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Technostress Effects on Technology Acceptance by Nurse Faculty

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TECHNOSTRESS EFFECTS ON TECHNOLOGY ACCEPTANCE BY NURSE FACULTY

by

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TECHNOSTRESS EFFECTS ON TECHNOLOGY ACCEPTANCE BY NURSE FACULTY

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Technology is an essential tool used in nursing academia. The rapid changes in technology and required adaptations can result in technostress, but little research exists about technostress among nurse educators. Gaps in this area of research generated several questions regarding the adaption to technology among nurse faculty and the impact technology has on stress, system use, job satisfaction, and intent to stay in the profession. This dissertation explored technostress and its influence on technology use, acceptance, job satisfaction, and intention to stay within the profession. Included are two manuscripts. The first is a concept analysis of technostress. The second manuscript is a research study report on the effects of technology acceptance on 1,017 nursing faculty using hierarchical regression. Three regression analyses involved up to seven predictors and their potential influence on technology use, job satisfaction, and intent to stay. Results yielded multiple factors that influence nursing faculty use of electronic learning technology.

Keywords: Nurse Educator, Faculty, Electronic Learning, Technological Stress, Technostress, Technology Acceptance, Job Satisfaction, Faculty Retention

Chapter One

Overview and Purpose of the Research Study

Traditional university expectations, philosophies, and historical experiences have guided faculty for decades along a continuum of lecture-based model learning. Over the last two decades, pressure to teach traditional courses in a non-traditional manner has increased in response to student demand (Axley, 2008). Approximately 95% of colleges and universities in the US employed some kind of electronic learning in 2003 (Pollack, 2003). In 2011, 6.7 million US students, or 32% of the total student population, enrolled in at least one online course (Allen & Seaman, 2011). The demand for innovative and effective strategies of electronic learning has affected nursing education. The American Association of Colleges of Nursing [AACN] (2011) cited significant enrollment increases in baccalaureate, masters, and doctoral degree programs in 2010-2011. The availability of electronic learning/technology has contributed to enrollment increases. In 2012, over 60 percent of accredited RN to baccalaureate programs offered hybrid coursework or fully online nursing programs (AACN, 2012). These statistics indicated the need for faculty to have the skills necessary to teach in a technological environment (Allen & Seaman, 2011). Although many nurse educators use strategies such as electronic learning and simulation, further expansion of technology in learning is anticipated (Benner, Sutphen, Leonard, & Day, 2010; Institute of Medicine [IOM], 2010).

While the infusion of technology into higher education is not unique to nursing, nursing faculty are tasked with preparing nurses to work in a high-stakes, complex and ever-changing technological environment (Axley, 2008). There is an urgency to bring the most recent technology systems and applications into current curricula, thus creating a push for educators to manage this need for quick transition (VanVooren, Devore, & Ambriz-Galaviz, 2011). This

rapid change and growth in technology has increased the need to bridge the gap between the current nurse faculty generation and today's learners.

Embracing and becoming proficient in new technology can be challenging and stressful. The obligation to engage in the teaching/service/research paradigm while maintaining clinical skills significantly affects the workload and stress levels of nurse educators (Axley, 2008; Shirley, 2006). These traditional obligations and constant emerging technologies affect faculty satisfaction, which is a critical component for the recruitment and retention of nurse faculty (Bittner & O'Connor, 2012). Without adequate numbers of nurse faculty, student enrollment will be limited at a time when growth is necessary for the future of nursing and patient care. The first article, *Technostress: A Concept Analysis*, explores the concept of technostress and provides an in-depth analysis and interpretation capturing the unique qualities found in the application to business and higher education. A lack of research specific to nursing made this an appealing topic for exploration and laid the groundwork for the subsequent research study.

The second article, *Understanding the Effects of Technology Acceptance in Nursing Faculty: A Hierarchical Regression*, reports on the research study that explored factors among nursing faculty using technology in education. The purpose of the study was to explain variation in electronic learning use, job satisfaction, and intent to stay: specifically, the effects of nurse faculty technostress, perceived usefulness, ease of use, and attitude toward using electronic learning, job satisfaction, and intent to leave the profession. The assessment of factors that may promote or impede the use of technology among nurse educators is essential to plan for and effect change in the educational system. Understanding how technostress influences nurse faculty provides insight into technology issues that may undermine satisfaction and influence their intent to stay in the profession. The results, explained in chapter three, reveal factors that

explain a significant amount of variance in technology use, job satisfaction, and intent to stay in the profession. The study was done in the Spring of 2015 following university institutional review board (IRB) approval (Appendix B).

Chapter Two

Technostress: A Concept Analysis

Abstract

Technology is ubiquitous and can create feelings of frustration, overload, and stress. Technology stress, also called technostress, is an emergent psychological disorder experienced by individuals who use technology. This concept analysis identifies relationships in the contexts of business, education, and nursing. The defining attributes and empirical referents of technostress are analyzed. The relevance of technostress and the acceptance of technology are applied to nursing education.

Key Words: technostress, technology stress, concept analysis, technology, nursing education

Technostress: A Concept Analysis

Over the last three decades, various technologies such as television, mobile phones, internet, and computers have changed approaches to health, education, entertainment, culture, and the economy (Hoffman, Novak, & Venkatesh, 2004). The constant flux of technological change and forced adaptation creates a form of stress called technostress (Weil & Rosen, 1997). Clark and Kalin (1996) suggest that technostress is a problem of adaptation caused by the inability to manage the use of technology in a healthy positive manner.

Several studies examine the incidence of technological stress in business, communications, education, and mass media (Agbu & Simeon, 2011; Al-Fudail & Mellar 2008; Beam, Eunseong, & Voakes, 2003; Burke, 2009). Research studies document the presence and negative impact of technostress. Technology changes the way people work, and rapid technological advances make ongoing change inevitable (Brand, 2000). These changes can create stress. The purpose of this paper is to perform an in-depth analysis of the concept of technostress using a modified Walker and Avant (2011) method of presentation.

Method of Analysis and Search Methods

According to Walker and Avant (2011), concept analysis is a process that examines the attributes and characteristics of a concept that make it unique. The following will identify the concept of technostress, ending with its application to nursing education.

Literature for this synthesis came from various online databases and Internet searches. Ebscohost was the primary resource for literature using these databases: Computers and Applied Sciences, Business Source Complete, Psychology and Behavioral Sciences, Nursing (CINAHL), and Education (ERIC). Ebscohost search queries were limited to articles within the last ten years. Search queries for “technostress” limited results to a minimum of one return to a

maximum of 19 returns with Business Source. Alternative search strings of *technology* and *stress* were used to provide multiple responses averaging around 200 responses. A Google Internet search was also used to gather additional information.

Review of Literature for Use of the Concept: Technostress

Technostress is defined as a stress or psychosomatic illness caused by working with computer technology on a daily basis (Technostress, n.d.). Clinical psychologist Craig Brod (1984) coined the term technostress in the early 1980s, thus defining it as a psychological disorder experienced by individuals when they interact with technology. Technostress is defined as "any negative effect on human attitudes, thoughts, behaviors, and psychology that directly or indirectly results from technology" (Weil & Rosen, 1997, p. 5). Brod (1984) states that technostress can manifest in multiple ways such as confusion, fear, technophobia, or physiological symptoms, but the primary symptom is anxiety. The negative emotional state of technostress can slow response time and interrupt normal working patterns (Brod, 1982). Technostressed people have negative attitudes and feelings toward technology (Weil & Rosen, 1997). Variables that affect technostress in users include experience, age, perceived control, and organizational climate (Brod, 1984). Weil and Rosen (1997) state that technostress is a problem of adaptation where individuals are unable to cope with adjustments to technology such as physical, social, and cognitive requirements related to technology use. In the literature, technostress is referred to as computer-anxiety, computer phobia, and stress related to uncomfortable computer usage (Weil & Rosen, 1995).

Technostress: Applications in Business

Technostress is a term used in the business literature. A large cross-sectional design study of 1,072 information and communication technology (ICT) users compared two groups

based on intensity of ICT use: non-intensive and intensive users (Salanova, Llorens, & Cifre, 2013). The study examined technostress experiences and used the terms technostrain and technoaddiction. Findings indicated that those who use technology develop the skills necessary to enable them to be less anxious, skeptical, and more efficient. Non-intensive technology users had significantly more anxiety ($F(1,1072) = 15.73$, $p < .001$, skepticism ($F(1,1072) = 5.04$, $p < .05$, and inefficiency ($F(1,1072) = 26.01$, $p < .001$. The study recommended future research to explore technostress experiences based on sociodemographic and occupational variables. Studying occupational variables might be particularly relevant to technostress in nursing as faculty retention becomes more important in the current shortage environment. The impact of stress from technology on job satisfaction is important in the dialogue about faculty retention.

Fuglseth and Sorebo (2014) examined how managers cope with the negative effects of technostress on employee use of information and computer technology. Utilizing a covariance structural equation modelling analysis through the mPlus test, it was found that "technostress creators have the strongest direct effect (-0.42, $p < 0.001$) on employee satisfaction with the use of ICT, and further, the strongest mediated effect (-0.37, $p < 0.001$) on employee intentions to extend the use of ICT" (Fuglseth & Sorebo, 2014, p. 168). Among the employees examined, technology that was too complex to understand and use purposefully created dissatisfaction with their use of ICT. Increasing complexity can undermine employee willingness to use ICT, so managers should implement strategies for coping with technostress.

A study of 237 institutional sales professionals examined technostress, technology-enabled innovation, technology-enabled performance, and overall performance (Tarafdar, Pullins, & Ragu-Nathan, 2015). This study identified technostress creators as reasons why individuals experience technostress, such as techno-overload, techno-invasion, techno-insecurity,

techno-uncertainty, and technology characteristics such as usefulness, complexity, reliability, and pace of change. Findings revealed an inverse relationship between technostress creators and decreasing performance with a path coefficient of -0.147 ($p < 0.05$). Tarafdar et al. (2015) found that "while traditional effort-based mechanisms, such as building technology competence, reduce the impact of technostress creators on technology-enabled innovation and performance, more empowering mechanisms such as developing technology self-efficacy and information systems (IS) literacy enhancement and involvement in IS initiatives are required to counter the decrease in overall performance because of technostress creators" (p. 103). This study revealed the phenomenon of technostress in the context of IS use among sales professionals and suggested a need for longitudinal studies to examine technostress over time.

Technostress: Applications in Education

The literature documents faculty resistance to technology adoption in higher education, yet little focus has been given to technostress found in education (Johnson, Wisniewski, Kuhlemeyer, Issacs, & Krzykowski, 2012). Adapting to technology was due to faculty's inability to use information and communication technologies, thus leading to technostress (Agbu & Simeon, 2011; Johnson et al., 2012)

A qualitative study to explore the issue of stress experienced by teachers while using information computer technology in the classroom involved nine instructors using interviews and galvanic skin response (GSR) readings (Al-Fudail & Mellar, 2008). Study findings revealed that GSR readings rose during stressful classroom situations. GSR findings increased in one teacher from -32m to +30m in response to computer access difficulties. Findings also revealed definitive spikes in GSR response when suffering voting instrument problems during classroom instruction. Al-Fudail and Mellar (2008) found that teachers do suffer stress associated with technology use

in the classroom and a lack of fit between the instructor and environment. This phenomenon created stress and was related to the instructor's ability, training, and technology use. The study's model teacher-technology environment interaction of classroom technostress facilitated faculty administrators' identification of environmental factors that reduce technostress and indicated a need to examine faculty coping strategies. Further research was recommended to see if mentoring with coping strategies would effectively reduce teacher stress.

A study by Agbu and Simeon (2011) randomly selected 52 academic and 49 administrative staff participants from six academic schools (including education, law, science, and technology) and seven non-academic departments at a Nigerian University to assess the effect of technostress on distance education. The study assessed symptoms and manifestations of technostress among workers in a traditional and distance learning institution. Academic staff manifested higher levels of technostress than the non-academic staff ($t(99) = 1.66$, $p < .05$, $r = .17$). Results showed that those aged 60 years and above presented the highest symptoms of technostress ($M = 62.33$, $SD = 4.18$), closely followed by those aged 50 to 59 ($M = 55.16$, $SD = 4.39$), 40 to 59 ($M = 53.22$, $SD = 4.66$), and the lowest mean score 48 ($SD = 3.87$) for those between the ages of 20 to 29. The study recommended improved training and stress management interventions as important factors for enhancing technostress.

Technostress: Applications in Nursing

Instructional technology. Nurse educators from 13 baccalaureate schools of nursing ($N = 311$) located in Louisiana were studied to determine the incidence of technological stress among nurse faculty. Analysis of variance (ANOVA) revealed no significant differences between the demographic and professional variables (age, gender, ethnic origin, educational level, years of experience as a nurse educator, academic rank, previous computer training, use of

a computer at home, on-line teaching, and compensation for incorporation of technology in nursing theory classes) and nurse educator technostress (Burke, 2005; Burke, 2009). ANOVA showed a significant difference among nurse educators based on their stress levels on the variable of perceived administrative support for classroom use of technology (F = 14.941 [1, 113], $p < .001$). Regression analysis was used to gain understanding about the influence of administrative support on technostress. The analysis was significant (F = 14.157 [1, 113], $p < .001$) and administrative support explained 12% of the overall variance in technostress. The findings indicate that nurse faculty with lower technostress believed they had higher administration support for incorporation of technology in the classroom. Further research to explore technological stressors was recommended to provide insight into nursing faculty use of technology and their perceived administrative support.

One of the most significant change to occur in nursing education since the move from hospital training to the university sector is electronic learning (Button, Harrington, & Belan, 2014). Button et al. (2014) examined primary research that focused on electronic learning issues of students and educators. A systematic review of 28 studies documented that increased time and skills were required to incorporate electronic learning. Studies recommended that educators incorporate information literacy and nursing informatics into pre-licensure nursing curriculum so graduates are prepared to meet current work requirements (Button et al., 2014). The review confirmed the need to further study technology use among nurse educators.

Technology skills for nurse faculty are a requirement rather than the option (Doutrich, Hoeksel, Wykoff, & Thiele, 2005). Support for faculty mentors and comprehensive technical assistance are needed to enhance the skills of current and new faculty. Doutrich et al. (2005) explained that programs must adapt, making traditions like pen and paper testing and sole faculty

lectures obsolete. Doutrich et al. (2005) noted that when technology does not work, both students and faculty experience high levels of stress. Students stated, "when you're learning the technology and it doesn't work, you are afraid you have done something wrong" or feel "stupid" (p. 29). Providing technological support in ways that are stress relieving and encouraging is critical to support faculty and students when dealing with technology that is new, difficult, or inoperative.

Skills learning and generational issues. Evolving technology, like simulation, requires faculty to adapt their teaching techniques. Faculty must demonstrate competency or risk losing credibility with students (Galloway, 2009). Today's student learners have grown up as the millennial generation with access to electronic devices, internet, and social media interaction. Millennial learners prefer experiential learning methods that include web-based and virtual environments (Parker & Myrick, 2009).

Occupational stress in changing work environments is a global health concern. One recent study related the problems experienced in psychiatric nursing (Koivunen, Kontio, Pitkanen, Katajisto, & Valimaki, 2012). The study (n = 146) examined nurse occupational stress with the implementation of information technology on acute psychiatric wards. The project involved common computer use and the implementation of a new internet based patient education system. The majority (56%) reported the process was mentally strenuous. Nurses with positive attitudes to Internet use reported less stress and more job satisfaction than nurses with neutral attitudes (mean 8.04 vs. mean 9.55, p = .010). The study provided insight into perceived work environments, stress, and the use of information technology, and noted the introduction of new technological applications commonly cause stress. Koivunen et al. (2012)

recommended tailoring the introduction of new technology with sensitivity to the nurses' attitudes and stress.

McNeil et al. (2005) conducted a study involving 266 baccalaureate and graduate nursing programs in the United States. The study evaluated nurse faculty preparedness to teach nursing informatics and their skills and use of informatics tools. Approximately one-third of the programs reported faculty are taught computer skills (e-mail, spreadsheets, databases, and software use) and over half of all programs indicated faculty are taught information literacy skills (bibliographic retrieval, internet and library services) (McNeil et al., 2005). A combined 86% (*n* = 229) of faculty identified themselves as "novice" or "beginner" level for nursing informatics competency. The findings indicate a gap in the knowledge needed by faculty to prepare nurses to be skilled in information technology and its use to manage clinical information. So faculty face learning and improving their technology skills, using more technology in teaching, and helping students learn. These demands can lead to faculty performance issues, pressure, and stress that can negatively affect students. Thus understanding technostress is important.

Concept of Technostress

The data search derived four critical attributes for technostress: computer related stress; fear, confusion, and mistrust of technology; technological phobia or anxiety causing work disruptions; and technology overload and invasion (Technostress, n.d.; Brod, 1984; Brod, 1982; Weil & Rosen, 1995; Weil & Rosen, 1997; Tarafdar et al., 2015).

Computer Related Stress

Computer related stress represents a negative emotional state when an individual uses a computer (La Paglia, Caci, & La Barbera, 2008) and can be a situational or continual state of anxiety directly related to computer use. The anxiety is characterized by symptoms of excessive

caution around computers, avoidance, negative feedback regarding computers, and attempts to limit computer usage (Mahar, Henderson, & Deane, 1997).

Fear, Confusion, and Mistrust of Technology

Fear, confusion, and mistrust of technology represents a general aversion and apprehension of technology. This negative emotional state can lead to psychological and physiological maladies (Haftor & Mirijamdotte, 2010). Technology can disrupt stable life routines, and rapid technological changes can increase the confusion, fear, and mistrust of technology.

Technological Phobia or Anxiety Leading to Disruptions of Normal Work Patterns

Technological phobia or anxiety can lead to disruptions of normal work patterns. Some individuals resist using technology because their faith or culture generates a negative taboo toward technology. Technophobia in the general sense can be due to anxiety or fear of the unknown and the science behind what it is at the core of innovation (Weil & Rosen, 1997). Sometimes this fear is created by popular culture via movies, books, and TV shows. The phobia can be disruptive in a society full of advancements in technology and the constant fast-paced shift to a fully online, connected world.

Technology Overload and Invasion

Technology overload is workload, faster work speed, or change in work-flow related to technology. Invasion involves aspects of technology that invade personal space, life, and time spent with family because of the time spent learning new technology (Tu, Wang, & Shu, 2005).

Antecedents and Consequences

Walker and Avant (2011) define antecedents as the events or attributes that must arise prior to a concept's occurrence. The following are antecedents, or necessary conditions, for the

concept of technostress (Technostress, n.d.; Brod, 1982; Brod, 1984; Weil & Rosen, 1997; Weil & Rosen, 1995):

1. Exposure to some type of technology.
2. Anticipation of a negative effect due to technological use.

Consequences are those events or incidents that occur as a result of the occurrence of a concept and that can often stimulate new ideas or avenues for research pertaining to certain concepts (Walker & Avant, 2011). The following are consequences, or what occurs as a result of the concept of technostress (Technostress, n.d.; Brod, 1982; Brod, 1984; Weil & Rosen, 1997; Weil & Rosen, 1995):

1. A chronic or lingering episode of technological anxiety and helplessness
2. Panic, humiliation, mental and physical fatigue
3. Resistance

Application of Exemplars in Nursing Education

Cases as described by Walker and Avant (2011) are examples of the use of the concept that incorporates all of the critical attributes of the concept. The following are example vignettes of a model and contrary case:

Model Case

Students in a transcultural course were learning about various cultures in the population. The nursing instructor created an instruction plan involving PowerPoint, lecture, and video examples through YouTube for the first hour of class. Then for the last hour, a question and answer session via Skype was planned with a Hmong patient who would share a recent hospital experience. At the beginning of class, things went well with the PowerPoint instruction. However, trouble began with the next activity involving a YouTube video when the link would

not work. After an embarrassing 10 minutes, the instructor was able to show the YouTube video. When it was time for the activity with the Hmong patient, the instructor was unable to get Skype to work properly. After 15 minutes of trial and error, a student offered help and got Skype working in under 2 minutes. Frustrated, stressed, and humiliated, the instructor proceeded without further difficulties. After class, the instructor was very upset about the 25 minutes of wasted class time due to technical errors and vowed never to use Skype or YouTube again in class.

In this case, the instructor exhibited computer-related stress coupled with fear and confusion due to the problems that arose. She then exhibited mistrust and fear of the varied technology programs due to the problems and stress encountered. She anticipated future problems demonstrating mistrust and vowed to limit the use of technology in her courses because of this experience.

Contrary Case

Students in a transcultural course were learning about various cultures in the population. The nursing instructor had an instruction plan using PowerPoint, lecture, and video examples through YouTube for the first hour of class. Then for the last hour, a question and answer session via Skype was planned with a Hmong patient who would share a recent hospital experience. The class started with PowerPoint instruction and lecture, followed by a YouTube video. The video started immediately and when done the class discussed it for 15 minutes. Next, the Skype session started without error. The Hmong patient shared her hospital experience and then answered questions for 20 minutes. After the lesson, the instructor asked for feedback, and students shared positive comments about the teaching methods and their engagement. Even after the class, many students talked about how great it was to other instructors and fellow

classmates. The department head heard about the great class and congratulated the instructor. The instructor had such a great experience she sought workshops and other techniques to make her classroom more interactive and technology driven.

In this case, the instructor did not run into any technical problems that led to mistrust or embarrassment as in the model case for the concept technostress. Lack of stress led to a positive outlook toward technology.

Empirical Referents

Instruments involved in assessing technology acceptance, perceptions, and use have provided insight into the aspects of technology use. Over the last two decades, a significant body of research has used the Davis' (1989) Technology Acceptance Model and examined factors explaining usage intentions and acceptance. The model measures how well consumers accept technology and can be used to measure different aspects of technology use.

Hudiburg (1995) developed the Computer Technology Hassles Scale to measure computer-related stress. The scale composed of 69 "hassles" to be rated on the degree of severity using a Likert scale, ranging from not at all to extremely severe. The Computer Hassles Scale yields a severity of hassles score for the total scale and two subscales, Computer Runtime Errors and Computer Information Problems. This scale is one of the first developed to evaluate the phenomenon of technostress. Burke (2009) devised the Nurse Educator Technostress Scale (NETS) based on the Hudiburg (1995) Hassles Scale. The NETS was reviewed for content validity by an expert panel and pilot tested (Burke, 2009). Other instruments based on the Computer Hassles Scale include a Somatic Complaints Scale developed by Richard Hudiburg (1995). Additional research studies in nursing education would enhance understanding of technostress.

Conclusion and Recommendations

Technostress manifests in many ways and can include computer anxiety, technophobia, and computer phobia. As technology grows in availability and complexity, so does the pressure to integrate and adapt, creating stress (McKenzie & And, 1997). Creating awareness of the concept of technostress is important to understand its impact on faculty. Lack of research specific to nursing technostress makes it an important area for research. Rapid changes in technology, growing expectations for faculty to use technology, and technological glitches can cause technostress in both faculty and students. Creating awareness of technostress and advancing science via research in this area are important steps in the smooth and stress-free integration of technology into the nursing academic arena.

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Chapter Three

Understanding the Effects of Technology Acceptance in Nursing Faculty: A Hierarchical Regression

Abstract

Problem: Technology is widely used in nursing academia, but little is known about the effects of technostress on technology acceptance among nurse educators.

Purpose: This study examined the effects of nurse faculty technostress, perceived usefulness, ease of use, and attitude toward using technology on use, job satisfaction, and intent to leave teaching.

Method: A survey design of 1,017 online nursing faculty tested the Davis' Technology Acceptance Model adapted with permission to include the variables of technostress, job satisfaction, and intent to leave teaching. Hierarchical regression tested the model.

Results: Technostress, perceived usefulness, perceived ease of use, attitude toward using, and behavioral intention to use technology explained 80% (R^2) of technology use. Technostress, perceived usefulness, attitude toward using, and use of technology explained 9.8% of the variance in job satisfaction although neither ease of use or behavioral intent made significant contributions to job satisfaction. Perceived usefulness, perceived ease of use, use of technology, and job satisfaction explained 4.2% of the variance in intent to stay in the profession.

Key Words: nurse faculty, technostress, technology, job satisfaction, faculty retention

Understanding the Effects of Technology Acceptance in Nursing Faculty:

A Hierarchical Regression

Nursing faculty prepare nurses to work in complex, technological environments (Axley, 2008). This creates an urgency to integrate new clinical technology into curricula quickly (VanVooren, Devore, & Ambriz-Galaviz, 2011). Faculty are expected to use technology in teaching to stimulate and facilitate learning. Pressure for faculty to teach traditional courses in non-traditional ways has increased in response to student demand (Axley, 2008). In 2011, 6.7 million US students, or 32% of the total student population, enrolled in at least one online course (Allen & Seaman, 2011). Substantial enrollment increases in baccalaureate, masters, and doctoral degree programs are attributed to the availability of electronic learning (AACN, 2011). Thus, increasing enrollments, diverse teaching methods, and rapidly changing technology have outpaced awareness of the factors influencing technology acceptance and use. While many nurse educators use strategies, like electronic learning and simulation, further use of technology is anticipated (Benner, Sutphen, Leonard, & Day, 2010; Institute of Medicine [IOM], 2010) so understanding the impacts of burgeoning technology on nursing faculty is needed.

Technology and its integration can create a condition, called technostress, which affects the attitudes and use of technology. Jena and Mahanti (2014) explain that faculty experience technostress when they are unable to adapt and use technology in a healthy manner. Faculty often feel compelled to check work email and online discussion boards while also feeling the need to engage and work quickly. The resulting stress may undermine job satisfaction and result in faculty leaving teaching (Khan, Rehman, & Rehman, 2013). It is important to recognize the effects of technostress in nursing faculty and manage effectively to improve both the quality of work life and retention.

This study was designed to increase our understanding of technology use and technostress among nurse educators in the United States. During the last decade, a call for action has been issued for increased educational quality and requirements for nurses (Benner, Sutphen, Leonard, & Day, 2010; IOM, 2010). The recommendations represent a significant responsibility and task for nursing education. Aging faculty, budget constraints, faculty shortages, and increasing job competition from clinical practice contribute to the problems of nurse faculty (AACN, 2015a). The average age of nurse faculty continues to climb, narrowing the number of productive years' nurse educators can teach (AACN, 2015a). The average ages of doctoral and master's prepared nurse faculty holding ranks of professor (61.6 doctoral and 57.1 masters), associate professor (57.6 doctoral and 56.8 masters), and assistant professor (51.4 doctoral and 51.2 masters) reflect an aging faculty workforce (AACN, 2015a). According to a 2010 AACN survey of vacant faculty positions, there was a 6.6% vacancy rate with 803 unfilled positions. In 2014, schools of nursing turned away 68,938 qualified applicants to baccalaureate and graduate programs primarily due to insufficient numbers of faculty (AACN, 2015a). Demands that impact the role of nurse faculty create a need to further examine factors that influence faculty job satisfaction and intent to stay. Nursing cannot afford to lose qualified faculty to educate and graduate more nurses.

Mitchell, Palacios, and Leachman (2014) explain that higher education funding for most states remains well below pre-recession levels. The large funding cuts have led to tuition increases, spending cuts, eliminated course offerings, closed campuses, and reduced library services. These deficits diminish the quality of education and compress faculty salaries of a highly educated workforce needed for the future healthcare of our nation. Competition from higher-paying positions has also eroded the potential pool of nursing faculty. Across the nation,

nurse educator annual salaries average $65,240, compared to the median salary for clinical nurse specialists at $81,586, and the median annual salary for nurse executives at $178,824 ("How Much Do", n.d.). There is a definite competitive, monetary edge for nurse educators to utilize their education and knowledge to branch outside of academia.

The retirement of experienced nurse educators, job competition, and role changes are challenges faced by nursing programs. This study explored technostress to gain insight into its effects on technology use, job satisfaction, and the intent to stay in teaching. Little research exists about strategies to delay the retirement of current nurse faculty; strategies to retain, replenish, and expand the future nurse faculty workforce can and must be addressed through research (U.S. Department of Health and Human Services, 2010).

Burgeoning technology with varied levels of administrative support poses a challenge to academic stability. Increasing expectations for nursing faculty to embrace and incorporate new technology is occurring at the same time faculty members are teaching growing numbers of students who must be prepared to work with technology in high stakes health care arenas. How much these issues create technostress and influence their attitudes, use of technology, job satisfaction, and intent to stay is unclear. This study aimed to fill that gap. The purpose of this study was to examine the effects of nurse faculty technostress, perceived usefulness, ease of use, and attitude toward using technology on use, job satisfaction, and intent to leave the profession. Tables and Figures for this study are located in the Appendices.

Review of Literature

The information age of computers has forever changed the way society functions, and this influence has become the universal constant for change since its inception. The acceptance of technology has become the industry standard for business, education, and daily life. For most

colleges, electronic learning has enabled them to serve student populations through non-traditional means such as distance education and hybrid courses. Over the last two decades, conflicting language and definitions of the terms electronic learning, online learning, and distance learning have made it difficult for researchers to perform cross study comparisons (Moore, Dickson-Deane, & Galyen, 2011). Nursing education continues to transition from traditional methods of instruction to the inclusion of technology to accommodate various learning needs and curriculum advances (Nguyen, Zierler, & Nguyen, 2011). Many researchers have sought to explain technostress in varying fields of education and research, but few have examined the effects on nursing education. It is important to understand the impact of technostress on nurse educators.

Technology-based Instruction: Faculty Incentives

Educational researchers have explored how variables such as motivation, perception, skills, training, attitude, stress, and acceptance have influenced electronic learning for students and faculty. Chapman (2011) studied a large southeastern university with over 300 distance education courses and 48 distance education degrees and evaluated the motivations and incentives for two groups (N = 97 tenured/tenure track and N = 45 contingent) who teach at least one distance education (DE) course annually (N = 142; 48% response rate). The online, dichotomous survey contained 23 motivation options and 20 incentive options (survey constructed from literature review and piloted). Chi Square analyses found three significant motivators to teach online courses: to better balance work and family, begin a teaching career, and supplement another job. Significant incentives included free professional development; tuition reimbursement at the institution; program for certification in online instruction; access to campus office space; mentoring from experienced faculty; opportunities to do research; job

security; and being part of an online faculty community. Clearly, educators saw many benefits in teaching online, which may impact their desire to remain in academia.

The focus on retaining faculty, given the faculty shortage, has led to continuing assessment of how faculty perceive their engagement in online education. Green, Alejandra, and Brown (2009) studied factors that affect faculty decisions about teaching online. Survey responses (N = 135) were used to examine tenured, tenure-track, full-time non-tenured, and part-time/adjunct faculty. Results showed that online faculty as a whole were highly motivated by situational incentives, such as flexible working conditions and the opportunity to use technology. The main factor that discouraged them from teaching distance education was their concern about time commitment. This study recommended further research including evaluation of gender differences, university enrollment, online distance education enrollment, and technology resources.

Technology-based Instruction: Faculty Preparation

Faculty perceptions of online education show paradoxes that may interfere with the ability to sustain an effective teaching-learning environment, but there is an interesting dynamic when comparing faculty and student perceptions. Osborne, Kriese, Tobey, and Johnson (2009) used an online survey of 152 students and 24 faculty members to compare perceptions and experiences with online versus traditional education. Significant perception differences of online courses existed in: student learning, time involvement, faculty-student interactions, internet problems, and course difficulty. Faculty perceived that students learned less, the internet took more time, technology problems were an issue, interactions were less effective, and online courses were easier. Students who had taken an Internet course were less likely to think the course took more time, resulted in less-effective interactions, or encouraged them to

procrastinate. This study suggests differences between student and faculty perceptions of online courses, which may diminish both student and faculty satisfaction with the online experience when outcomes seem inconsistent.

Faculty satisfaction with technology may not simply be limited to divergent viewpoints compared to student perceptions about learning situations. Faculty also show ambivalence about technology use for their own education and development needs. Georgina and Olson (2008) conducted an online study among faculty from 15 institutions of higher education. In an online sample of 237 respondents, 95% reported their university offered technology training, but only 7.2% attended the training. Fifty-six percent of the sample preferred training using small faculty groups with a trainer. Faculty technology skills showed strong correlations with both course design pedagogy ($r = .65$, $p < .001$) and course delivery pedagogy ($r = .64$, $p < .001$) indicating that faculty members with strong technology literacy were more apt to integrate that technology into their course assignments and might prefer to deliver the course with more technology. This study recommended more research about effective faculty training strategies and technology assessment tools at the user level. It also supports the idea that faculty vary in their desire and readiness to prepare for teaching in the technology rich environment.

Preparing faculty for online teaching has been an on-going challenge. Herman (2012) used an online survey to investigate the types and frequency of faculty development programs for online instruction at institutions ($N = 821$) with an established teaching and learning development unit. Results showed the most common faculty development programs offered were: 1) websites (90.4%); 2) technical services (89%); 3) printed materials (87.8%); and 4) consultation with instructional design experts (84.2%). Findings showed that faculty development programs for online instruction are offered frequently. Discussion with faculty

using a qualitative approach provided insight into what faculty need and expect when moving to a more technology-based teaching situation. Lackey's (2011) qualitative study ($N = 6$) interviewed three experienced and three non-experienced online faculty to identify how higher education institutions are preparing their faculty to teach online. Analysis of the interviews revealed that faculty found collaborating with colleagues, more one-on-one assistance from university personnel, and the offering of online courses and resources that support technical and pedagogical training to be the most beneficial for online instructional preparation. The study recommends more research into the challenges faculty identify in transition to the online learning environment to facilitate change effectively and identify best practices.

Technology-based Instruction: Faculty Engagement

While universities can provide opportunities for faculty to learn how to use technology and incentives to integrate technology into courses, the task of actually gaining faculty engagement in online teaching delivery systems remains a challenge. A study of 400 randomly selected faculty teaching at least one lecture, lab, or seminar explored the important factors influencing faculty members' decision to use or not use online course management applications (OCMA) (Zhen, Garthwait, & Pratt, 2008). Polynomial logistic analysis showed self-efficacy and philosophy had strong impacts on the probability of use of OCMA while teaching experience, peer pressure, and class innovation had no statistical impacts. The authors concluded that when faculty believe online education is useful and on par or better than traditional teaching, they are willing to invest the time and energy necessary. Thus, attitude is critical.

Attitude is a component of several models tested in studies of online education. Teo and Schaik (2012) compared the Theory of Planned Behavior, the Theory of Reasoned Action, and the Technology Acceptance Model (TAM) and found that, "across all models, the most dominant

direct effect on intent to use was attitude" (p. 185). As computer literacy, information literacy, and the use of information technologies are fundamental to nursing education, faculty must be adept in their use (National League for Nursing, 2008). Attitude assessment must be considered when introducing technology into nursing curricula in order to gain faculty engagement and acceptance of new ways of teaching. The authors suggested further research to include additional and mediating factors of the intention to use technology in educational contexts.

Technology-based Instruction: Faculty Acceptance

Park, Lee, and Cheong (2008) examined factors that influence the adoption of course management systems in higher education by using the Technology Acceptance Model (TAM). In the study, 191 instructors were surveyed with a 35% response rate. Findings validated the TAM model in that perceived ease of use had a significant impact on perceived usefulness (β.63, $p < .001$) and behavioral intent (β.44, $p < .05$). The researchers identified the need to compare the perception of users versus non-users of electronic courseware to explore factors involved in technology acceptance.

The TAM model was used in a study of 152 faculty (54% response rate) from the University of Hong Kong to determine acceptance of electronic learning (Yuen & Ma, 2008). Intention to use was predicted by perceived ease of use (β.39, $p = .010$) and computer self-efficacy (β.30, $p < .01$). Perceived usefulness was predicted by perceived ease of use (β.22, $p < .05$) and subjective norm (β.54, $p < .001$). Sixty-eight percent of the variance in the intent to use electronic learning was explained by the TAM model components of subjective norm, computer self-efficacy, and perceived ease of use. This study investigated the perceptions of instructors using electronic learning technology. The TAM model explained teacher acceptance, thus enhancing teaching and learning in their studies.

Using the TAM model, Ball and Levy (2008) examined computer self-efficacy, computer anxiety, and experience with technology use as factors influencing the acceptance and use of information systems. The findings indicated that computer self-efficacy was the only significant predictor of intent to use. Limitations of this study included a small sample size ($N = 56$) from a small private university with questionable generalizability of the findings based on this sample.

To understand student teacher's intent to use technology, Wong, Osman, Goh, and Rahmat (2013) distributed 302 questionnaires to student teachers from a Malaysian university with a 64.2% response rate yielding 194 female participants. Results indicated that perceived usefulness had a significant influence on attitude towards computer use ($\beta = .65$, $p < .00$) and behavioral intent ($\beta = .48$, $p < .00$). In addition, perceived ease of use influenced perceived usefulness ($\beta = .69$, $p < .00$), and attitude towards computer use influenced behavioral intent ($\beta = .19$, $p < .01$). The study by Wong et al. (2013) supports that the TAM model variables explain faculty acceptance of technology-based instruction. However, other factors that might inhibit acceptance of technology need exploration, such as stress arising from innovation.

Technostress

To determine the incidence of technological stress among nurse faculty, Burke (2009) surveyed 311 baccalaureate nurse educators with a 55% response rate. This study measured stress using the Nurse Educator Technostress Scale (NETS). ANOVA showed a significant difference in perceived administrative support among nurse educators based on their stress levels ($F = 14.941$ [1, 113], $p < .001$). Burke (2009) used regression analysis to understand the influence of administrative support. Results of this analysis showed that administrative support ($F = 14.157$, $p < .001$) explained 12% of the overall variance in nurse educator technostress. Nurse faculty with lower technostress reported higher administration support. Given the

significance of this variable, research was recommended to further clarify the role of administrative support in causing or ameliorating technostress.

Al-Fudail and Mellar (2008) conducted a qualitative study to determine teacher technology stress among nine instructors using interviews and galvanic skin response (GSR) readings totaling 32 hours of observed readings. Since GSR rises during stressful situations, the study produced a laboratory measure for the presence of stress. Encountering Internet access problems or instrumentation difficulties tended to increase GSR levels generally with one subject registering a more than 60+mm increase (-32m to +30m). The lack of fit between the instructor and the environment causing the stress related to instructor ability, training, and technology. The use of the teacher-technology environment interaction model of classroom technostress enabled managers to identify possible environmental factors that can reduce technostress and indicated a need to examine teachers' coping strategies. Agbu and Simeon (2011) also found that computer issues were related to stress reaction (r =.19 p <.01) in academic faculty with higher levels found in older versus younger subjects. These studies indicate the need for further research to determine if improved training or better mentoring with coping strategies would be effective in reducing stress.

Stress management is perceived as a way to help faculty manage anxiety related to incorporating technology into courses. La Paglia, Caci, and La Barbera (2008) reported computer expertise, computer self-efficacy, and internet attitude explained 69% of computer anxiety (R^2 = .69, F(3, 77) = 54.48; p < .0001) among primary school teachers in Palermo Italy (N = 77). Positive Pearson's correlations were found between computer expertise and computer self-efficacy (r = .45, p < .01), computer expertise and internet attitude (r = .40, p < .01), and computer self-efficacy and internet attitude (r = .36, p < .01). Negative correlations were found

between computer anxiety and computer expertise (r = -.52, p > .01), computer anxiety and computer self-efficacy (r = -.64, p < .01), and computer anxiety and internet attitude (r = -.55, p < .01). The researchers recommended that training programs should focus on improving individual teachers' trust of technology as opposed to just developing technology skills. Trusting the technology and gaining self-confidence can defuse the presence of tension, which manifests in aberrant ways, such as abnormal stress or technology addiction.

Salanova, Llorens, and Cifre (2013) studied 1,072 information and communication technology (ICT) users in a cross-sectional design study and found that non-intensive technology users had significantly more anxiety (F(1,1072) = 15.73, p < .001), skepticism (F(1,1072) = 5.04, p < .05), and inefficiency (F(1,1072) = 26.01, p < .001) than did intensive users of technology. The researchers pointed to demographic and occupational characteristics as fertile areas for studying the differences in stress related to technology. Since nursing faculty shortages are a growing problem, occupational comparisons might be insightful in seeking ways to decrease technostress and improve faculty retention.

Beam, Kim, and Voakes (2003) conducted a national study on job satisfaction in journalism and communication faculty members comparing their responses to technology-induced stressors. A selected random sample of 595 members of the Association for Education in Journalism and Mass Communication yielded 403 respondents who completed the telephone survey (77% response rate). This study found that technology stressors had a negative effect on job satisfaction (r = -.206, p < .05), were related to job dissatisfaction (r = .172, p < .05), and contributed to job-related exhaustion (r = .225, p < .05). Beam et al. (2003) found that in most instances, technology stressors stood out and mattered more than course load, tenure status, or rank. It is clear that faculty members are not immune to job stress, and this stress increased with

the introduction of technology into the teaching environment. There is no reason to think that nurse educator stress with the introduction of new technology differs from that experienced by faculty in other academic areas.

This research study examined nurse educator technology stress (technostress) relating to instructional technology. The review of literature found that administrative support, age, training, trust, inefficacy, and classroom stress influence faculty technostress. Studies using the Technology Assistance Model show that goal orientation, self-efficacy, and recurring use help influence technology acceptance. Measuring the influence of technostress on nurse educators' perceptions of usefulness, ease of use, attitude towards use, behavioral intent to use, job satisfaction, and intent to stay fills a gap in the work to improve job satisfaction and intent-to-stay among the dwindling numbers of nursing faculty. Although many nurse-related studies have looked at job satisfaction, none relate to technostress. With the technology sophistication of hospital environments and increasing patient complexity, nurse educators will continue to need higher levels of demand for technology proficiency. The expectations of millennial students from the technology generation will make early adoption and frequent use of technology by nursing faculty inevitable and mandatory. This review found that the use and acceptance of electronic instructional technology is predicted to be an essential part of achieving a work/life/family balance for future educators. Understanding how technostress influences the use of instructional technology provides insight into strategies that promote the essential and effective use of technology within nursing education; further, it may improve the job satisfaction and quality of life for nurse educators. Studies reveal a continual call for research regarding theoretical and scholarly development of the technostress phenomenon, in particular the context of technology, role, and tasks (Ayyagari & Purvis 2011; Shu, Tu, & Wang, 2011; Tarafdar et al.,

2015). Thus, research to examine the effects of nurse faculty technostress on technology acceptance will provide insight into the nurse faculty role and technology use that will impact the future of nursing education.

Theoretical Framework

Meeting the generational expectations of future generations of nursing students has pushed technology to the forefront of nursing education. Understanding communication technology has been one of the most challenging issues when studying new and emergent technologies (Park et al., 2008). Among various theories used to understand the acceptance of information technology, the Technology Acceptance Model (TAM) is one of the most cited theoretical frameworks in this area of research (Park et al., 2008). Critical assessment of factors that may promote or impede the use of technology acceptance among nurse educators is essential to plan for and effect change in the educational system.

Davis, Bagozzi, and Warshaw's (1989) Technology Acceptance Model theorizes that perceived usefulness and perceived ease of use determine an individual's intention to use a system, with intention specifically being the mediator for system use (Figure 1). TAM addresses perceived usefulness, ease of use, attitude, behavioral intention, and system usage as variables (Figure 1) that predict the acceptance of a new technology (Davis, 1989). Utilizing the Technology Acceptance Model, influences of nurse faculty technostress, perceived usefulness, ease of use, and attitude toward using technology were examined on use, job satisfaction, and intent to leave teaching. TAM assumes that given time and knowledge about a particular behavioral activity, an individual's preference to perform the activity will begin to resemble the way they behave (Han, 2003).

Technostressed people have negative attitudes and feelings toward technology (Weil & Rosen, 1997). Therefore, it is hypothesized that the use of technology, job satisfaction, and intent to stay is influenced by the degree to which nurse educators are experiencing technostress as well as perceived usefulness, ease of use, and attitude toward using technology (Figure 1). Davis's model postulates that technology use is determined by two leading beliefs, perceived usefulness and perceived ease of use. Attitude towards use and behavioral intention to use technology affects how nursing faculty respond to technological experiences; therefore, attitude and behavior are inferred to partially affect the perceived ease of use and perceived usefulness of technology (Figure 1). This theory suggests that if people believe that technology is useful, but at the same time believe that it is too difficult to use, the effort outweighs the benefits and thereby undermines use (Davis, 1989). Academic institutions require instructional electronic courseware to enhance instruction in higher education. Examination of the influences of nurse faculty technostress, perceived usefulness, ease of use, and attitude toward using technology on use, job satisfaction, and intent to leave teaching can assist in understanding future use of electronic learning and can predict the job satisfaction of aging faculty as a factor in their retention and intent to stay.

Conceptual Definitions

The variable definitions are discussed using the TAM as an organizing framework with the electronic learning system (technology) considered to be the external variable context for the study followed by definitions of technostress, perceived usefulness, perceived ease of use, attitude toward using, behavioral intention to use, actual system use, job satisfaction, and intent to stay. Operational definition information is in the instruments section.

Electronic Learning Technology/System Use

Use of technology/electronic learning is defined as, "broadly inclusive of all forms of educational technology in learning and teaching; …synonymous with multimedia learning, technology-enhanced learning (TEL), computer-based instruction (CBI), computer-assisted instruction or computer-aided instruction (CAI), internet-based training (IBT), web-based training (WBT), online education, virtual education, virtual learning environments (VLE), information and communications technology (ICT), and digital educational collaboration" ("Electronic learning", 2013, para. 1). The use of technology in nursing education is the use of software and/or hardware to supplement instructional methodologies. Examples of software technology include operating systems, nursing software, Graphical User Interfaces (GUI), learning management systems such as Blackboard Learn©, electronic medical records, and simulation. Examples of hardware technology include computers, tablets, hand-held devices, projectors, smart boards, simulation and audio-visual equipment.

Technostress (T)

Weil and Rosen (1997) define technostress as a problem of adaptation where individuals are unable to cope with adjustments to and use of technology. Specifically, technostressed people have negative beliefs and feelings toward technology.

Perceived Usefulness (PU)

Perceived usefulness is the degree to which an individual believes that using a particular technology will enhance job performance (Davis et al., 1989).

Perceived Ease of Use (PEU)

Perceived ease of use is the extent to which an individual believes that using technology/system would be free of effort (Davis et al., 1989).

Attitude Toward Using (AT)

Attitude toward using is defined as an "Individual's positive or negative feeling about performing the target behavior" (Venkatesh, n.d., para. 5).

Behavioral Intent (BI) and System Use (U).

Behavioral intent to use is the "the degree to which a person has formulated conscious plans to perform or not perform some specified future behavior" (Venkatesh, n.d., para. 5).

Job Satisfaction (S) and Intent to Stay (I)

Job satisfaction is the positive feelings workers have about their jobs (Brodke et al., 2009). Intent to stay is the variable to measure retention of in the current position.

Hypotheses

Ha1: Among nursing faculty using technology in education, technostress, perceived usefulness, perceived ease of use, attitude toward using, and behavioral intention to use technology explain variation in technology use.

Ha2: Among nursing faculty using technology in education, technostress, perceived usefulness, perceived ease of use, attitude toward using, behavioral intention to use, and use of technology explain variation in job satisfaction.

Ha3: Among nursing faculty using technology in education, technostress, perceived usefulness, perceived ease of use, attitude toward using, behavioral intention to use, use of technology, and job satisfaction explain variation in intent to stay in the profession.

Research Design

This descriptive, correlational study design was undertaken using nursing faculty invited to complete a 195-item survey online via Qualtrics (Appendices C). This study examined data derived from demographics and survey items to examine the relationships between seven

predictor variables and one dependent variable. Hierarchical regression was used to evaluate the three hypotheses.

Methods

Sample

Purposive, non-probability sampling of Southern Regional Education Board (SREB) member-nursing schools used a list of member schools provided on the SREB website. One hundred and twenty schools of nursing located across the south eastern United States (Appendix F) were included in this study with associate, baccalaureate and graduate nurse faculty (*N* = approximately 4,511) invited to participate. Potential participants were contacted personally via email. Email lists were created using school websites and obtaining each faculty's email address. For those schools without faculty email readily available on the world wide web (*n* = 12), the school dean or department head was contacted via email, informed of the study, and asked to disseminate an email invitation to their nursing faculty. The email invitation asked faculty who self-identify as teaching with technology to participate by accessing the electronic link to the questionnaire. Included in the invitation was a letter explaining the purpose of the study, consent, and assurance of confidentiality (Appendix C). To encourage participation, incentives were offered via a random drawing to win one of the following: iPad 2, $100 dollar gift card to Wal-Mart, $50 dollar gift card to Amazon.com, $50 gift card to Lowes. One follow up email reminder was sent to encourage participation.

Of the 4,511 emails sent, 1161 faculty participated (26% response rate). Data were cleaned and missing data reduced the sample size to 1017. Table 1 displays the demographics of study participants. The mean ages of doctoral and masters' prepared nurse faculty holding ranks of Professor (doctoral 61, *SD* = 6.6 and masters 51, *SD* = 12.8), Associate Professor (doctoral 57,

SD = 7.1 and masters 53, *SD* = 10.1), and Assistant Professor (doctoral 51, *SD* = 9.8 and masters 51, *SD* = 9.3). Study participants ages (Table 1) are similar to national nurse faculty data (AACN, 2015a). This reflects an aging workforce demographic reflective of the national population.

Data Collection

The email study invitation included a link to the online questionnaires via Qualtrics©, a secure web server. The surveys were live for 3 weeks, and an email reminder sent 2 weeks after the initial email. Results were downloaded, stored, and analyzed on a password-protected computer.

Instruments

A survey methodology was used and included five combined instruments: demographic information, Nurse Educator Technostress Scale (NETS), Technology Acceptance questionnaire which includes scales for perceived usefulness, perceived ease of use, behavioral intent, and actual system use), the Attitudes Toward E-Learning tool (ATEL), Job in General, and the Job Descriptive Index (see Appendix C). Permissions for tool use are in Appendix E. The demographic survey gathered the following data: age, gender, race and ethnicity, marital and family status, employment characteristics, education level, years of experience, and experience with technology.

Burke's (2009) Nurse Educator Technostress scale (NETS) was used to measure technostress (Appendix C). It is a 35-item Likert-type survey questionnaire that asks subjects to think about technology stressors experienced in the last 6 months and rate them on a five-point scale: 1, not at all; 2, little stress; 3, moderate stress; 4, stressful; 5, very stressful. The NETS scale was reviewed by an expert panel for content validity after initial development and then

pilot tested to evaluate internal consistency and performed well with reliability coefficient of α = .96 from a sample of 115 nurse educators (Burke, 2005). In this study, the first 22 items of the NETS pertaining to technology issues exhibited an internal consistency of α = .94 (*N* = 961).

The Technology Acceptance Model (TAM) Scales measured technology acceptance variables of perceived usefulness, perceived ease of use, behavioral intent, and actual system use (Appendix C). Perceived usefulness and perceived ease of use items were adapted from Davis' (1989) original research examining technology acceptance (*N* = 107). Previous reliability coefficients are listed for each scale. The perceived usefulness scale contains six items resulting in an α = 97 (Davis, 1989). The perceived ease of use scale also contains six items with an α = .91 (Davis, 1989). Both of these variables were measured using a seven-point scale of extremely likely to extremely unlikely. The behavioral intent scale contains three items (*N* = 101; α = .95) and the actual system use measure contains one item (*N* = 101; α = .86), two additional variations of the same use question were added to the study survey (Appendix C). Scales utilized a seven-point scale ranging from strongly agree to strongly disagree (Kim et al., 2009). For the current study, the scales had high internal consistency reliability: (*N* = 1003) perceived usefulness α = .96, (*N* = 1003) perceived ease of use α = .97, (*N* = 1011) behavioral intent to use α = .92, and (*N* = 1008) actual system use α = .96.

The nurse educator attitudes toward E-learning (ATEL) by Mishra and Panda (2007) contains 22 items (Appendix B). The items are scaled in a 5-point-Likert type format ranging from '5' (strongly agree) to '1' (strongly disagree). Seven statements on the ATEL are negatively worded and were reverse coded. Validity was supported by the survey authors utilizing a literature review to construct the survey statements and content validation by nine

expert reviewers. Mishra and Panda (2007) indicate an α = 81 from a sample of 78. This study had an internal consistency reliability with an α = .89 (*N* = 938).

Nurse educator job satisfaction was measured with the Job in General (JIG) adapted from Brodke et al. (2009). This instrument contains 18 items to measure job satisfaction using a yes, no, and "?" (means the respondent cannot decide) to each word or phrase (Appendix C). Eight items of the JIG are negatively worded and were reverse coded and scored. Brodke et al. (2009) indicate an alpha of α = .92 for the JIG. This instrument is available free for use in scholarly research through the JDI Research Group at Bowling Green University. The Job in General (JIG) was used to measure job satisfaction (*N* = 877) and had an internal reliability in this study of α = .90.

Procedure

Study data were converted to an electronic data set and analysis of variables was performed using the Statistical Package for the Social Sciences (SPSS) Version 23 (International Business Machines Corporation, 2015). Recoding was completed per instructions on each instrument as directed for relevant variables. Exploratory data analysis was done using histograms, skew, and kurtosis to evaluate normality and Levene's test to evaluate homogeneity of variance. Transformations were done for data that were not normally distributed but did not yield better results.

Descriptive statistics such as age, gender, educational level, and academic rank were used to characterize the sample (Table 1). Hierarchical regression analysis was used to test three hypotheses with variable entry based upon the model (Figure 1). For hypothesis one technostress, perceived usefulness, perceived ease of use, attitude, and behavioral intent to use were used in hierarchical regression to predict technology use (Figure 2). For hypothesis two

technostress, perceived usefulness, perceived ease of use, attitude, behavioral intent to use, and system use were used in hierarchical regression to predict job satisfaction (Figure 3). For hypothesis three technostress, perceived usefulness, perceived ease of use, attitude, behavioral intent to use, system use, and job satisfaction were used in a forced entry hierarchical regression to predict intent to stay in the profession (Figure 4).

Results

Missing data was managed using listwise deletion and mean substitution for all three hypotheses as noted in the Tables 2-4. All tables are located in Appendix A.

The correlations of the variables are shown in Table 2.1 and Table 2.3. Technostress, as expected, was inversely related to all model variables. The first prediction model contained five predictors tested in five steps with no variables removed. Listwise deletion was first used to analyze without missing data, and the total sample for this model was $N = 866$. The model was statistically significant, $F(5, 860) = 770.18$, $p < .000$, and explained 82% of the variation in system use ($R^2 = .816$). Next, mean substitution was performed via recoding missing data with the average instrument mean ($N = 1017$). The model was statistically significant, $R^2 = .80$, $F(5,1011) = 815.81$, $p < .000$. Thus, the hypothesis was accepted, which demonstrates the five variables explain 80% of the variation in technology use indicating a strong model.

Technology use was predicted by lower levels of technostress and higher levels of perceived usefulness, perceived ease of use, attitude toward using, and behavioral intention to use (Table 2.4). Inspection of the structure coefficients show that behavioral intent, perceived usefulness, perceived ease of use, and attitude were strong predictors of system use, and technostress was a moderate predictor that negatively impacts system use (Table 2.4).

Technostress entered as step 1 had the best chance of explaining variance yet only accounted for 4.3% of the variation in use (Table 2.5).

Technostress's minor role in the model was further evaluated to determine if technostress functioned as a mediator or moderator to ease of use and actual use. Using the steps recommended by Field (2013), technostress was not a significant linear mediator or moderator of ease of use and actual use.

The prediction model for hypothesis two containing six predictors and was reached in six steps with no variables removed. The correlations of the variables are shown in Table 3.1 and Table 3.3. Listwise deletion was first used to analyze without missing data, and the total sample for this model was $N = 761$. The model was statistically significant, $F(6, 754) = 15.806$, $p < .000$, and accounted for approximately 11% of the variance in job satisfaction ($R^2 = .105$). Next, mean substitution was performed via recoding missing data with the average instrument mean ($N = 1017$). The model was statistically significant, $R^2 = .10$, $F(6,1010) = 19.460$, $p < .000$, which demonstrates the six variables explain 10% of the variation in job satisfaction.

Job satisfaction was predicted by lower levels of technostress and higher levels of perceived usefulness, behavioral intent, and system use (Table 3.4). Neither attitude nor perceived ease of use were significant predictors of job satisfaction. This model was rerun without perceived ease of use and attitude, and the model did not perform well. Inspection of the structure coefficients suggest that system use, perceived usefulness, and attitude toward using were strong predicators of job satisfaction, and technostress was a moderate indicator that negatively impacts job satisfaction (Table 3.4).

The third and final prediction model contained seven predictors reached in seven steps. The correlations of the variables are shown in Table 4.1 and 4.3. Listwise deletion was used to

manage missing data, and the total sample for this model was $n = 657$. The model was statistically significant, $F(7, 649) = 7.92$, $p < .000$, and explained 7% of the variance in job satisfaction ($R^2 = .069$). Next, mean substitution was performed via recoding missing data with the average instrument mean ($N = 1017$). The model was statistically significant, $R^2 = .04$, $F(7,1009) = 7.383$, $p < .000$, which demonstrates the seven variables explain 4% of the variation in intent to stay (Table 4.4).

Intent to stay in the profession was primarily predicted by higher levels of perceived usefulness, perceived ease of use, and job satisfaction (Table 4.4). Neither technostress, attitude, behavioral intent, nor use were significant predictors of job satisfaction. This model was rerun without technostress, attitude, behavioral intent, and use; the model did not perform well.

Discussion

The sample included 1,017 nurse faculty from states across the southeastern United States. Table 1 shows the sample demographics. Gender differences showed 93% female and 7% male. The average age of participants was 53 with a range from 25 to 80. Sample racial makeup was 90% white, 6% black and 4 percent other shown in Table 1. The study demographics were not surprising compared to what nationally the nursing workforce profession entails with 9% male, 75% white and 10% black (HRSA, 2013). The nursing profession is aware of this bias and is continually working to enhance diversity. The American Association of Colleges of Nursing (AACN) (2015b) on behalf of the profession and discipline states an objective to "implement initiatives to increase diversity among nursing students, faculty, and the workforce" ("goal three," para. 3).

Study results validated the TAM model (Figure 2) with the addition of technostress and explained 80% of the variation in system use (Table 2.5). The large sample size of 1,017 far

surpasses prior TAM studies with samples ranging from *N* = 56 (Ball & Levy, 2008), *N* = 152 (Yuen & Ma, 2008), *N* = 191 (Park, Lee & Cheong, 2008), and *N* = 194 (Wong, Osman, Goh, & Rahmat, 2013). The explained variance was large and impressive.

The second model (Figure 3) added job satisfaction as an outcome variable after technology use. The majority (86.2%) of the sample were satisfied (somewhat satisfied, satisfied, and very satisfied) which is good news, but the job satisfaction scores failed the assumption of normality making it less amenable to regression. Transformation did not improve its performance. The model started with technostress and then added the traditional TAM variables of perceived usefulness, perceived ease of use, attitude toward using, behavioral intent to use. In this model, the use of technology became an independent variable with job satisfaction as the dependent variable. While the goal was to see if the strong TAM model fostered better understanding of job satisfaction, it did not perform well; and perceived ease of use and attitude toward using technology were not significant predictors of job satisfaction. Thus, perceived usefulness, attitude toward using, and system use positively predicated job satisfaction, while technostress negatively impacted job satisfaction. Although the TAM model has been widely used, adding a dependent variable of job satisfaction undermined the model. This study found that attitude and perceived ease of use, historically strong TAM variables, were not significant predictors of job satisfaction. The model was re-run excluding non-significant predictors but predicted only 10% of job satisfaction (Table 3.5). Thus technology use plays only a minor, but significant role, in job satisfaction.

The third and final model (Figure 4) sought to use the strong TAM model to evaluate whether it fostered understanding of nursing faculty intent to stay in the job. On average the faculty intended to stay 9 years with a *SD* of 6.81 and a range from 0 to 40 years. Forty percent

intended to stay 5 years or less. The model predicated that technostress, perceived usefulness, perceived ease of use, attitude toward using, behavioral intent to use, use of technology, and job satisfaction did explain variance in intention to stay in the profession. The hypothesis was partially accepted, but technostress, attitude toward using, behavioral intention to use, and use of technology were insignificant predictors of intent to stay. Therefore, perceived usefulness, perceived ease of use, and job satisfaction predicted intent to stay in the profession. This model was the lowest performing of the three studied with only 4% of prediction (Table 4.5). The model was also re-run without non-significant predictors but did not yield better results. Intent to stay in the profession was measured using only a single item, and future research is suggested with a stronger measure. Historically, research using the TAM model has shown that perceived ease of use and perceived usefulness generally are the strongest predictors (Yuen & MA, 2008). As seen in this model, both were significant, yet the other TAM variables were not significant. Technology use does not have a strong influence on intent to stay in the profession, yet job satisfaction does predict intent to stay in the profession, as expected (Table 4.4). Recoding was done creating two groups: those who intend to retire in 5 years or less (N = 293) and those who intend to stay 6 years or more (N = 461). Analysis of differences in job satisfaction showed a significant difference (U = 55268, z = -4.43, p < .000) with those intending to retire soon less satisfied (M = 46.86, SD = 11) than those planning to stay (M = 50.30, SD = 5.98). Technostress was not significantly different in the two groups (retiring <6 years; staying) t = 1.043 (df 1, 841), p = .30

The assumption driving this study was that technostress would be a strong predictor of technology use, job satisfaction, and intent to stay in the profession. Surprisingly, technostress was found to be a weak predictor for technology use and job satisfaction and irrelevant with

intention to stay in the profession. Although surprising, the large sample size and addition of technostress did provide strong study results with 80% explained variance in the TAM model as noted earlier. The study was not as strong in filling gaps in what is known about job satisfaction and intent to stay using the TAM model.

Recommendations

The TAM model is strong, and continued research using the model is recommended. Technostress plays a role in augmenting the model, and the use of other technostress measures may do more to advance science. Non-linear statistical analysis may also augment insight into the role of technostress. Technostress matters, and nursing programs can examine the negative effects of technostress and positive influence of perceived usefulness, perceived ease of use, attitude, and intent to use electronic learning technology in educational pedagogy. Technology is burgeoning while academic financial constraints may undermine provision of updated equipment and adequate administrative support. Future research can evaluate the impact of equipment and administrative support on technostress, perceived usefulness, perceived ease of use, attitude toward using, intention to use technology and technology use. Since this was the first study using technostress, job satisfaction, and intent to stay with the TAM model, more studies are needed.

The strength of the TAM model was evident with technostress added, but it did not perform traditionally with job satisfaction and intent to stay added as outcome variables. Perceived usefulness and behavioral intent for using technology were positive predictors of job satisfaction, and technostress negatively impacted job satisfaction. Longitudinal studies are needed measuring the traditional TAM variables with interventions to reduce technostress, provide technology support, and increase use while evaluating job satisfaction and intent to stay.

It would be interesting to know if interventions could improve job satisfaction enough to delay retirement of eligible faculty. Currently nursing is experiencing a severe shortage in the profession in all areas and specifically education (AACN, 2015a).

Study Strengths and Limitations

The use of an electronic questionnaire and email recruitment fostered a larger sample size than prior TAM studies with more explained variance than ever reported using the TAM model. The method employed for direct personal email recruitment and the incentive helped get a large sample size. The study was representative of US nurses (Table 1).

All study instruments had strong internal consistency reliability results except the single item intent to stay. The limited contributions of the three added variables of technostress, job satisfaction, and intent to stay may be the result of the instruments which were general measures rather than ones targeted to nursing faculty.

Summary

Guided by Davis' (1989) Technology Acceptance Model, this study added to the science of nursing by identifying factors that influence technology system use, job satisfaction, and intent to stay. Specifically, for hypothesis one, technostress, perceived usefulness, perceived ease of use, attitude toward using, and behavioral intent to use technology explained 80% (R^2) of technology use. This impressive variance created a strong model to explain technology use among nurse faculty. Technostress, although a weak variable added to the model, did negatively influence technology use among nurse faculty. For hypothesis two, technostress, perceived usefulness, perceived ease of use, attitude, behavioral intent to use, and system use explained 10% (R^2) of job satisfaction. In this model job satisfaction was only predicted by lower levels of technostress and higher levels of perceived usefulness, behavioral intent, and system use. For

hypothesis three technostress, perceived usefulness, perceived ease of use, attitude, behavioral intent to use, system use, and job satisfaction explained 4% (R^2) of intent to stay in teaching. Thus this model only derived that perceived usefulness and perceived ease of use of technology as well as job satisfaction predicted intent to stay in the profession.

This study examined the effects of technology acceptance in nurse faculty. Findings revealed that technostress undermines job satisfaction and technology use in nurse faculty, while supporting many other variables that positively influenced technology use, job satisfaction, and intent to stay in teaching. This study along with future research should propel administration and nursing programs toward engagement to create support of faculty struggling with technology issues to reverse technostress and recognize key variables that promote job satisfaction and influence faculty intent to say.

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Chapter Five

As technology in our society grows in use and impact, people may experience negative emotions in actual or anticipated interactions with computers (Shu, Tu, & Wang, 2011). While many nurse faculty use technology through simulation and electronic learning courseware, further use of technology is anticipated (Benner et al., 2010). Strategies to promote the acceptance and use of technology within nursing education are essential to influence faculty development, satisfaction, and retention. Nursing faculty must prepare the next generation of nurses to work in high stakes, complex and continually changing environments (Axley, 2008; AACN, 2015b). Therefore, exploration of factors such as technostress, technology use, job satisfaction, and intent to leave is vital to gain insight into nurse faculty influences. It is important for administration to engage in this discussion to promote and ensure a positive effect on current and future nurse faculty.

Overview of Findings

The first article, *Technostress: A Concept Analysis,* explored the attributes and characteristics of technostress. Continual advancements in technological change can create technostress but its impact has not been studied in nursing programs. Nursing faculty are urged to integrate new technology into curricula to meet the demand of the next generation of learners and prepare them for the advanced technological environments of practice (VanVooren, Devore, & Ambriz-Galaviz, 2011). Technology anxiety manifestations of technophobia, computerphobia, and the dehumanization of curricula are technology issues faced by faculty. Awareness of technostress through inquiry and analysis of programmatic issues will minimize the problem of technostress and future awareness that exists through use of technology in education.

The study report, *Understanding the Effects of Technology Acceptance in Nursing Faculty: A Hierarchical Regression*, reports findings from 1,017 nurse faculty participants from the southeastern United States to examine variations in electronic learning use, job satisfaction, and intent to stay in the profession. Specifically, the study explored the influences of technostress, perceived usefulness, ease of use, attitude toward using, and behavioral intention to use technology.

Findings showed that nursing faculty use of technology is negatively influenced by technostress, while perceived usefulness, perceived ease of use, attitude toward use, and behavioral intention to use technology explain a significant amount of variance in technology use (R^2 = .82). Additionally, this study found that technostress, perceived usefulness, and behavioral intent to use technology explain a significant amount of variation in job satisfaction (R^2 = .098). Results for faculty intent revealed perceived usefulness, perceived ease of use, and job satisfaction explain a significant amount of variance (R^2 = .042) in faculty intent to stay within the profession.

Significant growth in technology has outpaced awareness of factors that influence its use. Findings for this study can influence nursing education by recognizing the effects of technostress and technology acceptance on system use, job satisfaction, and intent to stay in the profession. Technostress, and how to manage it, could improve the quality of work/life to sustain our aging faculty population. Further research efforts focusing on generating evidence to explain what enables faculty to perceive ease and use, as well as supporting positive strategies to promote use, will support administrative decisions for the use of technology with nursing education. Studies like this contribute to a continual call for research regarding faculty acceptance and engagement with technology and the role of the nurse educator.

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Appendix A Tables

Table 1. Participant Demographics

N = 1,017	Subcategory	Participant Totals	Participant Percentage
Gender	Male	68	7%
	Female	949	93%
Place of Employment	Private University	156	15%
	Public University	796	78%
	Private College	24	3%
	Public College	19	2%
	Community College	22	2%
Program Currently Teach (online course)	AD	28	3%
	BSN	403	40%
	RN-BSN	278	27%
	MS	308	30%
	NP	196	19%
	PhD/DNS/DNP	292	29%
Academic Rank	Instructor	223	22%
	Assistant Professor	390	38%
	Associate Professor	203	20%
	Professor	139	14%
	Visiting Professor	5	0.5%
Faculty Status	Full-Time	933	92%
	Part-Time	51	5%
	Adjunct	33	3%
Highest Degree	Baccalaureate	6	1%
	Masters	388	38%
	Doctorate	551	54%
	Post-Doctoral	70	7%
Age	Total Participants	Average = 53	Range 25 – 80 Years
Age Per Academic Rank	Instructor	50	
	Assistant Professor	51	
	Associate Professor	56	
	Professor	60	
Age Per Highest Degree Held	Baccalaureate	46	
	Masters	51	
	Doctorate	54	
	Post-Doctoral	55	

Appendix A (Continued)

Table 1. Participant Demographics (Continued)

N=1,017	Subcategory	Participant Totals	Participant Percentage
Race	White	914	90%
	Black	65	6%
	American Indian and Eskimo	3	null
	Hawaiian and Pacific Islander	1	null
	Two or More Races	17	2
	Other	11	2%
Hispanic	Yes	32	3%
	No	962	97%
Marital Status	Single	85	8%
	Married	777	76
	Living With Partner	27	3%
	Separated	7	1%
	Divorced	87	8%
	Widowed	26	2%
Total Participant Percentage Of Teaching	Classroom Setting		44%
	Clinical Setting		37%
	On-Line Setting		48%

Table 2.1. Ha1 Listwise Correlations of the Variables in the Analysis (N = 866)

Variable	2	3	4	5	6
1. Use	-.241	.593	.609	.648	.893
2. Technostress	--	-.263	-.401	-.274	-.212
3. Perceived Usefulness		--	.585	.568	.576
4. Perceived Ease of Use			--	.536	.613
5. Attitude				--	.615
6. Behavioral Intent					--
Note. All correlations were statistically significant ($p < .001$).					

Table 2.2 Regression Results Listwise Deletion

Model	*b*	*SE-b*	Beta	Pearson *r*	Sr^2	Structure Coefficient
Constant	-.217	.463				
Technostress*	-.003	.003	-.015	-.241	.0002	-.267
Perceived Usefulness*	.030	.010	.060	.593	.002	.656
Perceived Ease of Use*	.016	.009	.039	.609	.0007	.674
Attitude*	.039	.006	.126	.648	.008	.717
Behavioral Intent*	.774	.022	.754	.893	.274	.988

Note. The dependent variable was Use. $R^2 = .817$, Adjusted $R^2 = .816$.
sr^2 is the squared semi-partial correlation.
* $p < .05$.

Table 2.3. Ha1 Mean Substitution Correlations of the Variables in the Analysis (N = 1017)

Variable	2	3	4	5	6
1. Use	-.210	.618	.638	.603	.882
2. Technostress	--	-.241	-.383	-.247	-.189
3. Perceived Usefulness		--	.589	.529	.605
4. Perceived Ease of Use			--	.508	.636
5. Attitude				--	.573
6. Behavioral Intent					--
Note. All correlations were statistically significant ($p < .001$).					

Table 2.4 Regression Results Mean Substitution

Model	*b*	*SE-b*	Beta	Pearson *r*	Sr^2	Structure Coefficient
Constant	-.749	.475				
Technostress*	.000	.003	.002	-.210	.000004	-.234
Perceived Usefulness*	.039	.010	.076	.618	.003	.691
Perceived Ease of Use*	.033	.009	.078	.638	.003	.713
Attitude*	.037	.006	.108	.603	.007	.674
Behavioral Intent*	.755	.021	.725	.882	.244	.985

Note. The dependent variable was Use. $R^2 = .801$, Adjusted $R^2 = .800$.
sr^2 is the squared semi-partial correlation.
* $p < .05$.

Appendix A (Continued)

Table 2.5 Mean Substitution Model Summary

Model	*R*	*R Square*	Adjusted R Square	Std. Error of the Estimate	Sig. F Change
1	.210[a]	.044	.043	3.66	.000
2	.621[b]	.386	.384	2.94	.000
3	.706[c]	.499	.498	2.65	.000
4	.747[d]	.557	.556	2.50	.000
5	.895[e]	.801	.800	1.67	.000

a. Predictors: (Constant), technostress
b. Predictors: (Constant), technostress, perceived usefulness
c. Predictors: (Constant), technostress, perceived usefulness, perceived ease of use
d. Predictors: (Constant), technostress, perceived usefulness, perceived ease of use, attitude
e. Predictors: (Constant), technostress, perceived usefulness, perceived ease of use, attitude, behavioral intent
f. Dependent Variable: use

Appendix A (Continued)

Table 3.1. Ha2 Listwise Correlations of the Variables in the Analysis (N = 761)

Variable	2	3	4	5	6	7
1. Job Satisfaction	-.168	.271	.181	.219	.205	.271
2. Technostress	--	-.263	-.411	-.261	-.228	-.255
3. Perceived Usefulness		--	.579	.552	.568	.580
4. Perceived Ease of Use			--	.541	.626	.630
5. Attitude				--	.609	.647
6. Behavioral Intent					--	.886
7. Use						--
Note. All correlations except perceived ease of use and behavioral intent were statistically significant ($p < .05$).						

Table 3.2 Ha2 Listwise Regression Results

Model	*b*	*SE-b*	Beta	Pearson *r*	Sr^2	Structure Coefficient
Constant	37.440	2.600				
Technostress*	-.049	.018	-.101	-.168	.008	-.503
Perceived Usefulness*	.227	.056	.186	.271	.019	.811
Perceived Ease of Use	-.076	.050	-.076	.181	.003	.542
Attitude*	.024	.035	.032	.219	.0005	.656
Behavioral Intent	-.472	.188	-.191	.205	.007	.614
Use*	.811	.191	.333	.271	.021	.811
Note. The dependent variable was Job Satisfaction. $R^2 = .112$, Adjusted $R^2 = .105$. sr^2 is the squared semi-partial correlation. * $p < .05$.						

Table 3.3 Ha2 Mean Substitution Correlations of the Variables in the Analysis (N = 1017)

Variable	2	3	4	5	6	7
1. Job Satisfaction	-.145	.272	.186	.194	.223	.275
2. Technostress	--	-.241	-.383	-.247	-.189	-.210
3. Perceived Usefulness		--	.589	.529	.605	.618
4. Perceived Ease of Use			--	.508	.636	.638
5. Attitude				--	.573	.603
6. Behavioral Intent					--	.882
7. Use						--
Note. All correlations except perceived ease of use and attitude were statistically significant ($p < .05$).						

Table 3.4 Ha2 Mean Substitution Regression Results

Model	*b*	*SE-b*	Beta	Pearson *r*	Sr^2	Structure Coefficient
Constant	39.376	2.134				
Technostress*	-.041	.015	-.087	-.145	.64	-.450
Perceived Usefulness*	.196	.045	.181	.272	.017	.845
Perceived Ease of Use	-.058	.039	-.064	.186	.002	.578
Attitude	.002	.028	.003	.194	.000004	.602
Behavioral Intent*	-.262	.144	-.119	.223	.003	.693
Use*	.611	.141	.289	.275	.017	.854
Note. The dependent variable was Job Satisfaction. $R^2 = .104$, Adjusted $R^2 = .098$. sr^2 is the squared semi-partial correlation. * $p < .05$.						

Table 3.5 Mean Substitution Model Summary

Model	*R*	*R Square*	Adjusted R Square	Std. Error of the Estimate	Sig. F Change
1	.145[a]	.021	.020	7.83	.000
2	.285[b]	.081	.079	7.59	.000
3	.285[c]	.081	.078	7.59	.814
4	.288[d]	.083	080	7.59	.117
5	.295[e]	.087	.083	7.58	.040
6	.322[f]	.104	.098	7.52	.000

a. Predictors: (Constant), technostress
b. Predictors: (Constant), technostress, perceived usefulness
c. Predictors: (Constant), technostress, perceived usefulness, perceived ease of use
d. Predictors: (Constant), technostress, perceived usefulness, perceived ease of use, attitude
e. Predictors: (Constant), technostress, perceived usefulness, perceived ease of use, attitude, behavioral intent
f. Predictors: (Constant), technostress, perceived usefulness, perceived ease of use, attitude, behavioral intent, use

Dependent Variable: Job Satisfaction

Appendix A (Continued)

Table 4.1 Ha3 Listwise Correlations of the Variables in the Analysis (N = 657)

Variable	2	3	4	5	6		7
1. Intent To Stay	-.057	.095	.160	.079	.130	.088	.216
2. Technostress	--	-.291	-.419	-.290	-.230	-.262	-.175
3. Perceived Usefulness		--	.583	.540	.544	.562	.273
4. Perceived Ease of Use			--	.555	.613	.636	.179
5. Attitude				--	.611	.657	.231
6. Behavioral Intent					--	.892	.186
7. Use						--	.237
8. Job Satisfaction							--
Note. All correlations except technostress, attitude, and behavioral intent were statistically significant ($p < .05$).							

Table 4.2 Ha3 Mean Substitution Correlations of the Variables in the Analysis (N = 1017)

Variable	2	3	4	5	6		7
1. Intent To Stay	-.052	.088	.137	.085	.116	.100	.185
2. Technostress	--	-.241	-.383	-.247	-.189	-.210	-.145
3. Perceived Usefulness		--	.589	.529	.605	.618	.272
4. Perceived Ease of Use			--	.508	.636	.638	.186
5. Attitude				--	.573	.603	.194
6. Behavioral Intent					--	.882	.223
7. Use						--	.275
8. Job Satisfaction							--
Note. All correlations except technostress, attitude, behavioral intent, and use were statistically significant ($p < .05$).							

Table 4.3 Ha3 Listwise Regression Results

Model	*b*	*SE-b*	Beta	Pearson *r*	Sr^2	Structure Coefficient
Constant	-1.288	2.678				
Technostress	.011	.017	.027	-.057	.0006	-.203
Perceived Usefulness*	-.040	.051	-.039	.095	.0008	.338
Perceived Ease of Use*	.144	.045	.178	.160	.015	.569
Attitude	-.018	.033	-.029	.079	.0004	.281
Behavioral Intent	.506	.171	.251	.130	.013	.462
Use*	-.506	.180	-.252	.088	.011	.313
Job Satisfaction*	.178	.032	.220	.216	.043	.769

Note. The dependent variable was Intent to Stay. R^2 = .079, Adjusted R^2 = .069.
sr^2 is the squared semi-partial correlation.
* $p < .05$.

Table 4.4 Ha3 Mean Substitution Regression Results

Model	*b*	*SE-b*	Beta	Pearson *r*	Sr^2	Structure Coefficient
Constant	-.332	2.038				
Technostress	.005	.013	.013	-.052	.00014	-.235
Perceived Usefulness*	-.031	.037	-.035	.088	.00063	.398
Perceived Ease of Use*	.088	.032	.122	.137	.0069	.620
Attitude	.007	.023	.012	.085	.00008	.385
Behavioral Intent	.194	.119	.110	.116	.0025	.525
Use	-.180	.118	-.106	.100	.0022	.452
Job Satisfaction*	.141	.026	.176	.185	.0279	.837

Note. The dependent variable was Intent to Stay. R^2 = .049, Adjusted R^2 = .042.
sr^2 is the squared semi-partial correlation.
* $p < .05$.

Appendix A (Continued)

Table 4.5 Mean Substitution Model Summary

Model	*R*	*R Square*	Adjusted R Square	Std. Error of the Estimate	Sig. F Change
1	.052[a]	.003	.002	6.33	.096
2	.094[b]	.009	.007	6.32	.013
3	.137[c]	.019	.016	6.29	.001
4	.138[d]	.019	.015	6.29	.617
5	.142[e]	.020	.015	6.29	.284
6	.144[f]	.021	.015	6.29	.428
7	.221[g]	.049	.042	6.20	.000

a. Predictors: (Constant), technostress
b. Predictors: (Constant), technostress, perceived usefulness
c. Predictors: (Constant), technostress, perceived usefulness, perceived ease of use
d. Predictors: (Constant), technostress, perceived usefulness, perceived ease of use, attitude
e. Predictors: (Constant), technostress, perceived usefulness, perceived ease of use, attitude, behavioral intent
f. Predictors: (Constant), technostress, perceived usefulness, perceived ease of use, attitude, behavioral intent, use
g. Predictors: (Constant), technostress, perceived usefulness, perceived ease of use, attitude, behavioral intent, use, job satisfaction

Dependent Variable: years intend to stay

Appendix B. Figures

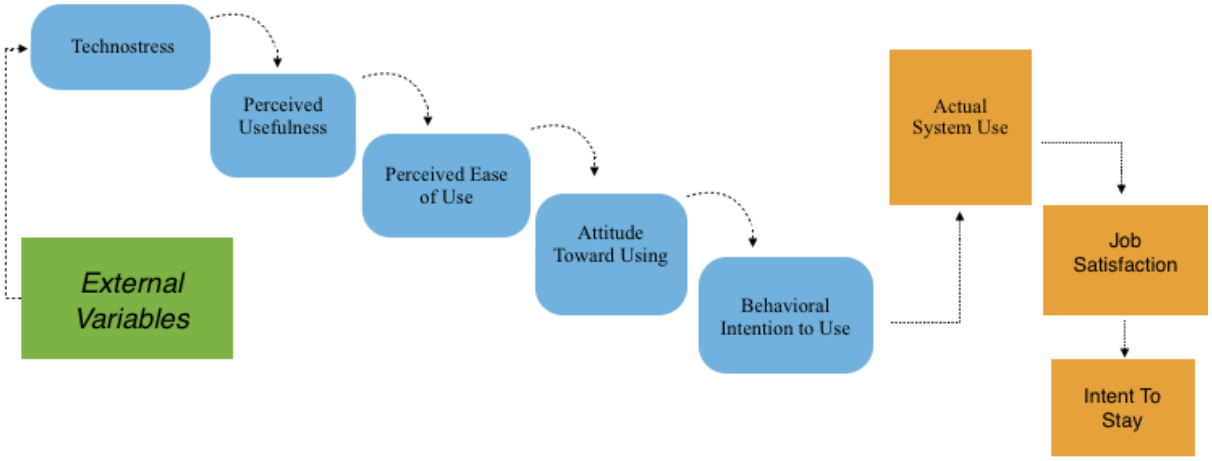

Figure 1. Adapted Technology Acceptance Model
(Davis, F. D., Bagozzi, R. P., & Warshaw, P. R. (1989). User acceptance of computer technology: A comparison of two theoretical models. Management Science, 35(8), 982-1003.)

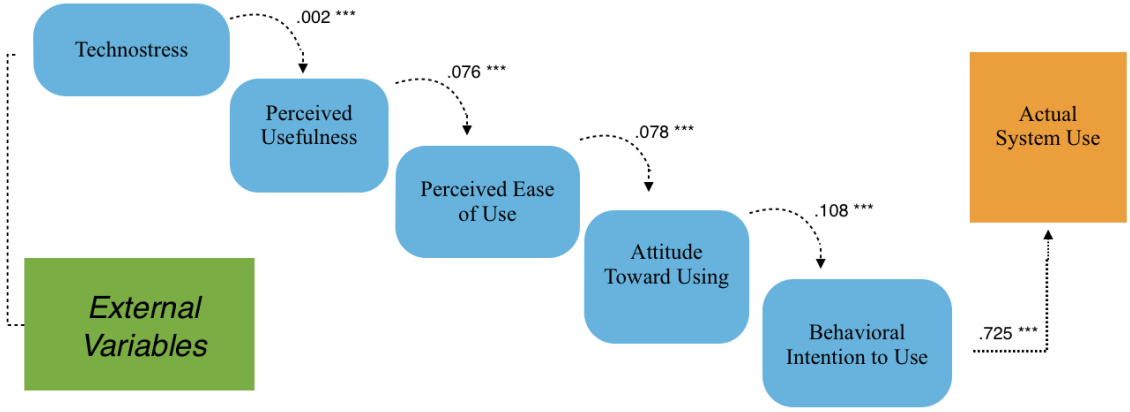

Figure 2. Ha1 Mean Substitution Regression Model
(*** $P < .001$; ** $P < .05$)

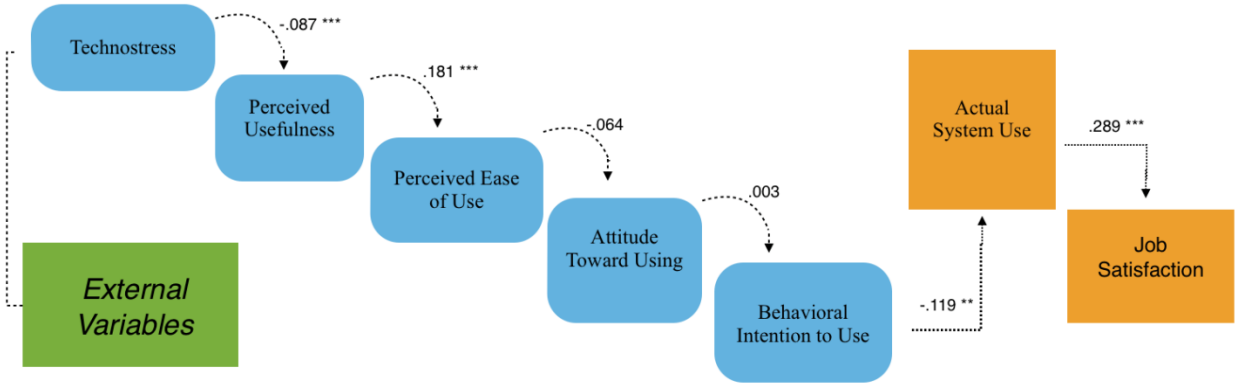

Figure 3. Ha2 Mean Substitution Regression Model
(*** $P < .001$; ** $P < .05$)

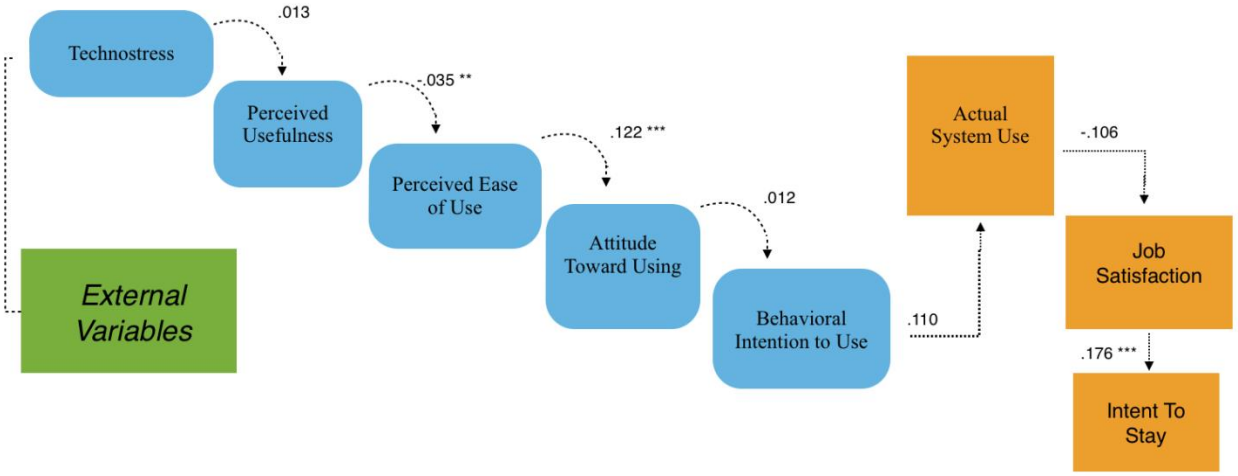

Figure 4. Ha3 Mean Substitution Regression Model
(*** $P < .001$; ** $P < .05$)

Appendix C Survey

Cover Letter

Dear Colleague,

I am a doctoral student at The University of Texas at Tyler. I am conducting a dissertation research study on technological stress and attitudes and perceived barriers to technology/electronic instruction among nurse educators. Nurse educators are dealing with demands of communicating via email, online advising, literature searches, online instructional environment, and computer technology in the classroom.

Participation in this study is voluntary and you may withdraw at any time. If you complete this study you will be included in a random drawing for a chance to win one of the following: iPad 2, $100 Wal-Mart gift card, $50 Amazon gift card, $50 Lowes gift card. This questionnaire should not take more than 15 minutes of your time and will remain open for 3 weeks.

Individual identities will be kept confidential and are anonymous through way of alphanumerical code assignment. Please feel free to contact me at any time for any question or concerns you may have about the study. Results from the study will be available in late spring, 2015. If you would like information about the results, please contact me via email. Thank you in advance for participating in this study.

Thank You For Your Time,
Joseph W. Tacy, MSN, RN, PhD Candidate
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THE UNIVERSITY OF TEXAS AT TYLER
Informed Consent to Participate in Research will be viewed on the first page from the link above
Institutional Review Board #Sp2015-55
Approval Date: February 11, 2015

Appendix C (Continued)

Survey Questions

Demographic Questions

1. What is your place of employment?

- ❍ Private University
- ❍ Public University
- ❍ Private College
- ❍ Public College
- ❍ Community College

2. Please check any programs in which you currently teach an online course (can be totally or partially online).

- ❍ AD
- ❍ BS
- ❍ RN-BS
- ❍ MS
- ❍ NP
- ❍ PhD/DNS/DNP

3. What is your academic rank?

- ❍ Instructor
- ❍ Assistant Professor
- ❍ Associate Professor
- ❍ Professor
- ❍ Visiting Professor
- ❍ Other (please explain) _____

4. Which of the following pertains to your faculty status?

- ❍ Full-Time
- ❍ Part-Time
- ❍ Adjunct

5. How many years of teaching experience have you had? _____

6. How many years of ONLINE teaching experience have you had? _____

7. What percentage of your teaching occurs in a:

_____ Classroom Setting
_____ Clinical Setting
_____ On-line Setting

8. What is your Gender?

- ❍ Male
- ❍ Female

9. What is your race?

- ❍ White
- ❍ Black
- ❍ American Indian and Eskimo
- ❍ Hawaiian and Pacific Islander
- ❍ Two or more races
- ❍ Other (Please State) _____

10. Are you Hispanic?

- ❍ Yes
- ❍ No

11. What is your marital status?

- ❍ Single
- ❍ Married
- ❍ Living with a partner
- ❍ Separated
- ❍ Divorced
- ❍ Widowed

12. What is your age? _____

13. How many children do you have that are living at home? _____

14. What is your highest degree of education?

- ❍ Associate
- ❍ Baccalaureate
- ❍ Masters
- ❍ Doctorate
- ❍ Post-doctoral Education

15. Do you work part-time/PRN in an acute care setting? (If Yes, how many hours each month as a staff nurse)

- ❍ Yes _____
- ❍ No

16. Please rate how stressful each of these are to you? (-1=Not Applicable, 100=very stressful)

_____ Classroom teaching
_____ On-line teaching
_____ Clinical teaching
_____ Work meetings
_____ Committee work
_____ Job rewards (salary, benefits, security)
_____ Work demands (work load)
_____ Office politics
_____ Time spent after work hours for job tasks
_____ Student issues
_____ Outdated technology equipment
_____ Unavailable technology assistance
_____ Promotion opportunity (upward mobility)
_____ Administrative support

17. Overall, how satisfied are you with your job?

- ❍ Very Dissatisfied
- ❍ Dissatisfied
- ❍ Somewhat Dissatisfied
- ❍ Neutral
- ❍ Somewhat Satisfied
- ❍ Satisfied
- ❍ Very Satisfied

18. How many years do you intend to stay at your current job? _____

19. How likely are you to leave your job in the next year? _____

- ❍ Very Unlikely
- ❍ Unlikely
- ❍ Somewhat Unlikely
- ❍ Undecided
- ❍ Somewhat Likely
- ❍ Likely
- ❍ Very Likely

20. How likely are you to leave your job in the next 5 years?

- ❍ Very Unlikely
- ❍ Unlikely
- ❍ Somewhat Unlikely
- ❍ Undecided
- ❍ Somewhat Likely
- ❍ Likely
- ❍ Very Likely

21. If you plan to leave your job, what is the primary reason you will probably leave

- ❍ job dissatisfaction
- ❍ retirement
- ❍ family reasons
- ❍ relocation
- ❍ I don't plan to leave my job

22. Have you had any formal training in ONLINE TEACHING?

- ❍ Yes
- ❍ No

23. Please estimate how many HOURS you spend working on a computer for your job each week. _____

24. What types of technology do you currently use in your TEACHING? (Answer all that apply)

- ❑ E-mail
- ❑ Video-Conferencing Software (ex: Zoom, Skype, FaceTime)
- ❑ Video-Presentations
- ❑ Over-Head Projector
- ❑ Video Recorder
- ❑ Smart Board
- ❑ PowerPoint
- ❑ BlackBoard Learn©
- ❑ WebCT©
- ❑ CANVAS©
- ❑ Word Processing
- ❑ Simulation
- ❑ Other, Please Specify _____

Instrument Questions

Burke (2009) NETS Scale

(A) Technology issues related to course planning and development:

How stressful are each of these e-learning TECHNOLOGY ISSUES to you?

	No Stress	Little Stress	Moderate Stress	Stressful	Very Stressful
Access to computer technology during course preparation (good equipment)	❍	❍	❍	❍	❍
The computer software is user friendly (easy to use and understand)	❍	❍	❍	❍	❍
Knowledge of computer technology	❍	❍	❍	❍	❍
Pressure to use more technology in courses	❍	❍	❍	❍	❍
Availability of technical support	❍	❍	❍	❍	❍
Computer hardware failures	❍	❍	❍	❍	❍
Computer software failures	❍	❍	❍	❍	❍

Appendix C (Continued)

	No Stress	Little Stress	Moderate Stress	Stressful	Very Stressful
Loss of data	❍	❍	❍	❍	❍
Outdated computer technology	❍	❍	❍	❍	❍
Not having needed computer software	❍	❍	❍	❍	❍
Network failure	❍	❍	❍	❍	❍
Damage to storage media	❍	❍	❍	❍	❍
Forget to save work	❍	❍	❍	❍	❍
Need to learn new software	❍	❍	❍	❍	❍
Hard drive crashes	❍	❍	❍	❍	❍
Availability of Internet access	❍	❍	❍	❍	❍
Use of personal data assistant to keep track of course assignments, tests, etc. (ex: ipad, PDA, electronic calendar device)	❍	❍	❍	❍	❍
Too much unsolicited e-mails (spam)	❍	❍	❍	❍	❍
Fear of computer viruses	❍	❍	❍	❍	❍
Fear of unauthorized access to your saved information (personal documents, tests, assignments, etc.)	❍	❍	❍	❍	❍
On-line course evaluation methods	❍	❍	❍	❍	❍
Ability to incorporate computer technology into a unit of study	❍	❍	❍	❍	❍

B. Technological stressors experienced during course delivery:

Please answer each of these items related to your use of technology during course delivery.

	No stress	Little stress	Moderate stress	Stressful	Very Stressful
Computer technology makes me feel stressed	❍	❍	❍	❍	❍
Feel anxious when faced with utilizing computer technology in classroom/clinical setting	❍	❍	❍	❍	❍
Student access to course materials	❍	❍	❍	❍	❍
Students' knowledge of computer technology	❍	❍	❍	❍	❍
Access to computer technology during class time	❍	❍	❍	❍	❍
Computer hardware failure	❍	❍	❍	❍	❍
Computer software failure	❍	❍	❍	❍	❍
Knowledge of computer technology utilized in classroom/clinical	❍	❍	❍	❍	❍
Technical support during class time	❍	❍	❍	❍	❍
Knowledge of how to setup computer technology in classroom/clinical	❍	❍	❍	❍	❍
Internet access in classroom/clinical	❍	❍	❍	❍	❍
Network failure	❍	❍	❍	❍	❍
Loss of data	❍	❍	❍	❍	❍

Appendix C (Continued)

TAM Scales

Perceived Usefulness (PU) Adapted From Davis (1989)
Perceived Ease of Use (PEU) Adapted From Davis (1989)
Behavioral Intent to Use (BI) Adapted From Kim, Chun, Song (2009)
Actual Use (U) Adapted From Kim, Chun, Song (2009) and Venkatesh & Davis, (2000)

Please rate the following regarding your use of e-learning technology (computers and other electronic devises) in teaching

	Strongly Disagree	Moderately Disagree	Slightly Disagree	Neutral	Slightly Agree	Moderately Agree	Strongly Agree
Using technology in my job enables me to accomplish tasks more quickly.	❍	❍	❍	❍	❍	❍	❍
Using technology improves my job performance.	❍	❍	❍	❍	❍	❍	❍
Using technology in my job increases my productivity.	❍	❍	❍	❍	❍	❍	❍
Using technology enhances my effectiveness on the job.	❍	❍	❍	❍	❍	❍	❍
Using technology makes it easier to do my job.	❍	❍	❍	❍	❍	❍	❍
I find technology useful in my job.	❍	❍	❍	❍	❍	❍	❍
Managing technology is easy for me.	❍	❍	❍	❍	❍	❍	❍
I find it easy to get technology to do what I want it to do.	❍	❍	❍	❍	❍	❍	❍
My interaction with electronic learning technology is clear and understandable.	❍	❍	❍	❍	❍	❍	❍
I find technology to be flexible to interact with.	❍	❍	❍	❍	❍	❍	❍

Appendix C (Continued)

	Strongly Disagree	Moderately Disagree	Slightly Disagree	Neutral	Slightly Agree	Moderately Agree	Strongly Agree
It is easy for me to become skillful at using technology	❍	❍	❍	❍	❍	❍	❍
I find technology easy to use.	❍	❍	❍	❍	❍	❍	❍
Assuming I have access to electronic learning I INTEND to use it.	❍	❍	❍	❍	❍	❍	❍
Given that I have access to electronic learning , I PREDICT that I would use it.	❍	❍	❍	❍	❍	❍	❍
In the future, I plan to use electronic learning MORE often.	❍	❍	❍	❍	❍	❍	❍
I have a positive attitude toward electronic learning.	❍	❍	❍	❍	❍	❍	❍
Assuming I have access to the system, I intend to use it.	❍	❍	❍	❍	❍	❍	❍
Given that I have access to the system, I predict that I would use it.	❍	❍	❍	❍	❍	❍	❍

Appendix C (Continued)

Attitudes toward E-Learning Scale (Mishra & Panda, 2007)
Please rate your attitudes toward e-learning.

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
Electronic learning will never replace other forms of teaching and learning.	❍	❍	❍	❍	❍
*Electronic learning makes me uncomfortable because I do not understand it.	❍	❍	❍	❍	❍
*Electronic learning is a dehumanizing process of learning.	❍	❍	❍	❍	❍
Electronic learning can solve a lot of educational problems.	❍	❍	❍	❍	❍
*I feel intimidated by electronic learning.	❍	❍	❍	❍	❍
Electronic learning will bring new opportunities for organizing teaching and learning.	❍	❍	❍	❍	❍
*Electronic learning is difficult to handle and therefore frustrating to use.	❍	❍	❍	❍	❍
There are unlimited possibilities of electronic learning that have not yet been thought about.	❍	❍	❍	❍	❍
Electronic learning saves time and effort of both teachers and students.	❍	❍	❍	❍	❍
Electronic learning increases access to education and training.	❍	❍	❍	❍	❍
Electronic learning will increase my efficiency in teaching.	❍	❍	❍	❍	❍

Appendix C (Continued)

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
Electronic learning enables collaborative learning.	❍	❍	❍	❍	❍
Electronic learning can engage learners more than other forms of learning.	❍	❍	❍	❍	❍
Electronic learning increases quality of teaching and learning because it integrates all forms of media: print, audio, video, animation.	❍	❍	❍	❍	❍
Electronic learning increases the flexibility of teaching and learning.	❍	❍	❍	❍	❍
Electronic learning improves communication between students and teachers.	❍	❍	❍	❍	❍
Electronic learning enhances the pedagogic value of a course.	❍	❍	❍	❍	❍
*I get a sinking feeling when I think of trying to use electronic learning for my courses.	❍	❍	❍	❍	❍
*Electronic learning is not-effective for student learning.	❍	❍	❍	❍	❍
*Electronic learning experiences cannot be equated with face to face teaching or even distance education.	❍	❍	❍	❍	❍
It is essential that electronic learning material is of high-quality	❍	❍	❍	❍	❍

The Job Descriptive Index and The Job in General Scale

Think of the majority of people with whom you work or meet in connection with your work. How well does each of the following words or phrases describe these people?
Choose: "Yes" if it describes your work
"No" if it does not describe your work
"?" if you cannot decide

	Yes	No	?
Stimulating	○	○	○
Boring	○	○	○
Slow	○	○	○
Helpful	○	○	○
Stupid	○	○	○
Responsible	○	○	○
Likable	○	○	○
Intelligent	○	○	○
Easy to make enemies	○	○	○
Rude	○	○	○
Smart	○	○	○
Lazy	○	○	○
Unpleasant	○	○	○
Supportive	○	○	○
Active	○	○	○
Narrow interests	○	○	○
Frustrating	○	○	○
Stubborn	○	○	○

The Job Descriptive Index and The Job in General Scale (Continued)

Think of your job in general. All in all, what is it like most of the time?
Choose: "Yes" if it describes your work
"No" if it does not describe your work
"?" if you cannot decide

	Yes	No	?
Pleasant	○	○	○
Bad	○	○	○
Great	○	○	○
Waste of time	○	○	○
Good	○	○	○
Undesirable	○	○	○
Worthwhile	○	○	○
Worse than most	○	○	○
Acceptable	○	○	○
Superior	○	○	○
Better than most	○	○	○
Disagreeable	○	○	○
Makes me content	○	○	○
Inadequate	○	○	○
Excellent	○	○	○
Rotten	○	○	○
Enjoyable	○	○	○
Poor	○	○	○

Appendix C (Continued)

The Job Descriptive Index and The Job in General Scale (Continued)

Think of the work you do at present. How well does each of the following words or phrases describe your work?
Choose: "Yes" if it describes your work
"No" if it does not describe your work
"?" if you cannot decide

	Yes	No	?
Fascinating			
Routine			
Satisfying			
Boring			
Good			
Gives sense of accomplishment			
Respected			
Exciting			
Rewarding			
Useful			
Challenging			
Simple			
Repetitive			
Creative			
Dull			
Uninteresting			
Can see results			
Uses my abilities			

Think of the pay you get now. How well does each of the following words or phrases describe your present pay?
Choose: "Yes" if it describes your work
"No" if it does not describe your work
"?" if you cannot decide

	Yes	No	?
Income adequate for normal expenses			
Fair			
Barely live on income			
Bad			
Comfortable			
Less than I deserve			
Well paid			
Enough to live on			
Underpaid			

The Job Descriptive Index and The Job in General Scale (Continued)

Think of the opportunities for promotion that you have now. How well does each of the following words or phrases describe these?
Choose: "Yes" if it describes your work
"No" if it does not describe your work
"?" if you cannot decide

	Yes	No	?
Good opportunities for promotion	○	○	○
Opportunities somewhat limited	○	○	○
Promotion on ability	○	○	○
Dead-end job	○	○	○
Good chance for promotion	○	○	○
Very limited	○	○	○
Infrequent promotions	○	○	○
Regular promotions	○	○	○
Fairly good chance for promotion	○	○	○

Think of the kind of supervision that you get on your job. How well does each of the following words or phrases describe this?
Choose: "Yes" if it describes your work
"No" if it does not describe your work
"?" if you cannot decide

	Yes	No	?
Supportive	○	○	○
Hard to please	○	○	○
Impolite	○	○	○
Praises good work	○	○	○
Tactful	○	○	○
Influential	○	○	○
Up-to-date	○	○	○
Unkind	○	○	○
Has favorites	○	○	○
Tells me where I stand	○	○	○
Annoying	○	○	○
Stubborn	○	○	○
Knows job well	○	○	○
Bad	○	○	○
Intelligent	○	○	○
Poor planner	○	○	○
Around when needed	○	○	○
Lazy	○	○	○

Appendix D. Institutional Review Board Approval

THE UNIVERSITY OF TEXAS AT TYLER

3900 University Blvd. • Tyler, TX 75799 • 903.565.5774 • FAX: 903.565.5858

Office of Research and Technology Transfer

Institutional Review Board

February 12, 2015

Dear Mr. Tacy,

Your request to conduct the study*: Technostress Effects on Technology Acceptance by Nurse Faculty,* IRB#SP2015-55, has been approved by The University of Texas at Tyler Institutional Review Board under expedited review. This approval includes the written informed consent that is attached to this letter, and your assurance of participant knowledge of the following prior to study participation: this is a research study; participation is completely voluntary with no obligations to continue participating, and with no adverse consequences for non-participation; and assurance of confidentiality of their data.

In addition, please ensure that any research assistants are knowledgeable about research ethics and confidentiality, and any co-investigators have completed human protection training within the past three years, and have forwarded their certificates to the IRB office (G. Duke).

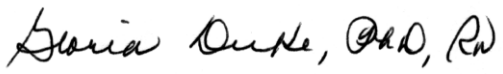
Please review the UT Tyler IRB Principal Investigator Responsibilities, and acknowledge your understanding of these responsibilities and the following through return of this email to the IRB Chair within one week after receipt of this approval letter:

- This approval is for one year, as of the date of the approval letter
- **The Progress Report form must be completed for projects extending past one year.** Your protocol will automatically expire on the one year anniversary of this letter if a Progress Report is not submitted, per HHS Regulations **prior** to that date (45 CFR 46.108(b) and 109(e): http://www.hhs.gov/ohrp/policy/contrev0107.html
- Prompt reporting to the UT Tyler IRB of any proposed changes to this research activity
- **Prompt reporting to the UT Tyler IRB and academic department administration will be done of any unanticipated problems involving risks to subjects or others**

- Suspension or termination of approval may be done if there is evidence of any serious or continuing noncompliance with Federal Regulations or any aberrations in original proposal.
- Any change in proposal procedures must be promptly reported to the IRB prior to implementing any changes except when necessary to eliminate apparent immediate hazards to the subject.

Best of luck in your research, and do not hesitate to contact me if you need any further assistance.

Sincerely,



Gloria Duke, PhD, RN

Chair, UT Tyler IRB

Appendix E. Permissions

Permission Letter

Mary S. Burke, PhD, RN, CNE
4849 Essen Lane
Baton Rouge, LA 70809
mburke@selu.edu

Dear Joseph,

Thank you for your interest in using the Nurse Educator Technostress Scale. This letter serves as written permission to use the instrument in your dissertation study. I would greatly appreciate it if you would share the results of your study upon completion.

Sincerely,

Mary S. Burke

Mary S. Burke, PhD, RN, CNE

School of Nursing · Baton Rouge Center · 4849 Essen Lane· Baton Rouge, LA 70809 · 225-765-2324 · Fax: 225-765-2315
A member of the University of Louisiana System

Appendix E (Continued)

Permission to use ATEL (E-mail Correspondence)

Dear Lisa & Joe:

Hi. Thank you very much indeed. I am copying this mail to Dr Mishra too, and I am sure he will also join me to agree to use the Attitude Scale, with due acknowledgements to the authors/ papers in which it was published. The following reference shall be useful in tracing the reliability and validity of the scale:

Mishra, S. & Panda, S. (2007). Development and factor analysis of an instrument to measure faculty attitude towards e-learning. *Asian Journal of Distance Education,* 5(1), 27-33.

Hope to hear from you later when your PhD thesis is defended successfully.

Cheers.
Santosh
Professor Santosh Panda
www.santoshpanda.net

Dear Lisa & Joe:
We are usually happy to permit others us use the instrument for their research. With this mail, I permit you to use the instrument in your research and also inform us about your work when completed. I am sure Prof. Panda may also have any suggestion to you on this.

With regards, Sanjaya

Appendix E (Continued)

Permission to use Perceived Usefulness and Ease of Use Scales

From: **Fred Davis** FDavis@walton.uark.edu
Subject: RE: Request to Use TAM Scales for Dissertation Study
Date: November 25, 2013 at 11:28 PM
To: Lisa Harless lharless@patriots.uttyler.edu
Cc: Joseph Tacy jtacy@patriots.uttyler.edu

Lisa
You and Joseph have my permission to use the perceived usefulness and ease of use scales for your dissertation research.

Best wishes
Fred Davis

From: Lisa Harless [lharless@patriots.uttyler.edu]
Sent: Monday, November 25, 2013 12:37 AM
To: Fred Davis
Cc: Joseph Tacy
Subject: Request to Use TAM Scales for Dissertation Study

Dr. Davis:
Hello. I am writing to formally request the use of your *Perceived Usefulness* and *Perceived Ease of Use* scales associated with the Technology Acceptance Model as published in MIS Quarterly, September 1989. A classmate (Joseph Tacy) and myself are currently doctoral candidates at the University of Texas at Tyler and would like to utilize your TAM scales to study technology acceptance among nurse educators. Should you require additional information please let us know. Thank you for your consideration.

Respectfully,
Lisa Harless (lharless@patriots.uttyler.edu)
Joseph Tacy (jtacy@patriots.uttyler.edu)

Appendix F. Participant Colleges and Universities

College and University List

Albany State University	North Carolina Central University	University of South Alabama
Alcorn State University	Northwestern State University of Louisiana	University of South Carolina-Aiken
Arkansas State University	Oakwood University	University of South Carolina-Columbia
Arkansas Tech University	Old Dominion University	University of South Florida
Armstrong Atlantic State University	Our Lady of Holy Cross College	University of Southern Mississippi
Auburn University	Our Lady of the Lake College	University of Tennessee at Knoxville
Barry University	Patty Hanks Shelton School of Nursing	University of Tennessee at Martin
Baylor University	Piedmont College	University of Tennessee Health Science Center, Memphis
Brenau University	Piedmont Technical College	University of Texas at Arlington
Charleston Southern University	Prairie View A&M University	University of Texas at El Paso
Clayton State University	Samford University	University of Texas Health Science Center at Houston
Clemson University	Shenandoah University	University of Texas Health Science Center at San Antonio
Cleveland State Community College	Southeastern Louisiana University	University of Texas Medical Branch at Galveston
Coahoma Community College	Southern Adventist University	University of Virginia
College of Coastal Georgia	Southern West Virginia Community and Technical College	University of West Georgia
Coppin State University	St. Petersburg College	
Cumberland University	State College of Florida, Manatee-Sarasota	
Davis And Elkins College	Texas A&M University-Corpus Christi	
Delta State University	Texas Christian University	
East Carolina University	Texas Woman's University	
East Tennessee State University	The Catholic University of America	
Eastern Kentucky University	The Johns Hopkins University	
Emory University	Towson University	
Faulkner State Community College	Troy University	
Florida Atlantic University	Tuskegee University	
Florida International University	University of Alabama	
Florida State University	University of Alabama at Birmingham	
George Mason University	University of Alabama in Huntsville	
Georgia Baptist College of Nursing of Mercer University	University of Arkansas for Medical Sciences	
Georgia College & State University	University of Central Arkansas	
Georgia Regents University	University of Central Florida	
Georgia Southern University	University of Delaware	
Georgia State University	University of Florida	
Greenville Technical College	University of Kentucky	
Hampton University	University of Louisiana at Lafayette	
Harding University	University of Louisiana at Monroe	
Hinds Community College	University of Memphis	
Howard University	University of Mississippi Medical Center	
James Madison University	University of North Alabama	
Jones County Junior College	University of North Carolina at Chapel Hill	
Kennesaw State University	University of North Carolina at Charlotte	
Kentucky State University	University of North Carolina at Greensboro	
Louisiana State University Health Sciences Center	University of North Carolina Wilmington	
Marshall University	University of North Florida	
McNeese State University	University of Oklahoma Health Sciences Center	
Medical University of South Carolina	Valdosta State University	
Middle Georgia State College	Virginia Commonwealth University	
Middle Tennessee State University	Walters State Community College	
Mississippi College	West Virginia University	
Mississippi University for Women	Western Kentucky University	
Morehead State University	William Carey College	
Nicholls State University	University of Texas at Tyler	

BIOGRAPHICAL SKETCH

NAME: Tacy, Joseph Wilson

eRA COMMONS USER NAME (credential, e.g., agency login):

POSITION TITLE: MSN RN

EDUCATION/TRAINING

INSTITUTION AND LOCATION	DEGREE	MM/YYYY	FIELD OF STUDY
West Virginia University	BA	12/2004	Regents
Davis and Elkins College	ASN	05/2007	Nursing
James Madison University	MSN	05/2011	Nursing
The University of Texas at Tyler	PhD	Candidate	Nursing

A. Personal Statement

The goal of the proposed research was to investigate the adaption of technology among nurse faculty and the impact technology has on system use, job satisfaction, and intent to stay in the profession. Specifically, we measured influences of technostress, perceived usefulness, perceived ease of use, attitude toward using, behavioral intention to use, and use of technology. My background and interest in informatics and post-graduate coursework in nursing and research enabled me to successfully carry out the study.

B. Positions and Honors

Positions and Employment

2013-Present. Nursing Instructor. James Madison University, Harrisonburg, VA
2007-Present. Nursing Administration, Patient Care Supervisor (per diem). Sentara RMH Medical Center, Harrisonburg, VA
2007. Med/Surg Orthopedic Staff Nurse. Yuma Regional Medical Center, Yuma, AZ

Other Experience and Professional Memberships

American Nurses Association
Virginia Nurses Association
National Student Nurse Association
Sigma Theta Tau International Honors Society