However, there were several commonalities among programs. All programs' content focused on one or more areas that included: simulation, telehealth, distance education and eLearning tools, and informatics. Programs required a competitive application or were invitation only. Two programs required that faculty from the same institution apply as a team, one program recommended faculty apply as a team, and two programs did not have any team suggestion. All programs had online modules. All programs had a conference component. All conferences were hosted by a large research university. Program conferences formats changed from year to year. Programs conferences frequently included follow-up support. Often, conferences included presentations by program participants. Programs included in the study were offered during 2008, 2009, 2010, and 2011.

Summary Description Study Participants' Work Environments

Study participants are employed at sixteen different institutions. Institutional types included large public research universities, a medium-sized branch campus of a large public research university, private liberal arts universities and colleges, a private special focus (professional degrees) university, and public community colleges. Three of the institutions have a religious affiliation. One of the institutions is designated as a Historically Black College and University. Institutions are located in large, midsize, and small cities, suburban areas, and distant and remote towns. Ten of the institutions are in the Atlantic region, one in the North Central region, two in the South Central region, two in the Mountain region, and one in the

Pacific region. Seven of the institutions are private not for-profit institutions and nine are public institutions. With regard to the highest degree available at the institutions: 11 of the institutions offer doctoral degrees, one offers a post-master's certificate, one offers a master's degree, and three offer associate's degrees. Total enrollment at the institutions ranges from about 3,000 to more than 43,000. The institutional information discussed above and displayed below was obtained from the Integrated Postsecondary Education Data System (IPEDS).

Table 3: Institution Descriptions

Control	Highest Degree	Enrollment	Regions	Geographic Location
Private,nonprofit-7 Public-9	Doctoral-11 Post MS-1 MS-1 Associates-3	Large-8 Medium-4 Small-4	Atlantic-10 North Central-1 South Central-2 Mountain-2 Pacific-1	Large City-7 Midsize City-1 Small City-3 Suburban-1 Distant Town-3 Remote Town-1

Chapter Summary

This chapter provided the research plan that was used for this study. Following restatement of the research questions, the rationale for a qualitative investigation of transfer of learning using an interpretive qualitative study design was discussed. My role as the researcher; human subjects' approval; pilot testing, a description of the study's purposive sampling plan, including an overview of the invited ITNEP faculty development programs was addressed next. This was followed by a discussion of data collection and the constant comparative data analysis strategies that were used. Discussions of validity and reliability and study limitations were presented next. The chapter concluded with a summary description of the study participants, a

table that provides individual participant information, and summary descriptions of the ITNEP programs in which participants took part in and their work environments.

CHAPTER FOUR: RESULTS

The purpose of this study was to understand how the transfer of learning was facilitated for participants in ITNEP faculty development programs pertaining to the use of health IT in nursing education. The study was designed to investigate participants' perspectives of how program design dimensions, their own personal characteristics, and their work environment characteristics supported the successful integration of a technology or informatics competency into the curriculum at their home institutions. This chapter presents the findings from interviews with 20 nurse educator faculty who participated in four ITNEP programs and were identified by ITNEP program PIs as having successfully transferred ITNEP program learning.

The chapter presents findings from this study using Baldwin and Ford's (1988) conceptual framework by working backwards from the conditions that demonstrated transfer of learning to training outputs to factors that influenced transfer. According to the model, transfer occurs when knowledge, skills, and behavior acquired in the training setting are generalized to the work environment and maintained over time. Therefore the chapter will begin with a discussion of how ITNEP participants changed their educational practices post-program and how those changes have been maintained and diffused. ITNEP program learning, as an antecedent to transfer, will be discussed next as a training output. The remainder of the chapter presents the facilitators of transfer and is divided into three subsections which present study results related to trainee, program, and work environment characteristics that supported successful transfer and provide the data to answer the research question.

Transfer Evidence

I asked study participants to describe the information technology or informatics competencies that they integrated into their curricula and how the ITNEP program affected their practices as educators so that I could understand how they defined their transfer. Careful analysis of transcripts of our conversations revealed three common themes of transfer evidence: changes made to courses and curricula, changes made to strategies and approaches to teaching, and assuming leadership and mentor roles.

Course and Curricular Changes

The study participants described integration of a wide range of new technologies, new strategies for technology use, and informatics competencies into the curricula. The majority of participants described changes related to eLearning or simulation. A few participants described the integration of informatics competencies and no one discussed telehealth integration. The complexity of the changes ranged from seemingly straightforward to highly complex across all domains. For example in the realm of eLearning, Nancy described using some new discussion strategies in her online course to assure good student interaction while Anne gave a simple explanation for an ostensibly complex eLearning project: "We created this critical thinking documentation tool. We've created the software. The program provides the instructor with a feedback loop." Oliver explained in some detail how he had incorporated an eLearning tool in one of his courses:

> I make them do a blog. They have to choose an infectious disease and then they have to blog about it for 10 weeks with specific aims that I have created for them to do that focus on epidemiology, pathophysiology, treatment, detection, surveillance and so forth, all relevant to a specific disease that they choose. It forces them to come up with their own literature. I give them the tools on how to search the literature but they have to go actively into the literature and search major websites. They have to go to the CDC, to the UNA, to WHO in their respective diseases.

Other eLearning changes included incorporation of Iclickers; adoption of new learning strategies or tools for online course content, courses, and programs; the integration of EHRs; and the implementation of PDAs.

Changes that were made related to simulation also ranged in complexity. Theresa described the integration of "mini sims:"

> I'll have three different dressings with three different types of drainage and then they have to identify which one is which. Then in another mini sim I'd have syringes and an order and it asks for an IM and they have to pick the proper syringe and then a sub-q and they have to pick the proper syringe.

Ivy integrated a more intricate simulation strategy, "pop simulations," to help students get comfortable with the simulation experience:

> It's like a pop quiz. They don't get evaluated on it. We videotape it and we talk about it. I teach certain subjects. Just the other day I did one on asthma, we were working on respiratory. So this person comes in the ED and we do the whole scenario...So they go in as clinical groups and they do the simulation and we videotape it and then we play it back and we debrief in the classroom. So it works out really, really well.

And, Grace explained how she initiated the use of simulation and progressively integrated more complexity:

> Well, most simulations initially were portrayed as skill. So that was pretty easy to bring in to our curriculum was skill development. Okay. So we have now got that at the junior level and the sophomore level, but more importantly simulation allows you to work on your professional communication when a crisis is occurring or just providing care and how to talk professionally to your patients, how to address them professionally and so we started using scenarios... It is no different than what you are doing in clinical…It started with skill development and then it went to teamwork and communications through scenario adoption implementation.

Changes related to informatics integration varied in difficulty as well. Fran talked about the integration of informatics competencies into a course: "I've been integrating informatics as I can into the research course and I really think it is making it more relevant to the student." Barbara explained that she and her partner had a larger plan in mind: "We're actually working on

integrating nursing informatics as well as the other QSEN competencies throughout all of our regular curriculum but our project that we developed was an elective course. So we developed a nursing informatics course and it's an elective course."

And, one participant, Dana, discussed multiple technology-related changes that she and her ITNEP partner implemented:

> Actually we had ideas before we started and sort of had greased the skids for the system to move forward at [our institution] and [the program] provided the expertise we needed to move it forward further. One was simulation going into different areas that we had not gone into, creating the psyche mental health simulation, creating a community health simulation as well as aligning our simulations up with the QSEN competencies. We wanted to see where we were meeting competencies through simulation so we created a framework for that. That was just one small area. Our big area was the electronic health record and how we were going to implement that into our baccalaureate program and roll it out, and we were looking to design that. The third aspect, we did not stop, was our PDA Program. We wanted to implement and integrate that into our curriculum as well, the use of handhelds.

New Strategies

In addition to the evidence of transfer through specific changes made to courses and curricula, transfer also was obvious as participants articulated changes to strategies and approaches to teaching. For example, Rachael described how she now contemplates the value technology use would bring to her teaching objectives: "What the [program] really helped with is to sort of realize there is a pedagogical side to this that it isn't just like plugging in the equipment. It is thinking about what is the learning goal, what are you trying to facilitate." Ivy explained that she was trying to use more experiential learning strategies:

> I'm trying really hard to eliminate PowerPoints, not 100% but most of the time. I really hate the PowerPoints myself because I just hate to stand up there and drone. From the PowerPoints, if you know the material, you are like five slides ahead before I remember to click. So I do want to try to keep that to a minimum and I'm trying to make them really think more in class instead of just sit there. I think simulation forces them to come out... they have to do something. I do know that it has changed my teaching style. I've tried to be more hands-on and do more talking about how it really applies.

Oliver also came to understand the value of using active learning strategies:

> Before [the program] I did what my colleagues did in this class and invited speakers and speakers then talked to my class. It changed the way I think about the course and structuring the course now. Once you step out of this passive or recipient role, I think then learning becomes much more impressive and it leaves really an impression behind. I call this the emotional side of learning. If I connect an emotion to my learning on how this felt, it is so much more powerful.

Fran recognized that threading content across courses was a viable alternative to a standalone course: "They talked about integration of informatics into the other courses like using electronic records in the simulation…Then I started looking for ways that we could integrate informatics concepts into the other classes. I think I had only heard it talked about before in terms of a course. It kind of changed my ideas about that." And, Anne explained that she came to understand the importance of technology integration in nursing education:

> I saw through [the program] that this is the future of nursing education ...So I really focused on getting myself as much up-to-speed as I could. I read articles, attending technology conferences, looking at the use of lots of technologies from integration of PDAs to the use of social networking. You know just really looking at all the technology options that are out there and how we can turn those into learning activities to expose our students to technology."

New Roles

The evidence of transfer did not end with changes to courses, curricula, and teaching strategies. After the ITNEP program many participants became informal and formal mentors or leaders locally and regionally in their educator roles. Cindy explained her unofficial position with helping her colleagues: "Faculty come to [my partner] and me and they ask us questions all the time because they know we teach this class. We are definitely peer mentors and getting other people excited." Helen spoke about how her leadership role has evolved: "This program helped me to know actually what other universities are doing which helped me in my professional development with other faculty members [at my institution]…It has evolved into continuous

development teaching. The Associate Dean delegated me to be the coordinator." Anne also acknowledged her role in faculty development: "The other piece I really worked on over the last year to year and a half was faculty training. I wanted to teach faculty to use technology. So through a variety of training seminars, I got many faculty in-service, up-to-speed and with total buy-in on [teaching with a variety of technology]." And, Dana has been reaching out to educators at other institutions: "What I'm trying to do is to teach other educators so that they have the teaching strategies to go back and be champions at their school."

Anne also explained she changed positions to take over the leadership of technology integration for her department:

> Shortly after the program…I looked at that person in that role and it didn't seem like they were really doing their position the justice that it deserved and the department was not achieving what I envisioned it needing to become. So there were some contacts with my chair and some conversations. I requested if they could manage it for me to maybe to a one-year reassignment to simulation and technology and I knew that would allow me to really integrate and embed the pieces into our curriculum which was not at that time being done. So administration supported it. It was a one-year reassignment and during that time I was able to put together the embedded curriculum and started putting the pieces together. So anyway, the one-year turned into a two-year and turned into a three-year and we, in fact, moved into a new building and the skills and the knowledge in technology, knowledge that I gained over that time allowed me to really be instrumental in the development of our new building. So we have embedded technology everywhere now which I don't think we would have had otherwise.

Maintenance and Diffusion

Transfer not only requires the integration of learning to different settings and people other than the training situation but changes also must be maintained over time. When I asked participants if they were still using the technology or other competencies learned in the program, nearly all of the participants described continued use and discussed ongoing changes that had been made. For example Cindy explained updating, editing, and adding new elements to her course in order to" make it richer." Oliver made the point that changes allow for improvement: "I

am still experimenting with myself on – how am I the most effective teacher? Every time I do something for the first time I get ideas of how I could do this better and how this could be more engaging, rather than – here is your content, learn it." Ivy agreed with Oliver but talked about continuous "tweaking" and noted that "each time we go to a simulation, we learn more about how to do it and what the better method is." Fran conveyed a similar attitude that change is constant: I don't consider it over by any means at this point. I mean I don't consider that the end when I finished the project. I mean I am still working on what I'm working on."

Generalization of learning and maintenance of transfer was also seen by diffusion to others. I asked study participants how their technology integration had influenced students, other faculty, and nursing education. Participants reported that the students are learning and are "more engaged." Mary explained how teaching with technology fits this generation of students:

> Their minds are different than our minds I think and they are so used to being stimulated and entertained. So sitting in a classroom to them is only one piece of the puzzle. What I have seen from these kids, and they just surprise us every time by how well they do, they are just like this works for their brain and that it is a different way of seeing something. A lot of the kids are hands-on learners and so simulation is just the key to them. They can't learn it by reading it or hearing it but they are going to do it with their hands and then it just sort of clicks with them I think, with this generation, and they are not sitting around. They are really actively participating and I think it really works for them.

Kelly found that she could better prepare students to problem solve during critical situations that they cannot experience during clinical rotations:

> I think in the long run we are seeing students more prepared for practice. I think they are able to critically think because in clinical, and I'm not saying that we should move away from a clinical experience, not at all or ever, but when a patient has a turn for the worse, let's say, what happens then is that the student must step back and just be the observer and allow the true professional to take over, to take the lead on that care for that patient. In the simulation lab we can create the same thing and yet the student must continue to problem-solve through it. Hopefully, then they are able to carry that into practice; 'I remember doing this and this worked and this didn't and so I think it is a great way to learn. I think simulation truly has impacted nursing education in the way we teach and it is going to continue to evolve.

In addition to enhanced learning, Lisa also testified to positive student reactions: “They said they had never had a simulation prior, any simulation, and they just felt that they really improved on their clinical thinking. You put them in a safe environment to tackle difficult patients and make decisions and they loved it. They just loved it!” And Quinn explained how experiences in the simulation lab carried over to a real life situation:

> One girl who graduated on a Saturday was on an airplane [just after graduation] and someone in front of her respiratory arrested. We had done the simulation every week; 14 weeks of critical care and she told me, “Wow, I really couldn’t believe how well I did and I really think it was because I was made to do that.”

Several participants also discussed the presentations and workshops that they provided for other faculty and how they have influence the adoption of the technology by other faculty in the department, across the institution, and even regionally. Fran reported that after a series of workshops on concepts like quality dashboards and QSEN, she believes that the nursing faculty “thinking is beginning to shift.” Similarly, Mary was pleased by the reaction of her peers: "That they have been doing this type of nursing for 25 years and now they see a different way of doing it. I have to say that I have been very surprised.” Theresa attested to her influence as well:

> The new people that we hired, especially the one for OB...she has just gone crazy and she was so afraid of simulation and she has told me over and over again that I made her feel better about it because she said, 'I was so scared coming on and you made me realize that it is not that intimidating and it will be fun.' Now she just loves it. She is doing all of these wonderful things.

After several presentations to faculty at large at her institution about the technology that she adopted, Ellen said that she noticed “a slow progression of people that are adopting the technology” across the campus. Successful technology integration has also had an interdisciplinary influence, as Dana explained: “The nursing program at our university is really seen as a leader for our simulation program. Nobody else was doing it. We are doing it now with criminal justice and the pharmacy programs.” Anne spoke of far-reaching influence:

> Some of the changes that we've made have gone throughout out district and also throughout the State. I can think of one program that I put together that...I've put it on the web, I pass it out at national conferences and I've given out the PowerPoint to everybody that asks for it. So I think that has spread to multiple locations throughout the country.

Program Learning

Program learning directly supports learning transfer. When I asked how program participation affected their practice as nurse educators, as well as reporting how they made practice changes, participants also spoke about how their thinking changed.

New Frameworks

Study participants discussed how the ITNEP programs enhanced their knowledge. Several participants specifically spoke about better understanding the broader implications of technology integration. For example Cindy declared: "I realized that the dynamic necessity and synergistic power of nursing informatics is much bigger than I ever imagined!" Dana talked about the importance of being introduced to new concepts:

> So I walked away with a very good understanding of what was happening in the healthcare practice setting so that I could bring that back to my teaching and why it was important to prepare our students for that. And, simply exposure to some things that I hadn't even heard of: second life, telehealth, things I wasn't exposed to. So I found that very fascinating. So it really filled in for me the gaps that I had in my personal background as an educator for what was out there and where our healthcare system is moving.

And, Rachael reported that the program gave her an understanding of alternatives for teaching and learning with technology within a pedagogical framework:

> I learned a great deal what the options were. It gave me a menu to work with and to think about and the huge benefit for me was once I know it is possible I like to try things and think about them and revise things. So it gave me a frame of reference for thinking about what the options were and then probably more important than anything the emphasis on like the broader framework would be on how people learn and thinking about ways of connecting people that weren't part of my headset moving into it but became a really useful part of a frame of reference for being an educator.

Potential to Make a Difference

Study participants told me how the program inspired a new vision of their potential to make a difference. Dana redirected her program learning to trying to effect change in her state:

> The program really provided me the national perspective of what was happening with nursing education. So once I had a grasp of what was happening, I got home and then thought– "How can I do that here? How can we help our schools in [our State], our healthcare in [our State]; bridge that gap with practice and help our nursing students to step over that gap?"

Anne recognized that her influence could reach across the country: "It was life changing. I think for the first time I realized personally that my nursing education does not have to be local…it was the first time I said, 'Oh, my gosh! I can be a tried and true educator for the nation.' It was life changing professionally for me without a doubt." And, Helen spoke about wanting to make an "impact" by doing more technology integration to reach students "even outside the United States."

Contagious Creativity

Participants described how the programs inspired them to think differently. Kelly explained that it was catching: "I think it opened my mind to possibilities. I always had a sense about that that in order to really survive in this technological environment that you kind of have to be an out-of-the-box thinker and they just validate that. It's nice to be in a room with people who really get it, who understand where you've been and where you are trying to get and it is contagious." Grace asserted that the program has provided an enduring source of inspiration that supports the adaption of new ideas:

> It keeps telling me what I can do and how to do it. So you do not need to be a Duke or a Michigan State or something. I am immersed in the simulation world. I belong to an INACSL, I belong to SSIH and so I know what our needs are and I can see how they are starting to do it in little pieces and then I can come back and apply it to our world here.

Ivy described how a program presenter who explained use of other departments for help with simulation prompted her ingenuity to find a source of free videographers for simulation:

> So I'm racking my brain on the way driving home from there thinking – who can I use? Who can I incorporate into this? Well, I'm walking down the hall the next week after and I saw this big sign for Communication. It's worked out to be a great collaborative effort. So, my new effort, since I'm still working on this "who" can I get to help me out, is after I was at the last one and the one presenter was talking about them using a team approach to simulation. . . So, I just touched base with the head of the Physical Therapy group and said, "We have got to get together here because we have a simulation lab and you guys can definitely use it but we want you to also help us out." So that's our next thing on the project board.

Validation

Several participants described a sense of validation after ITNEP participation. For example, Mary's explain how her concerns about the appropriate use of their simulation equipment were assuaged:

> My impression was that we were on the right track with what we were doing in simulation because we really had no way to know at that point if what we were doing was on target or not. I remember thinking with what they were saying; we were where we needed to be …it set my compass a little bit, like we are in the right direction and we need to keep going in this direction. The capacity that we use the simulators is very little. It's sort of like we have $1 million sitting in our lab and we used $20,000 of it and we kind of struggled with that a lot because we don't do real advanced simulation.

Cindy conveyed the same sense of relief when she stated: "It's a nice affirmation to see what other people are doing around the country and to know that you are on the right track and that you aren't crazy." Oliver also confirmed this feeling of support as he described his reaction during the ITNEP program: "So when I saw simulation I thought – oh my god! This is what I've done without calling it simulation. The simulation workshop was just really encouraging and reassuring that my thoughts were absolutely right."

Confidence

In addition to being reassured of their approaches to technology use, study participants described feeling more confident in their capacity to use technology post-program. For instance, Oliver remarked that since the program: "I've lowered my anxiety in front of technology." Other participants became more optimistic in their ability to teach using technology, as Julie noted: "I think I'm more comfortable using technology within my courses and even developing my intervention online." There were participants who became convinced of their ability to teach how to use technology after ITNEP program participation, like Theresa, who declared: "I didn't realize how much I knew until I went there, too, because I was at one of the hands-on workshops and it was like 'I know this stuff and I can probably teach this stuff!'" Quinn described how the ITNEP program bolstered her confidence about being from a small school: "There was not that feeling that we're Duke and you're [small school]; it wasn't just there ... I didn't feel that at the ITNEP program. We were all educators and it didn't matter if you were Ivy League or whatever."

Enthusiasm

Participants told me about feeling enthusiastic after their ITNEP participation. Helen proclaimed: "after that conference I was really energized a lot" and similarly, Ivy stated: "I was really excited when I came back." Quinn testified that despite the intensity of a particular type of technology integration, she was inspired to keep at it: "The simulation, I don't have to tell you, just sucks the life out of you. If it wasn't for something like [the ITNEP program] that I feel really motivated by I wouldn't do it. It's so intensive with the time but the results are so positive." Other participants, such as Kelly, used her motivation to inspire her co-workers: "I

came back from that conference and I'm telling you I was like a whirling dervish and told everybody about it and 'we need to do this and let's get on and make it happen here.'"

Little Effect

There were two study participants who reported that the program had little effect on their teaching practices. In addition to not remembering the program well, Peggy spoke about differences in teaching approaches:

> It's hard for me to say what I took away from that because I'm pretty old now and so things kind of mush together in relation to my experience. I think some people are really interested in learning how to do this kind of stuff and they get really gun-ho about it and they set it up. Then there are some who are more traditional in the way that they approach and are just not as interested in using various types of eLearning kinds of activities.

Sarah could not recall any particular program effect either and attributed it to her expertise:

> I came in at a higher level of knowledge and experience in using the technology. So maybe ... I'm sure there were little nuggets of new stuff that I learned. I think two and half years out I can't like tell you what those little nuggets are. I just give you the gestalt that I attended sessions that I thought – oh, maybe there is something new to learn here. At this point, I'm not sure anything stands out.

Since study participation was predicated on successful post-program integration of a technology or informatics competency, I asked Sarah why she thought that her name had been suggested for study participation. Sarah surmised that the confusion arose from a peer teaching evaluation completed after her ITNEP participation during which she was observed using a variety of technologies. However, she had integrated those tools prior to the ITNEP program.

Transfer Facilitators

The three common categories of factors identified in the transfer literature said to influence transfer of learning are trainee, training program design, and work environment characteristics. During interviews, study participants described how various features of each category contributed to their successful transfer of learning. All participants addressed aspects of

each category to varying degrees. While unique characteristics were discussed, there were many shared elements in participant explanations of the facilitators to their successes. The following subsections highlight the commonalities in each category.

Participant Characteristics

As previously discussed in Chapter Two, the personal characteristics of participants in training programs have been identified as factors that influence learning transfer (Baldwin & Ford, 1988; Chiaburu & Marinova, 2005; Colquitt, LePine, &Noe, 2000; Kozlowski, Gully, Brown, Salas, & Nason, 2001, Naquin & Holton, 2002). In our discussions, participants described how their individual attributes facilitated transfer. A range of qualities that participants share in common were revealed. The transfer literature has generally categorized individual characteristics by motivation-related factors, ability-related factors, and personality-related factors (Baldwin & Ford, 1988; Burke & Hutchins, 2007; Elangovan & Karawkosky, 1999; Ford & Weissbein, 1997). The section below is organized by the common characteristics that fit within these categories.

Motivation. Participation in the ITNEP programs was voluntary. Since the programs required application or invitation, participants had to be motivated to attend. When I asked them why they chose to participate in the ITNEP program, what they expected from the program, or what their goals were, nearly all participant responses were related to motivation to learn and reflected several recurrent themes, including that they were looking for knowledge, to fill gaps, for ideas, and that they had a passion for the technology.

Looking for knowledge. Many of the participants discussed wanting to expand their knowledge related to the use of technology and informatics in nursing education. For example, Oliver explained that he wanted to better understand online learning:

> I've never taught a class online so it was something that I wanted to learn. I've had classes in which I was televised to 30 different sites but I thought I wanted to know more about distance learning. "When would you choose distance learning over in class learning?' I may be very old fashion here but I love to see my students. I love to interact with them. I love to get into an argument with them to sort of facilitate my learning. So for me it was really hard to imagine how I would do this. So I wanted to hear from other people who had this experience. "How do you do this? Why do you do this? What do you get out of it? Is it more or less work? Do the students learn the same content?"

While some individuals were looking for the formal educational background on a particular technology use, Ellen was motivated to participate for more practical reasons. Over the few years preceding her ITNEP participation her course enrollments more than doubled, she commented: "I think desperation was the driver for me personally. I was teaching some pretty challenging classroom dynamics. So I was really looking for a whole variety of teaching tools to try to get students more involved and participate more actively in class." Similarly, Theresa was motivated by a need to learn the basics for the use of high-fidelity mannequins. She noted that: "I enjoyed the simulation aspect and we were just kind of getting going with Sim Man at that point and I thought this would give me an opportunity to learn what is going on and they could help me with learning, how to use the technology." Finally, while some were motivated to attend the ITNEP program for foundational and practical knowledge, others expected to gain more advanced knowledge. Kelly stated: "I was wanting more... I was wanting a higher level than what I had been exposed to before. When I saw [the announcement] I thought: 'Oh, yes! This is what I need. I need something to help me get to the next level.'"

Filling gaps. The motivation to learn more about technology was often precipitated by participants' recognition of a gap. A gap in the participant's own knowledge base, a gap in the nursing curriculum, or a gap between practice and education were often cited as the impetus for ITNEP participation. For instance, Barbara admitted: "I don't have a background in nursing informatics at all… we realized with QSEN that we needed to do something related to nursing

informatics as that is one of the QSEN competencies. So that was kind of the impetus that started it." Rachael also acknowledged a gap in her skill set: "At the time I was in a leadership position and transitioning out of [that position] but certainly had seen the utility of the applications of technology to enhance learning. I was going back into the classroom after having been in a [leadership role] for ten years."

Sometimes it was the nursing students who helped faculty recognize a gap. Anne confessed that: "It was just this overwhelming gap in our curriculum. We had some students that said, 'we are so frustrated because the hospitals won't let us document on the electronic charts and we don't feel that we are graduating with the skills that we need.' It was kind of like ding, ding, ding and a light bulb off. It was a new area we needed to target." Other times it was a faculty member's experience that made gaps apparent. Ivy explained: "When I started there in 2008, we didn't really have a simulation lab. We had no Sim Man. We had no Vital Sims. We just had some dummies and some beds that were very low tech. They just did nothing but lay there. We progressed from there... because I had been in a Sim Lab and I really wanted to try to get something like that setup for our kids." Dana experienced a gap between academia and practice first hand when she was with students during clinical rotations in hospitals that provided motivation to participate an ITNEP program:

> [My State] was leading the nation on EHRs in acute care setting and communication amongst the hospitals therefore our students were getting it in the clinical sites but nothing preparatory at the academic side and it was a big motivator for us to look into getting an EHR. We didn't have one at all. All our hospitals did and there are several different types, but a lot of the focus was just on the clinical side. When I took students in and was just getting the information in there. You know like data entry, it was not any sense of meaningful use and because we didn't have one on the academic side it was hard to lay that ground work for them.

Looking for ideas. Many of the participants were motivated to participate in an ITNEP program because they wanted to get ideas about how to use technology to meet particular

educational goals, such as for augmenting student clinical learning, enhancing student-faculty relationships, increasing technology use, or finding educational expertise. For example, Rachael spoke about the need to supplement clinical experiences:

> I was very interested in [simulation] because all of us saw that access to clinical sites, especially in certain areas, was getting to be more and more competitive. So we knew that we had to think creatively about alternative ways of preparing people for everybody to have a chance to observe or be part of caring for people with many different problems that was not going to happen in their clinical education.

Julie indicated that she motivated by a need to better connect with her students: "I really want to be more and more creative in my use of technology… So I really wanted to go to find out more about enhancing my ability to reach out to people, especially distance learners." While Quinn was looking for ideas to assist with a technology use outcome evaluation: "We wanted some ideas as to how we could, with very limited resources, do something other than the descriptive write-out as to what it is that we were doing, was it effective, rather than if the students liked it or not."

Some faculty were interested in what others were doing so that they could get ideas on how to expand technology into other programs or program levels, like Helen, who had already developed an online RN to BSN program and wanted to see how other programs were integrating more technology into their traditional program. Mary indicated an interest in what other programs were doing, as well:

> I think I wanted to know, were we on track? So I guess I was doing a little comparison shopping with, you know, here's what we are doing. We are kind of new and we are living in our bubble. What is everybody else doing? I was interested in how they were incorporating it in their upper levels because I think at the time I was trying to get some buy-ins here with our faculty.

In addition, several participants stated that they attended the ITNEP program hoping to "connect" with others as Dana explained: "We didn't have anybody at our nursing program or

at our university or really locally that I could go to as a resource, to find out more information, and get more education."

Passion. Faculty also were drawn to the ITNEP programs because of a strong interest in technology. Many told me that technology in general was a passion. Several participants talked about simulation in particular. In discussing her prior experience with technology, Dana revealed her zeal for simulation: "I was moderately experienced with simulation and so that component of technology I was embracing. That tends to be my passion." Ivy showed her enthusiasm for the technology when she commented on the benefits of simulation: "I loved it. Simulations, you can do some acting. It's a lot of fun. It's great hands-on learning and I saw how much the students liked it." And, Lisa declared that her motivation for participating in the ITNEP program was because she was "hungry for anything" about simulation.

Availability. The two study participants who reported that they were not affected by ITNEP program participation and indicated that they went, partially because the programs were available. When I asked why she chose to go, Sarah stated: "I guess for one thing it was being provided for faculty and we need to constantly keep our skills fresh in terms of teaching." Peggy's response hinted that convenience was a motivation and offered that: "The workshops were scheduled such that they would facility faculty participating. So they would be scheduled, for example, the week right after school ends in June, which most people are still around ... it has to be made reasonably accessible."

Ability. As noted in Table 1, participants' ratings of prior experiences with technology varied from those that stated they had basic computer skills to those that reported being very experienced. Participants were experienced educators, many with a long history in academia. With the intension of better understanding how individuality qualities facilitated transfer, I asked

the participants how they thought their personal characteristics supported the integration of technology. Responses clustered around three ability-related qualities: being a lifelong learner, having leadership abilities, and recognizing limitations.

Lifelong learner. Clearly, participants were well educated as demonstrated by the number of advanced degrees. Participation in the ITNEP programs in and of itself strongly suggests that most of these educators are lifelong learners, as Cindy pointed out: "… obviously, I'm a life-long learner. The personal professional development motivation is there." In addition, many of the participants discussed their drive to continue to learn. For example, Lisa remarked: "That was actually the very first [simulation] conference I attended. All the other information I have gotten on my own. I did research; I looked up Jeffries, looked at her theory of simulation related to nursing and so on and so forth. So I was self-taught up until this summer." Nancy declared: "I continue to seek out learning experiences for myself that I can incorporate into my teaching is probably the best. I pretty much will try anything that I think will be beneficial." And Barbara commented that being a student made her want to learn more: "I mean I like technology. I like to learn new things and I was in the mode of the whole distance learning thing and being in school and being so excited about that that it made me be really excited about lots of things in my life and this was just one other thing."

Leadership Abilities. Several participants discussed how their leadership abilities helped them with technology integration, such as Anne who explained that: "We were given the tools and the resources we needed in order to feel the support yet it really took a certain amount of leadership on our part to make it happen within our campus." She explicitly stepped up to take charge when she "volunteered at the district level to start a simulation integration technology committee and developed quite a reputation at a district level as being kind of the technology go-

to person." Other participants worked more subtly to promote their technology agenda, like Kelly who offered that she had: “always been that person that’s been out there gently pushing, you know, ‘we need to try this; we need to move forward; this is the future; we need to engage.’” Dana explained that she believed that she had to “champion” her efforts: “because really you are stepping into an area that is obviously new to your little piece of the world and it is going to demand time as well as your energy to go out there and research it and educate yourself again.” And, Theresa clarified how her leadership abilities facilitated simulation integration in the nursing curriculum at her institution: “I have a passion for learning simulation which people pick up on and I’m energetic, flexible, open to new ideas ...You have to have the ability to energize other people and to get them interested and excited about it. Otherwise, you are not going to be successful."

Recognize Limitations. Participants spoke about how being able to understand limitations was key to successful transfer. Cindy explained as being able to sort through and figure out what is important:

> So kind of like when you clean out your house, you know, what are you keeping, what are giving to Goodwill, what are you saving for later? We just couldn’t do everything. I mean literally everything you hear you are just like a sponge and you think “Oh, I want it all.” Then you have to remember “Now wait a minute. Let’s just scale back.”

Other participants talked about understanding the limitations in the context of the environment. For example, Dana declared: “While I do recognize chain-of-command, I also am smart enough to know its limitation and sometimes I don’t give a hoot about it." Ivy suggested it was a matter of being realistic and figuring out: “that won’t work for us because we don’t have that and we’re not even going to get that and that’s not even realistic in our budget and in our setting. It’s just not going to happen.” Anne explained that you have to understand when to scale back: “our ultimate goal was to get this to a handheld device. It would have been really big and

that was a little too much for us to achieve. So, if someone wanted to be successful then they really need to see what are the limitations of their institution and the limitations of the software." Kelly explained that knowing who your followers are is important but that "you also have to know who isn't supporting because those are the people you have to pull in somehow. You have to make them understand how important and trying this is."

Personality. Participants also discussed how personality-related traits facilitated their transfer of learning. Four themes emerged in our conversations that supported technology integration; being creative, persistent, a risk taker, and open to change.

Creative. Participants saw themselves as creative, innovative, or visionary. Several faculty indicated that they are able to take new things and adapt them. For example, Julie stated: "I'm also a high-achiever but I'm also an innovator. I mean I've created programs from scratch and so to me taking new things and putting them in that is part of my personality." Similarly, Dana referred to herself as a "visionary" because she can "see a place for things." By collecting little tidbits from others, is how Ivy explained the source of her ingenuity:

> Maybe all of it won't apply to your program but you can take some of them...So you just try to glean like those little things that people are talking about. There are ways like if you keep looking that, okay, it will work for me. I think you just have to listen to people and then say, Okay. This is not going to work for me but I can do it this way.

And, Mary explained that what she loved about simulation was that she can channel her creativity to direct students "in what we want them to do or what we want the student to know."

Persistent. Participants also spoke about being persistent, determined and committed when they want to accomplish something. For instance, Helen spoke of being "driven" to finish what she starts. Grace claimed that she was like "a dog with a bone" and asserted that persistence was how she dealt with opposition: "I met with resistance but I didn't let resistance wear me down. I did just step over it and keep on moving." Anne explained that she dealt with barriers

much in the same way as she commented: "When I commit to something, I make it happen and I think that's been a huge part of my ability to be successful and that I don't give up, I don't let obstacles get in my way, I trudge forward…I'm going to make this happen." Rachael claimed that she "loves a good challenge" and was not going "to give up at that but I'm going to be looking for other solutions that can make this possible." Kelly suggested that as she persisted through the transfer process it was helpful to be able to ignore criticism and commented that: "I think you have to have a little bit of a tough skin because initially when we started out, you know, I was the only one who saw the potential for using simulation."

Risk-taker. Many participants also talked about being risk takers and not being afraid of making a mistake. Several participants pointed out that taking chance and making an error is how you learn, like Sarah who commented: "I think mistakes are part of learning and you get feedback from the students and if things didn't work out the first time then, you just find a different way." Oliver confirmed this notion and when he declared:

> I'm not afraid of making mistakes. Everybody makes mistakes. If you don't do mistakes, how would you ever know something went right or wrong… I'm a risk taker when it comes to education. I try things out and really dissect them afterwards. That's why I say the scenario ... if there's an error in it, there's an error in it. We can learn from that error. So I can use an error to my advantage.

Trying to avoid blunders is what Ivy suggested inhibits some with technology integration: "I am a little bit of a risk taker. I'm willing to try new things and I think sometimes that is what holds people back about [using simulation] because it is so different than classroom teaching." Dana acknowledged facing the bumps in the road before finding success with simulation integration: I'm willing to take a chance and put myself out there and make a mistake. Literally, we bumbled into simulation that first year or two before we started to get any depth of knowledge or expertise of it." Kelly told me that she likes to hear all opinions, good and bad: "I

enjoy getting feedback, positive and negative, because if you don't tell me what I'm doing wrong or what you didn't think worked how am I ever going to fix it and that is kind of my approach to life in general really. I think you have to be a risk-taker."

Open. In our discussions about personal characteristics, participants indicated that they were open to technology and change. Ivy argued that in order to make a change: "You have to be willing to change and willing to do whatever it takes to make it a success" and suggested that you have to listen to others because "everybody has good ideas." She noted that she had gotten some of her best ideas for changes to simulations from the department secretary and her veterinarian. Quinn confessed that to her, exposure to new technology was "like someone has opened a toy box." Nancy admitted that it was teaching tech-savvy millennials that prompted her to be "flexible and open to change." Julie pointed to the basic necessity of being open to change in using technology to teach because "things are getting higher tech…you can't ignore it" and noted that new technology is not as difficult to use as she originally perceived.

Program Characteristics

Overviews of individual ITNEP programs and an outline of general program commonalities gleaned from interviews with program PIs and websites were previously presented in Chapter Three. The section below addresses participant perceptions of how the ITNPE program features supported transfer. To understand participants' insights, I asked them to describe the programs, their participation in the programs, and how particular features of the programs advanced technology and informatics integration. Participants also were asked how they believed the programs could improve. Participant responses shared four significant program components that helped explain how program design elements were supportive of transfer, which

are addressed below. In addition, summaries of other helpful program features and suggestions for improvement are presented.

Program Design. The program design features that participants found to be supportive of their successful transfer of learning include the opportunity to make connections, the diversity of presenter and participant experiences represented in the ITNEP programs, post conference support, and good teams.

Making connections. Many participants described how taking advantage of networking opportunities provided by the programs' designs supported their transfer initiatives. Ellen, who obtained background information on a technology in which she was interested, explained:

> It seems so silly to put out hors d'oeuvres and let people talk to each other about it. That really was the most valuable part of it for me was to be able to say 'Oh, which clicker system did you use? Why did you choose that one? How much do the clickers cost? How did you get the students to buy them?' Getting all of that background information was just so helpful. It made it very easy to avoid some of the mistakes that I might have otherwise made.

Ellen also pointed out the value of connecting with novices, "not necessarily seasoned experts…the people that have used it once or twice , so new to them, right, that they are not too long ago brushed into mud. They can really tell you 'Oh, gosh! Don't do this. I remember when I did that and it was a disaster.'"

Through networking, Barbara found camaraderie, which spawned enthusiasm. She declared: "You get to meet lots of other people and hear what they were doing and you kind of form some kind of relationships...you felt like you are kind of on the same boat as other people and learning about things that were completely new, which was very exciting."

Other faculty discussed the importance of networking for idea generation, As Ivy explained: "You learn so much through that networking. I liked the networking part a lot; talking to the people and asking if you do this and 'oh, we never thought of trying it that way.' You

know it's a great way to come up with ideas and give people your ideas." Kelly's comments supported the same notion: "So it's that networking. It's that collegiality that also helps get you through the night. 'I tried this and didn't work. What have you done?' So it's a think tank and it's great."

Participants also valued the relationships that they established because of the resource potential. For example, Grace pointed out: "The connections with the people that I made...It was always important to be networking because then I knew that if I had questions who I could go to because in this world there wasn't anybody for me to go to. So I needed to know somebody who could field questions for me."

Dana declared that being able to network during the program created partnership opportunities: She noted: "The other thing that I walked away with was a huge national network of professionals that I could collaborate with. I've been to several of them...I've visited, I've stayed connected with them, I see them at different conferences."

Even participants who were unable to take advantage of networking opportunities during the program recognized the importance. As Fran confessed: "I think I'm probably not outgoing enough and I don't network enough and if I had been more involved in that then I could have had a better experience."

Diverse expertise. Participants described that the ITNEP programs included a diversity of perspectives from a variety of educators who had experience with integrating technology. The opportunity to absorb a range of first-hand knowledge was helpful. As Kelly explained:

> It ended up being a lot of other nurses, educators who were experienced in simulation or other types of modalities for teaching students and they were actually the ones doing the presenting. I didn't realize that at first and they were from all over the country. So you get that different perspective of what it is like to walk in their shoes. So I found that great, just absolutely great.

In fact, Quinn insisted that learning from experienced users was imperative. She commented:

> I would definitely go to a school that is using the technology and not just with the seller, the vendor. I had a horrible experience; we all did. Horrible. Really good, got you to buy it but once you bought the equipment they were gone... It's nice to talk, to go, and to learn about the equipment from the user and not from the vendors.

Dana expressed how diverse viewpoints enhanced her knowledge:

> I mean you go into these projects sometimes with sort of this global understanding of what you are going to work on but not knowing the reality of how it is going to unfold. So sometimes different perspectives would be ... they may do it a little different in their area. So it just provided more depth of understanding for us to build our platform for our project.

Other participants found that the diversity of presenters was motivating. As Ivy shared:

> There were presenters there that were nursing educators that had instituted different types of simulation into their curriculum and how they were instituting it and what they were using it for and talking about their simulation programs and what exactly they were doing… I just found it totally fascinating what everybody was doing. There were so many things, so many options. There were people from all over the place. You know, it wasn't just like the one area. It was people from all over the country. So it was definitely exciting to hear what other people were doing and how they were instituting it.

Post conference support. Participants talked about how post program support was significant to their transfer efforts. Support came in a variety of formats, such as consultation via conference calls, discussion via email, and ongoing electronic resources. Anne spoke with some amazement about the post program support that she received:

> We had the conference calls [with an ITNEP program leader] and to have the frequent conference calls and the follow-up but even past [the end of the program]...I mean she has absolutely continued to support us in so many ways where she'd say "you guys need to publish, you guys need to present more, you guys need to do this," and we're like "okay, okay". So she has absolutely continued to support of us in every realm of our profession since that time. So that has been very inspirational.

For some participants, just to know that help was available was important: As Cindy recalled:

> We went back and worked on our project...periodically we heard back from the [program] leadership. They'd check in with us and see how we are coming along or if we had any questions. I remember that we emailed back and forth occasionally... the support was there though if we needed it.

Theresa explained that she continues to receive support via the Internet: "I've actually done my own simulation workshops the last two years and the wonderful thing is I have used [the program] website where they have these modules and keep creating more and more modules."

Good teams. As previously discussed in Chapter Three several of the ITNEP programs required or highly recommended participation as part of a team. The faculty who participated as part of a team found that having partners was a positive experience. However, how the partnerships facilitated transfer differed for the participants. For example, Dana alleged that it was because she and her teammate were so alike. She explained:

> I think the team affect was great and the fact that it is always nice to go with a peer, be involved with something and having somebody there to discuss it and troubleshoot and think about it because you are walking the same walk. I think [my partner] and I were both either innovators or early adopters and we both would have gotten things done and I think that's why our project was so big was because there were two people like that and that's why we could take on so much. It wasn't one leading the other.

On the other hand, some participants, like Anne, described that the positive team affect that was due to opposing skill sets:

> We have the common interest of technology. We have the personal dedication to integrating technology yet our skills as we work together developing things are quite different. She is more of a global visionary and I'm more of a detailed person and we just complement each other very well.

Similarly, Cindy said that the diversity of teammate abilities made it "richer" and reasoned that it was because they were "able to bring different things to the table." Alternatively, Ellen thought that being part of team during the conference made a difference because of the small size of her department. She rationalized:

> I can turn to the person on my right and I turn to the person to my left and say, "What are you saying? Is this going to work? Is this something we can do?" We kind of have come back with already a consensus of people saying ... you know a pretty good team of people who are willing to try something new. So that is pretty helpful. It's not one

> person going back and trying to convince 10 over faculty that hasn't seen the presentation. We already have a pretty good cabal of people who can then work together to start something.

Other program features. There were a variety of other program features that participants found particularly helpful in preparing them for technology integration. For example, Oliver described that it was "the doing. I'm very hands-on. I mean you can lecture to me for three days and a week later I have forgotten half of it. I have not forgotten with the hands-on." Anne explained that the highlight of the program for her was "meeting ... the all-time greatest of mentors in the world, the person who I read all the articles on. The person I've idolized for all these years. We were star struck." And, Quinn explained that she was motivated by the program's content relevance and applicability:

> The topics were just so applicable; everything that they presented. It wasn't just simulation. It was... anything that involved technology...and that they really didn't focus on how the technology worked but they more focused on the implementation end of it... it was really helpful because I really could follow everything. Everything was a need-to-know. It was like "wow, this is really a good idea."

Suggested Improvements. The majority of participants did not have suggestions. However, Anne implied that to ensure successful transfer programs could find a better means to screen participation. She explained:

> I can't help but wonder if someone's ability to be successful or not was really dependent upon the personality of the individual. I mean I sensed a lot of negativity from some… partners that didn't seem to even like each other and I think we looked at them and said, "How did you guys do it together because you don't seem to work well together?"

And, Sarah commented on faculty development program in general. She perceived an issue of "use it or lose it":

> That's the problem with some of these workshops is that, yeah, you get exposure but if you don't have the opportunity to apply it right away... I think some of the workshops may be more productive if faculty were invited to come with our existing course or curriculum and they have very defined goals in terms of "okay, this didn't work really well for my class and I want to see how some other ideas might invigorate this aspect of

> the learning." I think that is much more appropriate, but if you have a two-day workshop where basically there was time to absorb but not apply. It doesn't go very far. I mean that's why I skipped the simulation [component] because I didn't feel like I was going to be using it.

A few other ideas put forward by participants to enhance faculty development programs included: the development of a "canned" press-release for participants for public recognition, clearer expectations of participation, the creation of participant groups by particular interest, and the development of more post-program opportunities to network.

Work/Organizational Characteristics

The extant research demonstrates that contextual elements present within organizational work environments influence the transfer of learning (Burke & Hutchins, 2007; Ford & Weissbein, 1997; Kontonghiorghes, 2004,2002; Merriam & Leahy, 2005; Scaduto, Lindsay, & Chiaburu, 2008; Teleleab, 2005; Velada, 2007) Participants in this study reported a number of ways that their work environments supported technology and informatics integration. For nearly all of the participants in this study, organizational support came from multiple sources at multiple levels. However, numerous barriers were also present in these environments. The following sections address support for transfer as well as barriers in participants' work environments.

Support. Study participants explained that sources of support in their work environments came from the institutional level; the nursing department through administrators, peers, and students; other institutional departments; and from organizations external to their institutions.

Institutional. Participants described that their transfer efforts were supported at an institutional level because of a fit with missions and strategic plans. For example, Helen reported:

> Actually the university as a whole is also trying to implement online [education] not only in silos but for the entire university. There is a university-wide effort to identify those who are really versatile or who have that special ability, the leadership, and for them to come together and see if we can implement a system that is university wide on how to do this.

Dana commented that since one of the university's missions is experiential learning, her institution was willing to provide ongoing monetary support for an EHR because "you have to buy it every year." Anne acknowledged that the integration of technology into education as part of her school's mission and goals provided her with potential leverage for institutional support. She confessed:

> …that was always my ace in the hole web. I kept thinking "well, if I'm not being supported I certainly can pull out that trump card" and say, "look, this is completely in alignment with what our strategic goals are." But I never had to. They were always very supportive.

Departmental. Support at the departmental level generally came from deans and other supervisory administrators. Participants described how these individuals helped obtain financial resources, personnel, space, and buy-in for their technology and informatics integration efforts. In describing her Dean, Dana said:

> Our Dean was visionary. She plants the seed in the right place. So she has been very creative on manipulating and getting what our program needs. So her being a visionary and getting budget and personnel, I think is a combination of what has created the right recipe to embrace these sorts of things.

Mary also explained that it was leadership vision that helped facilitate her success:

> My Chair is very, very supportive. I think that is another thing I appreciated after being at the program, is that a lot of times there is not a lot of buy-in and she was actually the front person in getting this lab. She knew there was a need. She knew to be competitive we needed it.

Theresa explained that she received "huge administrative support" for space for a new lab "I just said I have to have it and the Dean of the School and the Dean of the College really got on my bandwagon and helped me." Grace believed that her Assistant Dean's passion for technology

enabled her transfer because: “she was able to essentially act as my mentor and help me out along the way to be successful in these things.”

In addition to support from administrators, Rachael described departmental support as a function of the culture. She explained:

> We were early in using very primitive kind of technology for our Outreach education. We live in a predominantly rural state so we had a number of programs that involved and necessitated actually having the ability to connect with people in a way that didn’t necessitate their coming to campus. I think our school got known on the campus as being IT innovators, not that we develop the IT components but if somebody said, “Hey, we have a new yadda yadda,” we went “oh, we can use that for …” we thought “wow, we use communication satellites for teaching, you know, why not do ...” and then fill in the blanks with whatever the next thing was. So that was really in our blood, kind of part of the culture.

Peers. Participants described feeling supported by co-workers because they were generally accepting of change. For instance, Theresa explained: “Our faculty are very open to new ideas. We have a very progressive faculty. We don’t have anybody that is set in their own ways and won’t change. I’m very fortunate. We have a faculty that likes change and change things all the time." Dana described her peers in a similar manner: “We have a lot of early adopters for faculty in our program so there wasn’t a lot of resistance. They embraced these changes.” And, she depicted the support to integrate simulation as collaborative effort: “It was really difficult for me to even imagine how I would make one of these and integrate it appropriately into the course. So some of the ideas I came back with from [the program] and ideas came from the primary faculty. Really, it’s a team effort.”

Other faculty recruited support from colleagues. For example, in order to justify costs associated with the technology that she wanted to integrate, Ellen explained that she looked for a partner:

> I knew that part of what I needed to do when I got back was find somebody else who was also teaching the juniors...because then at least they would use it for two classes so they would feel like they were getting their money's worth. So that is what I did.

Fran stated that she found a coworker to assist her because her time was limited and she was close to retirement: "My goal became to work with one of the younger faculty and there was one in the Second Life group, not my [program] partner, but there is one who was very interested and I still work with her."

And several participants explained that peer enthusiasm provided support. Barbara declared that her peers were "excited" and "honored" that she was participating in the program. Similarly, Anne noted that her fellow faculty were "proud."

Students. Participants seemed to feel encouraged by positive student reactions to technology and informatics integration. For example, Oliver stated: "I get great feedback from the students and so I know they like it even if they say, 'I've never done a blog,' and I say, 'I haven't either so let's figure this out together.' So taking away these first hurdles is always really important." Several faculty expressed the view that there was a generational influence that supported successful integration. As Ivy explained: "I get really good feedback from them when we do the pop simulations…almost all of our kids are traditional students. Traditional students learn in a different way. They are comfortable with technology, they like to use technology." Similarly, Kelly stated:

> This is what the students of today ... this is how they want to learn. They don't want you to stand up in front of them and just open up their brains and pour the information in. They want to be active participants and they are scared when they come to simulations…but the students sell it. For the faculty that does not want to come it's "why aren't we?" That is unsolicited from the students.

And, like Kelly, Grace explained that she used student support to drive technology integration through the backdoor: "My strategy has typically been to expose it to the students and the students propel the faculty because they want it."

Other institutional departments. Participants frequently described how the support they received from other departments played a role in their success. Anne explained that they garnered critical financial backing from another department:

> We were very fortunate that we worked in partnership with some other departments on campus to create what we needed. We were able to tap into our local resource on campus. The IT department came up with the cost; it didn't come out of the nursing budget. So that would have been a huge barrier had we not fallen into that opportunity.

Other faculty attributed their success, in part, to the support from IT departments as well. Cindy maintained that without the IT department, the integration of technology would not have been possible:

> You know we worked with [the IT department] to make sure that everything was up and running technologically with our mainframe and our computer tech because they recognize the value of information technology. I mean if we didn't have the mainframe system that we have then there is no way we could do it and teach online classes.

Quinn claimed that she was more confident with technology integration because she could count on IT departmental support: "We have an awesome Technology Department. So I feel that I can use it but I also have someone holding my hand because of our system here at the university."

Lacking expertise, manpower, and equipment, a few participants described how they formed collaborations with other departments so that they could have simulations recorded, like Ivy, who forged a partnership with the communications department and Julie, who was working with the video and film department. Kelly explained how she collaborated with another department to transfer her learning:

> The information [on standardized pts] that they had to share was so rich and so new to me that it just really peaked my interest. So I called the Chair of the Theater Department and

> asked if he would be interested in forming a liaison with the Department of Nursing or College of Health Professions so that we could utilize their students as actors.

Outside organizations. In addition to support from within the institutions, two participants talked about how support from organizations outside the institution facilitate transfer. For example, when I asked Theresa where she found support for remodeling and updating a relatively new simulation lab, she disclosed that it came from the public sector: "We had some stimulus money from the State that was given to the institution." The other participant's help came from the private sector. Ivy explained that while the clinical learning lab was in desperate need of updated equipment to support simulation integration, there was no funding. She revealed how she was able to find support elsewhere:

> So we went ahead and talked to hospitals and got beds donated like current beds like they really use in the hospital and not the metal ones that we had in our labs. We actually went through and I got those secured and I got some other donations from hospitals of used equipment. The one hospital's been excellent about donating stuff for us.

Barriers. Participants were faced with a number of barriers that they had to overcome in order to be successful. All most all of the barriers that participants identified stemmed from the work environment. Themes included faculty resistance, time, funding, IT support, and leadership.

***Faculty resistance*.** Several participants described peer resistance to the changes they were trying to integrate. Strategies to move past or breakdown these barriers varied. For example, Quinn explained that she just overlooked it: "I'm in the vast minority here with, although it's our second year, our faculty and they just will not do it. I just ignore it and I just move on." Helen said she approached faculty opposition by spending time educating her peers on the positive aspects of technology integration:

> Many faculty there were not comfortable with the RN to BSN online, they were used to traditional and paper and pencil so … it wasn't easy but we explained the situation and also led them to understand the advantages of bringing this into our curriculum...

> gradually they started accepting technology, using it in the classroom; like now we use the Clickers but before many people didn't even want to hear about the Clickers.

Allowing time for faculty to come around to new technologies was the approach to faculty resistance that Kelly, too, found helpful. As she explained:

> There was faculty who were very much opposed to using that. It's been a slow process. Moving from overheads, oh my lands! It's hard to move especially when it is what you've done all of your life, to move from standing up in the front of the class and imparting that knowledge, being that sage on the stage and suddenly turning the tables and letting the student be the active participant. That is really scary for some people. So it takes a little while for them to actually see "wow, this works."

Ellen expressed that she found the resistance assisted her in the identification other potential issues:

> ... the pushback was actually really helpful. So, when other faculty said, "Well, there's no way we are going to do this. I'm not going to make my students buy this technology because it is ridiculous. I don't know how much I'm going to use them. They are going to get aggravated that they had to spend all of this money." I think that was really a driver for us to figure out "All right. How can we remove that barrier?"

Time. Participants discussed how time was a limiting factor in transfer. As previously discussed, Quinn attested to technology integration as extremely time intensive. Lisa pointed out that transfer projects which require buy-in or training of other faculty, scheduling group time can be tricky. She stated: "Don't you know we are always so busy with different hours." Sarah suggested that a lack of support for release time limited transfer. She maintained:

> I think that faculty also realizes that there is a lot of time investment in trying anything new and if there is limited support for experimentation in terms of reducing course assignment because you are trying to introduce some new things to the class then I think people are more reluctant to try something new.

Other participants spoke of issues with their individual time because of multiple responsibilities within the context of the faculty role. For example, Julie stated:

> It takes extra time and as a faculty member I have to teach so many hours, I have to do research, I have to do scholarly work, I have to service and all of that. It's not a question

> that I don't want to do it. In fact, I enjoy doing it. It's more of a question of fitting it all in.

Funding. Participants discussed the financial barriers that they faced in the context of their work and how they interfered with technology and informatics integration. Ivy described the situation that she confronted: "The other problem was just the fact that our lab was like Bangladesh. It was just a mess. There are some limitations. I mean there are always limitations. I talked to the Dean about how to get more things and she said, 'There's no money.'" Not only was funding a problem for some at the department level, it was an issue for institutions in some states. For example, Fran said: "It sounded like there was going to be development resources and all kinds of things but somewhere in there I think not too long after we started the project [our State] started having budget issues and one of the things that got cut quite a bit was higher education." Rachael explained the extreme financial crisis at her institution:

> I am working in a university that's just lost 50% of its state funding so I can't go to somebody at my university and say, "Hey, I need you to do the techno stuff on this." It has to be pretty much a no-cost. We've never had a course management system that we've had to pay for… and we have never had the tuition setting authority that allowed us to charge the course fees.

IT support. Although participant described how IT departments were supportive of transfer, other participants describe how issues with technology support were barriers. For example, Mary said:

> In education, I think that is one of the biggest downfalls is we just don't have enough manpower to do what we want. They [IT] have offered sort of begrudgingly and have been supportive. It drives them completely crazy that we could be going out on the internet without virus protection. So was there resistance? Yeah.

A few other participants commented that is was the IT staffs' lack of expertise that created hurdles. Grace described the difficulties that she faced:

> My biggest barrier is always technology support. I mean, you know, I want to connect this system to this system. Well, we don't know how to do that, and our person who is supposed to know how to do that won't tell you that they don't know how to do that...

> then they are not available because their workload is so heavy elsewhere. It should be so simple but it is not because we don't have current technologists.

Peggy depicted a similar situation at her institution: "At one point, we had a fairly large IT distance learning support staff but as the grant funding has dwindled those people have been lost to other institutions. We don't have the same pedagogical, high-quality, well-educated and experienced people as a resource right now."

Leadership. Lastly, a few participants mentioned that the issues with leadership created barriers for successful transfer. For instance, Sarah revealed: "We are in a leadership transition right now and so there is a void in terms of what our mission and our values are with teaching." Rachael explained that there was a lack of understanding of nursing by university administrators which was a problem: "We have people helping us with re-budgeting to be able to run our programs and part of what we are having to do is teach people from central administration about the fact that nursing is highly regulated. So we are having to do a lot of re-education." Rachael also made it clear that a lack of understanding by government representatives about the importance of the use of technology in education was a barrier:

> The legislature really hasn't supported our use of technology for education and it really hasn't ... our state legislature has supported very little of the things like the backbone and the internet too. That's all federal funding. We have a bit of a challenge in trying to educate who is in our state legislature and many of them did not have access to higher education. So they of themselves are not well educated and so it is hard for them to... you know it is understandably hard for them to grasp the significance of [technology integration].

Chapter Summary

This chapter presented the results from this study on transfer of learning from faculty development. Changes to courses and curricula, and the adoption of new teaching strategies and new roles as explained by study participants was offered as evidence of transfer. Participant accounts of how their learning was generalized and changes were maintained were discussed.

The chapter focused on participant descriptions of the how their individual, ITNEP program, and work environment characteristics facilitate transfer. Identified individual characteristics were grouped by participant motivations, which included looking for knowledge, filling gaps, looking for ideas, and passion; abilities, which included, lifelong learner, leader, and recognition of limitations; and personality attributes, which included creativity, persistence, risk taking, and openness. The common ITNEP program design features that were found to be supportive were: the opportunity to making connections, the diversity of experiences of presenters and participants, post conference support, and good teams. Supports in the participants' work environments were identified at the institutional level; in the nursing department, including from administrators, peers, and students; within other institutional departments; organizations outside of the institutions. The chapter concluded with a presentation of the barriers in the work environments that were disclosed by study participants.

CHAPTER FIVE: CONCLUSION, DISCUSSION, AND IMPLICATIONS

The need to better understand the transfer of learning is critical in an environment of constant change that demands lifelong learning. This is especially true in nursing, where there is a critical shortage of practitioners and nurse educators to meet burgeoning healthcare conditions with 21st century technology knowledge and skills. This qualitative study sought to better understand the transfer of learning by uncovering how various factors supported the integration of knowledge and skills gleaned from ITNEP faculty development programs into nursing education curricula. The research questions that guided this study were:

From the perspective of participants, how did their respective ITNEP programs, individual characteristics, and work environments facilitate transfer of their learning? Specifically, from the participant's perspective, I am interested in how:

a. their ITNEP program facilitated the integration of health information technology or informatics into the curriculum at the participant's home institutions.
b. their individual characteristics facilitated the integration of health information technology or informatics into the curriculum at participant's home institutions.
c. their work environment facilitated the integration of health information technology or informatics into the curriculum at participant's home institutions.

The findings in this study advance our understanding of transfer of learning beyond what has typically been measured in other research studies. They point to the importance of assessing

transfer from a holistic and qualitative perspective to fully comprehend the influence of participant characteristics, training programs and work environments on transfer of learning.

Study findings underscore the importance of critical selection of training cohorts, especially when transfer of learning is vital to diffusion of knowledge and skills or when resources for training are limited. Participants in this study were proactive, they became agents of change. The interaction between the participants' characteristics and the ITNEP programs and between the participants' characteristics and their work environments was a catalyst for transfer.

Successful transfer of learning related to the particular intention of the ITNEP programs was verified through participant descriptions. Although the design and delivery of the ITNEP programs under study varied, they shared a common purpose to enhance faculty knowledge and skills in the use of simulation, e-learning, informatics, and telehealth in order to integrate information and other technologies into nursing education and practice. As reported in the previous chapter, participants integrated a wide range of new technologies, new strategies for technology use, and informatics competencies into the curriculum.

Additionally, the study findings demonstrate that the outcomes of the ITNEP programs went far beyond the transfer of program knowledge and skills into the nursing curricula at participants' home institutions. The ITNEP programs changed participants' beliefs, values, and decision-making. Participants described that the programs provided new frameworks for teaching and learning with technology, inspired a larger vision of their potential to impact nursing education, inspired creativity, validated their teaching approaches, fostered confidence, and engendered enthusiasm for change. These findings also demonstrate the important role that faculty development programs play in encouraging faculty to improve teaching and learning. Participants explained that they became more skilled educators. Additionally, participants in this

study served as role models for others. They demonstrated commitment to their institutions, administrators, peers, students, and nursing education. They reached across discipline silos and engaged other disciplines in advances in teaching and learning. They diffused their knowledge and skills to many others.

This chapter begins by answering the research questions through a discussion of conclusions drawn from participant perceptions of how these accomplishments were facilitated. Study limitations and implications for future research, practical implications, and a chapter summary follow.

Conclusion and Discussion

This study confirmed the importance of learner characteristics, program features, and factors in the work environment for supporting successful transfer of learning and supports a variety of other transfer research findings. While patterns of specific characteristics emerged through participant interviews and subsequent transcript analysis, interacting findings were found threaded through participant characteristics, the programs design elements, and characteristics in the work environment. The discussion below addresses the relevance of specific and interacting findings in this study and how they fit within the current transfer literature.

Participant Characteristics

The research participants in this study identified a variety of personal characteristics that supported their successful transfer of learning. During our interviews they described how particular motivations to learn, abilities, and personality traits supported the integration of technology and informatics into the curricula and helped them negotiate past barriers at their respective institutions. Individual characteristics have been well studied in the literature with an

emphasis on the Big Five (contentiousness, agreeableness, extraversion, openness, and neuroticism) (Major, Turner, & Fletcher, 2006). The common individual characteristics that were identified by participants as supportive to transfer of learning in this study were: motivation, lifelong learning, leadership abilities, understanding limitations, creativity, persistence, risk taking, and openness. While not necessarily new findings, other than motivation and openness, these characteristics have not been frequently investigated or discussed. These characteristics were intertwined to foster transfer. For example, the recognition of limitations highlighted the need to use creativity abilities, persistence, risk taking and the need to be open to change and to continue to learn.

These individual characteristics are often identified as hallmarks of effective leaders (Kirkpatrick & Locke, 1991; Mendez-Morris, 1992). Furthermore, participants reported that their leadership abilities were supportive of successful transfer of learning. Vaill (1996) suggests that leadership is demonstrated by initiative. The participants in this study took the initiative to attend and participate in the ITNEP programs and transfer their program learning by making changes to the curricula at their home institutions. Leading change requires an investment of an individual's time, energy, and resources. Few changes in higher education can be made in a vacuum; most require the endorsement, cooperation, and support of others. So participants had to be willing to "champion" their causes to overcome obstacles and resistance and to obtain needed buy-in and support from various individuals. Study participants demonstrated a desire to lead by taking the initiative to volunteer for new roles, lead faculty development efforts, create local collaborations, and regional alliances. Several participants became speakers at later ITNEP programs as they continued to promote change and innovation.

Bolman and Deal (2003) state that leadership varies with each circumstance and an effective leader must be able to recognize what the situation requires. Participants in this study understood the uniqueness of their work environments. They knew when to sell because there was interest, when to tell as to not overload peers with too much information, when to invite collaboration, and when to delegate because followers were willing and able to assume the responsibilities engendered by change. Participants generated endorsement, enthusiasm, and commitment from others at their institutions for the changes that were made, even if it took awhile.

And, in as much as participants had the ability to take charge and advocate for the changes that they wanted to make, they also had the ability to understand limitations and boundaries. Before they could find the ways around barriers, they first had to be able to identify them. And, they had to be realistic about what could be accomplished in the context of their work environments. Participants recognized when to "scale back", when to work to "pull" others in and when to "go around" resistance.

Participants had other particular abilities that supported successful transfer of learning. They were lifelong learners. Faculty spoke about "liking to learn," "being self-taught," and "continually seeking out professional development opportunities." Lisa and Dana spoke about "doing the research" and re-educating themselves. Purposeful ongoing participation in learning activities allows faculty to respond to the development of new knowledge, innovations, and pervasive change (Langley, O'Connor, & Welkener, 2004).

In this study, all but two of the participants explained that they had particular and compelling motivations to participate and learn from ITNEP program participation. The two without specific aims stated that program attendance had little, if any, impact on their education

practices. This demonstrates the importance of motivation for successful transfer. This finding agrees with other research, which has shown that an individual's pre-training motivation was strongly related to transfer of learning (Scaduto et al., 2008). Ottoson's (1997) rare qualitative study of professional development participants found that those who had strong motivations to participate with particular learning goals reported extensive application of their learning even in the face of limited support in their work environments.

Study participants' motivations stemmed from different sources. Several participants were motivated by the desire to gain more knowledge and skills about the use of technology in nursing education. Some were looking for formal background knowledge and others were seeking practical "tools" or foundational knowledge. Participants also were hoping to "fill gaps" in their own knowledge-base, the curriculum, or between practice and education. Participants were hopeful to get ideas and make connections to spark creativity, and to validate their own practices. And, some were determined to learn more because they had a passion for the topic. Not one participant mentioned that they were motivated by any directive or potential reward or sanction; all spoke of being driven from within.

In this study, participant motivations to participate in and learn from ITNEP programs were intrinsically rooted and driven by the desire to improve the quality of their education practices, which is characteristic of professional practice (Daley, 2002; Dirkx, Gilley, Gilley, 2004). Prior research that has examined intrinsic and extrinsic motivation on transfer of learning has resulted in mixed findings. Santos and Stuart (2003) and Taylor et al. (2005) found that employees who perceived that training lead to rewards, such as salary increases or promotions, were more likely to transfer their learning. On the other hand, other researchers have found that

intrinsic motivations enhance transfer or transfer mediators (Facteau, Dobbins, Russell, Ladd, & Kudisch, 1995; Kontoghiorghes, 2001).

Findings from this study suggest that since all participants faced barriers to transfer in their work environments, their motivations from pre-training through post-training remained strong enough to successfully transfer learning. In some cases motivation may have been enhanced. This finding is unique as there is little other research that has examined the effect of changes in individual motivation from pre-training to post-training (Alvarez et al., 2004). Motivational aspects more commonly have been researched as separate variables, most commonly as pre-training motivation to learn (Cheng, 2000; Colquitt et al., 2000; Klein, Noe & Wang, 2006; Kontoghiorghes, 2001) and post-training motivation to transfer learning (Kirwan & Birchall, 2006; Kontoghiorghes, 2002; Machin & Fogarty, 2003; Yamkovenko & Holton, 2010).

Study participants had several common personality traits that supported successful transfer of learning. They reported that they were creative, innovators, and visionary. This supported their transfer efforts because it allowed them to imagine potential uses of technology integration. For example, Dana could "see a place for things." Their creativity allowed them to be able to envision how to customize and fit the strategic use of the technology within a particular context, like Ivy who could adapt ideas that she "gleaned" from others. And, although several faculty mentioned that funding was an issue, the economic downturn and ongoing financial crisis in higher education was not necessarily a deterrent for transfer of learning. Like, Kelly, participants used creative solutions to find alternative resources by going to other departments and outside organizations.

Participants also were persistent, determined, and committed which helped them overcome resistance and barriers. Some described themselves as "driven," "tough-skinned," or

someone who loves a "good challenge." The majority of the technology and informatics changes that were integrated were not simple, quick fixes but were time consuming. Persistence helped participants to find the time, energy, and resources to be successful because as several participants indicated there was no release time for time intensive technology integration projects and whether it was funding, expertise, or manpower, adequate resources were an issue. Lack of time and inadequate resources have been cited as deterrents to training motivation and transfer of learning in other transfer investigations, as well (Brown & McCracken, 2009; Clark, 2002; Ginns, Kitay, & Prosser, 2010).

Participants were risk-takers. Uninhibited by potential negative feedback they were willing to "put themselves out there" and not afraid of mistakes. They pointed out that to integrate technology they had to be willing to try new things and admitted that their ideas did not always work out. They hit "bumps in the road" and "bumbled" through early adoption efforts but were not deterred. Participants were willing to admit mistakes and continue to "experiment" in order to know what worked and to find ways to improve. Like Oliver claimed, participants were able to use mistakes to their "advantage" and learn from them. However, there is little research regarding the relationship between risk propensity and transfer of learning

Findings in this study support a positive relationship between openness and transfer of learning. Participants were open to technology, change, and new ideas. By being open to technology integration, participants like Julie, found that it was not as difficult as originally perceived. And clearly, successful integration requires change, while technology itself is constantly changing. Furthermore, integration of technology required participants to adapt strategies to fit with particular contexts, for example to meet student learning needs or cope with limited resources. Ivy also spoke of the importance of being open to input from others because

"everyone has good ideas." Using ideas of others was also an effective strategy during integration to get "buy-in."

As one of the Big Five personality domains, openness to experience has received attention in the transfer literature. Openness to experience is related to various personality constructs, including creativity, experience seeking, intuitiveness, being open to new ideas, and readiness to re-examine values (McCrae, 1987). Research findings related to training and work performance include: a positive relationship between openness and training proficiency (Barrick &Mount, 1991, Barrick, Mount, & Judge, 2001), a stronger relationship between openness and jobs involving teamwork rather than service work (Mount, Barrick, & Stewart, 1998), and between openness and training outcomes (Lievens, Harris, Van Keer, & Bisqueret, 2003). Non-significant findings between openness and the motivation to improve work through learning (Naquin & Holton, 2002) and motivation to learn and motivation to transfer learning (Rowold, 2007) have also been reported.

Cheng and Hampson (2008), however, have argued that there is insufficient conclusive evidence for narrowly defined individual traits that support transfer of learning. Limited research has examined the influence of compound personality traits on transfer of learning. Compound personality traits are combined personality traits that have been shown to be relatively stable and do not co-vary (Hough, 2003). The proactive personality concept is an example of a compound variable. Individuals with a proactive personality identify and act on opportunities, show initiative, and take action and persist until they effect change (Crant & Bateman, 2000). The proactive personality also has been shown to be significantly related motivation to learn (Major et al., 2006), innovation and career initiative (Seibert, Kraimer, & Crant, 2001), and is associated with effective leadership behaviors (Crant, 2000; Kirkpatrick & Locke, 1991). Finding in this

study suggest that the combination of the identified participant characteristics and their actions fit the profile for proactive personality. Participants recognized gaps in their own knowledge, the curriculum, and between nursing education and practice and were responsive. They took the initiative to apply and attend the ITNEP programs. And, they persevered in the face of challenges to integrate technology and informatics.

Program Characteristics

A variety of program design elements have been found to encourage successful transfer of learning, including the use of active learning strategies, cognitive load balancing, training practice, feedback, and the effective use of technology tools (Burke & Hutchins, 2007). In this study, the program design elements that were found to support transfer were the opportunity to make connections, being able to learn from the diversity of participants and presenters, post conference support, and good teams.

Among other researchers, Bell and Kozlowski (2008) and Ford and Weissbein (1997) have maintained that interactions between the training design and the characteristics of the trainee effect learning and transfer. This study strengthens that assertion as the retention of strong motivation throughout the ITNEP program may be, in part, due to the fact that the participants in this study who had particular learning goals sought out ITNEP program participation to in order to meet those goals and found a match between their learning goals and the program content. For example Ellen wanted to learn about tools that could assist her with student engagement and Ivy wanted to learn about setting up a simulation lab and through participation in the ITNEP programs they met their objectives.

The study participants' subsequent successful transfer of learning also supports the notion that a match between the program content and the opportunity to use their program learning in

the work environment promoted the transfer of learning. This finding corroborates other transfer of learning investigations, which demonstrated a strong match between program content and employees work roles provided an opportunity to use training and increased the likelihood of transfer (Alliger, Tannenbaum, Bennett, Tranver, & Shotland, 1997; Baldwin & Ford, 1988; Lim & Johnson, 2002; Lim & Morris, 2006).

Closely aligned to the importance of match between program content and work roles and opportunity to use training, is the participants perceived relevance of the training. The perceived relevance of training has been shown to influence trainee reactions to training (Morgan & Casper, 2000), motivation to transfer (Alliger et al., 1997; Ruona, Leimbach, Holton, & Bates, 2002) and transfer (Velada et al., 2007). In this study, the two participants who did not find value in their ITNEP program participation reported that they transferred little or nothing at all.

The other study participants described how taking advantage of the opportunities to network supported transfer of learning. Networking saved participants from having to reinvent the wheel; they could take advantage of what others had already learned. For example, Ellen found that the chance to speak one-on-one with users of a particular technology gave her more insight to valuable strategies and potential pitfalls of use. For other participants, like Barbara, the camaraderie fostered "excitement." Participants remarked that the relationships they established during the programs became what Kelly labeled a "think tank," that spawned new ideas and nurtured creativity. And, several participants, including Grace and Dana, talked about how making connections through the programs allowed them to develop a network of colleagues that they could contact, visit, and collaborate with for feedback and help with technology and informatics integration.

Participants described how the variety of educators and diversity of perspectives in the programs supported technology integration by providing both global and realistic perspectives of what was happening across the country in terms of technology integration. Participants got firsthand knowledge and networked with fellow nurse educators. For some, the value was in getting background information and learning about potential pitfalls. Connecting with other participants provided ideas that participants could adapt. It was proof of what could be done and was inspirational for participants, like for Kelly; it helped them see endless "possibilities." For others, like Dana, it provided a reality check, and helped them get to a "deeper understanding" of what needed to be done in order to achieve technology integration goals.

As previously discussed, all programs included a conference component. All programs also offered post conference support via a variety of formats, including email discussions, conference calls, and electronic resources. Ongoing support was inspiration for some of the participants. For other participants it was just the reassurance that the support was there if needed that provided encouragement to be successful. Others, like Theresa, made continual to use of ITNEP programs' electronic resources to support integration endeavors.

Several of the ITNEP programs required or suggested that faculty participate in programs as part of a team from their institution. In this study, six participants took part in the ITNEP programs as part of a team. Although participants reported that having a partner facilitated the transfer of learning, their explanations for how that support influenced success varied. For example, it was the similarity in approaches to technology adoption which allowed a common understanding to develop that was the important feature of the partnership for Dana. On the other hand, Anne and Cindy explained that it was the differences between themselves and their

teammates that provided balance and richness. For Ellen, sharing program experiences with her teammates allowed significant endorsement of her proposed technology integration.

There is a paucity of research that examines trainee team effects on individual transfer of learning. Although not all teams are effective, high performance teams are capable of outstanding performance and are characterized by a shared vision, creativity, resilience to setbacks, risk taking, and continuous learning (Bateman, 1990; Castak, Bamber, Sharp, & Belohoubek, 2001). All of the participants who were part of a team reported that the team supported their transfer of learning, which suggests that the teams were highly effective. Moreover, the characteristics of high performance teams and the individual characteristics found to be supportive in this study share several commonalities, including creativity, persistence, risk taking, and ongoing learning. However, while the team effect may have contributed to the success of the individual, it was nearly impossible to isolate because many participants, if not all, worked with others in some fashion. Post program, three study participants who had been on a program team partnered with co-workers who had not participated on their original team. Others mentioned that they worked closely with peers and collaborated with individuals in other departments to integrate technologies and informatics competencies.

The four program design factors that were found to have facilitated transfer of learning in this study (opportunity to make connections, exposure to a variety of perspectives, post conference support, and good cabals) are threaded together by social influence. Social influence occurs when the attitudes or behaviors of an individual are changed by the intentional or unintentional influence of others, through the processes of compliance, identification, or internalization (Kelman, 2006). Compliance occurs when individuals accept influence in order to obtain rewards or avoid punishment or obtain approval or avoid disapproval from the influencer.

Identification occurs when individuals accept influence in order to create or sustain self-defining relationships with the influencer. Internalization occurs when individuals accept influence because the induced behavior is perceived as consistent with their self-concepts or conducive to the maximization of their value systems.

In this study participants were encouraged, received feedback or endorsement, recognized other perspectives, and gained new insights and understanding through their social interactions with others during the ITNEP programs and post-conference follow-ups. Since, participation in the ITNEP programs was voluntary, there was no system of rewards in the ITNEP programs, and post-program participants were largely removed from the realm of their influencers, their ITNEP experiences were primarily internalized and provided significant support for their technology and informatics integration. This finding supports Malhotra and Galletta's (1999) research study of employees from several hospitals who were trained on the use of new software. Their study found that social influence through the process of identification or internalization played a key role in determining the acceptance and usage behavior of new adopters of new information technologies.

Work/Organizational Characteristics

Research has shown that trainees are more likely to transfer their learning to their work environments when there is a climate of support (Lim & Morris, 2006; Seyler et al., 1998; Tracy & Tews, 2005). Encouragement in the work environment can come from various levels and forms. For example, support can come at the organizational level through perceptions of a quality driven culture or commitment (Kontonghiores, 2002, 2004); or at the departmental level through supervisors via reinforcement (Gumuseli & Ergin, 2002,), recognition (Tracey & Tews, 2005), or support (Scaduto et al., 2008; Velada, et al., 2007); and from co-workers (Chiaburu &

Marinova, 2005). Findings from this study demonstrated that sources of support in participants' work environments differed significantly by individual. Support came from the institutional level, the nursing department through administrators, peers, and students, and from other institutional departments and organizations outside of the institutions and through range of means. All participants had support from multiple sources. These findings demonstrate that support is context dependent and also help explain inconsistent findings that exist in the transfer research.

Of particular note, the findings in this study show that alignment between participant transfer efforts and institutional or departmental goals was supportive. For example, Helen explained that her institution was working toward pooling technology integration efforts across the university. This created a local network of expertise for technology integration. Other participants, like Dana and Anne, explained that because there was a strategic link, they received resources, which were critical to their successes. Prior research on the influence of strategic alignment between institutional or departmental goals and the trainee transfer goals is limited. Montesino (2002) found that the group of trainees who self-reported the greatest use of training perceived a significantly higher alignment of the training program with the strategic direction of the organization.

With regard to social support, there are contradictory findings present in the extant research. Various studies have shown the positive influences of supervisory or peer support on transfer of learning or mediators of transfer, while other have shown no relationship (Awoniyi, Griego, & Morgan, 2002; Colquitt et al., 2000; Chiaburu & Marinova, 2005; Chiaburu & Tekeleab, 2005; Velda et al., 2007). In this study, some participants found support from administrators, some from colleagues, and some found support from both. As Mary explained,

department administrators provided vision that helped with buy-in for participant integration efforts. They were instrumental in securing funding and personnel to facilitate faculty success. Colleagues supported participants' efforts by showing enthusiasm. Having fellow faculty that were open to change and willing trying new things made technology integration easier. Like other study participants, Dana pointed out that peers supported integration by providing feedback, new ideas, and worked alongside participants as teammates. However, some of the study participants found that that there was resistance from administrators or from their peers. In many cases, the resistance was overcome through social influence; however, this time participants became the influencers.

Participants in this study also cited other sources of support for transfer of learning in their work environments. Like peer support, students' positive reactions to technology integration were another source of encouragement for study participants. Students also helped faculty recognize differences in learning styles and facilitated buy-in with other faculty. Several participants discussed how other institutional departments provided support for technology integration. They spoke of the "handholding," manpower, expertise, equipment, and financial support that was provided by other departments as being integral to their successes. And, a couple of participants explained how outside institutions were instrumental to their successful transfer of learning by providing funding and much needed equipment. These particular findings have not received much attention in the transfer literature and warrant further research.

Schein (1985) argued that organizational culture influences a variety of individual behaviors, such as motivation, innovation, and risk-taking behaviors. One participant in this study reported that the department's culture of innovative technology use was inspirational, which facilitated her transfer of learning. This finding is related to other research results in the

transfer literature. In particular, an organizational culture that values learning has been shown to positively affect motivation to transfer training (Chiaburu &Tekeleab, 2005; Egan, Yang, & Bartlett, 2004) and post-training behaviors (Tracey, Tannenbaum, & Kavanagh, 1995) and transfer (Cheng, 2000; Kontoghiorghes, 2004).

Interactions between the work environment and the characteristics of the trainee have been shown to influence learning and transfer of learning (Ford & Weissbein, 1997). This was true for participants in this study. For instance, due to barriers in the institutions, participants had to find resources outside of their departments or institutions; however, they to be creative enough to think of where to go and persist until challenges were resolved.

Research has established that interactions between supervisory support (Chiaburu et al., 2010; Egan, et al., 2004; Seyler et al., 1998), the opportunity to use training and peer support (Seyler, et al.), and a positive transfer climate (Kontoghiorghes, 2004) influenced trainee motivation to learn. Kontoghiorghes also found that perceived culture elements in the organization positively influenced motivation to learn, including organizational commitment; reward or recognition for innovation, and risk taking; and job contribution to the organizational mission. Participants in this study also were motivated by factors related to their work environments such as apparent gaps in the curriculum and changing classroom dynamics. However, these and other participant motivations were rooted in the adaptive challenges of the environment at large, such as changes in the healthcare arena and likely by an allegiance to their professional values as nurses and educators.

Daley (2002) argues that professionals are often more closely aligned with the canons of their professional work than with the organization in which they are employed and are influenced by their occupational community. Research has demonstrated that interaction with others in the

community increases allegiance to the profession (Daley, 2000). Findings in this study support this conclusion. Several participants reported that through ITNEP program participation, they had transformational experiences that extended their professional roles in nursing education at their institution and beyond to regional and national activities.

Study Limitations and Implications for Future Research

The findings in this study were gleaned from higher education nursing faculty who participated in ITNEP faculty development programs related to technology and informatics. Due to confidentiality, I was unable to do individual case studies of each ITNEP program. Therefore, findings in this study represent a global perspective of the programs. These findings are limited by the specificity of the programs and the participants and are not necessarily generalizable to other training and development programs.

The findings in this study have several implications for future transfer of learning research. To begin with, several of the participant characteristics that were identified as supportive to transfer are newly identified or have seldom been discussed in the transfer research. These factors include: lifelong learning, leadership abilities, understanding limitations, creativity, persistence, and risk-taking. Research that examines these characteristics is reasonable. However, these characteristics may be nebulous, hard to define and measure because of their interrelatedness. This suggests research that includes the investigation of compound characteristics in future transfer studies, such as the proactive personality concept, which may be more easily identifiable through particular behaviors. Identification of employees who are more likely to transfer new skills and knowledge into the work environment can help organizations maximize training investments.

More research that examines the congruence between participant motivations and the mission and direction of institutions and departments is needed to better understand how transfer is facilitated through goal alignment. Findings from this type of research may help direct institutions in the selection of trainees and training cohorts. Results also could provide evidence for avenues of support for trainees.

This study confirmed other research that has established the importance of motivation in successful transfer. Yet, there are limited studies that examine how motivation changes from pre-to-post-training. This study established that motivation was maintained or enhanced from pre-to-post training. However, research that investigates how particular elements foster or hinder the maintenance of motivation from pre-to-post training is needed. Findings from this type of research can be used to tailor program design and content so as to maximize participant motivations to learn and transfer.

The role of social influence on transfer of learning found in this study has implications for future transfer research. Understanding how each process of social influence fits within training and development efforts and institutional culture can provide direction for programs and organizations that want to maximize transfer. For instance, supervisory sanctions have been found to be negatively related to motivation to transfer (Seyler, Holton, Bates, Burnett, & Carvalho, 1998), suggesting that training programs and institutions that need to reinforce compliance do so from a positive perspective.

Participation on teams positively influenced the transfer of learning for participants in this study. Participants were part of formal teams for the ITNEP programs. Reported support was manifested through teammate similarities and differences. Additionally, participants were part of informal teams post program or sought collaboration with a variety of individuals that may or

may not constitute teamwork to successfully transfer their learning. How team support facilitated transfer remains unclear and clearly demonstrates the need for more research that investigates the effect of teams on learning transfer.

In 1997, Ottoson stated that because of the complexities inherent in transfer research "additional qualitative studies grounded in participant experiences are needed to identify the universe of influences on application before for quantitative studies pursue the strength of selected influences" (p. 13). Yet, there remains a paucity of qualitative studies that have examined transfer and highlights the need for more transfer research that captures the voice of the individuals engaging in transferring efforts. More qualitative research will allow a better understanding of how trainees interpret the supports and barriers to successful transfer, which can help direct transfer efforts and future research.

Implications for Practice

There are a variety of practical implications that stem from the research findings in this study for faculty development providers, supporters, and participants, and for employers who want to encourage transfer of learning. In this study, even though they varied, strong specific motivations were critical to successful transfer of learning. This suggests that program providers should assess program applicants to look for highly motivated participants with defined rationales for participation and learning. It also implies that institutional administrators should consider the motivations of the individuals for whom they provide support for development program participation. Findings from this study suggest that participant motivations should match the content of the program and that program content should be relevant to employee job functions. Lim and Johnson (2002) suggested that the assignment of work projects related to training content before, during, or after the training should promote learning transfer.

The ITNEP programs met the learning expectations of most of this study's participants; however, they did not for two of the participants. And, it is highly likely that these two were not alone. This underscores support for needs assessments to insure program design, content, and timing are appropriate for particular training needs.

As identified in Table 3, prior to attending the ITNEP programs, all participants had at least some familiarity/experience with the technology or informatics competencies that they integrated. This suggests that faculty made need multiple exposures to a technology or informatics information before they attempt to integrate related changes. However, this could be entirely coincidental to my study sample.

Even though they were able to overcome them, all participants in this study faced barriers to transfer in their work environments. This suggests that strategies to help trainees transcend challenges should be employed. Ottoson (1997) suggested that development programs should take time to help participants think about potential obstacles and plan ways to strengthen possible avenues of support in their work environments. Faculty resistance was a barrier in this study. A useful strategy might be to teach negotiation and persuasion skills. Time was another hurdle. Post-conference, participants returned to their institutions and had to find the time to plan and integrate their learning in addition to performing their regular duties. Only one participant was given official release time. Lim & Morris (2006) found that the sooner trainees had the opportunity to use program learning the better as learning diminished over time, which highlights the immediacy of initiating transfer activities. Development programs might include planning time during conferences for participants or address time management skills to help participants begin the transfer process. Funding was an issue, so programs could take time to address grant

sources and grant writing skills. All of these strategies can be employed by institutions that want to encourage and enhance transfer of learning efforts by their employees.

The fact that participants faced financial obstacles and yet were able to successfully transfer their learning suggests that faculty development initiatives should continue despite austere times. It also suggests that faculty at financially strapped institutions should still participate. Program activities may provide participants the opportunity to connect with others with whom they can cost share or get ideas that can be adapted to their particular contexts. Additionally, several participants transferred their learning with no associated costs, such as Oliver, who structured part of a course around a blog.

Participants developed and demonstrated leadership skills during their transfer efforts. This suggests that programs could devote some time to leadership training. Additionally, institutions that want to encourage transfer of learning may want to offer leadership enhancing activities

Faculty development as part of a team may not always be realistic depending on the timing of program offerings, the number of faculty in the department, or how participation is financed. However, findings from this study indicate that when possible institutions and program providers should encourage team participation. Additionally, they should examine methods for the formation and development of high performance teams. Individual characteristics can be used in this process.

Several recommendations can be made on the basis of social influence that was found to be threaded throughout supportive program design elements and to participants' transfer efforts in their work environment. First, development programs should provide networking opportunities during programs. Several participants commented that the informal exchanges that

took place during the conferences were the most valuable part of the ITNEP program; where they learned the most. Creating these occasions is simple and the most significant cost would be time.

Second, since some participants stayed in touch with one another post-conference and established working relationships, development programs should provide ongoing opportunities for participants to stay connected. The advance of social software provides a relatively simple and easily accessible avenue to facilitate this objective. At a minimum, conferences could provide contact information for all program participants to share.

Third, institutions should encourage and provide opportunities for faculty to share their learning both within and outside of the department. This not only provides recognition for participant efforts, it also advances diffusion of knowledge and fosters interdisciplinary collegiality. Faculty development programs should make concerted and ongoing efforts to collect transfer outcome data from participants for dissemination. One of the participants in this study suggested that programs should provide "canned" press releases, ready for participants to announce their successes. This fosters confidence through an expectation of success. It also serves the purpose of encouraging participants who have not yet transferred their learning and provides contact information for advice. All of these ideas, related to using social influence to enhance transfer, help create communities of learners that can pool expertise and solve problems together (Davenport & Prusak, 1998).

Participants learned from the variety of perspectives that they encountered during ITNEP program participation. They were able to take ideas from others and adapt them to their particular contexts. This suggests that program organizers should maximize participant and presenter diversity and proactively attempt to solicit participation from those who have a wide

range of experiences and backgrounds and are from an array of institutional types and geographic locations to capitalize on a breadth of ideas.

Study participants found support in the alignment of institutional or departmental objectives and their individual transfer intentions. This indicates that institutions and departments should promote and provide training and development programs directly or support participants decisions to attend that align with organizational or departmental goals. This finding also implies that participants should consider strategic alignments while planning and integrating change.

Student support facilitated the transfer of learning by providing enthusiasm and encouragement to faculty for the use of new technologies. Like on many higher education campuses, many of these students were tech-savvy. This suggests that formation of student-faculty teams, where faculty provide the pedagogy and students help with technical aspects of integration, might facilitate transfer of learning related to technology integration.

Risk-taking behavior was identified by many of the participants in this study as essential for successful transfer of learning. Although it may not be possible in all organizations, some institutions may want to consideration strategies to develop a culture of risk-taking or encourage risk-taking activities to enhance transfer of learning. This could be accomplished, for example, by rewarding employees for risk-related endeavors or empowering individual employees to make independent decisions.

Chapter Summary

This chapter answered the main research question in this study by presenting conclusions of how participant characteristics, training program design elements, and characteristics of the work environments supported transfer of learning for faculty participants of ITNEP programs.

The chapter presented a discussion of the study findings, study limitations, and research and practical implications resulting from study findings.

This study was important for understanding the nuances of transfer of learning that predetermined categorical findings cannot discern. This study was also significant because it qualitatively corroborated quantitative research findings in the transfer of learning literature and examined how transfer was facilitated post-transfer, through the voices of those who successfully transferred their learning. Novel or seldom investigated factors that supported transfer were found.

Like Ottoson's (1995) quantitative study of faculty development participants that found a web of interacting factors which supported learning application but made it difficult to isolate common threads among study participants, this study also found that the numerous, interrelated, and varying factors which facilitated transfer of learning for participants that were threaded together creating a labyrinth of influences. Post- program, participants in this study integrated a range of technology and informatics changes into the curriculums at their institutions. Their attitudes, behaviors, and decision-making processes shifted. These findings underscore the importance of faculty development programs for diffusing knowledge and transferring learning in higher education.

The ITNEP programs provided opportunities for participants to expand their knowledge and skills related to technology and informatics integration in nursing education. Intrinsic motivation fostered ITNEP program participation, learning, and transfer. Participants were proactive in their approaches to meet today's complex challenges inherent in their professional roles as nurse educators. Griffin, Neal, and Parker, (2007) note that proactive behaviors are

critical in order to be able to respond to shifting demands during times of uncertainty, change, and increasing interdependence.

The threads of social influence that cut across program design elements provided opportunities for dialogue and reflection that fed participants' motivations to transfer their learning. In the process of transferring they became the influencers. They used creativity, persistence, risk-taking behaviors, and learned from missteps to lead change. They overcame resistance and won buy-in, involved other departments and organizations outside their institutions in their transfer efforts and they diffused their learning. Through ITNEP program participation, these nurse educators responded to the changing contexts of higher education and healthcare.

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Appendix A

Approved by the Human Subjects Committee University of Kansas, Lawrence Campus (HSCL). Approval expires one year from 5/27/2011. HSCL #19451

INFORMED CONSENT STATEMENT

Transfer of Learning from Faculty Development

INTRODUCTION

The Department of Education Leadership and Policy Studies at the University of Kansas supports the practice of protection for human subjects participating in research. The following information is provided for you to decide whether you wish to participate in the present study. You may refuse to sign this form and not participate in this study. You should be aware that even if you agree to participate, you are free to withdraw at any time. If you do withdraw from this study, it will not affect your relationship with this unit, the services it may provide to you, or the University of Kansas.

PURPOSE OF THE STUDY

The broad aim of this study is to understand of how the transfer of learning was facilitated for participants in faculty development programs pertaining to the use of health IT in nursing education. This study will explore the experiences of Faculty Development: Integrated Technology into Nursing Education and Practice Initiative (ITNEP) program participants who have successfully integrated newly acquired program knowledge and skills into the curricula at their home institutions to investigate the larger phenomenon of learning transfer.

PROCEDURES

If decide to participate in this study, your interview will last approximately 30-60 minutes. Your participation will involve answering questions about the ITNEP program for which you were the principle investigator to provide background information for this study. You may answer all, some, or none of the interview questions. You will be asked to identify graduates from your ITNEP program who have successfully integrated a health information technology or informatics into the curriculum at their home institution as potential participants for this study. You also will be asked to provide the investigator with access to documentation, Websites or artifacts that facilitate an understanding of the ITNEP program. Interviews will take place via the telephone. With your permission the conversation will be audio recorded. Audio files will be used by the investigator only and stored on a password protected laptop.

RISKS

There are no anticipated risks to human subjects who participate in this study.

BENEFITS

The anticipated direct benefits for human subjects who participate in this study are the opportunity to participate in an educational research study and receive a summary of study findings. The potential anticipated indirect benefits for human subjects who participate in this

study are the benefits that accrue to faculty development program developers and funders, future faculty development participants, and nursing education from transfer of learning knowledge gleaned from this study.

PAYMENT TO PARTICIPANTS

No payments will be made to study participants.

PARTICIPANT CONFIDENTIALITY

Your name and potential identifying information will not be associated in any publication or presentation with the information collected about you or with the research findings from this study. Instead, the researcher(s) will use a study number or a pseudonym rather than your name. Your identifiable information will not be shared unless required by law or you give written permission.

Permission granted on this date to use and disclose your information remains in effect indefinitely. By signing this form you give permission for the use and disclosure of your information for purposes of this study at any time in the future.

REFUSAL TO SIGN CONSENT AND AUTHORIZATION

You are not required to sign this Consent and Authorization form and you may refuse to do so without affecting your right to any services you are receiving or may receive from the University of Kansas or to participate in any programs or events of the University of Kansas. However, if you refuse to sign, you cannot participate in this study.

CANCELLING THIS CONSENT AND AUTHORIZATION

You may withdraw your consent to participate in this study at any time. You also have the right to cancel your permission to use and disclose further information collected about you, in writing, at any time, by sending your written request to:

Kim Z Rock, MA
Principal Investigator
Education Leadership and Policy Studies
Joseph R. Pearson Hall, Rm. 421
1122 W. Campus Rd.
University of Kansas
Lawrence, KS 66045
785-864-4458

If you cancel permission to use your information, the researchers will stop collecting additional information about you. However, the research team may use and disclose information that was gathered before they received your cancellation, as described above.

QUESTIONS ABOUT PARTICIPATION

Questions about procedures should be directed to the researcher(s) listed at the end of this consent form.

PARTICIPANT CERTIFICATION:

I have read this Consent and Authorization form. I have had the opportunity to ask, and I have received answers to, any questions I had regarding the study. I understand that if I have any additional questions about my rights as a research participant, I may call (785) 864-7429 or (785) 864-7385, write the Human Subjects Committee Lawrence Campus (HSCL), University of Kansas, 2385 Irving Hill Road, Lawrence, Kansas 66045-7568, or email mdenning@ku.edu.

I agree to take part in this study as a research participant. By my signature I affirm that I am at least 18 years old and that I have received a copy of this Consent and Authorization form.

_____ _____

Type/Print Participant's Name Date

_____

Participant's Signature

Researcher Contact Information

Kim Z Rock, MA
Principal Investigator
Education Leadership and Policy Studies
Joseph R. Pearson Hall, Rm. 421
1122 W. Campus Rd.
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Faculty Supervisor
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Appendix B

Approved by the Human Subjects Committee University of Kansas, Lawrence Campus (HSCL). Approval expires one year from 5/27/2011. HSCL #19451

INFORMED CONSENT STATEMENT

Transfer of Learning from Faculty Development

INTRODUCTION

The Department of Education Leadership and Policy Studies at the University of Kansas supports the practice of protection for human subjects participating in research. The following information is provided for you to decide whether you wish to participate in the present study. You may refuse to sign this form and not participate in this study. You should be aware that even if you agree to participate, you are free to withdraw at any time. If you do withdraw from this study, it will not affect your relationship with this unit, the services it may provide to you, or the University of Kansas.

PURPOSE OF THE STUDY

The broad aim of this study is to understand of how the transfer of learning was facilitated for participants in faculty development programs pertaining to the use of health IT in nursing education. This study will explore the experiences of Faculty Development: Integrated Technology into Nursing Education and Practice Initiative (ITNEP) program participants who have successfully integrated newly acquired program knowledge and skills into the curricula at their home institutions to investigate the larger phenomenon of learning transfer.

PROCEDURES

If you decide to participate in this study, your interview will last approximately 60 minutes. Your participation will involve answering questions about aspects of the ITNEP program in which you participated and your individual and work environment characteristics that supported the successfully integration health information technology or informatics into the curriculum at your home institution. You may answer all, some, or none of the interview questions. You also will be asked to provide the investigator with access to documentation, Websites or artifacts that help facilitate an understanding of the ITNEP program and the transfer of your learning. Interviews will take place via the telephone. With your permission the conversation will be audio recorded. Audio files will be used by the investigator only and stored on a password protected laptop.

RISKS

There are no anticipated risks to human subjects who participate in this study.

BENEFITS

The anticipated direct benefits for human subjects who participate in this study are the opportunity to participate in an educational research study and receive a summary of study findings. The potential anticipated indirect benefits for human subjects who participate in this

study are the benefits that accrue to faculty development program developers and funders, future faculty development participants, and nursing education from transfer of learning knowledge gleaned from this study.

PAYMENT TO PARTICIPANTS

No payments will be made to study participants.

PARTICIPANT CONFIDENTIALITY

Your name and potential identifying information will not be associated in any publication or presentation with the information collected about you or with the research findings from this study. Instead, the researcher(s) will use a study number or a pseudonym rather than your name. Your identifiable information will not be shared unless required by law or you give written permission.

Permission granted on this date to use and disclose your information remains in effect indefinitely. By signing this form you give permission for the use and disclosure of your information for purposes of this study at any time in the future.

REFUSAL TO SIGN CONSENT AND AUTHORIZATION

You are not required to sign this Consent and Authorization form and you may refuse to do so without affecting your right to any services you are receiving or may receive from the University of Kansas or to participate in any programs or events of the University of Kansas. However, if you refuse to sign, you cannot participate in this study.

CANCELLING THIS CONSENT AND AUTHORIZATION

You may withdraw your consent to participate in this study at any time. You also have the right to cancel your permission to use and disclose further information collected about you, in writing, at any time, by sending your written request to:

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Lawrence, KS 66045
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If you cancel permission to use your information, the researchers will stop collecting additional information about you. However, the research team may use and disclose information that was gathered before they received your cancellation, as described above.

QUESTIONS ABOUT PARTICIPATION

Questions about procedures should be directed to the researcher(s) listed at the end of this consent form.

PARTICIPANT CERTIFICATION:

I have read this Consent and Authorization form. I have had the opportunity to ask, and I have received answers to, any questions I had regarding the study. I understand that if I have any additional questions about my rights as a research participant, I may call (785) 864-7429 or (785) 864-7385, write the Human Subjects Committee Lawrence Campus (HSCL), University of Kansas, 2385 Irving Hill Road, Lawrence, Kansas 66045-7568, or email mdenning@ku.edu.

I agree to take part in this study as a research participant. By my signature I affirm that I am at least 18 years old and that I have received a copy of this Consent and Authorization form.

_____ _____

Type/Print Participant's Name Date

_____

Participant's Signature

Researcher Contact Information

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Lawrence, KS 66045
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Appendix C

Dear PI,

I am a doctoral candidate at the University of Kansas in the Education Leadership and Policy Studies department. I am in the process of recruiting participants for my dissertation research. The broad aim of my study is to understand how the transfer of learning was facilitated for participants in faculty development programs pertaining to the use of IT in nursing education. The intent of my study is to explore the experiences of ITNEP participants who have **successfully** integrated newly acquired program knowledge and skills into the curricula at their home institutions to investigate the larger phenomenon of learning transfer. You should have received a letter from HRSA that informed you of their awareness of my study.

I am initiating my study by inviting the first four recipients of ITNEP HRSA awards to participate. Your participation would involve a brief interview with you or your designee for the purposes of obtaining background information about your ITNEP program. You will be asked to provide access to documentation and artifacts such as grant applications, meeting minutes, announcements, published and unpublished articles, program agendas and brochures, program content and to any Web-sites information that would contribute to a better understanding of the ITNEP program. Finally, you will be asked to identify six program graduates who have **successfully** integrated information technology or informatics into the curriculum at their respective home institutions for potential study participation.

Program graduates who agree to participate will be interviewed. They will be asked how their respective ITNEP program, personal characteristics, and work environment facilitated their transfer of learning. These study participants also will be asked to provide access to documentation and artifacts including Web-sites, meeting notes, faculty communications, presentation abstracts, syllabi, or course assignments that would help in describe or explain how program features, personal characteristics, or their home institution's environment supported the integration of information technology into their education practice.

All data will be kept secure and confidential. ITNEP programs, individual, and institutions will not be identified. For further information, please see the attached informed consent forms.

Participation in this study will expand our understanding of how learning gained from a faculty development program translates into meaningful nursing education practice and to student learning. Your participation would be greatly appreciated.

Please contact me at your earliest convenience. Thank you for your consideration.

Kim Rock
krock@kumc.edu

Appendix D

Dear Faculty,

I am a doctoral candidate at the University of Kansas in the Education Leadership and Policy Studies department. I am in the process of recruiting participants for my dissertation research. The broad aim of my study is to understand of how the transfer of learning was facilitated for participants in faculty development programs pertaining to the use of IT in nursing education. The intent of my study is to explore the experiences of the HRSA ITNEP programs' participants who have **successfully** integrated newly acquired program knowledge and skills into the curricula at their home institutions to investigate the larger phenomenon of learning transfer.

NAME OF PI, the Principal Investigator from the ITNEP program in which you participated, NAME OF PROGRAM, has identified you as an example of a program participant who **successfully** integrated information technology or informatics into the curriculum at your home institution.

ITNEP program participants who agree to participate in this study will be interviewed about how their respective ITNEP program, personal characteristics, and work environment **facilitated** their transfer of learning. Study participants will also be asked to provide access to documentation and artifacts, such as Web-sites, meeting notes, faculty communications, presentation abstracts, syllabi, or course assignments that would help me better understand how program features, personal characteristics, or the home institution's environment supported the integration of information technology into their education practice.

All data will be kept secure and confidential. ITNEP programs, individuals, and institutions will not be identified. For further information, please see the attached informed consent form.

Participation in this study will help provide will expand our understanding of how learning gained from a faculty development program translates into meaningful nursing education practice and to student learning. Your participation would be greatly appreciated.

Please contact me at your earliest convenience. Thank you for your consideration.

Kim Rock
krock@kumc.edu

Appendix E

Principle Investigator Interview Guide

1. Please describe the ITNEP faculty development program.

2. Were there particular program design elements that were included to foster learning and transfer of learning for the program participants? If yes, what are they and how were they intended to work?

3. How did you select program participants?

4. How has the program changed over the years?

5. How have program outcomes been measured?

6. If another collaboration was about to embark on a faculty development program similar to this one, what advice would you give? What are the lessons that you have learned?

7. Are there accessible documents or Websites that are related to the ITNEP program that would help me understand the how the program was designed, implemented, and experienced that you can share?

8. Can you give me the contact information for participants of the ITNEP program who have successfully integrated a health technology into the curriculum at their home institutions? If yes, can you select a diversity of participants from institutions with an array of geographic locations, sizes and levels, from varying cohorts of ITNEP program participation, and who had integrated a range of information technologies into their education practices?

Appendix F

Participant Interview Guide

You were asked to participate in this interview because after ITNEP participation, you were identified as an example of having successfully integrated a health information technology into the curriculum at your institution. The questions in this interview are aimed at understanding how program features, personal characteristics, and work environment elements supported your success.

1. Please describe you background, how long have you been a nurse educator, how long have you been at this institution.

2. What courses do you teach?

3. Prior to the INTEP program, how experienced were you with health information and communication technology? For example: informatics, simulation, telehealth, and e-learning?

4. Tell about how and why you chose to participate in the ITNEP program. What did you expect? What were your goals?

5. Please describe the ITNEP program in which you participated.

6. Please describe your participation in the ITNEP program. Specifically what did you do?

7. How did the program affect your practice as an educator?

8. Tell me about the information technology or informatics competencies that you integrated into the curriculum.

9. How did the program support the integration of the technology into the curriculum? For example, were there particular features or activities that were helpful? How do think the program could improve?

10. How did your personal characteristics support the integration of the technology? For example, some individuals are more successful when they work independently while others flourish with more feedback and encouragement. Are there personal characteristics that were an impediment? For example, sometimes trying to accommodate the ideas of others can slow progress?

11. How did your work environment support the integration of the technology? For example were other individuals supportive of your efforts, if so how? What about at departmental and organizational levels? Were there barriers that your had to overcome? If so, what?

12. Are you still using the technology or other competencies learned in the program? Have you made changes?

13. How has the technology integration influenced students, other faculty, and nursing education? Has the adoption of this technology or other technology spread?

14. If another faculty was about to embark on the integration of a new technology similar to this one, what advice would you give? What are the lessons that you have learned from your experience integrating a technology or informatics into the curriculum?

15. Are there available documents that will help me understand how you integrated the particular technology, such as meeting notes, Websites, publications, presentation abstracts, syllabi, or assignments?

16. Is there anything else that we have not talked about that you would like to share that might help me understand your success in transferring your learning?