PREDICTORS OF NURSING FACULTY ACCEPTANCE OF MOBILE INFORMATION TECHNOLOGY IN BACCALAUREATE NURSING EDUCATION

by

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A DISSERTATION

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ABSTRACT

Integrating mobile information technology (MIT) into nursing faculty teaching practices is becoming a top priority in baccalaureate nursing education to better prepare today’s nurses for 21st century technology-enriched practice. MIT, characterized as an ultra-portable computing device with a touch-sensitive screen, capable of running computer applications, and able to connect to the Internet via a wireless network, is now the next technology innovation enhancing student learning and educational experiences in baccalaureate nursing education. The main objective of this correlational study was to examine interrelationships among variables (perceived usefulness, perceived ease of use, attitude toward MIT, administrative support, and computer experience) and their roles in predicting nursing faculty MIT acceptance in teaching practices in baccalaureate nursing classroom. Although researchers have examined the roles of these variables in other contexts, the present study was an examination of the manner in which these variables may jointly function to predict MIT acceptance among nursing faculty. The Technology Acceptance Model (TAM) served as the theoretical framework. Participants included fifty-eight (58) nursing faculty who taught in Commission on Collegiate Nursing Education (CCNE)-accredited pre-licensure baccalaureate nursing programs in three Mid-Atlantic States (Delaware, Maryland, and Virginia) and the District of Columbia. Findings revealed that hypotheses predictions were largely supported. Perceived usefulness, perceived ease of use, attitude toward MIT, administrative support, and computer experience were related to each other and contributed to the prediction of MIT acceptance in teaching practices among nursing faculty.
DEDICATION

In memory of my loving mother and brother, Maola Inman Day & Luther “Nudie” Day.

“Family – where life begins and love never ends.”
<table>
<thead>
<tr>
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<th>Description</th>
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<tbody>
<tr>
<td>A</td>
<td>Acceptance</td>
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<tr>
<td>AACN</td>
<td>American Association of Colleges of Nursing</td>
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<td>ANA</td>
<td>American Nurses Association</td>
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<td>AS</td>
<td>Administrative Support</td>
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<td>ATT</td>
<td>Attitude Toward Mobile Information Technology</td>
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<td>AU</td>
<td>Actual Use</td>
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<td>BI</td>
<td>Behavior Intention</td>
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<td>CA</td>
<td>Computer Anxiety</td>
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<td>CCNE</td>
<td>Commission on Collegiate Nursing Education</td>
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<td>CE</td>
<td>Computer Experience</td>
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<td>CINAHL</td>
<td>Cumulative Index to Nursing and Allied Health Literature</td>
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<td>CSE</td>
<td>Computer Self Efficacy</td>
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<td>DOI</td>
<td>Diffusion of Innovation</td>
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<td>ERIC</td>
<td>Education Resources Information Center</td>
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<tr>
<td>EUT</td>
<td>Experience with the Use of Technology</td>
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<tr>
<td>IOM</td>
<td>Institute of Medicine</td>
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<td>IS</td>
<td>Information Systems</td>
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<td>IT</td>
<td>Information Technology</td>
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<tr>
<td>KSA</td>
<td>Knowledge, Skills and Attitudes</td>
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<tr>
<td>Acronym</td>
<td>Full Form</td>
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<tr>
<td>MIS</td>
<td>Management Information System</td>
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<tr>
<td>MSCHE</td>
<td>Middle States Commission on Higher Education</td>
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<td>MSIS</td>
<td>Management Support Implementation Scale</td>
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<td>MIT</td>
<td>Mobile Information Technology</td>
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<td>NLN</td>
<td>National League for Nursing</td>
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<tr>
<td>PEOU</td>
<td>Perceived Ease of Use</td>
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<td>P-I-U</td>
<td>Perception-Intention-Usage</td>
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<td>PU</td>
<td>Perceived Usefulness</td>
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<td>QSEN</td>
<td>Quality and Safety Education for Nurses</td>
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<td>SCT</td>
<td>Social Cognitive Theory</td>
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<tr>
<td>SEM</td>
<td>Structural Equation Modeling</td>
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<td>SN</td>
<td>Subjective Norms</td>
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<tr>
<td>TIGER</td>
<td>Technology Informatics Guiding Education Reform Initiative</td>
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<tr>
<td>TAM</td>
<td>Technology Acceptance Model</td>
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<tr>
<td>TPB</td>
<td>Theory of Planned Behavior</td>
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<tr>
<td>TRA</td>
<td>Theory of Reasoned Action</td>
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<tr>
<td>UTAUT</td>
<td>Unified Theory of Acceptance and Use of Technology</td>
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LIST OF SYMBOLS

\[ a \quad \text{Cronbach’s index of internal consistency} \]

\[ \text{df} \quad \text{Degrees of freedom: number of values free to vary after certain restrictions have been placed on the data} \]

\[ F \quad \text{Fisher’s F ratio: A ration of two variances} \]

\[ M \quad \text{Mean: the sum of a set of measurements divided by the number of measurements in the set} \]

\[ p \quad \text{Probability associated with the occurrence under the null hypothesis of a value as extreme as or more extreme than the observed value} \]

\[ r \quad \text{Pearson Product-Moment Correlation Coefficient} \]

\[ t \quad \text{Computed value of t test} \]

\[ < \quad \text{Less than} \]

\[ = \quad \text{Equal to} \]

\[ > \quad \text{Greater than} \]

\[ \% \quad \text{Percent} \]
ACKNOWLEDGMENTS

“The Lord gives victory to those who are humble.” (Psalms 149:4)

Most of the dissertation process feels like a solitary endeavor, but when the time comes to write acknowledgements, it is clear that the support of others is critical to the success. First, giving God the highest honor and praise for being Lord in my life. I could not have completed this task without You (Philippians 4:13).

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CHAPTER 1 INTRODUCTION

“To better predict, explain and increase user acceptance, we need to better understand why people accept or reject computers” -Davis et al. (1989, p. 982)

As technology becomes more integral to the functioning of baccalaureate nursing education as a whole, the ability of nursing faculty to integrate new technology into teaching practices becomes an ever-larger determinant of success. Organizations that can anticipate and predict which nursing faculty will accept the technology changes that the organization has implemented are at an advantage over those that adopt a wait-and-see approach. Mobile information technology (MIT) is among the most visible areas in which workplace technology is advancing. To one degree or another, MIT is part of most nursing faculty’s daily activity. The use of course management systems (e.g., Blackboard), smart classrooms, and web 2.0 educational tools now comprise a large percentage of educational technology in nursing classroom settings, but were met with considerable resistance when they were initially introduced. There are many advantages to MIT use in baccalaureate nursing education, but there are also some unanswered questions regarding MIT utility in baccalaureate nursing classroom settings and nursing faculty acceptance, defined in this study as “expressing the willingness or intent to use or adopt” MIT to help improve performance and learner outcomes in baccalaureate nursing classroom settings (Dillon & Morris, 1996).

Defining Mobile Information Technologies

For this study, MIT is defined as any ultra-portable computing device with a touch-sensitive screen (generally less than 11 inches measured diagonally), capable of running
applications, and able to connect to the Internet via a wireless network. Examples of these devices include, but are not limited to, tablet computers, Apple iOS®-based devices like the iPad®, iPod Touch®, and iPhone®; Windows-based systems such as Microsoft™ Surface™ Pro, and Windows phone®; Android™-based devices like the Google™ Nexus®, Samsung™ Galaxy®, and similar systems and devices. References made to MIT in the study were generic in nature for a MIT that may look like a phone or tablet.

**Background - Mobile Information Technology in Higher Education**

Over the last 40 years, great strides have been made to infuse technology into higher education. During this period, faculty have accepted a variety of workplace technologies, for example, access to computer equipment, software, electronic teaching tools, Internet, email, chat and instant messaging, and other types of centralized methods for sharing computer technologies (Rossing, Miller, Cecil & Stamper, 2012). In addition, advances in educational technology over the last decade have complemented workplace technologies, resulting in increased opportunities for faculty to integrate more innovative teaching practices into classroom settings. Mobile information technology is now the next technology innovation frontier being researched for its potential in enhancing the learning and education experience for the students and the institutions.

**Institution administrators**

The National Survey of Computing and Information Technology (Green, 2012) reported that in the years 2000 through 2003, “The single most important information technology (IT) issue” to institution administrators was “Assisting faculty to integrate IT into teaching practices.” The issue of IT integration fell behind “Network and data security” during the years 2004 through 2008, according to Green, only to return as a top priority in 2010 and 2011. Green states that for 74% of institution administrators, “Assisting faculty to integrate IT into teaching practices” will be “a top priority for the next two to three years.” Once again, integration of IT
into teaching practices is a top priority for higher education administrators. In 2014, Green reports “Four-fifths (81%) of the CIOs and senior campus IT officers who represent the 470 colleges and universities that participated in the fall 2014 survey report that “assisting faculty with the instructional integration of information technology” is a very important institutional IT priority over the next two-three years.” This indicates a longstanding gap between the expectations of post-secondary administrators and the level of integration of IT into teaching practices by faculty. Is this gap a false perception held by administrators or is the reality that faculty are avoiding integration of IT into teaching practices? Providing a technology infrastructure alone does not guarantee faculty will use it (Georgina & Hosford, 2009).

**Digital natives, digital immigrants**

Prensky (2001a) labeled higher education faculty “digital immigrants” and the new generation of students “digital natives.” He also stated that “the biggest single problem facing education today” was the gap between current students’ digital, media-rich experiences and those of most university faculty. He goes on to state that “Today’s students are no longer the people our educational system was designed to teach” and that there is a need to adapt the current pedagogical paradigms to today’s students, economy, and society. Today’s students are demanding more from the educational system in terms of flexible delivery of lectures and administrative information from such offices as registrar, bursar, and university social programs. They are requiring different delivery modes, not only in terms of time and location but also in terms of multimedia-enhanced, interactive, and instantly-delivered educational material (Lam & McNaught, 2006; Carlson, 2005). The traditional student exists only in the eyes of those institution administrators not attuned to the needs and changes occurring in society and students, who believe in continuing the status quo in the approach to educating today’s students.
Pedró (2009) suggested that, contrary to this age-based classification of faculty as digital immigrants, most faculty in higher education had attained a high skill level and highly effective competency with the Internet and digital technologies. Faculty do not necessarily have the same “attachment to technology” (Pedró, 2009, p. 12) as their students do but their use of Internet and digital technologies has already contributed to the transformation of the learning environment with regard to course instruction, content delivery and assessment through widespread adoption of mobile information technology (Pedró, 2009).

**Student demands**

In addition, most of the limited amount of research directly related to MITs in education has been conducted in higher education settings. These limited studies have demonstrated an overwhelming preference for MIT by students in post-secondary educational settings (Gupta & Koo, 2010; Milrad & Spikol, 2007; Scornavacca, Huff, & Marshall, 2009). For instance, McGraw-Hill (2014) surveyed 1,697 college students who were enrolled in U.S. colleges and universities about MIT habits. Findings indicated that 81% of college students used MIT to study. This has not gone unnoticed or ignored by higher education. This has resulted in rapid expansion of MIT learning spaces at institutions across the United States, as students demand better ways to complement their mobile lifestyles in support of their learning (New Media Consortium, 2015).

The EDUCAUSE 2015 study, reported similar findings (Dahlstrom, Brooks, Grajek, & Reeves, 2015). EDUCAUSE surveyed 27,864 students at 103 two- and four-year institutions, noting that most undergraduates today are "digital natives" who have grown up immersed in technology. Faculty can expect from digital natives' new methods of interacting with information, different expectations and preferences for acquiring knowledge and skills. This implies less emphasis on the "sage on the stage" and a linear acquisition process focusing on a
"single best source," and instead, focuses on "active learning" that comes from synthesizing information from multiple types of media like MIT (Dahlstrom, et al., 2015).

**Faculty resistance**

Faculty resistance to adopting and integrating IT into their teaching practices is documented by previous research (Lin, Singer, & Ha, 2010; Reid, 2014). Rapidly emerging MIT have presented a challenge to MIT acceptance among faculty. Dahlstrom and Bichsel (2014) found that only 30 percent of faculty incorporate MIT into assignments, and 69 percent actually banned or discouraged classroom use of mobile devices. The study also found that 47 percent of students and 67 percent of faculty perceived MIT as a distraction in traditional learning environments. Overall, findings suggested that faculty had been slow to accept MIT in the classroom. Thus, MIT was not achieving its full potential for academic use in response to student demands.

In contrast, in the 2015 study by EDUCAUSE, students and faculty were noted to have similarly high levels of interest in using MIT to enhance learning, but actual use of these devices in academics remained low. The study reported evidence of slow but measurable growth in faculty acceptance of MIT in the classroom. In addition, 63% of students reported that faculty banned or discouraged use of smartphones in class in 2015, compared with 69 percent in 2014 and 74 percent in 2013 (Dahlstrom, et al., 2015).

In Gikas’ (2011) qualitative study, faculty respondents reported willingness to use MIT but expressed fear of the MIT not working and a need for “support infrastructure in place to assist instructors with any university-supported application as well as any network issues” (p. 97). While using technology away from the university, one faculty member was unsure if the MIT would work if the Wi-Fi connection was different than the university’s Wi-Fi connection. A second issue identified was that while the MIT were supported by the university, the software
that faculty chose to use was not supported. This created additional work for faculty, who created detailed instructions in order for their students to use the applications (Gikas, 2011).

**Mobile information technology in baccalaureate nursing education**

Among faculty in higher education, nursing faculty in baccalaureate nursing education are challenged to bring 21st-century technology into learning in meaningful ways to engage, motivate, and inspire nursing students (Skiba, 2013). Essentially, 21st century nursing faculty are called to keep up with workplace technology, develop ways to integrate emerging technologies like MIT into the instructional experience, assess student learning in a variety of instructional delivery modes as well as shape the next generation of professional nurses for technological advances in practice (Fiedler, Gidden & North, 2014). However, teaching models of instruction and practices in nursing education are often inconsistent with institutional needs and student demands for MIT in the classroom (Benham & Carvalho, 2016; Dahlstrom, et al., 2015; Montenery, Walker, Sorensen, Thompson, Kirklin, White, and Ross, 2013; Oblinger, 2012; Skiba & Barton, 2006; Talcott, O’Donnell & Burns, 2013), as nursing faculty lag in responding to MIT integration into the classroom (National Advisory Council on Nurse Education and Practice [NACNEP], 2010).

NACNEP (2010) suggested that nursing education adopt technology innovation like MIT incrementally while the practice environment continues to embrace new technology advancements at warp speed. Despite this view, nursing faculty have addressed the integration of technology into baccalaureate nursing curricula with the advancement of computerized human simulators (Decker, Fey, Sideras, Caballero, Rockstraw, Boese, Franklin, Gloe, Lioce, Sando, Meakim, and Borum, 2013; Guimond, Sole, & Salas, 2011; Hayden, Smiley & Goss, 2014; Horsley & Wambach, 2015), computerized testing (Schwartz & Francis, 2016), online learning
(Osborne, Kriese, Tobey, & Johnson, 2009; Zhen, Garthwait, & Pratt, 2008) and interactive classrooms (DeBourgh, 2008).

**Classroom settings**

In this study, the researcher defines the classroom setting as a learning space, a room in which classes are held, represented as a brick-and-mortar classroom environment. Historically, a typical classroom prior to the technology explosion would reflect the nursing faculty as the sender, the course materials as the message, and the students as the receivers of the information (Lewis, Fretwell, Ryan & Parham, 2013). The face-to-face lecture format would represent the communication medium (Lewis, et. al, 2013). Nursing faculty could easily control the feed of information and pace of learning (e.g., in traditional teaching practices, such as textbook reading, group work and classroom discussions). Fast-forward to a 2016 typical classroom setting and the classroom is filled with digital native students (Litchfield & Matteis, 2016; Revell & McCurry, 2010; Prensky, 2001). Prensky (2001) noted digital native students use MIT almost as if it were the first language in communicating with each other. Given the intensity of use of MIT by students and the potential gap in technical expertise between students and faculty, an even greater move toward interactive learning is needed in baccalaureate nursing classrooms to engage these digital native students in the teaching-learning process.

**MIT integration in the classroom**

Nursing faculty have been propelled toward delivering instructional content to students using educational technology like MIT in classroom settings (National League of Nursing [NLN], 2008). Teaching a discipline such as nursing requires experiential teaching and learning to reduce the tensions existing between teaching “everything” a student needs for the transition to practice and teaching for a lifetime of practice (Benner, 2015). Within the nursing education context, the use of MIT supports more situated, experiential, and contextualized learning and
affords the use of up-to-date and accurate information (Doyle, Garrett & Currie, 2013; Kenny, Park, Van Neste-Kenny, & Burton, 2012; Park, Van Neste-Kenny, Burton, & Kenny, 2010). Furthermore, research supports the use of MIT within the learning environment (Wu, Wu, Chen, Kao, & Lin, 2012). Nursing faculty are in a pivotal position to seriously look at MIT, student learning outcomes, and instructional designs that will foster students’ learning to become competent clinicians, prepared to use cutting edge MIT in healthcare delivery (Doyle, et al., 2013; Gu, Zhu & Guo, 2013; Kowitlawakul, Chan, Pulcini & Wang, 2015).

**Key stakeholders**

Nursing faculty are critical stakeholders in the success of integrating MIT into both education and practice. However, published anecdotal evidence (Skiba, 2016, 2011) found that faculty resistance hindered integration of MIT within nursing education. While use of MIT in education and practice has increased, research suggests that nursing faculty still have not fully embraced MIT as a resource in baccalaureate nursing classroom settings (Raman, 2015, Secco, Doiron-Maillet, Amirault & Furlong, 2013; Swan, Smith, Frisby, Shaffer, Hanson-Zalot, & Becker, 2013). In contrast, administrators of the institutions must understand new and emerging technologies like MITs, to avoid failure when implementing technology. The administrators cannot stand still and sit on current and past performances and applications. They are responsible for IT assets that are increasing in value and that support all faculty, staff, students, trustees, alumni, and other constituents of the institution. In addition, administrators are wrestling with how to positively engage and support faculty members in MIT acceptance to enhance teaching practices (Johnson, Wisniewski, Kuhlemeyer, Isaacs & Krzykowski, 2013).

Successful MIT initiatives in baccalaureate nursing education depend on nursing faculty's knowledge, skills and attitudes (KSA) to implement and utilize MITs (Sezer, 2015) in classroom settings. In *Merriam-Webster.com*, knowledge (2016) is defined as “applying facts or ideas
acquired by study, investigation, observation, or experience.” In this study, “knowledge” refers to nursing faculty’s familiarity with technology and/or MIT for personal or professional use. “Skills” refers to nursing faculty’s ability to operate MIT for personal or professional use. “Attitudes” relates to nursing faculty’s positive or negative affective (manner, disposition, position) feelings about using MIT in baccalaureate nursing classroom settings as measured by responses on the instrument (Davis, 1989).

In general, understanding how KSA may affect nursing faculty’s willingness to accept MITs in teaching practices in baccalaureate nursing education can provide other faculty, institutional administrators, instructional technologists and designers with useful information about factors that impact nursing faculty’s behavioral responses toward MIT. These key stakeholders are invested in the welfare and success of institutions and their students. In addition, key stakeholders in baccalaureate nursing education include both prospective employers in practice and patients who will be recipients of care. There may be incongruence between key stakeholder expectations of MIT integration and nursing faculty’s belief in and ability to carry out these expectations in classroom settings.

It is generally accepted that MIT utility in higher education has altered, and continues to transform the educational landscape dramatically, fueling changes in content, methodology of teaching, and assessment (Benham et al., 2016; Rossing et al., 2012; Smith & Kukulska-Hulme, 2012). To capitalize on potential benefits of MIT in baccalaureate nursing classrooms, leading health care authorities (e.g., Institute of Medicine [IOM]; the American Hospital Association; the Robert Wood Johnson Foundation [Kimball & O’Neil, 2002]; and the Joint Commissions [2016]), nursing organizations, as key stakeholders have instituted initiatives intended to increase MIT use in nursing education and practice.
In a study conducted by Smith, Cronenwett, and Sherwood (2007), researchers found 38% nursing faculty wanted to provide more skills using informatics, the science of information and computer information systems. In addition, the study reported gaps in faculty members’ KSA, particularly related to informatics and in teaching of those competencies. The National League for Nursing (NLN) report (2015), *A Vision for the Changing Faculty Role: Preparing students for the technological world of health care* contended that nursing faculty must be able to apply it [technology] appropriately, and become conversant with new technological tools like MITs, resources, and approaches in classroom settings. These initiatives generally recognize the need for effective, continuous professional faculty development programs designed to increase nursing faculty beliefs about the usefulness and ease of use of MIT.

Axley (2008) noted that nursing faculty who did not grow up with technology often face the same challenges as students. A shift in teaching practices can be difficult to achieve if the person providing the education lacks the necessary skills (Wood, 2009). So, it makes logical sense for institution administrators to focus on increasing technological competency of nursing faculty. However, this researcher will argue that designing professional faculty development programs without considering other factors that may affect nursing faculty MIT acceptance (intent) in baccalaureate nursing classroom settings limits potential impact. Moreover, monetary decision-making by institutional administrators to support MIT initiatives in baccalaureate nursing programs must be based on consideration of all factors that impact nursing faculty MIT acceptance (intent) in teaching practices in baccalaureate nursing classroom settings. Finally, from a research perspective, it is important to establish the extent to which empirical findings support intuitional or conventional wisdom when investigating perceived factors affecting
nursing faculty MIT acceptance in teaching practices in baccalaureate nursing classroom settings.

**Statement of Problem**

The slow adoption and acceptance of MIT by nursing faculty members has become a critical concern of institution administrators since nursing faculty are central to successful MIT integration into baccalaureate nursing programs. According to Hung and Zhang (2012), mobile learning support was rare in classroom settings and research on faculty support regarding how mobile technologies can be used for teaching is even scarcer. Turale (2011) suggested that nursing faculty who lack of knowledge or skills about new technologies, or do not take part in policy- and decision-making, accept the status quo and work harder in a reactive fashion under known and unknown powers that have a vested interest in ensuring that rapid technological innovations like MIT are implemented without serious scrutiny. This often occurs before nursing faculty have had a chance to embark on stringent research to evaluate the outcomes of the learning process using the technology. This has impacted the rate and consistencies of MIT integration in nursing faculty teaching practices across baccalaureate nursing curricula.

Research suggested that MIT integration is not being maximized in nursing faculty teaching practices in classroom settings to better prepare today’s nurses for 21st century practice (Raman, 2015), despite increased presence and use of MIT in academia among students (Dahlstrom, et al., 2015), expectations of institutional administrators (Bowe, 2011), and stakeholders in high-stakes, complex and ever-changing technological practice environment (Huston, 2013; 2014). In addition, resistance to change continues in traditional teaching practices (Hamer & Cipriano, 2013) by nursing faculty who did not grow up with MIT like many of their students. In a study by Novelli & Fernandes (2007), faculty reported that traditional class with
chalk & talk was superior to using technology, while another study was in favor of using PowerPoint in teaching practices (Savoy, Proctor & Salvendy, 2009). According to the 2014-15, The National League of Nursing (NLN) Faculty Census Survey of Schools of Nursing, 50 percent of nursing faculty were, then, between ages 46 and 60 and 20 percent were over the age of 60. Faculty who have taught 20 to 30 years in traditional media did not want to change because of their full command on traditional teaching methods (Waheed, 2009) and believe the use of MIT is disruptive and distracting to teaching and learning in classroom settings (Anderson & McGreal, 2012; Parry, 2011).

**Purpose of the Study**

The purpose of this non-experimental correlational study is to determine if, in 2016, relationships existed among between perceived usefulness (PU), perceived ease of use (PEOU), attitudes toward MIT (ATT) [as derived from TAM (Davis, 1989)], administrative supports (AS) (as applied from Klein, Conn & Sorra, 2001), computer experience [CE] (Bauer, Truxillo, Tucker, Weathers, Bertolino, Erdogan, & Campion, 2006) and the criterion variable, MIT acceptance (intent) by nursing faculty who were teaching in Commission on Collegiate Nursing Education (CCNE)-accredited pre-licensure baccalaureate nursing programs in three mid-Atlantic states (Delaware, Maryland, and Virginia) and the District of Columbia. Due to the proliferation of MIT and its use in baccalaureate nursing education, the study aimed to determine whether AS and CE (as supported by the TAM constructs of PU, PEOU, ATT) impacted MIT acceptance (intent) in teaching practices among the population of nursing faculty who teach in baccalaureate nursing classroom settings.

The TAM serves as the theoretical model for this study. Quantitative correlational analysis was appropriate for investigation of relationships among the five predictor variables
(PU, PEOU, AS, CE, and ATT) and the criterion variable, MIT acceptance (intent) by nursing faculty. Data collection employed an electronic survey using a 7-point Likert-type scale to gather the study variables, and was distributed to a purposeful sample of nursing faculty teaching in 17 baccalaureate nursing programs accredited by CCNE from three states (Delaware, Maryland, and Virginia) and the District of Columbia (DC). Data analysis utilized the Statistical Package for the Social Sciences SPSS® 24 for Windows, specifically, Pearson Product-Moment Correlation Coefficient analysis, to determine the degree to which a relationship exists between five predictor variables (PU, PEOU, AS, CE, and ATT), and the criterion variable acceptance (intent).

**Research Question**

The following overarching research question and hypotheses for the study were driven by the objective to assess the predictive relationships and associations among five predictor variables, (perceived usefulness (PU), perceived ease of use (PEOU), attitudes toward MIT (ATT), administrative support (AS), and computer experience (CE), upon one criterion variable, MIT acceptance (intent):

**RQ1:** Are the constructs of perceived usefulness (PU), perceived ease of use (PEOU), attitudes toward MIT (ATT), administrative support (AS), and computer experience (CE) significant predictors of nursing faculty MIT acceptance in teaching practices in baccalaureate nursing classroom settings as defined by acceptance (intent)?

**Hypothesis 1:**

H1₀ There is no relationship between administrative supports and perceived usefulness.

H₁ₐ There is a significant relationship between administrative supports and perceived usefulness.

**Hypothesis 2:**
H2₀ There is no relationship between computer experience and perceived ease of use

H2ₐ There is a significant relationship between computer experience and perceived ease of use.

**Hypothesis 3:**

H3₀ There is no relationship between computer experience and perceived usefulness.

H3ₐ There is a significant relationship between computer experience and perceived usefulness.

**Hypothesis 4:**

H4₀ There is no relationship between perceived usefulness and attitudes toward MIT.

H4ₐ There is a significant relationship between perceived usefulness and attitudes toward MIT.

**Hypothesis 5:**

H5₀ There is no relationship between perceived ease of use and attitudes toward MIT.

H5ₐ There is a significant relationship between perceived ease of use and attitudes toward MIT.

**Hypothesis 6:**

H6₀ There is no relationship between attitudes and MIT acceptance.

H6ₐ There is a significant relationship between attitudes and MIT acceptance.

**Hypothesis 7:**

H7₀ Administrative support (AS) is not a predictor of nursing faculty MIT acceptance (intent) in teaching practices in baccalaureate nursing classrooms.

H7ₐ Administrative support (AS) is a predictor of nursing faculty MIT acceptance (intent) in teaching practices in baccalaureate nursing classrooms.
Hypothesis 8:

H8₀ Computer experience is not a significant predictor of nursing faculty MIT acceptance (intent) in teaching practices in baccalaureate nursing classrooms.

H8₁ Computer experience is a significant predictor of nursing faculty MIT acceptance (intent) in teaching practices in baccalaureate nursing classrooms.

Hypothesis 9:

H9₀ There is no relationship between perceived usefulness and MIT acceptance.

H9₁ There is a significant relationship between perceived usefulness and MIT acceptance.

Technology Acceptance Model

In baccalaureate nursing education, the use of technology acceptance prediction models to study technology acceptance situations can be a useful tool for understanding and managing technology initiatives. Examples of such studies include Gao (2005) who stated that “technology acceptance models can serve the purpose of evaluating competing products such as e-textbooks and technology systems” and can provide a valuable tool to educators (p. 237). The technology acceptance literature documents a rich collection of models and theories that could be used to explain nursing faculty MIT acceptance and adoption in teaching practices in baccalaureate nursing classrooms (Ajzen, 1991; Davis, Bagozzi, & Warshaw, 1989; Fishbein & Ajzen, 1975; Rogers, 2003; Venkatesh, Morris, Davis, & Davis, 2003). With respect to individual (as opposed
to organizational) acceptance of technology, these models use acceptance (intent) or usage as a dependent variable. In this study, the Technology Acceptance Model (TAM) was selected as the theoretical framework because researchers (Davis, et al., 1989; Venkatesh & Davis, 2000; Lee, Kozar, & Larsen, 2003; Teo, Lee & Chai, 2008; Venkatesh & Bala, 2008) have found that the parsimony of the TAM combined with its predictive power make it easy to apply it to different technologies across different organizational settings and user populations. In Landry, Griffeth, and Hartman (2006), the TAM was used to examine students’ perception of usage, usefulness, and ease of use of web-enhanced instruction using Blackboard.

The TAM as shown in Figure 1 is based upon the Theory of Reasoned Action (TRA).According to TRA (Fishbein & Ajzen (1975), an individual’s intention to perform a behavior is a function of his/her attitude toward the act or behavior and social norms. An individual’s attitude predicts his/her intention and intention shapes the action behavior (actual use). Attitude toward technology (ATT) was defined as “nursing faculty’s positive or negative feeling about performing the target behavior, teaching with MIT in baccalaureate nursing classrooms” (Fishbein & Ajzen 1975, p. 216); and behavioral intention (BI) is defined as “the degree to which nursing faculty has formulated conscious plans to perform or not perform some specified future behavior [e.g., accepting MIT in teaching practices in baccalaureate nursing classrooms]” (Davis, 1989). According to Davis et al (1989), one’s actual use of a technology system is influenced directly or indirectly by the user’s behavioral intentions, attitude, perceived usefulness of the technology, and perceived ease of the MIT. Davis (1989) claimed, PU and ATT directly influence BI, commonly what is meant when one refers to acceptance.

The TAM is built from TRA and postulates that an individual’s acceptance of a technology can be captured by behavioral intention which can be explained by the individual’s
perception of the usefulness and ease of use of the technology. Perceived usefulness (PU) is described in this study as “degree to which nursing faculty believe that MIT would enhance his or her teaching performance to improve learner outcomes in baccalaureate nursing classroom settings” (Davis, 1989, p. 320); and perceived ease of use (PEOU), as “the degree to which nursing faculty expect the use of MIT in teaching practices to be free of effort or easy to use” (Davis, 1989, p. 320). Davis claimed PU was influenced by PEOU. For example, when nursing faculty found MIT, “easy to use,” then they perceive the technology as a “useful one.” In order for MIT acceptance in teaching practices to occur, nursing faculty must perceive that MIT planned for classroom integration is easy to use and useful.

**Defining acceptance**

Acceptance is an ambiguous term, capable of some richer, complex technical connotations. In technology acceptance research, acceptance is equated with assimilation, readiness, diffusion, adoption, implementation, intention to use, and actual usage (Dillon & Morris, 1996). This is evident in two significant bodies of research that include the term “acceptance,” TAM (Technology Acceptance Model) and UTAUT (Unified Theory of Acceptance and Use of Technology) being used for investigating technology adoption. Chismar and Wiley-Patton (2002) offer this definition of acceptance as “the intention to adopt an application.” Hernandez, Jimenez & Martin (2009) argue that adoption and acceptance are two different decisions for end users, in this case nursing faculty, but many researchers do not strictly distinguish between adoption and acceptance. In addition, literature has used the term, acceptance, as shorthand to refer to both acceptance and non-acceptance (i.e., rejection).

Based on the work of Davis (1989), acceptance has been construed as simply the relationships between antecedent factors and user beliefs (e.g., perceived usefulness and perceived ease of use) that predict user intention. Schwartz and Chin (2007) support this claim,
but added that acceptance research has implicitly followed this perception-intention-usage lens (P-I-U) to portray the phenomenon of acceptance, with perceptions covering appraisals of the technology, abilities of the user, and/or external factors (e.g. organizational support). As a result, models in this tradition have relied heavily upon the Theory of Reasoned Action (Fishbein & Ajzen, 1975) or the Theory of Planned Behavior (Ajzen, 1991) to justify the constructs. For this study, acceptance is synonymous with behavioral intention [BI], (Davis, Bagozzi & Warshaw, 1989).

Measuring acceptance

There has been some discussion regarding the most appropriate measure of technology acceptance (see Sun and Zhang, 2006). The TAM can predict both behavioral intention to use the technology (Intent) and also actual use after implementation (Use). These two indications of technology acceptance are conceptually different in that Intent is derived from attitudes, whereas Use is a measure of completed actions. For most applications, technology acceptance is conceptually most similar to behavioral intent; that is, we can infer acceptance of the technology if nursing faculty indicate that they intend to use it. Davis (1989) suggested users’ BI shaped AU of the technology. If users have intention to use a specific technology, then they use it. Because BI is thought to reliably predict actual use, and the latter (AU) is difficult to measure, BI is sometimes the only measured outcome of interest in a study of TAM (Chau & Hu, 2002). The alternative measure of future usage depends on a number of implementation and historic factors that may or may not be directly associated with characteristics of the technology itself. The construct, actual use was not tested in this study.

Significance of the Study

A study of nursing faculty acceptance of MIT in teaching practices in baccalaureate nursing program classroom settings is important for several reasons. First, the study could
improve institutional administrative policy and/or decision making. By examining the relationship between nursing faculty and MITs and how they perceive usage and usefulness, institutions can improve implementation of MIT campus-wide. In addition, this could affect financial aspects of MIT implementations that could fail by providing knowledge on what nursing faculty want in these technological tools for teaching practices. Many technologies fail due to a lack of understanding of how the actual technology could work among those nursing faculty who utilize it daily (Mitchell, Gagné, Beaudry, & Dyer, 2012). No technology is a perfect fit for every situation, but by understanding factors that could predict nursing faculty acceptance of MIT in teaching practices, implementation would focus on the need to produce a technology that benefits future productivity.

Secondly, the study helped to improve current teaching and learning practices through the lens of nursing faculty’s personal MIT usage. Significance comes not from institutions implementing MIT, but from those IT (e.g., Apple) and mobile application development companies (e.g., Skyscape), creating technology. Market forces alone do not drive new technologies. A keen understanding of human factors, how nursing faculty consume and personally use technology, benefits those technologies that might become the next advanced product or process. Institutions tend to follow market forces as opposed to driving them (Leadership Board for CIOs in Higher Education, 2013). By having knowledge of MIT beliefs of nursing faculty, individuals who create and support educational technology (Moser, 2007) have a better understanding of whom and with what they are dealing. This is a major shift, as many times technical personnel drive technology implementation in institutions. Opinions of nursing faculty come later in implementation, a critical factor when considering numerous disconnects between the two groups.
Third, findings from the study may contribute to changes in baccalaureate nursing curricula. The International Council of Nurses, Sigma Theta Tau International Honor Society of Nursing, and many National Nurses Associations, have called for the integration of IT into nursing curricula to prepare nursing students for the current practice environment which requires access to large amounts of information to provide evidence-based patient care (Raman, 2015). Nursing administration and nursing faculty involved in program changes and modifications to current curricula may use study findings as a guide in reducing human factors (i.e., negative attitude toward MIT) in acceptance of MIT in classroom settings and in aligning the technology with faculty needs (Gonen & Lev Ari, 2016).

Fourth, MIT has transformed how healthcare is delivered, the quality of the patients’ experiences, and the cost of healthcare. Adequately preparing nursing students for “life after nursing school” requires early student exposure to MIT. By utilizing MIT in baccalaureate nursing classroom settings, millennial nursing students develop enhanced skills in critical thinking and clinical decision-making that mirror real world workplace experiences (Yoost, 2011). Graduate nurses are expected to use not only electronic medical record systems but also MIT for decision support and for billing, documenting and archiving information. Wolters Kluwer Health Survey (Lippincott Williams & Wilkins, 2014) found nurses and healthcare organizations accepting professional use of online reference & mobile information technology. According to the survey findings, nurses are increasingly relying on mobile devices, social media and the Internet. The findings indicate that nurses increasingly rely on MIT and the Internet for work needs, with 65% using a device at work and 95% of healthcare organizations supporting electronic devices for clinical consulting and accessing information. These findings suggest that
current MIT trends drive the use of new technologies in health care (Swenty & Titzer, 2014) and that MIT integration into baccalaureate nursing education has a similar crucial role to play.

Lastly, many colleges and universities across the nation are experiencing rapid technological changes, continuous shifts in the learning environments, and a new generation of students exhibiting varied MIT skills. Nursing faculty have begun to address the integration of technology onto nursing curricula. Nursing faculty acceptance of MITs in classroom settings is integral to the MIT implementation process in baccalaureate nursing programs. This trend calls for a current understanding of nursing faculty MIT integration practices into classroom settings.

Not many researchers have studied the interacting effects of variables in nursing education contexts. It is critical for them to study factors that positively predict nursing faculty’s behavior toward MIT in teaching practices in baccalaureate nursing classroom settings. This study is designed to contribute to current research in that regard, as it attempts to fill this gap in the literature of technology acceptance and nursing education. It is hoped that findings and conclusions from this study will serve as useful input for administrators in higher education as they develop strategies, policies and faculty development activities aimed at encouraging nursing faculty to accept or implement MIT when teaching in baccalaureate nursing classroom settings.

Definition of Terms

For the purposes of the study, the predominant focus of these definitions relates to educational technology, since it was an important part of the study. Other definitions clarify variables related to TAM (Davis, 1989). In addition, the following terms revealed the definitions found in the literature and the revised definitions used in this study.

Acceptance. Behavioral intention (Davis et al., 1989). Within this study, acceptance is operationalized as nursing faculty “expressing the willingness or intent to use or adopt” the MIT
to help improve performance and learner outcomes in baccalaureate nursing classroom settings (Dillon & Morris, 1996).

**Adoption.** Adoption is “an act or process of giving official acceptance” (In *Merriam-Webster.com*).

**Administrative support.** Administrative support is defined in this study was defined as an individual’s perception of the degree to which an organization supports that individual. According to Igbaria & Iivari (1995), PU was directly affected by organizational support.

**American Association of Colleges of Nursing (ACCN) Commission on Collegiate Nursing Education (CCNE) Accredited Baccalaureate Nursing Programs.** These undergraduate nursing programs are those identified as CCNE-Accredited Baccalaureate Nursing Degree Programs on the AACN website on December 31, 2015.

**Attitude toward MIT.** Attitudes relate to nursing faculty’s positive or negative affective (manner, disposition, position) feelings about using MIT in baccalaureate nursing classroom settings as measured by responses on the instrument (Davis, 1989).

**Behavioral Intention.** Acceptance (Davis et al., 1989). Davis (1989) describes behavioral intention as the degree to which a person has formulated conscious plans to perform or not perform some specified future behavior. (p. 320).

**Classroom Setting.** Throughout this study, “traditional classroom” is defined as a learning space, a room in which classes are held; represented as a brick-and-mortar classroom environment. In the classroom setting, nursing faculty can easily control the feed of information and pace of learning [e.g., in traditional teaching practices, such as face-to-face lectures, textbook readings, group work, and classroom discussions]. (Lewis et al., 2013).
**Computer Experience.** Computer experience refers to the amount of computer use and the opportunities to use computers by nursing faculty over time (Ball & Levy, 2008, Smith, Caputi, Crittenden, Jayasuriva & Rawstorne, 1999).

**Digital Immigrant.** Nursing faculty classified as people born before the introduction of digital technology (Prensky, 2001).

**Digital Native.** Students who were born after 1980 into an era that features the Internet, computers, video games, MP3 digital music players, digital cameras (web and non-web), instant messaging and cell phones. These digital technologies are second nature to them; they rely on many of these technologies in their daily lives (Prensky, 2001).

**Educational Technology.** Educational technology is the study and ethical practice of facilitating learning and improving performance by creating, using and managing appropriate technological processes and resources (Kaware & Sain, 2015).

**End user.** In information technology, the term, “end user” distinguishes the person for whom the MIT hardware or software product is designed from the developers, installers, and servicers of the product. In this study, the end user is nursing faculty.

**Higher Education.** An educational institution in any state that provides an educational program for which the institution awards a bachelor’s degree or provides not less than a 2-year program that is acceptable for full credit toward such a degree, or awards a degree that is acceptable for admission to a graduate or professional degree program, subject to review and approval by the Secretary of Higher Education; is accredited by a nationally recognized accrediting agency or association (Higher Education, 2011).

**Innovation(s).** New technology.
**Institution Administrator.** Administrator in a college or university who makes executive decisions regarding things such as the purchase of IT equipment from suppliers or the creation of new systems. S/he are responsible for leading and directing the workforce of their specific organization includes chief information officer (CIO), chief digital information officer (CDIO) or information technology (IT) directors.

**Integration.** The process of blending technology into curricular disciplines (Wright & Wilson, 2012). As a general term, integration covers the stages of MIT acceptance into teaching practices by nursing faculty. This MIT integration may refer to the level, intensity, or frequency of technology adoption.

**Key Stakeholders.** In the For this study, key stakeholders are defined as university/collge administrators, instructional technologists, IT designers, national accreditations bodies, professional nursing organizations, the colleges of nursing, nursing students, prospective employers in practice and the patients who will receive care that impact nursing faculty’s behavioral responses toward MIT in teaching practices.

**Knowledge.** For the purposes of this study, the term knowledge refers to the nursing faculty’s “familiarity” with technology and/or MIT for personal or professional use (In Merriam-Webster.com).

**Mid-Atlantic States.** The Mid-Atlantic, also called Middle Atlantic States or the Mid-Atlantic states, form a region of the United States generally located between New England and the South Atlantic States. Its exact definition differs upon source (In "United States." (2009). Encyclopedia Britannica. Retrieved from http://academic.eb.com/unitedstates). The following three states (Delaware, Maryland, and Virginia) and the District of Columbia will be used in this study. The three states and the District are recognized by the Mid-Atlantic Region Commission
on Higher Education, doing business as the Middle States Commission on Higher Education (MSCHE), is recognized by the U.S. Secretary of Education to conduct accreditation and pre-accreditation (Candidacy status) activities for institutions of higher education.

**Mobile device.** Any mobile information technology with multiple functions and capabilities, especially the ability to access information via the Internet for use in classroom settings. Some of the current popular devices on the market include smartphones, tablets, e-readers, and netbooks (Ozdamli & Cavus, 2011).

**Mobile information technology.** For this study, MIT is defined as any portable (mobile) device that has computing ability (Zayim & Ozel, 2015).

**Perceived ease of use.** Perceived ease of use is defined as the degree to which nursing faculty expect the use of the MIT to be free of effort or easy to use as measured by responses on the instrument (Davis, 1986; 1989).

**Perceived usefulness.** Perceived usefulness is defined as the degree to which nursing faculty believe that the MIT would enhance their teaching performance to improve learner outcomes in baccalaureate nursing classroom settings as measured by responses on the instrument (Davis, 1986; 1989).

**Predictor.** The presumed “cause” on a non-experimental study. Often used in correlational studies. Alternative term for independent variable (Polit & Beck, 2012)

**Resistance.** In this study, resistance is defined as rejection of adoption of a system.

**Self-efficacy.** Self-efficacy, a determining factor in TAM, examines attitudes toward the ability to do a given task, in this case, to accept MIT into academic and clinical instruction (Legris, Ingham & Collerette, 2003). This belief is closely related to the original TAM construct of perceived ease of use described as the extent to which an individual believes that using the
system will be free of effort (Davis, 1989). Similarly, outcome expectations as identified by Bandura (1982) align with perceived usefulness construct developed by Davis (1989), where individuals tend to undertake behaviors they believe will help job performance. For the purposes of this study, self-efficacy refers to nursing faculty’s belief in the ability to integrate MIT into baccalaureate nursing classroom settings successfully as measured by responses on the instrument.

**Skill.** For the purpose of this study, the term “skill” refers to the nursing faculty’s ability to operate MIT for personal or professional use. (“Skill,” n.d.).

**System.** Technology (hardware, software) involved in the dissemination of information.

**Teaching Practices.** Nursing faculty teaching practices refers to lectures (presentations of content) and may be accompanied by some types of visual aid or handouts, and electronic courseware (e.g., Blackboard course management system) used in traditional classroom settings.

**Technology acceptance.** Technology acceptance is the degree to which a person perceives that using MIT can enhance job performance.

**Technology.** A channel of communication.

**Undergraduate nursing faculty.** For this study faculty are described as appointed and promoted by the governing body of a college or university (Bowden & Gonzales, 2012; Hamilton, 2007). A master’s or doctorally-prepared academic nurse educator who teaches full time or part time and has taught a clinical or didactic course to undergraduate nursing students in a CCNE accredited bachelor of science in nursing program over the past year

**User.** Nursing faculty.

**Willingness.** Readiness to accept (and use) MIT in teaching practices in the classroom.
Organization of the Study

This dissertation consists of five chapters. Chapter one includes an overview of the proposed study and the research question. The theoretical framework presented in chapter two is used as a guide in developing hypotheses and selecting testable variables appropriate to those hypotheses. Chapter three discusses the methods that were used to test the proposed model, and chapter four presents the results. Discussion and areas for future research follow in chapter five.

Chapter Summary

With the evolution and implementation of new technologies, acceptance and use of technology, by both individuals and organizations, remains an important area of study. The understanding of why individuals, or groups, choose to accept or reject a particular technology continues to be an important issue. Several models, embrace a broad range of technologies, exists to further the understanding of technology acceptance. The intent of this chapter is to provide an overview of the study, and identified the research topic of nursing faculty MIT acceptance in teaching practices in baccalaureate nursing classroom settings. This chapter also described the purpose of the study and its significance to baccalaureate nursing education and healthcare communities.
CHAPTER 2 LITERATURE REVIEW

Given the expectations of institution administrators, key stakeholders, students in higher education and the potential gap in digital expertise between students and nursing faculty, a greater understanding of predictors of nursing faculty mobile information technology (MIT) acceptance as teaching practice in baccalaureate nursing classroom settings to prepare nurses for practice is needed. This literature review provides an explanation for the results in other studies and in the theoretical prediction at the end of the study (Creswell, 2014). This literature review presents a background of the integration of MIT into the curriculum; a theoretical basis for technology adoption, as well as research into factors attributed to resistance by nursing faculty and barriers to the acceptance, adoption and integration of MIT into teaching practices in baccalaureate nursing education.

Criteria for Selecting Literature

To provide a foundation for the study, a review of current literature was conducted using Academic Search Premier, Education Resources Information Center (ERIC), Cumulative Index to Nursing and Allied Health Literature (CINAHL) Plus with Full Text, Science Direct, and MEDLINE online databases accessible from the University of Alabama Libraries system and Google Scholar. The searches consisted of multiple search terms, including acceptance, acceptance of MIT adoption, attitudes, determinants, information MIT, intention, TRA, TAM, UTAUT, TAM and higher education, TAM and MIT, and combinations of these terms. The researcher also explored databases using terms found from these articles to develop a comprehensive list of key terms. Additional key terms included baccalaureate nursing education, accreditation, educational technology, faculty, faculty development, higher/nursing education,
mobile device, administrative/organizational support, and combinations of these terms. All searches were limited to English language, peer-reviewed journal articles and texts with a publication date of 2010 or later. The researcher also excluded studies that did not use TAM as a theoretical framework but tested one or more relationships specified by TAM because those studies do not represent tests of the model.

In searches, key terms were not limited to title or abstract. To maintain relevance to the current study, only research pertaining to MIT acceptance in higher education has been included, except in the case of ground breaking articles or measurement instruments (e.g., Rogers, 2003; Davis, 1989; Davis et al., 1992; Venkatesh et al., 2003; Ajzen, 1991), and relevant “faculty or teacher resistance to MIT” research in higher education. In addition to articles retrieved through the searches described above, examination of the sources referenced in the retrieved articles led to additional sources of information including books and reports.

Mobile Information Technologies (MIT) in the Classroom

The growing use of MIT in nursing education suggests that the future of the classroom, including learning activities, research, and even student-faculty communications, will rely heavily on MIT. Su and Liu (2012) reported “mobile devices are increasingly being used to extend the human mind's limited capacity to recall and process large numbers of relevant variables to support information management, general administration, and clinical practice.” (p. 1139). In addition, Benham and Carvalho (2016) suggested that, with so many educational technologies to enhance student learning, faculty are generally free to adopt those technologies they believe to be useful. Researchers reported that studies of best practices for MIT use in the classroom are relatively scarce and in the beginning stages for nursing education (Baran, 2015; Cahill & Li, 2011; Ekanayake & Wishart, 2015; Garrett & Klein, 2008; Nguyen, Zierler,
Nguyen, 2011). MIT presents a number of new benefits and challenges compared to previous technology in education. The research in this section provides a historical perspective on MIT and demonstrates that the integration of MIT into the curriculum thus far has led to both successes and failures.

Multiple research studies (Herro, Kiger, & Owens, 2013; Jianjun & Yixin, 2010) were found on the use of MIT in the classroom in both K-12 and higher education. The research findings demonstrated that MIT is being used in the classroom but faculty struggle with how to implement MIT effectively as an active learning tool. Struggles reported by faculty include (a) lack of instruction on how to use the technology, (b) lack of faculty development related to the integration of the mobile information technology in the classroom, and (c) lack of learning opportunities to use the mobile information technology in the classroom (Herro et al., 2013; Kale & Goh, 2014). Multiple study authors and national organizations have called for the integration of MIT into nursing education (Baran, 2015; Cahill & Li, 2011; Ekanayake & Wishart, 2015; Garrett & Klein, 2008; Institute of Medicine, 2010; NLN, 2008; Nguyen et al., 2011).

Shippee and Keengwe (2014) reported that MIT in the classroom allowed for a new dimension of collaboration and connectivity for students but required educators to reevaluate existing instructional models. In an empirical study of mobile learning at a large university in Malaysia, Tan, Ooi, Sim and Phusavat (2012), reported that younger students felt they were able to navigate smartphones easily and had a more positive perception of the devices (p < .01). The researchers recommended developing coursework that works well with mobile devices and providing additional mobile services such as course registration.

Tacy, Northam, and Wieck (2016) conducted a survey of 1,017 online nursing faculty to test Davis’ Technology Acceptance Model using as variables, technostress, job satisfaction, and
intent to leave teaching. Results showed that technostress, perceived usefulness, perceived ease of use, attitude toward using, and behavioral intention to use technology explained 80% (R2) 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 nor 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.

Raman (2015) conducted a literature search on the use of MIT in nursing programs in Academic Search Complete, Cumulative Index of Nursing and Allied Health Literature (CINAHL), Medline with Full Text, and Medline Journals. Seventeen studies, published within the last five years in peer-reviewed journals, regarding the mobile information technology in nursing programs were identified. Results indicate that select nursing programs had implemented the use of mobile information technology in the clinical, classroom, and laboratory settings. Raman concluded that additional work needs to be done to overcome the concerns related to: cost, lack of IT support, lack of faculty acceptance and role-modeling, lack of structured assignments and/or activities designed to encourage the implementation of mobile devices, and constraints on use in clinical settings.

Cochrane and Bateman (2010) conducted a four-year study of smartphones used to support learning and found that a successful implementation consisted of an integration of the technology into course criteria and assessment, regular feedback from lecturers and students, choice of the correct mobile devices and supporting software, and support for technology and pedagogy.
Mobile technology devices, specifically cell phones, have been criticized for being a nuisance in the classroom. This criticism is rebuked by research findings conducted by Ardito, Buono, Costabile, Lanzilotti, & Piccino (2009). Students were provided with a learning game delivered in the traditional format and also delivered via mobile device. From research findings, there were no significant differences in test results and the authors concluded that delivery via mobile devices did not enhance student learning but most importantly, it did not distract student learning.

In a study conducted by Geist (2011), faculty had a negative view of browsing on an iPad® during lecture time and considered it a distraction. Students reported “being baffled” as to why instructors were upset with browsing during lecture time (p. 766).

In a case study at Indiana University-Purdue University Indianapolis, Miller (2012), described the results of an iPad® integration initiative. Three cohorts of faculty formed learning communities to investigate how iPads® might enhance teaching and learning. Cohort members came from a diverse variety of disciplines, including English, communications studies, music, engineering, organizational leadership and supervision, physical education, library studies, and tourism management. This iPad® study focused on student perceptions and engagement with iPad® integration in the class. Of the 209 respondents, students generally agreed that the iPad® improved learning and engagement. On the negative side, some students struggled to effectively use the technology and/or found the iPad® to be a distraction during class, posed technical issues. While this case study focused on students, the faculty cohort approach provided a good example of peer engagement and support for the development of faculty skills.

Del Barrio-Garcia, Arquero, & Romero-Frias (2015) analyzed results of a study in Malaysia, validating the usefulness of mobile wireless technology in collaborating, interacting,
and supporting students in real time. However, a majority of students in their study revealed an inherent level of skepticism associated with mobile wireless technology and disruptions that might arise including dependency, redundancy, and misuse in the classroom. No students in that study were currently using mobile wireless technology, proving that social factors in Malaysia strongly influenced student usage.

Stickel and Hum (2008) investigated the use of tablet-PCs by instructors as content delivery systems during lectures. The two investigators incorporated animated and complex graphics into PowerPoint presentations during lectures. Skeleton versions of PowerPoint were distributed to students prior to lectures for students to use as advanced organizers and to facilitate note taking. Of the 129 survey respondents, 63% said the use of tablet-PCs by the instructors enhanced the learning experience, and 65% liked having the skeleton outline as an organizer. Two findings to note; first, students (45%) preferred a mix of blackboard and PowerPoint use. Secondly, it takes significant effort to move a lecture to a multimedia platform. While this was a small study, it does present findings on integration of mobile technology from both sides of the lectern.

DiVall and Zgarrick (2014) explored the impact of iPads® on faculty productivity. Thirty-four pharmacy faculty were issued iPads® as part of a technology pilot program. The results of an anonymous survey indicated that while faculty used the devices to communicate with students and manage papers and projects, 86% and 68% respectively, only 43% of faculty actually used the devices in the classroom. Furthermore, while the overall perceptions of faculty remained positive after nine months, perceptions about the usefulness of the iPad®, especially in the classroom setting, declined.
Jairak, Praneetpolgrang, and Mekhabunchakji (2009) utilized a mixed-methods approach to examine the implementation of mobile technology in e-learning and the acceptance of e-learning among 390 students in higher education institutions. Student respondents reported that mobile technology was easy to learn, use, and understand as demonstrated by a mean value of effort expectancy of 3.51 (Jairak et al., 2009). Results showed that performance expectancy had a positive relationship on attitude towards using technology as demonstrated by $\beta = 0.398$, $p<0.001$. Effort expectancy and social factors each had a significant positive correlation with attitudes toward the use of e-learning as revealed by ($\beta = 0.219$, $p<0.001$) and ($\beta = 0.142$, $p<0.01$), respectively.

Yamakawa, Delgado, Diaz, Garayar, and Laguna (2013) used the Technology Acceptance Model (TAM) to understand undergraduates’ intention to use mobile technology. Survey results from 300 of the 2,000 undergraduates showed a strong association with perceived usefulness and perceived ease of use, two of the three major tenets of TAM. These results helped inform considerations for faculty undertaking a mobile technology integration project. In other words, students must find the technology useful and easy to use for faculty to seriously consider its integration.

Gan and Balakrishnan (2014), in an empirical analysis study identified that adopting aspects of wireless electronic technology increased interactivity between educators and students during lectures. The study focused on the quality of communications with students from an educator’s perspective in promoting interactivity. An acceptance model for wireless Internet via electronic devices was proposed to include technology difficulty, individual differences, and social influences. Ease of use, usefulness, and trust can affect implementation of wireless electronic technology in lectures as an interaction tool between students and lecturers. Perceived
ease of use, perceived usefulness and quality of services, along with cultural aspects strongly impacted the acceptance of electronic learning in Malaysia. The participants agreed (34%) that wireless electronic technology was a supportive tool for students and faculty to access learning materials and to assist with the interaction between faculty and students. Noted concerns were that electronic devices caused distractions during the teaching process and that learners would be dependent upon the wireless devices for learning. The majority of the participants felt that wireless electronic technology would bring about an increase of interactions by using electronic devices as interaction tools.

Rosenthal and Eliason (2015) reported on a study that introduced the use of iPad® to students training to become physical education teachers. In the study, faculty introduced iPad® into the curriculum to better prepare the students to become teachers who integrate mobile technology into their teaching position. The study found that the faculty adapted well to the technology and were able to model the use of mobile technology in the classroom for assessment and evaluation of teaching practices.

Spies, Kjos, Miesner, Chesnut, Fink, D’Antonio, & Russo-Alvarez (2010) acknowledged that the underlying issues in the misuse of technology surround maintaining professional behavior or losing focus in the classroom. However, faculty who participated in the study believed rather than banning potential distractions, educators should assist students in managing the technology. Classroom distractions have always been a problem in education, and the availability of technology has provided another means of distraction. Spies et al. realized the need to explore the intertwining of the academic environment with increasing technology. The Student Affairs Committee at Drake University, College of Pharmacy, underwent an internal exploration of faculty members’ and students’ beliefs, attitudes, and current practices regarding
the use of electronic devices in the classroom. The response rate for faculty members was 92% or 36 out of 39. The students’ response rate was 43% or 356 out of 831. The study results indicated that most faculty members teach students who currently use electronic devices during class, and of the faculty respondents, 74% have witnessed inappropriate or unprofessional conduct involving the use of electronic devices in the classroom (Spies et al., 2010).

**Technology Acceptance Theories and Models**

Extant research on technology acceptance attempts to explain human behavior in the context of accepting or resisting technology. “Technology” has multiple definitions, and types of technology can be differentiated along various dimensions. In the broadest sense, technology can be defined as “the practical application of knowledge… or a manner of accomplishing a task” (Merriam-Webster, 2016). Much of this research concentrates on the technological, social and psychological reasons for accepting new technology (Özbek, Alnıaçık, Koc, Akkılıç, & Kaş, 2014). Acceptance of technology is most often defined in terms of adoption, use, and sometimes purchase. However, how these terms are measured across studies varies tremendously. Research on acceptance of information technology and system models has so far focused primarily on organizational context and on adoption specifically for work. Antecedents were mainly constructed using electronic commerce (Kabugumila, Lushakuzi, & Mtui, 2016) and do not reflect the actual mobile environment (Ooi & Tan, 2016).

This section presents an overview of the most cited and influential theories and models in technology acceptance research. Theory is the aim of science in that it transcends the specifics of a time, place, and group of people and aims to identify regularities in the relationships among variables (Polit & Beck, 2012). According to Polit and Beck, theory is constructed in order to explain, understand and predict the relations of a number of observed variables (e.g. human
behavior, animal behavior and natural events). Baumgart (2005) argued that a good theory consists of the following characteristics, parsimony (simplicity), accuracy, and verifiability (data supported). The purpose of a theoretical framework is to organize the variables and relationships among the variables (Creswell, 2014). Drawing on prior work of social psychologists, technology acceptance research attempts to explain human behavior in the context of accepting or resisting new technology. As was customary for adapting such theory to new contexts (Ajzen & Fishbein, 1980), a preliminary study took place to determine what would be the appropriate variables to include to understand IT use behavior (Davis, 1986). The Variables that were selected and formed technology acceptance research are defined in Appendix A.

**Theory of Reasoned Action**

The Theory of Reasoned Action (TRA) proposed by Fishbein and Ajzen (1975) provides a model to measure behavioral intention (BI) (intention to perform a behavior) based on personal attitude and subjective norms (SN). Subjective norm is the measure of perceived expectations from social operatives and their possible positive or negative reactions to nursing faculty performing the behavior or not. Fishbein and Ajzen have provided a formula to calculate Behavioral Intention: \( BI = A + SN \). The Theory of Reasoned Action is the basis for several other technology adoptions and diffusions through the organization models.

![Figure 2: Theory of Reasoned Action](image)
Sheppard, Hartwick, and Warshaw (1988) meta-analytically analyzed 87 studies to test the predictive utility of the theory. They found a significant correlation between the theorized predictors (attitudes toward behavior and subjective norms) and behavioral intention ($r=0.66$, $p<.001$). Additionally, they found strong evidence for the relationship between behavioral intention and actual performance ($r=0.52$, $p<.01$).

The TRA was criticized for measuring behavioral intentions rather than actual behavior (Straub, Limayem & Krahanna-Evaristo, 1995). Sheppard et al (1988) also criticized the TRA and its measurement. The TRA can predict the performance of a voluntary act, providing there is no change to intent (Sheppard et al., 1988). Ajzen revised the TRA to include perceived behavioral control, which led to the Theory of Planned Behavior.

**Theory of Planned Behavior (TPB)**

Building on Fishbein and Ajzen’s work, Ajzen (1991) developed the theory of planned behavior (TPB), extending TRA by adding the construct of perceived behavioral control, defined as “the perceived ease or difficulty of performing the behavior” (Ajzen, 1991, p. 188). In TPB, perceived behavioral control was theorized to be an additional determinant of intention and behavior as illustrated in Figure 3. Ajzen (1991) presented a review of several studies that successfully used TPB to predict intention and behavior in a wide variety of settings. TPB has also been successfully applied to the understanding of individual acceptance and usage of many different technologies (Mathieson, 1991).
Figure 3: Theory of Planned Behavior

TPB postulates that attitude, subjective norms, and perceived behavioral control predict intention, and intention, along with perceived behavioral control, predicts actual behavior (Ajzen, 1991). In addition, the TPB further postulates that the development of attitude, subjective norm, and perceived behavioral control involves an interaction between underlying salient beliefs and the subjective value or relevance nursing faculty attribute to those beliefs. Perceived behavioral control reflects nursing faculty’s beliefs about how easy/difficult it will be to perform the behavior. The salient beliefs underlying the formation of this concept are control beliefs, which involve nursing faculty’s perceptions of resources versus barriers to engaging in the behavior. These beliefs are combined with the perceived power of each control factor to facilitate/impede the behavior to form the overall perceived behavioral control.

Armitage and Conner (2001) studied the efficacy of the Theory of Planned Behavior. The researchers looked at 185 independent studies, and found the theory helped account for the variance in behavior and intention. They also found the perceived behavioral control construct accounted for significant amounts of variance in intention and behavior, independent of Theory
of Reasoned Action variables (Armitage & Conner, 2001). The subjective norm construct was found to be a weak predictor of intention. This was partly attributed to poor measurement and the need for expansion of the normative component.

Schulze and Wittmann (2003) completed a meta-analysis of 27 studies that used either the Theory of Planned Behavior or the Theory of Reasoned Action. The researchers found that Theory of Reasoned Action showed strong overall relationships. Perceived Behavior Control (part of the Theory of Planned Behavior) was not found to be a strong predictor of intention in the 27 studies. It should be noted, however, that Schulze and Wittmann’s (2003) analysis was limited in scope due to the small sample size of the studies examined.

**The Diffusion of Innovation Theory (DOI)**

The Diffusion of Innovation Theory (Rogers, 1995) has been used to study a variety of innovations. Rogers identified five attributes of an innovation that influence adoption and acceptance behavior: relative advantage, complexity, compatibility, trialability, and observability. In the information systems field, Moore and Benbasat (1991) expanded this attributes set to study information technology acceptance. The set includes: 1) Relative Advantage: “the degree to which an innovation is perceived as being better than its precursor” (p. 195); 2) Ease of use: “the degree to which MIT is perceived as being difficult to use” (p. 195); 3) Image: “The degree to which use of MIT is perceived to enhance nursing faculty’s image or status in one's social system” (p. 195); 4) Visibility: The degree to which nursing faculty can see colleagues using the system in the organization; 5) Compatibility: “the degree to which MIT is perceived as being consistent with the existing values, needs, and past experiences of potential adopters” (p. 195); 6) Results Demonstrability: “the tangibility of the results of using MIT,
Innovativeness is one of the original model's constructs. Innovativeness is the main dependent variable, defined as the degree to which nursing faculty is relatively early to adopt compared to others. Scholars have categorized innovativeness into the following adopter categories: 1) Innovators (2.5%) – require the shortest adoption period. Venturesome, mobile and daring, and they have the financial means to absorb non-profitable innovations and adopt even with high degrees of uncertainty; 2) Early Adopters (13.5%) – Upward and socially mobile, they provide the greatest leadership. Respected by peers, they serve as role model in social systems; 3) Early Majority (34%) – Interact frequently with peers, they seldom hold positions of opinion leadership and deliberate before adopting new ideas; 4) Late Majority (34%) – Respond to peer pressure and adopt when it becomes an economic necessity, they are cautious; and 5) Laggards (16%) – No opinion leadership, they are isolated and their point of reference is the past. They are suspicious of innovation (Rogers, 2003). Rogers illustrates the adopter categorizations as shown in Figure 4.

(Rogers, 1995)

*Figure 4: Diffusion of Innovation*
Innovation diffusion research regards individuals’ perceptions about these characteristics of an information technology as important factors in influencing these individuals’ acceptance behavior (Agarwal and Prasad, 1999; Karahanna, Straub, & Chervany, 1999; Plouffe, Hulland, & Vandenbosch, 2001). Thus, DOI theory is most related to higher education and educational environments. According to Medlin (2001), Roger’s diffusion of innovations theory is the most appropriate for investigating the adoption of technology in higher education. For example, Oates (2001) used Rogers’ model to frame a qualitative study of faculty. The researcher’s results indicate professors who adopted new computer technologies shared characteristics of early adopters (Oates, 2001). Factors that influenced participants to adopt computer technology included a long history of computer use, personal interest, and university support. Oates (2001) found faculty participants who were self-motivated adopted computer technology using similar steps to those of the innovation decision-making process, similar to the innovation adoption process described by Rogers (2003). In addition, Waugh (2004) applied Rogers’ model to a study examining technology adoption in Nebraska universities. Waugh found the independent variables of discipline and age were statistically significant in predicting faculty technology adoption rates.
The Social Cognitive Theory (SCT)

The Theory of Planned Behavior (TPB), the Technology Acceptance Model (TAM), and the Innovation Diffusion Theory assume that there are only unidirectional causal relationships among the major variables in their models. In contrast, the Social Cognitive Theory (Bandura, 1982), shown in Figure 5, suggests that environmental factors, personal factors (in the form of cognitive factors, affective factors etc.), and behaviors are determined reciprocally. Nursing faculty’s cognitive competencies influence the behavior of using a technology, and the successful interactions with the technology also influence the cognitive perceptions (Compeau, Higgins & Huff, 1999).

(Bandura, 1986)

Figure 5: Social Cognitive Theory

The Social Cognitive Theory (SCT) gives prominence to the concept of self-efficacy (Compeau et al., 1999). Self-efficacy is defined as the judgment by nursing faculty of their own to use MIT to accomplish a particular job or task (Compeau and Higgins, 1995). Outcome expectations, including personal and performance-related ones, are major cognitive factors in
influencing nursing faculty’s behavior (Compeau and Higgins 1995). Personal-related outcome expectations are concerned with nursing faculty’s self-esteem and sense of accomplishment. Performance-related outcome expectations are concerned with job-related outcomes. SCT posits that self-efficacy influences both personal and performance-related outcome expectations (Compeau and Higgins 1995). Affect and anxiety are the two affective factors. Affect refers to nursing faculty’s liking for a particular behavior (e.g., MIT). Anxiety refers to nursing faculty’s anxious or negative emotional reaction in performing a behavior (e.g., using MIT in teaching practices in the classroom).

The Motivation Model

Davis, Bagozzi, & Warshaw (1992) applied the motivational theory to study information technology adoption and use. The Motivation Model suggests that nursing faculty’s behavior is based on extrinsic and intrinsic motivations. Extrinsic motivation is defined as the perception that nursing faculty want to perform an activity “because it is perceived to be instrumental in achieving valued outcomes that are distinct from the activity itself, such as improved job performance, pay, or promotions” (Davis et al., 1992, p. 1112). Perceived usefulness, perceived ease of use, and subjective norms are examples of extrinsic motivation. Intrinsic motivation relates to perceptions of pleasure and satisfaction from performing the behavior (Vallerand, 1997). Nursing faculty want to perform an activity “for no apparent reinforcement other than the process of performing the activity per se” (Davis et al., 1992, p. 1112). Computer playfulness and enjoyment are examples of intrinsic motivation (Davis et al., 1992; Venkatesh, 2000).

The Unified Theory of Acceptance and Use of Technology (UTAUT)

Venkatesh et al. (2003) incorporated constructs from the above eight theories and models to formulate a new model called the Unified Theory of Acceptance and Use of Technology
(UTAUT) shown below in Figure 6. UTAUT suggests that three constructs are the main determinants of intention to use an information technology. The three constructs are performance expectancy, effort expectancy, and social influence. All of them are comprised of the most influential constructs of the eight models or theories discussed above. These three constructs are defined as follows:

- **Performance expectancy** is defined as “the degree to which nursing faculty expects that using MIT will help him or her attain gains in job performance” (p. 447). This new construct has five root constructs: perceived usefulness (from TAM/TAM2, Combined TAM and TPB), extrinsic motivation (from the Motivational Model), relative advantage (from the Innovation Diffusion Theory), and outcome expectations (from the Social Cognitive Theory);

- **Effort expectancy**: “the degree of ease associated with the use of MIT” (p. 450);

- **Social influence**: “the degree to which nursing faculty perceives that important others (e.g., administrators) believe that he or she should use MIT in teaching practices” (p. 451).

Venkatesh et al. (2003) also found that the influence of facilitating conditions on usage was moderated by age and experience of the individual, nursing faculty members. They defined facilitating conditions as “the degree to which nursing faculty believes that an organizational and technical infrastructure exists to support use of the technology” (p. 453). As a survey instrument incorporating the most influential constructs from the eight technology acceptance theories and models, UTAUT shares other technology acceptance models’ major assumptions. A study by Anderson, Schwager, & Kerns (2006) to evaluate business faculty acceptance of tablet personal computer using the UTAUT suggested that performance expectancy and voluntariness are the most salient drivers of acceptance for business faculty.
Ball and Levy (2008) utilized the UTAUT model to investigate information systems (IS) faculty’s’ acceptance of web-based instructional tools and non-information systems faculty’s acceptance of the web-based tools as quickly. Ball and Levy (2008) surveyed 56 IS and non-IS classes at a small private university using the UTAUT model for an empirical investigation. The constructs in the study consisted of Computer Self Efficacy (CSE), Computer Anxiety (CA), and Experience with the Use of Technology (EUT). Analysis of the results demonstrated CA and EUT were not significant predictors of intention to use technology. Conversely, CSE had the greatest influence on intention to use the technology. The limitations of the study included the minimal use of constructs to predict acceptance.
Technology Acceptance Model and Its Extensions

Based on the Theory of Reasoned Action, Davis (1989) developed the Technology Acceptance Model to find out what factors caused people to accept or reject an information technology in the workplace environment. He suggested that perceived usefulness and perceived ease of use are the two most important individual beliefs about using an information technology.

Perceived usefulness is defined as “the degree to which nursing faculty believes that using MIT would enhance his or her job performance” (p.320). The definition of perceived usefulness is based on the Fishbein and Ajzen’s Theory of Reasoned Action. Perceived ease of use is defined as “the degree to which nursing faculty believes that using MIT would be free of effort” (p.320). These two behavioral beliefs, perceived usefulness and perceived ease of use, then lead to nursing faculty behavior intention (acceptance) and actual behavior as shown in Figure 1 (chapter 1). Davis found that perceived usefulness was the strongest predictor of an individual’s intention to use an information technology.

TAM fulfills the theoretical characteristics of simplicity (parsimony) and data support (verifiability) and also could be applied to predict acceptance (and usage) of innovation in various fields (generalizability). Researchers have widely used the TAM to study the adoption of various technologies with a variety of populations, and TAM has arguably become the most influential theory in the IS field. Over the past two decades, the model has effectively predicted or explained the acceptance of workplace technologies but it sometimes did not predict acceptance as well for special populations (i.e., physicians) or very specialized technology. For example, Hu, Chau, Liu Sheng, and Tam (1999) used the TAM to study the acceptance of telemedicine technology by physicians. They found moderate fit of the model overall, but the influence of perceived ease of use on intent was not significant. It is thought that ease of use
considerations can be overridden when necessary; presumably in this case the physicians were willing to use a technology that was not easy to use because they found it to be beneficial to their patients.

Kowitlawakul (2008) examined the predictors that influenced the probability of the nurses’ acceptance of telemedicine technology (eICU®) in a healthcare setting. She examined the variables of perceived usefulness, perceived ease of use, attitude, behavioral intent, and external variables. Perceived usefulness was found to be a significant predictor that influenced the probability of the nurses’ acceptance of telemedicine technology (Kowitlawakul, 2008). Perceived ease of use was found to be more of a significant predictor of attitude than perceived usefulness for influencing the probability of the nurses’ acceptance of telemedicine technology. Fifty-eight percent of the variance was explained by the study’s model, based on the Technology Acceptance Model variables (Kowitlawakul, 2008).

Researchers have also extended TAM (Wixom & Todd, 2005). For instance, some researchers introduced many other factors to the model, such as subjective norm, perceived behavioral control, and self-efficacy (Hartwick & Barki, 1994; Mathieson, 1991; Taylor & Todd, 1995). Other researchers introduced additional belief factors from the diffusion of innovation literature, such as trialability, visibility, or result demonstrability (Agarwal & Prasad, 1999; Karahanna et al., 1999; Plouffe et al., 2001). Some researchers introduced external variables or moderating factors to the two major belief constructs (perceived usefulness and perceived ease of use), such as personality traits and demographic characteristics (Gefen & Straub, 1997; Venkatesh, 2000; Venkatesh & Morris, 2000). Figure 7 shows the various TAM extensions.
Figure 7: Extensions of TAM

The research can clearly identify the core positions of the two belief constructs: perceived usefulness and perceived ease of use. Therefore, the researcher can say that the structure and main assumptions of these models remain the same as those of the TAM.

Gibson, Harris, & Colaric, 2008 conducted a study with university faculty and found that ease of use and perceived usefulness variables were predictive of the intent to teach online classes, but most of the variance was accounted for by perceived usefulness. In addition, Kim (2008) used SEM to examine factors affecting faculty acceptance of online education using an extended version of the TAM. Ease of use, perceived usefulness, online teaching experience, facilitating conditions (i.e., faculty support and training), competence, and intent to teach online courses were analyzed. Ease of use and perceived usefulness accounted for 80% of the variance in intent to teach online courses. Facilitating conditions and prior online teaching experience accounted for 34% of the variance in ease of use, whereas, online teaching experience and competence accounted for 20% of the variance in perceived usefulness (Kim, 2008). Together,
these findings demonstrate that an extended version of the TAM may help predict faculty intent to teach online.

**Studies of the Technology Acceptance Model**

A number of meta-analyses have demonstrated that the TAM is a valid, robust, and powerful model. In addition, Table 1 lists the number of TAM citations. Davis (1993) alone had over 700 citations to date.

Holden and Karsh (2010) performed an analysis of 16 data sets in over 20 TAM studies of clinicians using information technology in health care. They discovered that certain TAM relationships were consistently found to be significant. In 16 of 16 studies, test results confirmed a significant relationship between the perceived usefulness and behavioral intention to adopt an information technology (Holden & Karsh, 2010). In 10 of 12 studies, tests of the influence of perceived ease of use on perceived usefulness were significant. The relationship between perceived ease of use and behavioral intention tested as significant in only seven of 13 studies.

Lederer, Maupin, Sena, and Zhuang (2000) have recorded more than 15 published studies that show the existing relationships among perceived ease of use, perceived usefulness, attitude toward use, and usage of information technologies from 1989 to 1999, a period of 10 years. The results of these studies support the use of the TAM as a predictive or explanatory model of the usage of different technologies. King and He (2006) identified 88 studies published on the TAM. The results of this meta-analysis confirmed that the model can be used in a wide variety of contexts and that perceived usefulness brings about the impact of perceived ease of use on the intent to use.

In a critical review of the TAM, Legris, et al., (2003) reviewed 22 studies in which researchers tested the model for its integrity with a well-defined methodology as well as
complete and available results. Their conclusions followed the same direction as those of King and He (2006); that is, the TAM is a theoretical model used in different contexts to help understand and explain the use of information technologies. The range of studies included the use of technologies such as word processing and telemedicine software, electronic mail, the Internet, personal computers, and university resource centers. The value and power of the TAM lies in its ease of use and its cost-effectiveness (Morris & Dillon, 1997). The TAM has been cited as the “most widely applied theoretical model in the information systems field” (Lee, Kozar, & Larsen, 2003, p. 752), with over 700 studies citing Davis et al., 1989 (Bagozzi, 2007).

Table 1: TAM Articles Ranked by Citation Count

<table>
<thead>
<tr>
<th>Authors</th>
<th>Title</th>
<th>Year</th>
<th>Source</th>
<th>Cites</th>
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<tbody>
<tr>
<td>Venkatesh V., Morris M.G., Davis G.B., Davis F.D.</td>
<td>User acceptance of information technology: Toward a unified view</td>
<td>2003</td>
<td>MIS Quarterly: Management Information Systems</td>
<td>5666</td>
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<tr>
<td>Venkatesh V., Davis F.D.</td>
<td>Theoretical extension of the Technology Acceptance Model: Four longitudinal field studies</td>
<td>2000</td>
<td>Management Science</td>
<td>3860</td>
</tr>
<tr>
<td>Taylor S., Todd P.A.</td>
<td>Understanding information technology usage: A test of competing models</td>
<td>1995</td>
<td>Information Systems Research</td>
<td>2397</td>
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<tr>
<td>Venkatesh V.</td>
<td>Determinants of Perceived Ease of Use: Integrating Control, Intrinsic Motivation, and Emotion into the Technology Acceptance Model</td>
<td>2000</td>
<td>Information Systems Research</td>
<td>1559</td>
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<td>Bhattacherjee A.</td>
<td>Understanding information systems continuance: An expectation-confirmation model</td>
<td>2001</td>
<td>MIS Quarterly: Management Information Systems</td>
<td>1425</td>
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<td>Mathieson K.</td>
<td>Predicting user intentions: Comparing the technology acceptance model with the theory of planned behavior</td>
<td>1991</td>
<td>Information Systems Research</td>
<td>1353</td>
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<td>Venkatesh V., Morris M.G.</td>
<td>Why don't men ever stop to ask for directions? Gender, social influence, and their role in</td>
<td>2000</td>
<td>MIS Quarterly: Management Information Systems</td>
<td>1281</td>
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<tr>
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<td>2001</td>
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<td>1993</td>
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<td>Why do people use information technology? A critical review of the technology acceptance model</td>
<td>2003</td>
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<td>1032</td>
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<td>1996</td>
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<td>2004</td>
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<td>Assessing IT usage: The role of prior experience</td>
<td>1995</td>
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<td>A Conceptual and Operational Definition of Personal Innovativeness in the Domain of Information Technology</td>
<td>1998</td>
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<td>760</td>
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<td>Agarwal R., Prasad J.</td>
<td>Are individual differences germane to the acceptance of new information technologies?</td>
<td>1999</td>
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</tr>
<tr>
<td>Wixom B.H., Todd P.A.</td>
<td>A theoretical integration of user satisfaction and technology acceptance</td>
<td>2005</td>
<td>Information Systems Research</td>
<td>723</td>
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</tbody>
</table>
Limitations of the TAM

The TAM has been widely used in reviews and research to explain technology acceptance (Legris, Ingham, & Collerette, 2003). TAM explains how an individual accepts new technology. Also, TAM has been used in multiple studies, suggesting that TAM is popular (Chuttur, 2009; Lin, Fofanah, & Liang, 2011). TAM has been known to have limitations. The first limitation is that the model relies on an individual’s self-reported use of technology rather than using relying on real life data (Yousafzai, Foxall, & Pallister, 2007). Self-reported use of technology can be unreliable in determining the actual use of technology. The second limitation is that an individual’s attitude can have an effect on the acceptance of technology (Smith & Nosek, 2011). The attitude of an individual can determine whether the individual actually uses the technology. The third limitation is that an individual’s intention does not always represent the individual’s actual use of technology (Elango, Paul, Kundu, & Paudel, 2010). The fourth limitation is that there is a lack of real-world data of technology acceptance by individuals in organizations. Students were used in most of the studies on technology acceptance (Chau & Hu, 2002). The fifth limitation is that most of the studies were on office productivity applications, and not on business class applications (Brown, Dennis, & Venkatesh, 2010). The last limitation is that a lack of consideration of the effect of organizational dynamics, as well as the factors that influence individuals in organizations, limits the validity of the TAM (Legris et al., 2003). The rigor used, as well as the relevance, have been the subject of some criticism of the TAM (Chuttur, 2009; Recker & Rosemann, 2010).
Additionally, the lack of using any social issues within the model has been an issue (Venkatesh & Morris, 2000). Research has shown that while TAM is useful, there is still a need to expand the model to include social factors (Venkatesh, Morris et al., 2003). In the technology acceptance model, the dependent factor is the intended use of technology, and the two independent constructs are perceived usefulness and perceived ease of use (Davis, 1989). In order to study an individual’s behavior, the TAM uses the two independent constructs. The idea of an individual making rational and independent decisions is present in the TAM. This has been reported in multiple studies (Im, Hong, & Kang, 2011; Oliveira & Martins, 2011). The TAM is suitable for studying an individual’s adoption of mobile computing due to the flexibility and multiple uses of technology adoption. In multiple studies pertaining to the adoption of technology, there are citations showing the use of TAM (Legris et al., 2003). The reliability and validity of the TAM model has been demonstrated by detailed meta-analysis (King and He, 2006). Based on previous research, the usefulness of this model and its applicability to multiple domains have been confirmed (Legris et al., 2003); most recently in nursing education.

**Literature Related to the Study**

**Technology mandates in baccalaureate nursing education**

Besides federal mandates (American Recovery and Reinvestment Act, 2009), collaborative efforts of leading health care authorities (e.g., Institute of Medicine [IOM], the American Hospital Association (2009), the Robert Wood Johnson Foundation [Kimball & O’Neill, 2002], and the Joint Commissions [2016]), nursing organizations and key stakeholders influenced the national information technology agenda, 2007 *Technology Informatics Guiding Education Reform Initiative* [TIGER] to support safer higher-quality health care as envisioned by the 1997 IOM report, *The Computer-Based Patient Record: An Essential Technology for Health Care*. Within the IOM report were recommendations that called for professional schools,
programs, societies, and organizations to support educational programs that would prepare students to use of computer-based systems of care (IOM, 1997). The TIGER Initiative was launched to ensure that all practicing nurses and nursing students are fully engaged in the unfolding digital era of healthcare (Du Long, 2008). TIGER Education and Faculty Development Collaborative recommended that accrediting agencies such as the AACN and the National League for Nursing (NLN) formally require informatics competencies as part of their accreditation standards (Du Long, 2008).

**Nursing organizations**

Nursing has been identified as having the potential for making the largest impact on a transformation of health care delivery to a safer, higher quality and more cost-effective system (Nelson, Batalden & Godfrey, 2007). As the lead nursing organization, the American Nurses Association (2014) aligned with the core competencies set forth by IOM report, *The Future of Nursing: Leading Change, Advancing Health* (2010) to support nursing transformation of healthcare using information technology (IT) particularly regarding the role of nursing informatics. Operationalized in baccalaureate nursing programs, the *Essentials of Baccalaureate Education for Professional Nursing Practice* (AACN, 2008) provides guidelines to prepare graduates to use technology to promote effective communication in diverse health care settings. Long at the forefront and concurrently with TIGER's efforts, in May 2008, the NLN released a critical position statement “in support of reform of nursing education to promote quality education that prepares a workforce capable of practicing in a healthcare environment where technology continues to increase in amount and sophistication” (NLN, 2008, p. 2).

As a major contributor to the agenda, The Joint Commission, a United States-based nonprofit tax-exempt 501(c) organization that accredits more than 20,000 health care organizations and programs in the United States, reports that the primary root cause of more than
70 percent of treatment delays and sentinel events is a breakdown in communications (Malkary, 2014). In the *Point of Care Communications for Nursing 2014* study, at point of care, nurses agreed that mobile devices support and enhance communication and collaboration, streamline nursing productivity, improve patient care quality and safety, and increase nursing satisfaction (Malkary, 2014). In support of the TIGER initiative, Quality and Safety Education for Nurses [QSEN] project, funded by the Robert Wood Johnson Foundation since 2006, has reinforced informatics care through established competencies essential for safe patient care (Cronenwett, Sherwood, Barnsteiner, Disch, Johnson, & Mitchell, 2007).

Most recently in *A Vision for Changing Faculty Role: Preparing Students for the Technological World of Health Care* position statement (NLN, 2015), the NLN suggests “nursing curricula and teaching strategies need to teach with and about technology to better inform health care interventions that improve health care outcomes and prepare the nursing workforce” (p. 4). For effective technology implementation in nursing programs, stakeholders must comprehend the attributes of effective implementation of new technologies in the higher education environment including faculty members’ levels of readiness for implementation as well as their fears, preferences, teaching styles, and passions (Marzilli, Delello, Marmion, McWhorter, & Roberts, 2014).

**Essentials of Baccalaureate Education**

Health care delivery has changed dramatically since the *Essentials of Baccalaureate Education for Professional Nursing Practice*, provided a framework for achieving specific outcomes of nursing graduates and for emphasizing patient-centered care, interprofessional teamwork, evidence-based practice, quality improvement, patient safety, informatics, clinical reasoning/critical thinking, genetics and genomics, cultural sensitivity,
professionalism, and practice across the lifespan (American Associations of College of Nursing [AACN], 2008)

The Essentials were developed in response to calls for reform (Benner, 2015) in preparing baccalaureate nurses for the continually changing health care environment. The Essentials guide nursing faculty to develop learning experiences needed to prepare pre-licensure nursing students with adequate informatics and technology competencies to meet demands of the technology-driven healthcare industry. A growing challenge to full incorporation of AACN Essential 4 (Information Management and Application of Patient Center Technology) in the clinical setting is not enough orientation time or face-to-face clinical time for nursing students to fully master both informatics skills and MIT used at the bedside (Kaddoura, Williams, & Jabaley, 2012). With the rapid growth in the use of mobile and Internet technology for pedagogical purposes in higher education and in healthcare, nursing education should serve as a platform for continued lifelong learning and should include opportunities for seamless transition to the surge in MIT technology. According to Park, Lee and Cheong (2008), every nurse - student, faculty member, researcher or practitioner - must help create education and work environments that support the acceptance of the latest technologies.

Impact on Nursing Practice

According to Huston (2013), leadership skills required of nurses to appropriately respond to emerging technologies now include being able to use technology to facilitate mobility, communication and relationships; having expertise in knowledge information, acquisition, and distribution. The 2010 IOM report, The Future of Nursing, suggested that nurses would be called up to fill expanding roles and to master technological tools and information systems while collaborating and coordinating care across teams of health care professionals. MIT use in nursing
practice is not an emerging technology. Much of what is evidence-based for practice has roots in the introduction of personal device assistant (PDAs) palmtops. During the mid-1990’s, Palm Pilot PDA received much acclaim from physicians and medical students for medical student education and physician training, daily clinical practice, and research (Baumgart, 2005). Although PDAs have been around for over a decade, the introduction of mobile technologies, the iPad®, iPhone®, and other smartphones and tablets, changed the type of information that could be easily accessed on mobile devices. These changes have been accompanied by an increase in published research (Boruff & Storie, 2014; Burnette, 2011; Ozdalga, Ozdalga & Ahuja, 2012), both in the medical literature and the library literature on the use of mobile devices in medicine.

Earlier published studies in nursing (Farrell & Rose, 2008; Fisher & Koren, 2007; George & Davidson, 2005; Stroud, Erkel, & Smith, 2005; White, Allen, Goodwin, Breckinridge, Dowell, & Garvy, 2005) demonstrated how using PDAs effectively promoted patient safety through an informatics-based approach to nursing education for the use of documentation during clinical encounters, including retrieving patient safety-related information at the point-of-care, and developing procedural skills. More recently, mobile information technology in nursing programs has been implemented in the clinical setting (Beard, Greenfeld, Morote & Walter, 2011; Chioh, Yan, Tang, Mustaffa, Koh, Sim, & Chan, 2013; Cibulka & Crane-Wider, 2011; George, Davidson, Serapiglia, Barla, & Thotakura, 2010; Secco et al., 2013; Strandell-Laine, Stolt, Leino-Kilpi, & Saarikoski, 2015; Swan et al., 2013, in the classroom setting (Beard et al., 2011; Chioh et al., 2013; Cibulka and Crane-Wider, 2011; George et al., 2010; Martyn, Terwijn, Kek, & Huijser, 2014; and Swan et al., 2013), and in the laboratory/simulation setting (Schlairet, 2012; Swan et al., 2013).
Many studies provided information on the use of MIT in the classroom and clinical setting. Use of the devices was centered in the BSN programs, and the devices were only used for reference material, not as active learning tools in the classroom (Bourouis, Zerdazi, Feham, & Bouchachia, 2013; Cibulka & Crane-Wider, 2011; George et al., 2010).

Faculty development needs for the inclusion of MIT in the classroom were also echoed in the research related to nursing education (Doyle et al., 2014). More recently, Raman (2015) conducted a literature search on the use of mobile information technology in nursing programs in Academic Search Complete, CINAHL, Medline with Full Text, and Medline Journals. Seventeen studies, published within the last five years in peer-reviewed journals, regarding the mobile information technology in nursing programs were identified. Results indicated select nursing programs have implemented the use of mobile information technology in the clinical, classroom, and laboratory settings. Raman concluded that additional work needed to be done to overcome the concerns related to: cost, lack of IT support, lack of faculty acceptance and role-modeling, lack of structured assignments and/or activities designed to encourage the implementation of mobile devices; and constraints on use in clinical settings.

**Nursing Faculty as Digital Natives**

Demographic data need to be explored to determine whether or not demographics impact nursing faculty acceptance of MIT in teaching practices in classroom settings. Research suggests that adults over age 50 have a variety of characteristics and capabilities in regards to MIT. Some have been digital immigrants and not digital natives who grew up among different technological devices (Prensky, 2001). The National League of Nursing (NLN) Faculty Census Survey of Schools of Nursing Academic Year 2014–2015 reported 70% of full-time nursing faculty were over the age of 45, with 50%, ages 46-60 and 20% over the age of 60. The percentage of full-
time faculty under 30 was 1.6%, with 28%, 30 to 45. Age had received less attention in prior studies. Age was often identified as having a potential impact on nursing faculty’s willingness to accept new educational technologies like MIT, but research results identifying the link between the influences of age and technology adoption have been mixed. Older adults were historically identified in the literature as more fearful of having lower levels of technology skills than those being taught. Further, as early as 2006, Hawkins and Oblinger reported that students used digital media almost as if it were the first language in communicating with each other.

In general, age has been identified as an influencing factor (Billings & Kowalski, 2004; Friedman, Bolick, Berson, & Porfeli, 2009). For example, Morris and Venkatesh (2000) conducted a study of age differences in technology adoption decisions during a 5-month period among 118 customer account representatives being introduced to a new technology. Results indicated compared to older workers, younger workers' technology usage decisions were more strongly influenced by attitude toward using the technology. In addition, “increased age has been shown to be associated with difficulty in processing complex stimuli and allocating attention to information on the job” (Venkatesh et al., 2003, p. 450), implying that PEOU is a stronger determinant of BI for old users.

Sun and Zhang (2006) found similar results and suggested older workers were more strongly influenced by social influence. In contrast, other studies showed no significant difference in the adoption of new technologies by age grouping (Guo, Dobson, & Petrina, 2008; Hendrickson, 2007). Kenny et al., (2012) reported that the use of mobile devices is likely dependent on the confidence of users, regardless of age. Furthermore, Martyn et al. (2014) reported a disadvantage experienced by older adults who found the screen size of some MITs devices to be too small and difficult to see.
Gender Considerations

Gender has also been found to play a role in the organizational environment (Mikkelsen, Ogaard, Lindoe, & Olsen, 2002; Morris, Venkatesh, & Ackerman, 2005). Gefen & Straub (1997) reported that men and women differ in their perceptions of the technology they studied, which was email. Morris and Venkatesh (2000) demonstrated that compared to women, men’s technology usage decisions were more strongly influenced by their perceptions of usefulness. In contrast, women were more strongly influenced by perceptions of ease of use. Gattiker, Gutek, and Berger (1988) reported that males and females differed in how they use computers. Morris, Venkatesh, and Ackerman (2005) reported that gender differences in technology perceptions became more pronounced among older workers, but a unisex pattern of results emerged among younger workers. The results from this study suggest that old stereotypes portraying “technology” as a male-oriented domain may be disappearing, particularly among younger workers.

Employee education was also shown to have a positive influence on the acceptance of technologies (Agarwal & Prasad 1999; Chao & Kozlowski, 1986; Mikkelsen, Ogaard, Lindoe, & Olsen, 2002). However, while among consumer users the effect of education seems to be driven by the effect of differences in cognitive abilities on acceptance, in the workplace, the effect of education also may be driven by job security concerns (Chao & Kozlowski, 1986).

Another organization-related demographic of employees that may influence the acceptance of technologies concerns tenure in the work force. However, Agarwal and Prasad (1999) reported no significant impact of tenure in the work force. What did influence acceptance of technologies were the employees’ positions within an organization. For instance, Gruenfeld and Foltman (1967) showed that supervisors who were more integrated into the management
group and had a high level of job satisfaction, were more likely to accept new technologies in their organization. Manross and Rice (1986) and for instance Baldridge and Burnham (1975) reported that the acceptance and usage of technologies also differed by organizational roles–such as management, technical staff, and administrative personnel.

**Prior Computer Experience**

In this study, the hypothesized model hypothesized the same relationships as the TAM, and added an experiential component. Experience refers to the amount of exposure the user has had to a given technology. Experience is an important concept in the study of technology acceptance because, in general, people rely on the knowledge gained through their past experiences to form their behavioral intentions for the future (Smith, et al., 1999). Users who were exposed to technology that was similar to systems that they had used in the past would assimilate new information more easily because it was associated with previously-acquired knowledge (Ajzen and Fishbein, 1980). Many of the studies in Table 1 that used the TAM were conducted in organizational settings with controlled rollouts of new technology initiatives. One of the advantages of studies that use new systems is that it is reasonable to assume that all of the participants have had the same (lack of) prior experience with the technology. Venkatesh and Davis (2000) have shown that even over a wide variety of jobs (retail electronics store employees, real estate professionals, and financial accounting clerks) the factors that affect technology acceptance vary as a function of experience with the system. Specifically, they found that more variance in perceived ease of use was explained at higher degrees of experience (60%) than at lower experience levels (40%). Venkatesh’s study suggests that the nature of the relationship between user and technology varies as a function of experience with that technology. His findings suggest that user characteristics (as opposed to characteristics of the technology)
become increasingly important as user experience grew. Szajna (1996) conducted a longitudinal study of 91 email users and found support for the technology acceptance model but cautioned that there is an “experience component” that is not accounted for by the model. The researcher found that perceived ease of use was partly a function of experience, and ease of use was not predictive of intention when experience was high. Igbaria, Zinatelli, Cragg, and Cavaye (1997) found that experience and training were both positively related to perceptions of ease of use and usefulness, and user expertise was a significant determinant of technology use.

**Administrative Support**

Administrative support has been previous defined as the individual’s perception of the degree to which an organization supports that individual in the exchange of emotional and instrumental resources, as well as information by institution administrators (Caplan, Cobb, French, Harrison, & Pinneau, 1975). A key factor for the effective integration of MIT into nursing curricula has been support from the organization (Griffin-Sobel, Acee, Sharoff, Cobus-Kuo, Woodstock-Wallace, and Dornbaum, 2010; Huffstutler, Wyatt, & Wright, 2002; Melnyk and Davidson, 2009). Lack of administrative support has been noted as a factor in projects that fail (Rogers, 2003). When funding and release time have been available for team members’ projects have been more likely to achieve the implementation goals (George et al., 2010; Griffin-Sobel et al., 2010; Huffstutler et al., 2002). Many projects have failed due to insufficient funds and/or human resources including technological support (Carlton, Dillard, Campbell, & Baker, 2007). For instance, Hanberg, Leners, and Roehrs (2007) reported that faculty perceived that the lack of administrative “buy-in” affected the diffusion of high-fidelity simulation throughout the curriculum. “Buy-in” in this study included financial support, encouragement of faculty utilization, and active participation. The faculty also thought that support of faculty could have
been demonstrated in recognition of their successful projects. Faculty training on the use and pedagogical application of educational technology and the skills needed to use it were reported as additional issues affecting faculty members’ willingness to adopt (Tapp, Kumar, & Hansen, 2006). Hixon and Buckenmeyer (2009) stated that the effective use of technology goes beyond learning the technical skills; application of the technology is also important (p. 140).

According to Igbaria & Iivari (1995), PU was directly affected by organizational support. Researchers have argued that, by providing computer support to individual users, their ability to use PDAs improved, which in turn resulted in higher usage (Igbaria, Guimaraes & Davis, 1995). Computer-related support, in addition to increasing individual user ability, served as an indication of how important the system was perceived to be within the organizational context. Organizations that expended great effort in providing computer and institutional administrative supports were sending a strong signal to individuals that they were expected to use the technology, and that using that technology would improve the individual’s job performance.

Chapter Summary

Chapter two provided an overview of the integration of (mobile information) technology in baccalaureate nursing education. An investigation of the technology acceptance literature provided the background for chapter two. Chapter three will provide a road map to the study of mediated effects among a variety of variables that are expected to influence nursing faculty’s MIT acceptance behavior.
CHAPTER 3 METHODOLOGY

The purpose of the third chapter is to present the research methodology used to test the study’s hypotheses. Information is presented with respect to the research design, participants, data collection procedures, measures, and analyses used in the study.

The Purpose of the Study

The purpose of this non-experimental correlation study was to determine if there is a relationship between perceived usefulness (PU), perceived ease of use (PEOU), attitudes toward MIT (ATT) [as derived from TAM (Davis, 1989)], administrative support (AS) (as applied from the Klein, et al., 2001), computer experience [CE] (Bauer et al., 2006) and the criterion variable, MIT acceptance (intent) among nursing faculty who teach in Commission on Collegiate Nursing Education (CCNE)-accredited pre-licensure baccalaureate nursing programs in three mid-Atlantic states (Delaware, Maryland, and Virginia) and the District of Columbia. Due to the proliferation of MIT and its use in baccalaureate nursing education, the study aimed to determine whether AS and CE (as supported by the TAM constructs of PU, PEOU, ATT) impacted MIT acceptance in teaching practices among the population of nursing faculty who teach in baccalaureate nursing classroom settings.

Research Design

This quantitative study used a correlational design to address the overarching research question and to test the research hypotheses. A quantitative method was chosen as behavior will be observed as it occurs naturally with no manipulation (Cozby, 2009; Kraska, 2010; Zikmund, Babin, Carr & Griffin, 2010), and random assignment of participants will not occur (Kraska,
Since the variables analyzed (i.e., technology acceptance) comprised an established area of research (Davis, 1989; Gong, Xu, & Yu, 2004; Venkatesh & Davis, 1996; Venkatesh et al., 2003), exploratory research was not suitable for this intended study (Zikmund et al., 2010). Further, provided the scholarly foundation of exploratory research from the TAM (Davis, 1989; Venkatesh & Davis, 1996)), a correlational research design allowed for a statistical generalization of the target population from the representative sample gathered from the sampling frame (Zikmund et al., 2010).

Past researchers who have examined faculty adoption of technology have favored the quantitative approach (Akour & Dwairi, 2011; Buchanan, Sainter, & Saunders, 2013, Holden & Rada, 2011; Sahin & Thompson, 2007). In addition, a qualitative method, which has the propensity to collect data in an unstructured format, yielding the inability to make statistical generalizations to a population, was not appropriate for this study because the discussion and findings may have reduced replication and reliability of the study results (Zikmund et al., 2010). Given that numerical data were evaluated in this study, objectivity was required over subjectivity thereby allowing quantitative research to be a best fit for this study (Zikmund et al., 2010). Qualitative research employs the use of exploratory research and collects data in an unstructured free-form manner (Zikmund et al., 2010), and given that this study tested the predictive value of a specific research question and aligned hypotheses through a structured 7-point Likert scale, a qualitative research method was not applicable. Finally, the quantitative correlation design was chosen for this study as it permitted the explanation of the potential predictor variables PU, PEOU, AS, CE and ATT (Kraska, 2010; Martin & Bridgmon, 2012).
Research Question

The following overarching research question and hypotheses for the study were driven by the objective to determine the predictive relationships among five predictor variables (PU, PEOU, AS, CE, and ATT) upon one criterion variable, MIT acceptance (intent):

RQ1: Are the constructs of perceived usefulness (PU), perceived ease of use (PEOU), attitudes toward MIT (ATT), administrative support (AS), and computer experience (CE); significant predictors of nursing faculty MIT acceptance in teaching practices in baccalaureate nursing classroom settings as defined by acceptance (intent)?

- **Hypothesis 1:**
  
  $H_{10}$ - There is no relationship between administrative supports and perceived usefulness.

  $H_{1a}$ - There is a significant relationship between administrative supports and perceived usefulness.

- **Hypothesis 2:**
  
  $H_{20}$ - There is no relationship between computer experience and perceived ease of use.

  $H_{2a}$ - There is a significant relationship between computer experience and perceived ease of use.

- **Hypothesis 3:**
  
  $H_{30}$ - There is no relationship between computer experience and perceived usefulness.

  $H_{3a}$ - There is a significant relationship between computer experience and perceived usefulness.

- **Hypothesis 4:**
  
  $H_{40}$ - There is no relationship between perceived usefulness and attitudes toward MIT.

  $H_{4a}$ - There is a significant relationship between perceived usefulness and attitudes toward MIT.
Hypothesis 5:

H5₀ - There is no relationship between perceived ease of use and attitudes toward MIT.

H5ₐ - There is a significant relationship between perceived ease of use and attitudes toward MIT.

Hypothesis 6:

H6₀ - There is no relationship between attitudes and MIT acceptance.

H6ₐ - There is a significant relationship between attitudes and MIT acceptance.

Hypothesis 7:

H7₀ - Administrative support (AS) is not a predictor of nursing faculty MIT acceptance (intent) in teaching practices in baccalaureate nursing classrooms.

H7ₐ - Administrative support (AS) is a predictor of nursing faculty MIT acceptance (intent) in teaching practices in baccalaureate nursing classrooms.

Hypothesis 8:

H8₀ - Computer experience is not a significant predictor of nursing faculty MIT acceptance (intent) in teaching practices in baccalaureate nursing classrooms.

H8ₐ - Computer experience is a significant predictor of nursing faculty MIT acceptance (intent) in teaching practices in baccalaureate nursing classrooms.

Hypothesis 9:

H9₀ - There is no relationship between perceived usefulness and MIT acceptance.

H9ₐ - There is a significant relationship between perceived usefulness and MIT acceptance.

Participants

The target population studied was important to identify in this quantitative research study (Creswell, 2014). The population and site were selected for the study to capture the willingness of nursing faculty MIT acceptance in teaching practices in baccalaureate nursing program.
classroom settings during the fall semester 2016. Descriptions of the target population, the setting, sampling method, sample size, recruitment, and measurement instruments for the study follows.

**Population**

The target population that served as the sampling frame consisted of nursing faculty teaching in Commission on Collegiate Nursing Education [CCNE] accredited schools of nursing with pre-licensure programs, e.g., entry-level Bachelor of Science in Nursing (BSN) or accelerated BSN programs in the Mid-Atlantic Region (e.g., Delaware [DEL], Maryland [MD], and Virginia [VA] and the District of Columbia [DC] of the United States. Participants varied in age and academic rank; full time and part time faculty were considered for this study’s target populations.

**Sample**

The sampling frame for the study was developed from CCNE- list of accredited programs. A purposeful sampling method was used to invite participants from the sampling frame of CCNE accredited schools of nursing with pre-licensure BSN programs. Email lists were created using school websites and obtaining each nursing faculty member’s email address. Each nursing faculty represented potential users of MIT in teaching practices in baccalaureate nursing classroom settings. One CCNE-accredited school of nursing in Maryland is the workplace setting of the researcher thus was excluded from this study. An adequate minimum sample size, which should be representative of the target population, has been suggested to be five to 10 times greater than the number of variables used (Gorard, 2010). Therefore, a G*Power analysis was conducted to determine the statistically significant sample size for five predictor variables, and a minimum sample size of 85 participants was determined by using the G*Power 3.1 software for correlation (effect size=0.25; 0.95 power; $\alpha = 0.05$) (Faul, Erdfelder, Buchner, & Lang, 2009).
The sampling frame from the CCNE-accredited mid-Atlantic BSN programs constitute a total of 426 nursing faculty as shown in Table 2 and the minimum participation of 85 faculty represented an expected return rate of 19.95%.

Table 2: Number of Nursing Faculty Members in Targeted Mid-Atlantic Schools of Nursing Baccalaureate Pre-Licensure Programs

<table>
<thead>
<tr>
<th>Mid-Atlantic Schools of Nursing Baccalaureate Pre-Licensure Programs</th>
<th>Number of Nursing Faculty Members</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Bon Secours Memorial College of Nursing</td>
<td>23</td>
</tr>
<tr>
<td>2. Delaware State University</td>
<td>29</td>
</tr>
<tr>
<td>3. Eastern Mennonite University</td>
<td>14</td>
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<tr>
<td>4. George Mason University</td>
<td>29</td>
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<tr>
<td>5. George Washington University</td>
<td>24</td>
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<tr>
<td>6. Hampton University</td>
<td>13</td>
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<tr>
<td>7. Howard University</td>
<td>20</td>
</tr>
<tr>
<td>8. James Madison University</td>
<td>27</td>
</tr>
<tr>
<td>9. Jefferson College of Health Sciences</td>
<td>50</td>
</tr>
<tr>
<td>10. Liberty University</td>
<td>29</td>
</tr>
<tr>
<td>11. Longwood University</td>
<td>10</td>
</tr>
<tr>
<td>12. Lynchburg College</td>
<td>13</td>
</tr>
<tr>
<td>13. Salisbury State University</td>
<td>23</td>
</tr>
<tr>
<td>14. Stevenson University</td>
<td>40</td>
</tr>
<tr>
<td>15. Towson University</td>
<td>29</td>
</tr>
<tr>
<td>16. Trinity Washington</td>
<td>3</td>
</tr>
<tr>
<td>17. University of Maryland</td>
<td>53</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>426</strong></td>
</tr>
</tbody>
</table>

**Instrumentation**

Selection and development of the instruments

The development of the survey instruments occurred in the following stages. First, the researcher identified the purpose of the study, research question, and the study framework. Second, the related research studies and well-made survey instruments in previous studies were located. Third, all the items for this survey were carefully selected from the available literature in this field. The number of items for each variable and its source are given in the Table 3. All the items
used 7 point-Likert scale for measuring the responses. Additionally, demographic questions were included in the survey. Fourth, the researcher obtained permission from the original authors of the survey instruments, through emails, and adapted the instruments for the current study (Appendix G). Fifth, a pilot study was conducted to test the face validity of the survey instruments for this study with two researchers and ten nursing faculty from a mid-Atlantic CCNE-accredited baccalaureate nursing program excluded from this study. Finally, based on the results of the pilot study and feedback from these professional researchers and nursing faculty, the final survey questionnaire was completed, after undergoing additional suggested revisions.

Table 3: Measurement Items and Source

<table>
<thead>
<tr>
<th>Constructs</th>
<th>No. of Items</th>
<th>Likert Scales</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perceived Usefulness (1-6)</td>
<td>6</td>
<td>Perceived Usefulness Scale</td>
<td>Davis, 1989</td>
</tr>
<tr>
<td>Perceived Ease of Use (7-12)</td>
<td>6</td>
<td>Perceived Ease of Use Scale</td>
<td>Davis, 1989</td>
</tr>
<tr>
<td>Administrative Supports (13-18)</td>
<td>6</td>
<td>Management Support Implementation Scale</td>
<td>Klein, Conn, &amp; Sorra, 2001</td>
</tr>
<tr>
<td>Computer Experience (30-34)</td>
<td>5</td>
<td>Computer Experience Scale</td>
<td>Bauer et al., 2006</td>
</tr>
<tr>
<td>Acceptance [Intent] (35-37)</td>
<td>3</td>
<td>Behavioral Intention Scale</td>
<td>Davis, 1989</td>
</tr>
<tr>
<td>Attitudes toward MIT (38-40)</td>
<td>9</td>
<td>Attitudes toward Technology Scale</td>
<td>Davis, 1993; Venkatesh, Morris, Davis &amp; Davis, 2003</td>
</tr>
</tbody>
</table>

**Measures**

Permissions to adapt the instruments were obtained through emails (Appendices H-J). Unless otherwise noted, all of the survey items, in Table 3, employed on a seven-point Likert scales anchored at $l = strongly disagree$ and $7 = strongly agree$. Scale scores were used as
indicators of latent constructs. Items were coded such that higher values represented higher levels of the construct (Likert, 1932).

**Definition of Variables**

**Demographic characteristics**

This section was designed to identify demographic attributes of the respondents (Altun, 2013). It contained (6) demographic items, includes age, ethnicity, gender, and academic rank. The items are provided in Appendix B. The less sensitive demographic questions were placed at the beginning of the survey; the more sensitive, such as age, were placed at the end. Participants’ race was collected by the researcher and coded as 1 = White, 2 = Black, 3 = Other. Given that the majority of the respondents were white, race was recoded into 1 = White, 0 = other. Participants provided self-report data about gender, which was coded as 0 = female, 1 = male. Participants also were asked to report age and years of teaching experience.

**Control variables**

To minimize potential alternative explanations for the relationships hypothesized in the study, a number of control variables (e.g., age, gender, experience) were collected and included. Years of computer experience were included, as studies have shown that years of experience using computers were predictors of intention to integrate technology (Paver, Walker & Hung, 2014). Researchers have shown an increasing interest in the effects of demographic variables such as age and gender in the workplace. According to Morris, Venkatesh, and Ackerman (2005), both gender and age have a philosophical influence on individual perceptions and attitudes toward technology in the workplace. With the idea of attitudes differing between genders, Venkatesh et al., (2000) suggested that studies focusing on gender should include at least the two concepts of gender that are prominent in research, the physical and psychological. Venkatesh et al., (2000) states that, “Much of the large body of research on gender differences
have examined mean differences between women and men in terms of abilities, traits, and psychological constructs” (p. 34).

Another variable that influences nursing faculty’s decisions about MIT is the discipline or subject area. Research (Becher, 1994; Nelson Laird, Shoup, Kuh, & Schwarz, 2008) has shown a faculty member’s field of study may influence decision-making behaviors as well as practices in teaching. Agarwal and Prasad (1999) investigated the influence of tenure in the workforce, level of education, role with regard to technology, prior similar experience, and participation in training.

**Criterion - Acceptance of MIT**

Acceptance (behavioral intention) is “expressing the willingness or intent by nursing faculty to use or adopt MIT in teaching practices to help improve performance” (Dillon & Morris, 1996). Acceptance (intention) was measured with a scale that was used by Davis (1989). The scale consists of three questions on a 7-point Likert scale in which 1 = “strongly disagree” and 7 = “strongly agree.” Cronbach's alpha = .81. The items are provided in Appendix B.

**Predictor 1 - Administrative support**

The administrative support-predictor variable was linked to the UTAUT construct of facilitating conditions, whereby organizational and technical infrastructure exists to support a system (Venkatesh, Shaw, Dicks, Lowerison, Zhang, & Sanjakdar, 2007). Administrative support was measured with a scale that had been used by Klein, Conn & Sorra (2001). The scale consisted of six questions on a 7-point Likert scale (1 = “strongly disagree” and 7 = “strongly agree”). Cronbach's alpha = .65. Administrative support were measured as an interval level criterion variable using an online survey. The items are provided in Appendix B.
Predictor 2 - Computer experience

Computer experience is described as “specific feelings or emotions that are engendered by computer-related stimuli” (Smith et al., 1999, p. 241). Computer experience was measured with a scale that have been used by Bauer et al (2006). The scale consisted of five questions on a 7-point Likert scale in which 1 = “strongly disagree” and 7 = “strongly agree.” Cronbach's alpha = .97. The items are provided in Appendix B.

Predictor 3 - Perceived usefulness

PU was one of five predictor variables used in the study. Perceived usefulness is defined as “the degree to which nursing faculty believes that using MIT would enhance his or her job teaching performance” (Davis, 1989 p. 320). The PU predictor variable consisted of six questions and was measured as an interval-level variable with a 7-point Likert scale in which 1 = strongly disagree; 7= strongly agree; higher scores reflect greater PU. PU was derived from TAM and has good psychometric properties; Cronbach's alpha = 0.97 (Davis, 1989). The items are provided in Appendix B.

Predictor 4 - Perceived ease of use

PEOU was another of five predictor variables to be used in the study. Perceived ease of use refers to “the degree to which nursing faculty believes that using MIT would be free of effort” (Davis, 1989, p. 320). The PEOU predictor variable consisted of 6-items and was measured as an interval-level variable with a 7-point Likert scale in which 1 = strongly disagree; 7 = strongly agree; higher scores reflect greater PEOU, and were gathered with an online survey dispensed to the participant pool. PEOU is derived from TAM and has good psychometric properties; Cronbach's alpha = 0.94 (Davis, 1989). The items are provided in Appendix B.
**Predictor 5 - Attitudes toward technology**

ATT, in turn, is a function of the two beliefs: perceived usefulness and perceived ease of use. Based on the work of Ajzen and Fishbein (1980) and within the proposed TAM, attitude toward using the system (e.g. MIT) is defined as “the degree of evaluative affect (e.g., unfavorable, neutral, or favorable) that some nursing faculty associate with using MIT in their teaching practices.” The researcher will measure attitudes toward MIT with an established 3-item scale (Davis, et al., 1989). The scale consisted of three questions on a 7-point Likert scale in which 1 = “strongly disagree” and 7 = “strongly agree.” Cronbach's alpha = .91. The items are provided in Appendix B.

**Data Collection Procedures - Survey Research**

Fraenkel, Wallen and Hyun (2012) stated that —in educational research, the most common descriptive methodology is the survey, as when researchers summarize the characteristics abilities, preferences, behaviors, and so on) of individuals (p. 14). A survey design was used as a method of data collection. Surveys are flexible in tackling a range of problems related to attitudes, perspectives and beliefs of subjects and can employ written questionnaires or interviews (McMillan, 2004). As a data collection method, surveys are useful when one needs to collect quantitative data from a large group of people in the least expensive way as possible (Russ-Eft & Preskill, 2001). Survey was the preferred method of data collection over others in this particular study because many questions could be asked and it was possible to reach a large enough group within a short period of time (Fowler, 2009). Babbie (2007) identifies two basic types of surveys: cross-sectional surveys and longitudinal surveys. Cross-sectional surveys gather information about a particular population at a distinct time. Longitudinal surveys on the other hand, collect information over a period of time. The study utilized the cross-sectional
survey method to collect data on MIT acceptance and integration in baccalaureate nursing programs’ classroom settings by nursing faculty.

The study was cleared through the University of Alabama IRB office. The study procedures were cleared as “Exempt” under federal regulations. The assigned protocol number was EX-16-CM-035-SP15 (see Appendix C). The first step in data collection was an introductory email and link to the electronic survey sent to all DEL-, MD-, VA- and DC- BSN nursing faculty of each school of nursing as identified on list of CCNE- approved baccalaureate nursing programs for Mid-Atlantic baccalaureate nursing programs. Using an electronic survey, data was collected from the Mid-Atlantic States (Delaware, Maryland, and Virginia) and the District of Columbia CCNE-accredited baccalaureate nursing pre-licensure program nursing faculty during three weeks in the fall of 2016. Informed consent was embedded into the electronic survey and preceded the survey questions; respondents’ participation in the survey indicated consent. The subjects completed the electronic survey, and responses were collected using Qualtrics,™ a web-based survey software tool. No incentives were offered to the potential respondents to fill in the survey. The measures to maintain confidentiality of data and anonymity of the quantitative data are described in the data collection section of this chapter. Qualtrics™ functionality supports the ability to exclude respondents based on answers to questions, a function they refer to as skip logic (Qualtrics, Provo, UT, 2012). Qualtrics™ also provides an email distribution option that permits anonymous surveying; and provides an option to not record any personal information (Qualtrics, Provo, UT, 2012). This information was accessed, as needed, after completion of the analysis of the electron survey. Through the use of a browser cookie, Qualtrics™ allowed for a return-and-complete later option (Qualtrics, Provo, UT, 2012). A reminder email was scheduled in Qualtrics™ and sent to the BSN nursing faculty one week
after the initial contact through the three-week window identified for survey completion. This information was stored in a separate file with only the respondent identification number. Subsequently, repeated weekly reminders were scheduled in Qualtrics™ and sent to the BSN nursing faculty through the three-week window identified for survey completion. Results were downloaded, stored, and analyzed on a password-protected computer.

Data Analysis

Data analysis is a logical way of understanding and interpreting of the collected data. This analysis included two processes; analytical process, in which he data was collected, categorized, compared, and integrated. The interpretation process of analysis was employed circularly while making sense out of the analyzed data (Hassan, Nareeman, & Pauline, 2013). Since the study sought to determine the significances of predictors affecting nursing faculty MIT acceptance in teaching practices in Mid-Atlantic region BSN nursing programs, it triggered the need to employ statistical analysis. The data generated in the study was analyzed using a quantitative analysis. The main variables in the study consisted of PU, PEOU, AS, CE and ATT. The procedures used for the quantitative data were as follows.

Data Analysis Procedures

Prior to testing the hypothesis in the study, the researcher examined the descriptive statistics of the variables of interest in the study including reliability analysis. Reliability analysis is the ability of a measure to produce consistent result and was conducted to test an internal consistency of measures by using Cronbach's alpha (Churchill, 1979; Crano & Brewer, 1973; Cronbach, 1951). A minimum value of .70 was used to assess internal consistency, since a Cronbach's alpha value of .70 or higher was considered a sufficient level of reliability for an item
Descriptive statistics were analyzed to provide respondents' demographic background profiles.

Data were analyzed using SPSS® 24 for Windows. Data analysis occurred after the three-week invitation to participate had expired. Returned surveys were reviewed for completeness and duplicate submission; consequently, any incomplete and duplicate surveys were withdrawn from the analysis phase of this study. Correlational analysis employed the Pearson Product-Moment Correlation to examine the strength and direction between two interval-level variables (Lee, 2013). Pearson Product-Moment Correlation coefficient assumptions required that four data assumptions were met prior to data analysis: (a) normal distribution, (b) linearity, (c) homoscedasticity, and (d) independence of errors (Martin & Bridgmon, 2012). Data were reviewed for normality and deemed normally distributed (Martin & Bridgmon, 2012). Linearity was assessed when a straight relationship existed between the independent variable and the dependent variable (Martin & Bridgmon, 2012). Homoscedasticity was assessed when evidence suggested that the variance of predicted dependent variables was the same for values of the independent variable (Martin & Bridgmon, 2012). An assessment for independence of errors was conducted to ensure that the data was random and not correlated (Martin & Bridgmon, 2012). When these assumptions were confirmed, data were analyzed using the Pearson Product-Moment Correlation coefficient to determine the relationships among the five predictor variables and one criterion variable. The Statistical Package for the Social Sciences (SPSS) was used for analysis.

**Delimitations**

Delimitations of the study included the use of only BSN programs excluding associate and diploma programs. The determination to use BSN only programs responded to the Institute
of Medicine (IOM) 80/20 initiative. The initiative stated that, by the year 2020, 80% of the nursing workforce would be BSN-prepared while only 20% would be Associate degree (AD) prepared. The study was bound by geographic location and limited to nursing faculty from CCNE- accredited BSN schools of nursing from three Mid-Atlantic States (Delaware, Maryland, and Virginia) and the District of Columbia (DC). The study was further delimited to nursing faculty members who had taught face-to-face in a baccalaureate nursing classroom setting for more than five years. Finally, as noted, study results should be generalized only to similar populations (Lee, 2013).

Limitations

Results of the study may be limited and generalizability may likely be limited to similar populations. Another potential limitation was posed by a self-administered questionnaire, which may be limited by inaccurate or incomplete participant responses. Additionally, a self-administered survey may limit accurate and complete responses, as participants may become annoyed or disinterested in completing the survey if the questions are not relevant to them or if they encounter contingency questions (Lee, 2013). Finally, the adapted survey for this instrument was originally developed by Davis (1986, 1989), and given the expedient nature of evolving technology, study results may be limited (Holden & Rada, 2011).

Assumptions

The study was based on five assumptions. First, it was assumed that participants answered the questions to the self-administered survey honestly, subjectively, and accurately. Second, it was assumed that all prospective respondents read and understood the letter of informed consent (see Appendix D) and consequently clicked the hyperlink to complete the online survey under their own free will without coercion after submission of consent to
participate. Third, it was assumed that participants understood the survey questions, and the questions were written without ambiguity. Fourth, it was assumed that the collection and analysis of data familiarity and personal experience with use of a mobile information technology.

**Protection of Human Subjects/Ethical Considerations**

The Belmont Report provided ethical guidelines for behavioral researchers, and its three ethical principles were upheld: respect for persons, beneficence and justice (Streubert & Carpenter, 1999). The first principle, respect for persons, focused on the necessary autonomy of individuals and the protection of vulnerable populations with diminished autonomy (Belmont Report, 1979). The second principle, beneficence, discussed the obligation to protect the well-being of the individual, specifically by doing no harm and maximizing benefits while minimizing risks (Belmont Report, 1979). The third principle, justice, involved sharing the burdens and benefits equitably through equal distribution or distribution based on need, effort, merit, or contribution to society (Belmont Report, 1979). Appropriate Institutional Review Board (IRB) approval was secured from the University of Alabama (UA) IRB prior to formally beginning this research. This quantitative research considered these fundamental ethical principles. The disclosure of the study’s purpose, and respect for research sites and process are important ethical considerations that researchers should consider (Creswell, 2014). Therefore, the following paragraphs discuss potential or actual conflicts of interest identified by this researcher, the researcher’s position statement, and other ethical issues related to this study.

**Researcher position**

An important part of the research process was to ensure that the researcher was qualified to conduct the study, free from conflict of interest, and had guarded against bias (Creswell, 2014). This researcher was particularly interested in how MIT was being used in nursing education to prepare students for a data, information, and technology intensive healthcare
environment. The researcher sought to determine if differences in MIT acceptance in baccalaureate nursing program classroom settings by nursing faculty might be related to AS and CE. In addition, the researcher explored differences in MIT acceptance related to factors such as age, gender and nursing faculty degree levels.

The researcher has been a full-time faculty member at a Mid-Atlantic CCNE-accredited baccalaureate nursing program since fall, 1996 and has taken a position of neutrality. The researcher relied on her own judgment to select sample group members. Therefore, skills and capabilities of the researcher to find appropriate individuals to contribute to the achievement of research objectives played an important role in the outcome of the study.

The researcher of the study understood that ethical issues could arise at any point throughout the research process. The potential ethical issues were minimized through use of the study design process. To address such issues, most organizations and institutions, like the University of Alabama, have formulated an Institutional Review Board (IRB), a panel of persons who review research proposals with respect to ethical implications and decide whether additional actions need to be taken to assure the safety and rights of participants. By reviewing proposals for research, IRBs also help to protect both the organization and the researcher against potential legal allegations of having neglected to address important ethical issues of participants (Creswell, 2014).

Conflict of interest

Conflicts of interest occur in research projects when researchers have coexisting personal, financial, political, and academic interests and the potential exists for one interest to be favored over another that has equal or even greater legitimacy in a way that might make other reasonable people feel misled or deceived (Israel & Hay, 2006). Researchers risk appearing to be negligent, incompetent, or deceptive. Academic, financial, or other personal interests do not compromise
the objectivity with which this research was designed, conducted, and reported. There was no financial interest in or arrangement with a company whose product was used or referred to in the study. This researcher has not received sponsored program support from the college of nursing in which she has a substantial financial interest. This researcher did not hold a position in or associated with for an outside agency that does business with the University of Alabama (Tuscaloosa) or any of the schools of nursing through which the research was conducted.

**Ethical issues in the study**

Research that involves human beings requires careful consideration of the procedures to be used to protect their rights (Polit & Beck, 2012). Ethical issues were important considerations in order to maintain the integrity of this study. Ethical considerations focused on a number of questions. Who would benefit from the research? What would the research give back to the study community? To maintain the integrity of the study, approval for the study was requested of The University of Alabama (Tuscaloosa, Alabama) Institutional Review Board prior to initiation of the study. The researcher completed *Collaborative Institutional Training Initiative* (Citi Program) as specified by The University of Alabama. According to Kim (2012), gaining IRB approval can increase the perception of the credibility of research studies. Potential subjects were notified of the study via email after IRB approval was acquired. Initial contact with study subjects was made by the researcher via the organization’s email system as identified on each school’s website. Elements of informed consent, the purpose of the study, the format of the survey, anticipated risks and benefits, and the subject’s right to withdraw from the survey at any time without consequence were included at the beginning of the electronic survey (Beauchamp & Childress, 2001).
Protection from harm

The subjects received the researcher’s contact information in the informed consent documentation. Additionally, the subjects received information as to who should be contacted in the event of any issues arising in the course of the research that could not be resolved with members of the project team.

Informed consent. The subjects were made fully aware of the purpose of the study, as well as the level of involvement and risk that participation entailed (Creswell, 2014). Informed consent documentation describing the level of commitment needed for study participation and the potential risks of study participation was shared in the request for participation and reinforced in introductions of the quantitative questionnaires.

Assurance of volunteerism

All nursing faculty at the study sites had the opportunity to choose to participate in the study. All subjects had the right to choose to answer any and all questions. Subjects were made aware of their right to withdraw from the study at any time. Subjects were informed clearly of their right to withdraw the consent at any time. They were assured that any data that had been provided would be destroyed if so requested and that there would be no resultant adverse consequences.

Confidentiality and anonymity

Confidentiality of the names of the subjects and the data collected was maintained through Qualtrics™ which also provided an email distribution option that permitted anonymous surveying, and provided an option to not record any personal information (Qualtrics, Provo, UT, 2012). This information was accessed, as needed, after completion of the analysis of the electronic survey. Submission of the Qualtrics™ survey constituted consent.
The findings of the study were written in an aggregate manner concealing any opportunities of participant identification. The data and participant identifying information collected in the study were confidential, and all data was coded and to assure confidentiality was available only to the principal investigator. All research material, such as the completed surveys and the completed consent forms, have been secured for the sole use of the principal investigator for a period of seven years.

**Potential risks**

Subjects involved in this research study were unlikely to face any present risk. Subjects may possibly have felt discomfort in answering questions related to their work environment. Subjects may have perceived these questions to be of a more sensitive nature than was the perception of the researcher. Qualtrics™ functionality supported the ability to exclude respondents based on answers to questions, a function they referred to as skip logic (Qualtrics, Provo, UT, 2012). Subjects did not receive any invasive procedures during this project. Participant burden have been experienced during completion of the data collection instrument. The instrument used was made as concise and precise, yet as user-friendly as possible. Large print and an easy to follow format were designed to decreased difficulties related to survey completion. Respondent sessions were limited in time to prevent additional respondent burden. Through the use of a browser cookie, Qualtrics™ allowed for a return-and-complete later option (Qualtrics, Provo, UT, 2012).

The risks associated with conducting Internet research were low, however subjects may still be at risk (Fowler, 2009). By default, data delivered via the Internet is not protected. Subjects may have been at risk for identity exposure as a result of their participation. The survey for this research was deployed through a secure, commercial electronic service offered by Qualtrics™ survey system exported into SPSS® 24 for Windows for data analysis. The research
question was not of a personal nature, and questions presented to participants were at an organizational level.

Transparency/Honesty with professional colleagues

Subjects were given an opportunity to receive a summary of the outcomes of the research and had the opportunity to be debriefed after data was provided, if they chose to do so.

Chapter Summary

In this chapter the reader was introduced to the research methodology and design used in the study. The research methods included research setting, study population, sample and sampling, data collection instrument and data collection as well as validity and reliability were all fully described. Ethical issues that were considered were also discussed. The next chapter will review the data analysis and results of the study. Chapter five then discusses the findings and relevant literature as well as the results through the lens of the research question.
CHAPTER 4 RESULTS

Chapter four includes demographic information about the respondents and data, analysis and results (using the SPSS program) of the overarching research question and nine corresponding null hypotheses. The instrument included questions related to: Perceived usefulness, perceived ease of use, attitude towards MIT, administrative support, computer experience, and acceptance (intent). The population included 58 faculty members who taught in CCNE-accredited pre-licensure baccalaureate nursing programs in the mid-Atlantic region of the United States.

Purpose of the Study

The purpose of this non-experimental correlation study was to determine if there was a relationship between perceived usefulness (PU), perceived ease of use (PEOU), attitudes toward MIT (ATT) (as derived from TAM [Davis, 1989]), administrative supports (AS) (as applied from the Klein, Conn & Sorra, 2001), computer experience [CE] (Bauer et al., 2006) and the criterion variable, MIT acceptance (intent) among nursing faculty who taught in CCNE-accredited pre-licensure baccalaureate nursing programs in three mid-Atlantic states (Delaware, Maryland, and Virginia) and the District of Columbia. Data were collected via the web-based survey distribution site, Qualtrics using a 7-point Likert scale to gather the study variables. Surveys were distributed to a purposeful sample of nursing faculty teaching in 17 baccalaureate nursing programs accredited by CCNE from three states (Delaware, Maryland, and Virginia) and the District of Columbia (DC). Data analysis utilized the Statistical Package for the Social Sciences SPSS® 24 for Windows, specifically, Pearson Product-Moment Correlation Coefficient analysis,
to determine the degree to which a relationship existed among five predictor variables (PU, PEOU, AS, CE, and ATT), and the criterion variable acceptance (intent).

**Initial Analysis**

**Pilot study**

In traditional empirical research, the researcher is mindful of the importance of establishing reliability and validity of measures and procedures (Shahrabia, Ahnaninjanb, Nourbakhshsc, Ashlubolaghd, Abdulmalekie, & Mohamadif, 2013). Reliability refers to the ability of a measure to produce consistent results, while validity indicates that an instrument and protocol measure what they purport to measure (Rudestam & Newton, 2007). One method to establish content validity of scores on the instrument and to improve questions, format and scales is by pilot-testing the survey (Creswell, 2014). The researcher can also establish face validity, the extent to which a measuring instrument looks as though it is measuring what it purports to measure (Polit & Beck, 2012) and also, construct validity, the degree in which an instrument measures the construct under investigation in a pilot trial. The term pilot study is used in two different ways in research. It can refer to so-called feasibility studies which are "small scale version[s], or trial run[s], done in preparation for the major study" (Polit & Beck, 2012 p. 467). However, a pilot study can also be the pre-testing or 'trying out' of a research instrument (Baker, 1994, p. 182-3). This survey was pre-tested during the spring of 2016 with ten nursing faculty who taught in one of the Mid-Atlantic region CCNE-accredited nursing program excluded from the study.

**Pre-testing the survey**

The methods used to pre-test the survey are listed in Table 4. After slight modifications of the instrument to facilitate the Qualtrics system, a pilot test was performed. These modifications were only functional in nature. A slider bar was added to the instrument along with
selection boxes. The participants reviewed the survey for clarity and readability. During pre-
testing, the participants, while suggesting no major changes to the instruments, did generally
agree on two changes; 1) the addition of a definition of “mobile information technology” in
question item #1; and 2) the addition of examples of doctorate (e.g., PhD) and professional
degrees (e.g. DNP) in question item # 49. Feedback from this test was then incorporated into the
final, web-based survey instrument.

Table 4: *Pilot Study Procedures*

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Assess whether each question gives an adequate range of responses;</td>
</tr>
<tr>
<td>2.</td>
<td>Establish that replies can be interpreted in terms of the information that is required;</td>
</tr>
<tr>
<td>3.</td>
<td>Administer electronic questionnaire to pilot subjects in the same way as it will be administered in the main study;</td>
</tr>
<tr>
<td>4.</td>
<td>Ask the subjects for feedback to identify ambiguities and difficult questions;</td>
</tr>
<tr>
<td>5.</td>
<td>Check that all questions are answered after subjects have completed the questionnaire;</td>
</tr>
<tr>
<td>6.</td>
<td>Re-word or re-scale any questions that are not answered as expected;</td>
</tr>
<tr>
<td>7.</td>
<td>Shorten and revise; and</td>
</tr>
<tr>
<td>8.</td>
<td>Discard all unnecessary, difficult or ambiguous questions.</td>
</tr>
</tbody>
</table>

Results Summary

A total of 111 responses were received, representing a return rate of 26.05%. As stated in the data analysis procedures in chapter 3, only participants who consented and completed the entire survey were included in the data analysis. Therefore, of the 111 responses, 58 were fully completed; the adjusted response rate was 13.61%. In accordance with the G*Power analysis, the required minimum participation should have been 85 valid responses, which was not met.

Sample size and characteristics

The sample consisted of 58 fully completed respondents, of which 81% (n= 47) were full-time nursing faculty and with 19% (n=11) representing part-time/adjunct nursing faculty members) from 17 CCNE-accredited baccalaureate nursing programs in the mid-Atlantic region of the United States. Demographic variables collected from participants included age, gender, race/ethnicity, education (highest degree earned), academic rank and years of teaching. The following sections provide a comprehensive description and analysis of the sample demographic characteristics.

Age

The age range was 30 -72 years with a mean age 55.34 years (S.D = 8.74). Of the 58 respondents, 77.59% (n=45) ranged between the age 50-72 while only 20.6% (n=12) of the respondents were ages 30 -45. Study participant ages were similar to national nurse faculty data, as discussed in chapter 2. Ages of the respondents reflect an aging nursing workforce (AACN, 2015a). Table 5 displays the ages of the study participants.
Table 5: *Age of the Sample*

<table>
<thead>
<tr>
<th>Subcategory</th>
<th>Number of Respondents</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>30-39</td>
<td>5</td>
<td>8.6%</td>
</tr>
<tr>
<td>40-49</td>
<td>7</td>
<td>12%</td>
</tr>
<tr>
<td>50-59</td>
<td>24</td>
<td>41.3%</td>
</tr>
<tr>
<td>60-69</td>
<td>20</td>
<td>34.5%</td>
</tr>
<tr>
<td>72</td>
<td>1</td>
<td>2%</td>
</tr>
<tr>
<td>No response</td>
<td>1</td>
<td>2%</td>
</tr>
</tbody>
</table>

Total Participants = 58

Mean = 55.34 Range 30 – 72 Years

**Gender**

Of the 58 respondents, 98.3% (n= 57) were female, only 1.7% (n=1) was male.

**Race/Ethnicity**

The demographic variable, race/ethnicity, included seven subgroups: (1) White/Caucasian, non-Hispanic; (2) Black/African American, non-Hispanic; (3) Native American and Eskimo; (4) Native Hawaiian and other Pacific Islander; (5) Asian; (6) Hispanic/Latino; (7) Two or more races or (8) other. A significant majority 88% (n= 51) of respondents reported race/ethnicity as White, not of Hispanic/Latino. In comparison, non-White participants comprised a smaller proportion of nursing faculty (12%), with African-Americans representing the largest non-white group 8.6% (n=5). Only one (non-White) respondent, 1.7% (n =1) reported race/ethnicity as Native Hawaiian or Pacific Islander origin and only one (non-White) respondent, 1.7% (n =1) indicated race/ethnicity as two or more races. There were no Hispanic/Latino or Asian respondents. Frequencies and percentage of participants, according to race/ethnicity, are provided in Table 6.
Table 6: *Race/Ethnicity of the Sample:*

<table>
<thead>
<tr>
<th>Subcategory</th>
<th>Number of Respondents</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>White/Caucasian Non-Hispanic</td>
<td>51</td>
<td>88%</td>
</tr>
<tr>
<td>Black/ African American Non-Hispanic</td>
<td>5</td>
<td>8.6%</td>
</tr>
<tr>
<td>Native Hawaiian and Other Pacific Islander</td>
<td>1</td>
<td>1.7%</td>
</tr>
<tr>
<td>Asian</td>
<td>0</td>
<td>null</td>
</tr>
<tr>
<td>Hispanic/ Latino</td>
<td>0</td>
<td>null</td>
</tr>
<tr>
<td>Two or more races</td>
<td>1</td>
<td>1.7%</td>
</tr>
</tbody>
</table>

**Highest degree earned**

Respondents were asked via the survey to indicate the highest degrees they had earned. Response options included the following degrees: master’s, doctorate, and professional degree. Most nursing faculty 62% (n=36) reported having a doctorate degree as their highest degree earned. Thirty-one percent (n=18) had earned a master’s degree. Though not an earned degree, a significantly smaller proportion indicated post-doctorate 2% (n=1). Only 5% (n=3) reported professional degrees (e.g. Doctor of Nursing Practice [DNP]).

Table 7: *Highest Degree Earned*

<table>
<thead>
<tr>
<th>Subcategory</th>
<th>Number of Respondents</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Masters</td>
<td>18</td>
<td>31%</td>
</tr>
<tr>
<td>Doctorate</td>
<td>36</td>
<td>62%</td>
</tr>
<tr>
<td>Professional Degree</td>
<td>3</td>
<td>5%</td>
</tr>
<tr>
<td>Post-Doctorate</td>
<td>1</td>
<td>2%</td>
</tr>
</tbody>
</table>
**Academic rank**

The primary teaching appointment was also included in the questionnaire but was not the basis for any of the research questions or hypotheses. However, the frequency and percentage of the nursing faculty who responded by academic rank is presented in Table 8 to provide the reader a complete profile of the participants.

Table 8: Academic Rank

<table>
<thead>
<tr>
<th>Subcategory</th>
<th>Number of Respondents</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Instructor</td>
<td>2</td>
<td>3.4%</td>
</tr>
<tr>
<td>Assistant Professor</td>
<td>25</td>
<td>43.1%</td>
</tr>
<tr>
<td>Associate Professor</td>
<td>22</td>
<td>37.9%</td>
</tr>
<tr>
<td>Professor</td>
<td>6</td>
<td>10.3%</td>
</tr>
<tr>
<td>Other</td>
<td>3</td>
<td>5.2%</td>
</tr>
</tbody>
</table>

**Teaching experience**

Table 9 represents teaching experience. 24.1% (n=14) of nursing faculty members had been teaching between 5 and 9 years, while 27.6% (n=16) of nursing faculty had been teaching between 10 and 14 years, and 31.0% (n=18) of nursing faculty between 15 and 19 years. 17.3% (n=10) of nursing faculty had been teaching for 20 or more years.

Table 9: Years of Teaching Experience

<table>
<thead>
<tr>
<th>Years of Teaching</th>
<th>Number of Respondents</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>5-9</td>
<td>14</td>
<td>24.1%</td>
</tr>
<tr>
<td>10-14</td>
<td>16</td>
<td>27.6%</td>
</tr>
<tr>
<td>15-19</td>
<td>18</td>
<td>31.0%</td>
</tr>
<tr>
<td>&gt;20</td>
<td>10</td>
<td>17.3%</td>
</tr>
</tbody>
</table>
Reliability Assessment

Cronbach’s alpha was used to assess reliability and internal consistency of the survey instruments. Pearson Product-Moment Correlation Coefficient Results of the reliability assessment indicating good internal consistency and reliability, can be found in Table 10. The Cronbach’s alpha indicated a high level of internal consistency for the instrument. Scale ratings as greater than .7 indicated acceptable reliability and ratings greater than .9 indicated excellent reliability (Nunnally & Bernstein, 1994).

<table>
<thead>
<tr>
<th>Predictors</th>
<th>Items</th>
<th>Cronbach’s Alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perceived Usefulness of MIT</td>
<td>1, 2, 3, 4, 5, 6</td>
<td>.97</td>
</tr>
<tr>
<td>Perceived Ease of Use of MIT</td>
<td>7, 8, 9, 10, 11, 12</td>
<td>.94</td>
</tr>
<tr>
<td>Administrative Supports of MIT</td>
<td>13, 14, 15, 16, 17, 18</td>
<td>.65</td>
</tr>
<tr>
<td>Computer Experience</td>
<td>19, 20, 21, 22, 23</td>
<td>.97</td>
</tr>
<tr>
<td>Behavior Intention (acceptance)</td>
<td>24, 25, 26</td>
<td>.81</td>
</tr>
<tr>
<td>Attitudes toward MIT</td>
<td>27, 28, 29, 30, 31, 32, 33, 34, 35</td>
<td>.91</td>
</tr>
</tbody>
</table>

Study Variables

The study variables included calculation of means and standard deviations for items in the instrument related to nursing faculty MIT acceptance in teaching practices in baccalaureate nursing classrooms, as shown in Table 11.

<table>
<thead>
<tr>
<th>Variable</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>PEOU</td>
<td>6.31</td>
<td>1.54</td>
</tr>
<tr>
<td>PU</td>
<td>4.85</td>
<td>1.41</td>
</tr>
<tr>
<td>AS</td>
<td>4.15</td>
<td>.76</td>
</tr>
<tr>
<td>CE</td>
<td>6.60</td>
<td>.68</td>
</tr>
</tbody>
</table>
Detailed Analysis

One overarching research question was used to guide this study, and statistical tests were conducted to evaluate nine null hypotheses. The data analyses are presented in this section.

Refer to Appendix B for a list of associated survey items. Table 12 presents Pearson Product-Moment Correlation Coefficient among the study variables.

Table 12: Correlation Matrix

<table>
<thead>
<tr>
<th></th>
<th>Perceived Usefulness (PU)</th>
<th>Perceived Ease of Use (PEOU)</th>
<th>Administrative Supports (AS)</th>
<th>Computer Experience (CE)</th>
<th>Acceptance (BI)</th>
<th>Attitudes toward MIT (ATT)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PU</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PEOU</td>
<td>.866</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AS</td>
<td>.783</td>
<td>.771</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CE</td>
<td>.642</td>
<td>.651</td>
<td>.600</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BI</td>
<td>.766</td>
<td>.744</td>
<td>.692</td>
<td>.651</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>ATT</td>
<td>.875</td>
<td>.847</td>
<td>.812</td>
<td>.670</td>
<td>.780</td>
<td>-</td>
</tr>
</tbody>
</table>

Note: PU = perceived usefulness; PEOU = perceived ease of use; AS= administrative support; CE= computer experience; BI= acceptance (intent); ATT = attitudes toward technology

All are significant at p < .01

**RQ1**: Are the constructs of perceived usefulness (PU), perceived ease of use (PEOU), attitudes toward MIT (ATT), administrative support (AS), and computer experience (CE) significant predictors of nursing faculty MIT acceptance in teaching practices in baccalaureate nursing classroom settings as defined by acceptance (intent)?
Hypothesis 1:

H1₀ - There is no relationship between administrative support and perceived usefulness.

H₁ᵃ - There is a significant relationship between administrative support and perceived usefulness.

The relationship between administrative support (as measured by the Management Support Implementation Scale [MSIS]) and perceived usefulness (as measured by the Perceived Usefulness Scale) were investigated using Pearson Product-Moment Correlation Coefficient. Preliminary analyses were performed to ensure no violation of assumptions of normality, linearity or homoscedasticity. The results of the analysis revealed a significant positive relationship between administrative support ($M = 4.15, SD = .76$) and perceived usefulness ($M = 4.85, SD = 1.41$) and a significant correlation between the two variables, administrative support and perceived usefulness, $r = .783$, $n = 58$, $p < .01$. As a result of the analysis, the null hypothesis was rejected. Table 12 (above) provides the test results.

Hypothesis 2:

H₂₀ - There is no relationship between computer experience and perceived ease of use.

H₂ᵃ - There is a significant relationship between computer experience and perceived ease of use.

The relationship between computer experience (as measured by the Computer Experience Scale) and perceived ease of use (as measured by the Perceived Ease of Use Scale) was investigated using Pearson Product-Moment Correlation Coefficient. Preliminary analyses were performed to ensure no violations of assumptions of normality, linearity or homoscedasticity. The results of the analysis revealed a significant positive relationship between computer experience ($M = 6.60, SD = .68$) and perceived ease of use ($M = 6.31, SD = 1.54$) and a significant correlation between the two variables, computer experience and perceived ease of use.
use, $r = .651, n = 58, p < .01$ As a result of the analysis, the null hypothesis was rejected. Table 12 (above) provides the test results.

- **Hypothesis 3:**
  
  $H_{30}$ - There is no relationship between computer experience and perceived usefulness.
  
  $H_{3a}$ - There is a significant relationship between computer experience and perceived usefulness.

The relationship between computer experience (as measured by the Computer Experience Scale) and perceived usefulness (as measured by the Perceived Usefulness Scale) was investigated using Pearson Product-Moment Correlation Coefficient. Preliminary analyses were performed to ensure no violations of assumptions of normality, linearity or homoscedasticity. The results of the analysis revealed a significant positive relationship between computer experiences ($M = 6.60, SD = .68$) and perceived usefulness ($M = 4.85, SD = 1.41$) and a significant correlation between the two variables, computer experience and perceived usefulness, $r = .642, n = 58, p < .01$. As a result of the analysis, the null hypothesis was rejected. Table 12 (above) provides the test results.

- **Hypothesis 4:**
  
  $H_{40}$ - There is no relationship between perceived usefulness and attitude toward MIT.
  
  $H_{4a}$ - There is a significant relationship between perceived usefulness and attitude toward MIT.

The relationship between attitude toward MIT (as measured by the Attitude toward MIT Scale) and perceived usefulness (as measured by the Perceived Usefulness Scale) was investigated using Pearson Product-Moment Correlation Coefficient. Preliminary analyses were
performed to ensure no violations of assumptions of normality, linearity or homoscedasticity. The results of the analysis revealed a significant positive relationship between attitude toward MIT ($M = 5.44, SD = 1.04$) and perceived usefulness ($M = 4.85, SD = 1.41$) and a significant correlation between the two variables, attitude toward MIT and perceived usefulness, $r = .875$, $n = 58$, $p < .01$. As a result of the analysis, the null hypothesis was rejected. Table 12 (above) provides the test results.

- **Hypothesis 5:**
  
  $H_{50}$ - There is no relationship between perceived ease of use and attitude toward MIT.

  $H_{5a}$ - There is a significant relationship between perceived ease of use and attitude toward MIT.

  The relationship between attitude toward MIT (as measured by the Attitude toward MIT Scale) and perceived ease of use (as measured by the Perceived Ease of Use Scale) was investigated using Pearson Product-Moment Correlation Coefficient. Preliminary analyses were performed to ensure no violations of assumptions of normality, linearity or homoscedasticity. The results of the analysis revealed a significant positive relationship between attitude toward MIT ($M = 5.44, SD = 1.04$) and perceived ease of use ($M = 6.31, SD = 1.54$) and a significant correlation between the two variables, attitude toward MIT and perceived ease of use, $r = .847$, $n = 58$, $p < .01$. As a result of the analysis, the null hypothesis was rejected. Table 12 (above) provides the test results.

- **Hypothesis 6:**
  
  $H_{60}$ - There is no relationship between attitude toward MIT and MIT acceptance (intent).

  $H_{6a}$ - There is a statistically significant relationship between attitude and MIT acceptance (intent).
The relationship between attitude toward MIT (as measured by the Attitude toward MIT Scale and MIT acceptance (as measured by the Behavioral Intention [BI] Scale) was investigated using Pearson Product-Moment Correlation Coefficient. Preliminary analyses were performed to ensure no violations of assumptions of normality, linearity or homoscedasticity. The results of the analysis revealed a significant positive relationship between attitude toward MIT ($M = 5.44$, $SD = 1.04$) and MIT acceptance ($M = 5.02$, $SD = 1.83$) and a significant correlation between the two variables, attitude toward MIT and MIT acceptance, $r = .780$, $n = 58$, $p < .01$. As a result of the analysis, the null hypothesis was rejected. Table 12 (above) provides the test results.

- **Hypothesis 7:**

  H7\_0 - Administrative support (AS) is not a predictor of nursing faculty MIT acceptance (intent) in teaching practices in baccalaureate nursing classrooms.

  H7\_a - Administrative support (AS) is a predictor of nursing faculty MIT acceptance (intent) in teaching practices in baccalaureate nursing classrooms.

The relationship between administrative support (as measured by the MSIS Scale) and MIT acceptance (as measured by the Behavioral Intention Scale) was investigated using Pearson Product-Moment Correlation Coefficient. Preliminary analyses were performed to ensure no violations of assumptions of normality, linearity or homoscedasticity. The results of the analysis revealed a significant positive relationship between administrative support ($M = 4.15$, $SD = .76$) and MIT acceptance ($M = 5.02$, $SD = 1.83$) and a significant correlation between the two variables, administrative support and MIT acceptance, $r = .692$, $n = 58$, $p < .01$. As a result of the analysis, the null hypothesis was rejected. Table 12 (above) provides the test results.
Hypothesis 8:

H8<sub>0</sub> - Computer experience is not a significant predictor of nursing faculty MIT acceptance (intent) in teaching practices in baccalaureate nursing classrooms.

H8<sub>a</sub> - Computer experience is a significant predictor of nursing faculty MIT acceptance (intent) in teaching practices in baccalaureate nursing classrooms.

The relationship between computer experience (as measured by the Computer Experience Scale) and MIT acceptance (as measured by the Behavioral Intention [BI] Scale) was investigated using Pearson Product-Moment Correlation Coefficient. Preliminary analyses were performed to ensure no violations of assumptions of normality, linearity or homoscedasticity. The results of the analysis revealed a significant positive relationship between computer experience ($M = 6.60, SD = .68$) and MIT acceptance ($M = 5.02, SD = 1.83$) and a significant correlation between the two variables, computer experience and MIT acceptance, $r = .651$, $n = 58$, $p < .01$. As a result of the analysis, the null hypothesis was rejected. Table 12 (above) provides the test results.

Hypothesis 9:

H9<sub>0</sub> - There is no relationship between perceived usefulness and MIT acceptance (intent).

H9<sub>a</sub> - There is a significant relationship between perceived usefulness and MIT acceptance (intent).

The relationship between perceived usefulness (as measured by the Perceived Usefulness Scale) and MIT acceptance (as measured by the Behavioral Intention [BI] Scale) was investigated using Pearson Product-Moment Correlation Coefficient. Preliminary analyses were performed to ensure no violations of assumptions of normality, linearity or homoscedasticity. The results of the analysis revealed a significant positive relationship between perceived usefulness ($M = 4.85, SD = 1.41$) and MIT acceptance ($M = 5.02, SD = 1.83$) and a significant
correlation between the two variables, perceived usefulness and MIT acceptance, r = .766, n = 58, p < .01 As a result of the analysis, the null hypothesis was rejected. Table 12 (above) provides the test results.

**Hypothesis Summary**

Table 13 summarizes the findings examined in this study.

*Table 13: Hypothesis Summary*

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Supported</th>
</tr>
</thead>
<tbody>
<tr>
<td>H10</td>
<td>Not Supported</td>
</tr>
<tr>
<td>H1a</td>
<td>Supported</td>
</tr>
<tr>
<td>H20</td>
<td>Not Supported</td>
</tr>
<tr>
<td>H2a</td>
<td>Supported</td>
</tr>
<tr>
<td>H30</td>
<td>Not Supported</td>
</tr>
<tr>
<td>H3a</td>
<td>Supported</td>
</tr>
<tr>
<td>H40</td>
<td>Not Supported</td>
</tr>
<tr>
<td>H4a</td>
<td>Supported</td>
</tr>
<tr>
<td>H50</td>
<td>Not Supported</td>
</tr>
<tr>
<td>Hypothesis</td>
<td>Description</td>
</tr>
<tr>
<td>------------</td>
<td>-------------</td>
</tr>
<tr>
<td>H5a</td>
<td>There is a statistically significant relationship between perceived ease of use and attitudes toward MIT. (PEOU $\rightarrow$ ATT)</td>
</tr>
<tr>
<td>H6o</td>
<td>There is no relationship between attitudes toward MIT and MIT acceptance (intent).</td>
</tr>
<tr>
<td>H6a</td>
<td>There is a statistically significant relationship between attitudes toward MIT and MIT acceptance (intent). (ATT $\rightarrow$ Intent)</td>
</tr>
<tr>
<td>H7o</td>
<td>Administrative supports (AS) is not a predictor of nursing faculty MIT acceptance in teaching practices in baccalaureate nursing classrooms.</td>
</tr>
<tr>
<td>H7a</td>
<td>Administrative supports (AS) is a predictor of nursing faculty MIT acceptance (intent) in teaching practices in baccalaureate nursing classrooms. (AS $\rightarrow$ Intent)</td>
</tr>
<tr>
<td>H8o</td>
<td>Computer experience is not a statistically significant predictor of nursing faculty MIT acceptance (intent) in teaching practices in baccalaureate nursing classrooms.</td>
</tr>
<tr>
<td>H8a</td>
<td>Computer experience is a statistically significant predictor of nursing faculty MIT acceptance (intent) in teaching practices in baccalaureate nursing classrooms. (CE $\rightarrow$ Intent)</td>
</tr>
<tr>
<td>H9o</td>
<td>There is no relationship between perceived usefulness and MIT acceptance (intent).</td>
</tr>
<tr>
<td>H9a</td>
<td>There is a significant relationship between perceived usefulness and MIT acceptance (intent). (PU $\rightarrow$ Intent)</td>
</tr>
</tbody>
</table>

**Chapter Summary**

This chapter provided demographic information and statistical analyses for the overarching research question and eight null hypotheses. Pearson Product-Moment Correlation
Coefficient was conducted to analyze the data. All eight null hypotheses were rejected, and support existed for the alternative hypotheses as summarized in Table 13. The discussion, limitations of the study, recommendations for practice, and recommendations for future research in nursing education are detailed in chapter five.
CHAPTER 5 DISCUSSION, IMPLICATIONS, AND RECOMMENDATIONS

In this non-experimental correlational study, the intent of the researcher was to determine if there was a relationship between perceived usefulness, perceived ease of use, attitudes toward MIT, administrative supports, computer experience and the criterion variable, MIT acceptance (intent) among nursing faculty who teach in CCNE-accredited pre-licensure baccalaureate nursing programs in three mid-Atlantic states (Delaware, Maryland, and Virginia) and the District of Columbia within the U.S. The study aimed to determine whether administrative supports and computer experience (as supported by the TAM constructs of perceived usefulness, perceived ease of use, attitude toward MIT) had an impact on MIT acceptance (intent) in teaching practices among the population of nursing faculty who teach in baccalaureate nursing classroom settings. Fifty-eight nursing faculty who taught in baccalaureate nursing classroom settings within three Mid-Atlantic States and the District of Columbia participated in the study, using the survey instrument designed on Qualtrics®. Analysis examined the predictors to determine why nursing faculty adopt or do not adopt MIT. This chapter provides a summary of the research, including an explanation of the findings and conclusions from the data collected during the study. In addition, the chapter includes a discussion of the implications of the study, limitations of the study, recommendations for future direction of the research, and a conclusion.

Summary of Results

The primary focus of the study was to determine relationships between predictors related to MIT acceptance from nursing faculty in baccalaureate nursing education. The study utilized TAM by Davis (1989) that included the variables of perceived usefulness, perceived ease of use,
and attitudes toward MIT on acceptance (intent). TAM has been widely used in research to assess the acceptance of technology in a variety of settings. The research assessed whether true correlation existed between perceived usefulness, perceived ease of use, attitudes toward MIT, administrative supports, computer experience and the criterion variable, MIT acceptance (intent). Participants included 58 nursing faculty who answered 100% of the questions on the survey instrument. The survey instrument was adopted from Klein, Conn & Sorra, 2001, Bauer et al., 2006, and Davis, 1989. The survey instrument consisted of 41 questions. The first 35 questions, items 1-35, measured technology acceptance based on a 7-point Likert scale, ranging from Strongly Agree to Strongly Disagree and identified predictors (perceived usefulness, perceived ease of use, attitudes toward MIT, administrative supports, and computer experience) that influenced MIT acceptance in teaching practices by nursing faculty who teach in baccalaureate nursing classroom settings within three mid-Atlantic states and the District of Columbia. The remaining 6 questions, items 36-41, collected demographic information. The results derived from Pearson Product Moment Correlation revealed significant correlation between 1) administrative supports and perceived usefulness (r = .783, n = 58, p < .01); 2) computer experience and perceived ease of use (r = .651, n = 58, p < .01); 3) computer experience and perceived usefulness (r = .642, n = 58, p < .01); 4) perceived usefulness and attitudes toward MIT (r = .975, n = 58, p < .01); 5) attitudes toward MIT and perceived ease of use (r = .847, n = 58, p < .01); 6) attitudes toward MIT and MIT acceptance [intent] (r = .780, n = 58, p < .01); 6) administrative supports and MIT acceptance [intent] (r = .692, n = 58, p < .01); and computer experience and MIT acceptance (r = .651, n = 58, p < .01).

The following overarching research question guided the study:
**RQ1:** Are the constructs of perceived usefulness, perceived ease of use, attitudes toward MIT, administrative supports, and computer experience; significant predictors of nursing faculty MIT acceptance in teaching practices in baccalaureate nursing classroom settings as defined by acceptance (intent)?

Data analysis using the Statistical Package for the Social Sciences (SPSS® 24) determined a significant relationship between nursing faculty MIT acceptance (intent) and the five independent predictors (perceived usefulness, perceived ease of use, attitude toward MIT, administrative supports, and computer experience). This corroborates the finding by Davis et al (1989). The demographic analysis of the data showed that 98.3% of respondents (n = 57) were female and 1.7% (n= 1) was male. Among age groups, 77.59% ranged between the ages 50-72 while only 20.6% (n=12) of the respondents were ages range 30-45. Of the 58 respondents, 24.1%, (n = 14) of nursing faculty had taught in nursing education for 5-9ears; 31.0% (n = 18) had taught for 15 -19; and 17.3% (n= 10) had taught for 20 years and more.

**Implications and Conclusion**

Based on the findings of this study, this research can identify predictors that induce nursing faculty to adopt (buy-into) such initiatives. Such insight can be used for diagnostic purposes and for the planning and management of MIT initiatives in baccalaureate nursing education curricula. Perceived ease of use and perceived usefulness were revealed as determinants that predict willingness to accept MIT in teaching practices and confirmed in the literature (Kowitlawakul, 2008; Sweeney, Saarmann, Flagg, & Seidman 2008; Venkatesh & Davis, 2000). External variables have also been identified as predictors for technology acceptance and use (Levin & Wadmany, 2008; Ward, et al., 2009). The following were the external variables explored in this study:
• computer experience
• administrative support
• attitude toward MIT

Findings did support these variables as predictors of nursing faculty’s willingness to accept MIT in teaching practices in the classroom.

Attitude toward technology had a strong, positive direct influence on acceptance (intent) of new technology like MIT (Albirini, 2006; Davis et al., 1989; Fishbein & Ajzen, 1975; Marzilli et al., 2014). The attitude of a nursing faculty member is not the only factor that determines the use of MIT, which is also influenced by the impact MIT may have on teaching practice in classroom settings (Davis et al., 1989; Marzilli et al., 2014). Therefore, even if a nursing faculty member does not welcome MIT into teaching practices in classroom settings, the probability that the individual will use it is high if s/he perceives that MIT will improve performance in the classroom setting (Davis et al., 1989). Prior computer experience with information technology has been identified as a key variable affecting acceptance [intent] (Lee, Kozar, & Larsen, 2003) that can influence nursing faculty’s future use of MIT in teaching practices in baccalaureate nursing classroom settings.

There are previous studies demonstrating the relationship between age and the adoption of technology in the workplace (Hernandez, Jimenez, & Martin, 2011; Pan and Jordan-Marsh, 2010; Venkatesh, Thong, & Xu, 2012). It has been shown that younger people were more open to accepting and adopting new technology (Prensky, 2001). The study demographics reflecting race were not surprising, considering the current national profile of the nursing workforce profession. In 2013, 75% of nursing professionals identified as white and only 10% black (HRSA, 2013). According to the NLN (2016), few nurses from racial/ethnic minority groups with advanced nursing degrees pursue faculty careers. In addition, of full-time nursing faculty,
16 percent were members of minority groups: African American, 8.4%; Hispanic, 3.7%; Asian, 2.7%; and American Indian, 0.4% (NLN, 2016). Only 0.6% described themselves as multiracial (NLN, 2016). The nursing profession is aware of the need to attract nursing faculty from underrepresented groups and is continually working to enhance diversity. The 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).

HRSA, 2013 noted 9% of professional nurses are males. Empirical evidence demonstrates that males and females have different perceptions about ease of use and usefulness toward information systems and thus have different system usage behavior (Gefen & Straub, 1997). Research on gender differences indicates that men tend to be highly task-oriented (Hernandez et al., 2011) and, therefore, performance expectancies, which focus on task accomplishment, are likely to be especially sapient to men. Women typically experience high levels of anxiety in using computers (Morrow, Presll & McElroy, 1986) which could lead to lower level of perceived ease of use. Men’s relative tendency to feel more at ease with computers has also been demonstrated in IS literature (Gefen and Straub, 1997). Similar findings emerged in technology acceptance studies (i. e., Venkatesh & Morris, 2000; Venkatesh et al, 2003). As a predictor of intention in the short-run, men were more influenced by instrumentality, while women were more strongly influenced by social factors and environmental constraints; however, no significant gender differences in the determinants of technology use (Morris, Venkatesh, and Ackerman, 2005). The role of gender is important in technology adoption. Educated people are more open and faster to adopt new technology when compared to less educated people (Lleras-Muney & Lichtenberg, 2002). As demonstrated in a previous study, education and the
knowledge about new technology reduces uncertainty, as well as helps with the acceptance and adoption of the new technology (Venkatesh et al., 2012).

When assessing predictors that determined why nursing faculty in baccalaureate nursing education accept or reject MIT, the key predictor was attitude towards MIT. It is crucial for the success of incorporating MIT in teaching practices in baccalaureate classroom settings to first address the attitude of nursing faculty towards accepting MIT. The results confirmed the main constructs of the TAM model, showing perceived usefulness and perceived ease of use as the main determinants of nursing faculty’s attitude towards acceptance of MIT, which, in turn, was of greater significance when determining MIT acceptance (intent) in teaching practices in baccalaureate nursing classroom settings. Findings revealed that MIT acceptance (intent) could predict nursing faculty’s actual use of MIT in teaching practices in baccalaureate nursing classroom setting.

Finally, and importantly, the positive effects of administrative supports on job outcomes have been extensively studied. Faculty who report having administrative supports experience higher levels of job satisfaction, organizational loyalty, and work-life balance as well as less stress (Baruch-Feldman, Brondolo, Ben-Dayan, & Schwartz, 2002; Greenberger, Strasser, Cummings, & Dunham, 1989; Jones & Johnston, 2000; Thomas & Ganster, 1995). Furthermore, prior studies have shown that employees are more likely to prefer and benefit from a management style that encourages employee participation, input and innovation (Bass, 1998; Church & Waclawski, 1999).

From a theoretical perspective, this research adds to the literature dealing with “willingness,” acceptance and adoption of MIT in baccalaureate nursing education. This research
also contributes to general technology acceptance and adoption literature by studying the theoretical validity and empirical applicability of the TAM model.

**Limitations of the Study**

There were a number of limitations in the study which inhibited generalizable results and introduced biases. The first limitation related to the sample size of the study. Data was collected in survey questionnaire format using a sample of nursing faculty teaching in CCNE-accredited pre-licensure baccalaureate nursing programs in three Mid-Atlantic States (Delaware, Maryland, and Virginia) and the District of Columbia within the U.S. The standard limitations of self-report data including bias and low response rate applied to this research. Of the 426 surveys distributed, only 58 were returned which resulted in a response rate of 13.6%. The sample size might not have been large enough to adequately increase the power of the significance tests, especially since the new measures were generated in the study. Data was collected from only 17 mid-Atlantic CCNE accredited baccalaureate nursing programs. Further research should include a larger population from all CCNE-accredited baccalaureate nursing programs across the United States to build a comprehensive list of all the factors at play in deciding whether to accept MITs in current teaching practices in baccalaureate nursing classroom setting. Future research with a larger population or over a longer time frame might yield differing results requiring that additional factors be included or resulting in some existing factors being modified or removed.

A second limitation related to the technologies evaluated. The study focus was on a broad category of MITs rather than one technology or technology in general. In the study, it was assumed that by evaluating MIT, generalizations could be made about this category of educational technologies in general. However, most existing studies use the TAM to measure one technology within a single sample. Perhaps future technology research studies could focus
solely on nursing faculty decisions to accept tablets or smartphones for teaching practices in classroom settings. This type of data could be helpful in providing information for institutions and nursing administrators when they are consider the appropriateness of adding either of those MITs into existing teaching practices in classrooms.

In addition, a third limitation common to all TAM studies (Yousafzai, et al., 2007) relates to the objectives of the study. The data analysis showed only the variables that influenced other variables and the strengths of those relationships. The analysis did not explain why these relationships existed.

Finally, a fourth limitation related to data conditions, i.e., small sample size which is difficult to analyze by a structural equation modeling (SEM) standard. Although some existing studies have used non-parametric techniques, the most common data analysis technique for TAM studies is SEM (Aggorowati, Iriawan, Suhartono & Gautama, 2012). It would have been more advantageous for the study to have use both data analysis techniques to test the hypotheses.

**Implications for Future Research**

The study was limiting insomuch as it surveyed only nursing faculty teaching in baccalaureate nursing classrooms in the Mid-Atlantic region of the United States. Future researchers should include multiple institutions and examine differences based on region, available resources, and faculty technology training. Additional research could also be conducted to include nursing faculty in all pre-licensure nursing programs. In addition, researchers may want to investigate if differences exist with respect to school affiliation. That type of analysis was not possible in this study because nursing faculty teaching in associate degree (AD) programs were not included within the demographics of this study.
Future researchers may also want to investigate factors that affect faculty attitudes and perceptions toward MIT teaching and learning practices in clinical settings. It was necessary to investigate the attitudes and perceptions of a large sample to add to the current research, but it would also be beneficial to analyze how the use of specific mobile applications could be used in a classroom or could be used by nursing faculty to promote informal learning. Although some studies have been done with regard to specific mobile learning activities in the classroom, new studies could focus on the capabilities of newer technologies and the investigation of how the use of MIT could affect learning.

Future research should also further develop MIT acceptance model theory as it relates to current technology and best practices, so that MIT acceptance research can acquire its own identity separate from current technology acceptance models (e.g., TRA, TPB, and TAM).

While this study employed a quantitative method for data collection, future research in this area might also include faculty focus groups to leverage the sense of community and collaboration that emerged through the interviews undertaken in qualitative research. Future researchers in this area could also consider a longitudinal study to test the prevalence and progress of MIT acceptance.

This research study has given rise to several questions regarding the culture of nursing faculty, the need for institutional change, and the best approach to classroom instruction practices for nursing students enrolled in baccalaureate nursing programs. The study has also identified a number of challenges to the implementation of changes necessary for an enriched learning environment that leverages the power of MIT, the capacity that institutions have in supporting and financing those changes, and the need for nursing faculty to re-evaluate their own roles in own teaching and learning practice and current approaches to teaching and learning in
classroom settings. Future research should focus on those questions to help institutions and nursing faculty meet the identified challenges so that effective transformation in baccalaureate nursing programs can take place in schools of nursing in the mid-Atlantic states—Delaware, Maryland, Virginia and the District of Columbia, and ultimately across the country and internationally.

**Implications for Nursing Education**

MIT offers the opportunity for nursing faculty to reshape teaching practices in baccalaureate nursing classroom settings and redefine the roles of nursing faculty as providers of content and students as the consumers of content. Working with MITs inside baccalaureate nursing classroom settings, nursing faculty and students can become partners in teaching and learning through improved interactions and access to content. With the enriched learning environments that MIT can support and encourage, schools of nursing in the mid-Atlantic states—Delaware, Maryland, Virginia and the District of Columbia could become leaders in providing learning that nurtures the development of real-world problem solving and communication skills required by today’s and future graduates. Additional and ongoing research is essential to building an understanding of how nursing faculty culture and the institution can support the changes necessary and to identifying the best approaches to implementation of appropriate MITs that would best support learning for today’s pre-licensure students as well as future generations of pre-licensure nursing students.

With the proliferation of MIT initiatives in baccalaureate nursing education, studies analyzing the acceptance and adoption of such initiatives complement existing attempts to better prepare today’s nurses for 21st century practice and meet expectations of institution administrators and stakeholders. Specifically, evaluating nursing faculty acceptance and adoption
of such MIT-based initiatives in baccalaureate nursing education provide insight regarding predictors behind the success or failure of such initiatives. In this study, the researcher employed a variation of the TAM to determine predictors driving the acceptance of MIT in teaching practices by nursing faculty in baccalaureate nursing programs in the mid-Atlantic region states (Delaware, Maryland and Virginia) and District of Columbia in the U.S. In effect, institution administrators wishing to engage in MIT initiatives need to:

- Engage in professional faculty development training programs aimed at influencing nursing faculty’s attitudes and perceptions towards MIT. Such programs should emphasize the utility of MIT to nursing faculty (for teaching practices in classroom settings and professional use) as well as the user-friendliness of MIT;

- Create and sustain a mobile-user environment;

- Institute support mechanisms such as help desks, user groups, and schools of nursing champions to facilitate the use of MIT and respond to nursing faculty’s questions and concerns regarding the effective use of MIT in teaching practices; and

- Offer incentives for best practices related MIT integration into teaching practices in classroom settings.

The results of the study should be interpreted in the light of its limitations. This research work explored the relationship between various predictors, perceived usefulness, perceived ease of use, attitudes toward MIT, administrative supports, and computer experience. However, in baccalaureate nursing education, many more factors may influence MIT acceptance by nursing faculty in current classroom teaching. Practices not addressed in the study include but are not limited to factors surrounding tenure and promotion policies of the university/college, merit pay, work load and time constraints. Further studies in technology acceptance could “shed more light on these areas.”
Chapter Summary

Chapter five presented a brief overview of the study, including brief descriptions of its research question, purpose, methodology, and major findings. The main objective of the study was to identify significant factors influencing nursing faculty’s acceptance of MIT in teaching practices in baccalaureate nursing classroom settings. This chapter discussed the findings, provided recommendations for further research, and included implication for nursing education. Conclusions from the study were provided, along with recommendations for practice and future research.
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Green, K. C. (2012). A mixed Assessment about the Effectiveness of Campus IT Investments; More Campuses Go Mobile and Slowly to the Cloud, While Fewer Experience IT Budget Cuts: The Campus Computing Project.


Kim, M. R. (2008). Factors influencing the acceptance of e-learning courses for mainstream faculty in higher institutions. *International Journal of Instructional Technology and Distance Learning, 5*, 29-44.


## APPENDIX A - Definitions of Variables in TAM and Related Models

<table>
<thead>
<tr>
<th>Variable</th>
<th>Definition</th>
<th>Models that include the variable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Behavior</td>
<td>The action, specific or general, whose prediction is of interest</td>
<td>TRA/TPB</td>
</tr>
<tr>
<td>Use (USE)</td>
<td>One specific behavior of interest performed by individuals with regard to some information technology (IT) system</td>
<td>TAM, TAM2, UTAUT</td>
</tr>
<tr>
<td>Behavioral intention (BI)</td>
<td>An individual’s motivation or willingness to exert effort to perform the target behavior</td>
<td>TAM, TAM2, UTAUT, TRA/TPB</td>
</tr>
<tr>
<td>Attitude (ATT)</td>
<td>An individual’s evaluative judgment of the target behavior on some dimension (e.g., good/bad, harmful/beneficial, pleasant/unpleasant)</td>
<td>TAM, TRA/TPB</td>
</tr>
<tr>
<td>Perceived ease of use (PEOU)</td>
<td>An individual’s perception that using an IT system will be free of effort</td>
<td>TAM, TAM2</td>
</tr>
<tr>
<td>Perceived usefulness (PU)</td>
<td>An individual’s perception that using an IT system will enhance job performance</td>
<td>TAM, TAM2</td>
</tr>
<tr>
<td>Subjective norm (SN)</td>
<td>An individual’s perception of the degree to which important other people approve or disapprove of the target behavior</td>
<td>TAM2, TRA/TPB</td>
</tr>
<tr>
<td>Perceived behavioral control (PBC)</td>
<td>An individual’s perception of how easy or difficult it will be to perform the target behavior (self-efficacy), of factors that impede or facilitate the behavior (facilitating conditions), or of the amount of control that one has over performing the behavior (controllability)</td>
<td>TPB</td>
</tr>
<tr>
<td>Effort expectancy</td>
<td>(See PEOU)</td>
<td>UTAUT</td>
</tr>
<tr>
<td>Performance expectancy</td>
<td>(See PU)</td>
<td>UTAUT</td>
</tr>
<tr>
<td>Social influence</td>
<td>(See SN)</td>
<td>UTAUT</td>
</tr>
<tr>
<td>Facilitating conditions</td>
<td>(See PBC)</td>
<td>UTAUT</td>
</tr>
<tr>
<td>Image, job relevance, output quality, results demonstrability</td>
<td>Real or perceived characteristics of IT that influence its PU</td>
<td>UTAUT</td>
</tr>
<tr>
<td>Behavioral beliefs, normative beliefs, control beliefs</td>
<td>An individual’s perceptions about specific positive/negative outcomes of performing the target behavior, specific groups or people who encourage/discourage the behavior, and specific factors or circumstances that make behavior easier/more difficult</td>
<td>TRA/TPB</td>
</tr>
</tbody>
</table>
Note: TAM, Technology Acceptance Model; TAM2, Technology Acceptance Model 2; UTAUT, Universal Theory of Acceptance and Use of Technology; TRA, Theory of Reasoned Action; TPB, Theory of Planned Behavior.
APPENDIX B - Nursing Faculty MIT Acceptance Survey 2016

Items used for measuring: **Perceived Usefulness Scale (PU)**

*Please indicate your level of agreements for the following statements from Strongly Disagree to Strongly Agree*

<table>
<thead>
<tr>
<th>Question</th>
<th>Strongly Disagree</th>
<th>Neither</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1  Using the mobile information technology in my job would enable me to accomplish more quickly.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>2  Using mobile information technology would improve my job performance.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3  Using mobile information technology in my job would increase my productivity.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4  Using the mobile information technology would enhance my effectiveness on the job.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5  Using the mobile information technology would make it easier to do my job.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6  I would find mobile information technology useful in my job.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Items used for measuring: **Perceived Ease of Use Scale (PEOU)**

*Please indicate your level of agreements for the following statements from Strongly Disagree to Strongly Agree*

<table>
<thead>
<tr>
<th></th>
<th>Strongly Disagree</th>
<th>Neither</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Question</strong></td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>7</td>
<td>Learning to operate the mobile information technology would be easy for me.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>I would find it easy to get the mobile information technology to do what I want it to do.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>My interaction with the mobile information technology would be clear and understandable.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>I would find the mobile information technology to be flexible to interact with.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>It would be easy for me to become skillful at using the mobile information technology.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>I would find the mobile information technology easy to use.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Items used for measuring: **Management Support Implementation Scale (MSIS)**

*Please indicate your level of agreements for the following statements from Strongly Disagree to Strongly Agree*

<table>
<thead>
<tr>
<th>Question</th>
<th>Strongly Disagree</th>
<th>Neither</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>13</td>
<td>Since mobile information technology came to the university, administrators and supervisors have actively pushed to make mobile information technology a success.</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>14</td>
<td>Administrators and supervisors are strongly committed to the successful implementation of mobile information technology.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Administrators and supervisors have expressed doubts about whether mobile information technology will help this university.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>Administrators and supervisors show little interest in mobile information technology.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>Administrators and supervisors stress the importance of mobile information technology.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>Administrators and supervisors take an active interest in mobile information technology problems and successes.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Items used for measuring: **Computer Experience Scale**

Please indicate your level of agreements for the following statements from Strongly Disagree to Strongly Agree

<table>
<thead>
<tr>
<th>Question</th>
<th>Strongly Disagree</th>
<th>Neither</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>19  The computer has become an essential part of my life.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>20  I find myself using computers more and more during my free time.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>21  My computer is an important part of my day-to-day life.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>22  The Internet is an important part of my daily life.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>23  When I need to find information about a topic that is new to me, the Internet is my first source.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Items used for measuring: **Behavioral Intention (Acceptance) Scale**

*Please indicate your level of agreements for the following statements from Strongly Disagree to Strongly Agree*

<table>
<thead>
<tr>
<th>Question</th>
<th>Strongly Disagree</th>
<th>Neither</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>24 Given the chance, I intend to use mobile information technology in the classroom in the next 12 months.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25 Given the chance, I predict I would use mobile information technology in the classroom in the next 12 months.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>26 Given the chance, I plan to use mobile information technology in the classroom in the next 12 months.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Items used for measuring: **Attitude toward MIT Scale**

*Please indicate your level of agreements for the following statements from Strongly Disagree to Strongly Agree*

<table>
<thead>
<tr>
<th>Question</th>
<th>Strongly Disagree</th>
<th>Neither</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>27  I believe using mobile information technology is a good idea.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>28  I believe using mobile information technology is a wise idea.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>29  I like the idea of using mobile information technology.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>30  I feel using mobile information technology is pleasant.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>31  I believe using mobile information technology is a beneficial idea.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>32  I believe using mobile information technology is not time consuming.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>33  I believe using mobile information technology is valuable.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>34  I believe using mobile information technology is an appealing idea.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>35  I believe using mobile information technology is an interesting idea.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Survey Questions

Demographic Questions

36. What is your academic rank?
   - Instructor
   - Assistant Professor
   - Associate Professor
   - Professor
   - Visiting Professor
   - Other (please explain) ____________________

37. What is your Gender?
   - Male
   - Female

38. What is your race/ethnicity?
   - White/Caucasian, non-Hispanic
   - Black/African American, non-Hispanic
   - Hawaiian and Pacific Islander
   - Asian
   - Two or more races
   - Other (Please State) ____________________

39. Are you Hispanic?
   - Yes
   - No

40. What is your highest degree of education?
   - Baccalaureate (for example: BA, AB, BS)
   - Masters (for example: MA, MS, MSN, MBA)
   - Doctorate (for example: PhD, EdD)
   - Professional Degree (for example: DNP, MD, JD)
   - Post-doctoral Education

41. What is your birth year? _______________
Thank you for your participation!

This instrument was adapted from the references below:


APPENDIX C – IRB Approval

April 13, 2016

Crystal Day-Black, MSN
ELPTS
College of Education
University of Alabama
Box 870302

Re: IRB # EX-16-CM-036 “Predictors of Faculty Acceptance and Use of Mobile Information Technology Integration in Baccalaureate Nursing Education”

Dear Ms. Day-Black:

The University of Alabama Institutional Review Board has granted approval for your proposed research. Your protocol has been given exempt approval according to 45 CFR part 46.101(b)(2) as outlined below:

(2) Research involving the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures or observation of public behavior, unless:
(i) information obtained is recorded in such a manner that human subjects can be identified, directly or through identifiers linked to the subjects; and (ii) any disclosure of the human subjects’ responses outside the research could reasonably place the subjects at risk of criminal or civil liability or be damaging to the subjects’ financial standing, employability, or reputation.

Your application will expire on April 12, 2017. If your research will continue beyond this date, complete the relevant portions of Continuing Review and Closure Form. If you wish to modify the application, complete the Modification of an Approved Protocol Form. When the study closes, complete the appropriate portions of FORM: Continuing Review and Closure.

Should you need to submit any further correspondence regarding this proposal, please include the assigned IRB application number.

Good luck with your research.

Sincerely,

[Signature]

[Name]
Office for Research Compliance
APPENDIX D - Informed Consent

Message line: “Research Invitation”

UNIVERSITY OF ALABAMA
HUMAN RESEARCH PROTECTIONS PROGRAM

Crystal Day-Black, Principal Investigator from the University of Alabama, is conducting a study called Predictors of Faculty Acceptance and Use of Mobile Information Technology Integration in Baccalaureate Nursing Education. She wishes to examine factors that predict nursing faculty’s willingness to accept and use mobile information technology (e.g. smartphones and tablet pc’s) in baccalaureate nursing classroom, clinical and laboratory settings.

Taking part in the study involves completing a two-part web survey that will take about 15-30 minutes. These surveys contain questions about nursing faculty’s current mobile information technology use and beliefs about use of mobile information technology in baccalaureate nursing classroom settings.

We will protect your confidentiality by avoiding mention of participant names and/or affiliated schools of nursing. Only the investigator will have access to the data. The data are password protected. Only summarized data will be presented at meetings or in publications.

There will be no direct benefits to you. The findings will be useful to nursing faculty, institutions, and organizations to restructure educational curricula and classroom, clinical and laboratory settings to bridge the existing mobile information technology gap in nursing education and practice.

The chief risk is that some of the questions may make you uncomfortable. You may skip any questions you do not want to answer.

If you have questions about the study, please contact Crystal Day-Black, investigator by email cydayblack@crimson.ua.edu or my University of Alabama faculty advisor, Dr. Douglas McKnight at 205-348-1449. If you have questions about your rights as a research participant, contact Ms. Tanta Myles (the University Compliance Officer) at 205-348-8461 or toll-free at 877-820-3066. If you have complaints or concerns about the study, file them through the University of Alabama IRB outreach website at http://osp.ua.edu/site/PRCO_Welcome.html. Also, if you participate, you are encouraged to complete the short Survey for Research Subjects online at this website. This helps University of Alabama improve its protection of human research subjects.

YOUR PARTICIPATION IS COMPLETELY VOLUNTARY. You are free not to participate or stop participating any time before you submit your answers.

If you understand the statements above, are at least 18 years old, and freely consent to be in the study, click on the I AGREE button to begin.

○ I agree
o I disagree
APPENDIX E - Electronic Message to Dean (First Message)

ELECTRONIC INVITATIONAL MESSAGE TO DEAN

Date: ______________

Dear Dean:

I am writing to request your assistance with a survey for my dissertation at The University of Alabama, Tuscaloosa, entitled “Predictors of Nursing Faculty Acceptance and Usage of Mobile Information Technology in Baccalaureate Nursing Education.”

The survey responses will be collected electronically with an instrument that takes approximately 15-30 minutes to complete. The survey is completely anonymous so no issues of confidentiality will be violated.

The purpose of the study is to examine factors that predict willingness of nursing faculty’s acceptance and usage of mobile information technologies in baccalaureate nursing programs’ (traditional and accelerated) classroom settings. Additionally, the study will attempt to describe the extent of the influence of these factors on nursing faculty at Mid-Atlantic Region Schools of Nursing.

Mobile information technology is characterized by wireless communications and support mobile applications that typically run on wireless mobile computing devices such as smartphones and tablets.

Please respond to this message (cydayblack@crimson.ua.edu) if you agree to let your institution participate by May 23, 2016.

When I receive your approval, I will send another e-mail message to confirm the start and end of the data collection. Nursing faculty listed on your School’s website will receive an email invitation which will include an attached Informed Consent Form and instructions for how to access and complete the survey.

After one week, a second message will be forwarded to your faculty to encourage those that have not participated in the study to respond.

I urge you to participate in this research project as its topic is timely and relevant in today’s educational environment. I also ask that you encourage your full- and part-time faculty members to complete the survey in a timely manner.

A summary of the study results will be available upon request.

Thank you for your time and attention.

Sincerely

Crystal Day-Black
Doctoral Student
College of Education
cydayblack@crimson.ua.edu

Dr. Douglas McKnight
Faculty Advisor
College of Education
dmcknigh@bama.ua.edu
APPENDIX F - Electronic Message to Faculty (First Message)

ELECTRONIC INVITATIONAL MESSAGE TO FACULTY
First Message

Date: ______________

Dear Colleague:

My name is Crystal Day-Black. I am a nursing professor in a baccalaureate nursing program and doctoral candidate at the University of Alabama. I am conducting a research project focusing on attitudes about mobile information technology and nursing education among full-and part-time faculty members. This research is being conducted to fulfill dissertation requirements for the degree of Doctor of Education. I am writing to request your participation in this brief survey.

Mobile information technology is characterized by wireless communications and support mobile applications that typically run on wireless mobile computing devices such as smartphones and tablets.

The nursing faculty of baccalaureate nursing programs in the Mid-Atlantic region of the United States are being invited to participate in my research. Your institution is one of the 17 nursing programs that have been selected to participate in this research so each faculty member’s participation in the study is very important.

The surveys are very brief, survey one will take about 15 minutes to complete.

I urge you to participate in this research project, as the topic is timely and relevant in today’s educational environment.

I am willing to share the results of my study with anyone who is interested. If you have any questions or comments, you may contact me at the email listed below.

Thank you for your time and attention.

Sincerely

Crystal Day-Black
Doctoral Student
College of Education
cydayblack@crimson.ua.edu

Dr. Douglas McKnight
Faculty Advisor
College of Education
dmcknigh@bama.ua.edu

Follow this link to the Survey:
Take the survey
Or copy and paste the URL below into your internet browser:
https://baruch.az1.qualtrics.com/SE/?Q_DL=734qGMetCpX1hYx_5i5mhdXHet5uV3n_MLRP_3jc0XE0ZZLZyuyx
&Q_CHL=email

Follow the link to opt out of future emails:
Click here to unsubscribe
APPENDIX G - Electronic Message to Faculty (Second Message)

ELECTRONIC MESSAGE TO FACULTY
Second Message

Date: ______________

Dear Colleague:

You should have recently received a request to participate in research that I am conducting at your institution concerning “Predictors of Nursing Faculty Acceptance and Usage of Mobile Information Technology in Baccalaureate Nursing Education.”

If you have already completed the survey, thank you very much for your time and assistance. If you have not, I encourage you to participate.

The responses will be collected electronically with a questionnaire that takes only 15-30 minutes to complete. The survey is completely anonymous so no issues of confidentiality will be violated. The survey will need to be completed by October 31, 2016.

If you would like to participate in the study, please open the attached Informed Consent and click on the link at the bottom of the document to open the survey instrument.

I urge you to participate in this research project as its topic is timely and relevant in today’s educational environment.

I am willing to share the results of my study with anyone who is interested. If you have any questions or comments, you may contact me at cydayblack@crimson.ua.edu.

Thank you for your time and attention.

Sincerely,

Crystal Day-Black                                      Dr. Douglas McKnight
Doctoral Student                Faculty Advisor
College of Education                                               College of Education
cydayblack@crimson.ua.edu                                     dmcknigh@bama.ua.edu

Follow this link to the Survey:
Take the survey
Or copy and paste the URL below into your internet browser:
https://baruch.az1.qualtrics.com/SE/?Q_DL=734qGMeCpXt1hYx_5j5mhdXHet5uV3n_MLRP_3gc0XE0ZZLZyuyx&Q_CHL=e
mail
Follow the link to opt out of future emails:
Click here to unsubscribe
APPENDIX H - Permission Letters

Permission Letter I

I am a doctoral student at the University of Alabama, Tuscaloosa conducting a dissertation research study on nursing faculty acceptance and use of mobile learning technologies ("anytime, anywhere learning") with the assistance of a mobile handheld device (e.g., smartphone) in the classroom by evaluating the relationships among perceived usefulness, perceived ease of use, attitude towards using behavioral intentions to use and actual use.

I am seeking permission to adopt your "Technology Acceptance Model (TAM) questionnaire.

If you have any questions or concerns feel free to contact me or my faculty advisor, Dr. Doug McIlhag, College of Education at dock@bama.ua.edu.

Sincerely,

Crystal Day-Black, graduate student
The University of Alabama
College of Education
cydayblack@crimson.ua.edu

Sent from Windows Mail

Fred Davis <fdavis@salton.uak.edu>

To: me

Crystal
You have my permission to use the TAM questionnaire for your research.
best wishes
Fred Davis

From: cydayblack@crimson.ua.edu <cydayblack@crimson.ua.edu>
Sent: Saturday, June 27, 2015 8:50 AM
To: Fred Davis
Subject: Request permission to adopt TAM Questionnaire

Crystal Day-Black <cydayblack@crimson.ua.edu>

To: Fred

Thank you very much for such a timely response. I am grateful. Crystal
APPENDIX I - Permission Letters

Permission Letter II

Request for Scale

C. Black <C.Black@cappin.edu>
Fri 5/20/2016 4:49 PM

From: Talya Bauer <cetb@pdx.edu>
Date: May 20, 2016 at 4:41:55 PM EDT
To: "C. Black" <c.black@cappin.edu>
Subject: Re: Request for Scale
Reply-To: <TalyaBauer@pdx.edu>

Hello,

Here are the items I found in a survey using this scale.

Good luck with your work in this area.- Talya.

<table>
<thead>
<tr>
<th>Attitudes Towards Computers and the Internet</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. The computer has become an essential part of my life.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>2. I find myself using computers more and more during my free time.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>3. My computer is an important part of my day-to-day life.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>4. The Internet is an important part of my daily life.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>5. When I need to find information about a topic that is new to me, the Internet is my first source.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

Talya M. Bauer, Ph.D.
Cameron Professor of Management
Associate Editor, Journal of Applied Psychology
Area Director, Management & Leadership/MRM
School of Business Administration
Portland State University
SBA 674 | 631 SW Harrison St. | Portland, OR 97201
(503) 725-5660 | talyabauer@pdx.edu | @TalyaBauer
https://sites.google.com/a/pdx.edu/talya-bauer/
APPENDIX J - Permission Letters

Permission Letter III

>From: <Klein>, Katherine
><kleink@wharton.upenn.edu<mailto:kleink@wharton.upenn.edu>>
>Date: Monday, September 7, 2015 at 4:30 PM
>To: Crystal Black
><"C. Black" <cblack@coppin.edu>>
>Subject: RE: Request for Scale

>Thanks for your interest. I've attached a document which includes the
>survey items you're looking for, as well as others.
>
>From: C. Black<mailto:cblack@coppin.edu>
>Sent: Saturday, September 05, 2015 11:01 AM
>To: Klein, Katherine
><kleink@wharton.upenn.edu<mailto:kleink@wharton.upenn.edu>>
>Subject: Request for Scale
>
>Hi Professor Klein,
>
>My name is Crystal Day-Black. I am a doctoral student at the University of Alabama. I would like your
>permission to include the 6-item scale in the study below to measure Management Support for
>MRPTOD implementation:
>Klein, K. J., Conn, A. B. & Sonca, J. S. {2001}. Implementing
>computerized technology: An organizational
>analysis<http://www-management.wharton.upenn.edu/klein/documents/Klein_Con
>>Thanks for your assistance.
>>Crystal