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Acceptance of integration of mobile technology in the higher education environment : instructors' perception

Shawnice L. Avilez

ABSTRACT

ACCEPTANCE OF INTEGRATION OF MOBILE TECHNOLOGY IN THE HIGHER EDUCATION ENVIRONMENT: INSTRUCTORS' PERCEPTION

Shawnice L. Avilez, Ph.D.
Department of Educational Technology, Research, and Assessment
Northern Illinois University, 2017
Wei-Chen Hung, Director

The purpose of this survey research was to determine factors that influenced college instructors' behavioral intentions to use mobile technology.

The study extended the Technology Acceptance Model (TAM) framework, with subjective norm and facilitating conditions acting as potential predictors of instructors' behavioral intention and self-reported intention to use mobile technology (iPads/laptops). A survey instrument was adapted by the author from published guidelines and prior research surveys. The survey was delivered using Qualtrics, a web-based survey tool. The survey instrument included items based on the constructs of the TAM model. The researcher analyzed the data using multiple regression analyses. Utilization of TAM was based heavily on its predictive ability to measure users' acceptance or rejection of technological innovations within an organization.

The findings of this study suggest that despite the moderate fit of the overall model to the data, TAM is nonetheless useful for predicting college instructors' behavior intention to utilize mobile technology within the higher education environment. While none of Davis's (1989) main predictors influenced the user's intent to utilize mobile technology, subjective norms provided the strongest prediction. It was the strongest predictor in explaining the variance, a finding that

differed from the majority of empirical research that employed TAM in mobile and other learning technology research.

Consideration of emerging technological tools, such as mobile technology, as an educational resource can be viewed as an important step for tertiary level administrators. Examining the relationship between current usage of mobile technology and college instructors' behavioral intentions to use the device can shed light on future adaption patterns of mobile technology in the higher education environment. The findings of this study have a number of implications. First, by investigating the manner in which mobile technology is being used by instructors in the higher education environment, school administrators could use the findings (a) to improve technology implementation and utilization strategies; and (b) to support making decisions and regulations related to the use of mobile technology. In addition, the results of this study can be used to make informed strategic decisions regarding technological integration within the higher education environment. By capitalizing on the relationships between subjective norms and facilitating years (experience) with college instructors' intention, administrators can creatively and effectively increase use of technological tools in the higher education environment.

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SHAWNICE L. AVILEZ

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DEDICATION

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CHAPTER 1

INTRODUCTION

The functionality of mobile technology has evolved tremendously. The history of mobile technology started with a two-way pager in the 1940s to 1983, when the first handheld mobile phone was launched by Motorola. In the 1990s, tablet computers were deployed; however, it was not until 2010 that Apple tablets were launched as the real alternative to phones and personal computers (Tayebinik & Puteh, 2012). The evolution of mobile technology has reshaped the lives of society, by impacting the socio-economic lifestyle of modern-day society (Affolderbach & Schulz, 2016; El-Hussein & Cronje, 2010, p. 12). In addition to societal change, this progress is reshaping the educational institution (Drijvers, 2015; Oblinger, 2010, p. 4; Nguyen, Barton, & Nguyen, 2015).

Oblinger (2010) noted that a future challenge for higher education is the need to consider the innovations of the digital age. Historical technological challenges have led scholars to question the future of higher education. Gourley (2010) questioned, "Is innovation being embraced quickly enough? Have we reached a scale necessary to the task? Can technology help? Can we bring more hands to the wheel? Are we managing and leading in an appropriate way?" (p. 5). Noeth and Volkov (2004) asked, "How and when will evaluation of technology's impact on teaching, learning, and achievement be done? How will accountability for implementation be assessed? How will technology be used to evaluate teaching and learning?" (p. 10). The proposed questions can be addressed through research studies that focus on

technological innovations being used to improve learning and teaching within the educational learning environment.

According to Atwell and Hughes (2010), universities are exploring the use of technological tools that have the ability to (a) establish a relationship with students; (b) support student success; and (c) manage resources and eliminate redundancy. Jackowski and Akroyd (2010) noted that such ‘‘trends indicate that the use of technology for instructional purposes in community colleges will continue to increase’’ (p. 632). In an attempt to generate 21st-century competencies in college students, Montoya and Hernández (2016) conducted a research study on how flexibility, technology, and innovation impacted the learning environment. By utilizing mobile technological tools, institutions can obtain the necessary technological support required to improve learning and teaching within the 21st-century educational environment.

To equip students with the required skills for the 21st-century workforce, educational professionals will constantly need to explore, implement, and evaluate the use of emerging technological tools within the educational environment. Technology is forcing rapid changes in higher education that cannot be ignored. If universities are to remain competitive in the new millennium, they must effectively integrate technology across the university community. They must utilize technology to support and enhance the efficiency and effectiveness of the institution’s policies and procedures (Bozeman, Rimes, & Youtie, 2015; Jackowski & Akroyd, 2010).

Background

Technological tools have continuously evolved, from the development of radio in 1901 to the current 21st-century utilization of mobile technology as a platform for online learning

(eLearning) and mobile learning (mLearning). The integration of technological tools within the learning environment has increased over the long history of education. As technology continues to advance, implementation of technological tools as educational resources to support teaching and learning can be noted throughout the educational system (Azar & Nasiri, 2014; Grinager, 2006; Jaradat, 2014; Noeth & Volkov, 2004; Sung, Chang, & Liu, 2016). As new technologies emerge, higher education institutional leaders are working aggressively to implement various technological innovations that would effectively and efficiently enhance and support the learning environment (Economist Intelligence Unit, 2008).

The emergence of technological devices, such as mobile technology, can and has impacted the field of educational technology (Editorial Projects in Education Research Center, 2011). The origin of mobile technology can be dated as early as the 1940s, when pagers were first introduced. According Sarrab and Elgamel (2012), mobile devices are portable equipment such as wireless laptops, Personal Digital Assistants (PDAs), and smart phones. These devices are not just limited to the classroom; they are useable as learning devices in various environments. For the purposes of this study, “mobile technology" and “mobile devices” are defined as technological tools such as iPads and laptops. With the use of mobile technologies, educational institutions can provide learners with increased access to learning materials (Shohel & Shrestha, 2010) and other educational opportunities (Domingo & Gargante, 2016; Rahamat, Shah, Din, & Aziz, 2017; Sung et al., 2016); hence, the development of mobile learning.

Kukulska-Hulme and Traxler (2005) noted the following:

> Mobile learning can be spontaneous, portable, personal, situated; it can be informal, unobtrusive, ubiquitous and disruptive. It takes us much nearer to “anytime, anywhere”

> learning but it is still too early to predict how our understandings of learning and teaching will evolve as a consequence. (p. 42)

The current development of mobile technology has sparked institutional leaders to redefine their instructional delivery modes by utilizing various forms of mobile technologies: iPads and laptops. Siemens and Matheos (2010) suggested that two trends exist in education: (a) learners having freedom to access, create, and recreate their learning content; and (b) learners having opportunities to interact outside of a learning system. Engagement and interaction through technology is viewed as an essential aspect for both students and professors in the educational environment. Research has suggested that technological integration in higher education improves teaching and learning when integrated appropriately (Surry & Land, 2000). According to Sarrab and Elgamel (2012), mobile learning (mLearning) resulted from the integration of modern mobile devices integrated within the educational learning environment. This new emerging trend utilizes mobile technological tools to enhance training, learning, and teaching in the educational environment. The authors noted that "using modern methods and techniques integrated in M-learning, help in making the learning of our students more interesting, more interactive, widely available and flexible" (p. 32). The use of mobile technology provides great opportunities for learning inside and outside the classroom (Sung et al., 2016).

The use of mobile technology as a technological resource tool plays a valuable role in the educational environment as long as it is used appropriately, supports the learning pedagogy, and does not detract or distract from the content structure and organization (Murray & Olcese, 2011). Consideration of emerging technological tools, such as mobile technology, as an educational

resource can be viewed as an important step for tertiary level administrators. Mobile technological tools can help transform classroom focus by changing the traditional way of teaching to a more conducive mobile learning environment. Therefore, an "examination" of the relationship between current usage of mobile technology and instructors' behavioral intentions to use such devices can shed light on future adaption patterns of mobile technology in the higher education environment.

Purpose of the Study

The purpose of this survey research was to determine if college instructors' behavioral intentions to use mobile technology are related to their perception and attitude. The researcher proposed to empirically examine the relationships among the following constructs: perceived usefulness (PU), perceived ease of use (PEU), and attitude towards using (ATU) the system. Utilizing mobile technology as a vehicle that promotes and enhances learning is an emerging trend in educational environments; as a result, the integration of mobile technology within the higher education environment has been endorsed as an essential academic tool (Johnson, Adams, & Cummins, 2012; Kim, Mims, & Holmes, 2006; Mac Callum, Jeffrey, & Kinshuk, 2014; Marmarelli & Ringle, 2011; Raths, 2012). This research study focused on the technological innovation of mobile technology within the higher education environment.

The rapid evolution of emergent technology requires the need for additional empirical research on the implications of instructors' behavioral intentions to use technological devices within the higher education environment. There has been a significant growth in research to study the advancement of mobile technology and its value and utilization within the educational environment (Cochrane, Narayan, & Oldfield, 2011; Mac Callum et al., 2014; Oakley, Pegrum,

Faulkner, & Striepe, 2012; Pegrum, Howitt, & Striepe, 2013; Rahamat et al., 2017; Sung et al., 2016). Empirical studies have shown that technology resistance is still visible amongst a large population of instructors due to their technological beliefs and the required technological skills needed to effectively integrate mobile technology within the educational curriculum (Mac Callum et al., 2014). With the research data collected, educational professionals can articulate the importance of mobile technology and how mobile technology can be used effectively and efficiently within the educational system. Much can be learned to better facilitate meaningful integration of technological resources and processes by providing an analysis of how technology is actually used within the higher education environment.

The improvement of instructional and learning processes within the educational environment can be supported by the integration of mobile technology. However, the success of mobile technology as an academic tool depends on several factors, one being the instructors' behavioral intentions to use the tool for educational purposes (Mac Callum & Jeffrey, 2013). By focusing on the variables that contribute to an individual's decision to utilize technological tools, these characteristics may help in determining why some college instructors utilize mobile technological tools while others do not. A more consistent use of mobile technology may result in a more engaging educational experience for both students and faculty.

Utilization of mobile technology (iPads and laptops) to support instructional processes can be adapted for a range of pedagogical practices. Empirical studies have shown statistically significant effects when mobile technology is integrated for variety of educational processes, such as policies, support, and beliefs (Cochrane, et al., 2011; Oakley et al., 2012; Pegrum, Oakley, & Faulkner, 2013) and within a range of academic disciplines including language

learning (Azar & Nasiri, 2014; Jaradat, 2014; Lai, 2013), science (Samms & Mozayani, 2012; Sung et al., 2016; Walsh, Sun, & Riconscente, 2011), and mathematics (Bryant et al., 2015; Cristol & Gimbert, 2011). Overall, the findings indicated that there is a gradual increased usage of mobile technology in the educational environment. However, more research is required to appropriately examine the mainstreaming of mobile technology within the educational environment.

There is a need to review more pilot technological innovations that incorporate the use of emerging technological tools as a pedagogical resource; more data should be collected to encourage a broader acceptance of said resource (Moran, Hawkes, & Gayar, 2010). The integration of any technological tool should focus on its educational possibilities, answering the "when, why and how." As mobile technologies are shared and adopted as academic tools within the educational system, a continuous review of instructors' and students' educational experience is required. Additional research is needed to determine the optimal educational usages for mobile technology as academic tools (Mac Callum et al. 2014). For educational technology professionals, the literature reviewed and the data collected can be used to conceptually address effective ways of integrating mobile technologies within the educational environment (Park, 2009).

Significance of the Study

By studying the instructors' behavioral intentions, the researcher hoped to determine if college instructors' behavioral intentions to use mobile technology are related to their perception and attitude. The relevance of this study is that an examination of instructors' behavioral intentions to utilize mobile technology (iPads/laptops) could contribute to enhanced usage of

mobile technology in the educational environment. Previous scientific studies (Chau & Hu, 2002; Thong, Hong, & Tam, 2002) that have tested the Technology Acceptance Model (TAM) did not examine the actual system use, which is identified as a construct in the original model. Utilization of this model will not only explain key factors of user acceptance to technology, but also its usage.

Kim et al. (2006) stated that there has been an increase in the use of mobile technological tools as important resources for teaching and learning (p. 77). Exploration of mobile technology within the higher education environment may require educational scholars to redefine or extend studies utilizing various technology acceptance frameworks, such as TAM and/or TRA. As an educational professional, it is important to streamline the user's behavioral intentions and their ability to influence the actual use of the technology. The synergy between mobile technology and the higher education environment holds huge potential for learning and teaching at the tertiary level (Kim et al., 2006).

This researcher examined the potential link between instructors' behavioral intention and self-reported intention to use mobile technology (iPads/laptops) to determine if there is a statistical significance; the researcher analyzed the data by using multiple regression analyses.

Research Question

Utilizing mobile technology as a vehicle that promotes and enhances learning is a trend that is constant in the educational environment (Economist Intelligence Unit, 2008; Kim et al., 2006). This research study focused on the stated trend in the higher education environment. The research question was tailored for a specific population of instructors, to examine their behavioral intentions for actual use of mobile technology within the educational environment.

The following question served as a guide for the research:

Research Question: What factors influence university instructors' intention to use the mobile devices to support teaching and instruction?

Research Hypotheses

H_1: Perceived usefulness (PU) will have a relationship with the instructor's behavioral intention to use (BI) mobile technology.

H_2: Perceived ease of use (PEU) will have a relationship with the instructor's behavioral intention to use (BI) mobile technology.

H_3: Attitude towards computer use (AU) will have a relationship with the instructor's behavioral intention to use (BI) mobile technology.

H_4: Subjective norm (SN) will have a relationship with the instructor's behavioral intention to use (BI) mobile technology.

H_5: Facilitating conditions (FCs) will have a relationship with the instructor's behavioral intention to use (BI) mobile technology.

H_6: There is a relationship between the instructors' demographic characteristics and their behavioral intention (BI) to use mobile technology.

Theoretical Framework/Constructs

Educators and school administrators have integrated the use of technology to support teaching and explore different learning strategies in the educational environments to accommodate the diverse learning population (Grinager, 2006). Despite the increased

availability and support of technological innovations within the educational environment; incomplete technological integration is still being noted (Chong, 2012).

Various underlying problems are identified when technological innovations are implemented throughout an organization (Economist Intelligence Unit, 2008). To address the notion of technological integration within the educational environment, Davis's (1989) Technology Acceptance Model (TAM) was adopted as the theoretical framework to support this study. TAM is an extension of Fishbein and Ajzen's Theory of Reasoned Action (TRA). TRA states that an individual's behavioral intention (BI) is developed from both the attitude (A) that the individual has towards the behavior and the subjective norm (SN). As a result, the actual behavior (B) is a result of the behavioral intention (1975).

Utilization of TAM was based heavily on its predictive ability to measure users' acceptance or rejection of technological innovations within an organization. According to Hu, Chau, Sheng, and Tam (1999), TAM has been one of the most developed research areas in current information systems research, due to its ability to explain the adoption of new information technologies.

The Technology Acceptance Model (TAM) created by Davis (1989) documents the implementation process and the core factors that influence users' acceptance of technology. The model suggests that the actual use of the system (AU) can be explained by the following constructs: perceived usefulness (PU), perceived ease of use (PEU), attitude towards using (ATU) the system, and behavioral intention (BI) to use the system, as shown in Figure 1. Davis defined the primary factors as follows:

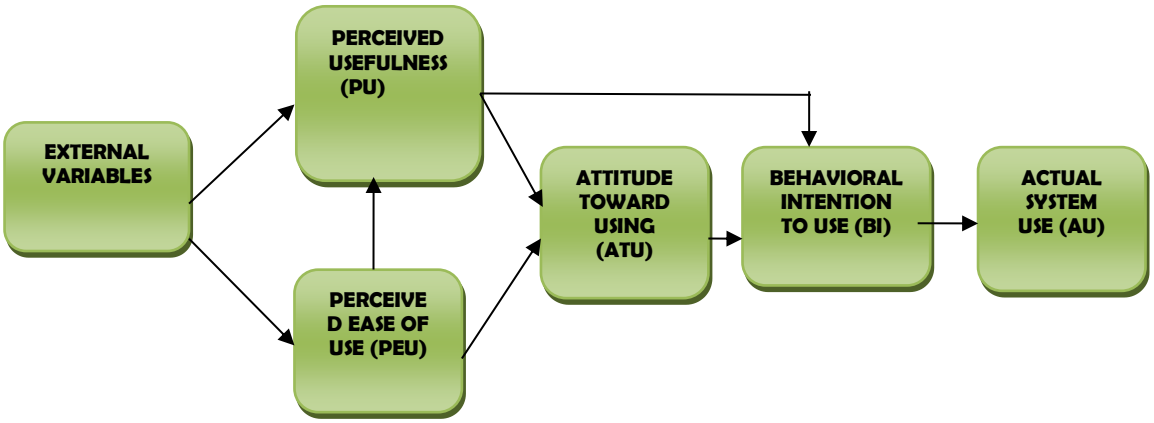

Figure 1. Technology Acceptance Model (Davis, 1989).

a. **Perceived Usefulness** is defined as "the degree to which a person believes that using a particular system will enhance his or her job performance."
b. **Perceived Ease of Use** refers to "the degree to which a person believes that using a particular system would be free of effort." (1989, p. 320)

Prior studies (Teo, 2009; Venkatesh & Davis, 2000) identified two external variables (subjective norm and facilitating condition) as additional predictors that impact intention to use a system. In addition, perceived usefulness is suggested to influence both attitude and behavioral intention. As a result, it was necessary to posit six research hypotheses for this study, as discussed in Chapter 3.

Emerging technology, along with the increased investment in technological resources, has had a substantial impact on the educational environment. The Center for Digital Education reported that the total educational IT spending in 2010-2011 was approximately $19.7 billion—$9.4 billion for K-12 and $10.3 billion for higher education. Educational IT spending in 2015 was reported as increased to approximately $21 billion.

As technological investment increases, executive board members within the educational institution should make every attempt to comprehend why technological innovation is accepted or rejected in various circumstances. Users' behavioral intentions can impact the technological design and implementation processes. As a result, educational leaders must be strategic with the methods they use to diffuse technological tools within the educational community; they must be proactive to ensure that there are minimal factors that can negatively impact the utilization of the technology (Economist Intelligence Unit, 2008).

The conceptual framework of this research study was structured to explain the focus, methods, underlying theory, variables, and their relationships to technology acceptance and TAM as applied within the higher education environment. The implementation process and acceptance of technological innovations are complicated processes, as they include multifaceted decisions. Perceived ease of use, perceived usefulness, attitude towards using the system, behavioral intention to use the system, and actual use of the system are all variables that can successfully influence technological innovations and acceptance within an organization (Davis, 1989). As a result, various studies have been conducted to understand and assess the impact and success of technological innovations within the higher education environment. The results of these research efforts were used to develop evidence-based strategies that will contribute to making the technological integration process as effortless as possible.

The fundamental components for this study were established by the use of previous research studies, which all methodologically addressed the technology acceptance behavior amongst the users according to influential factor(s). The studies captured users' perceptions of technology implementation and utilization within the educational environment (Cassim &

Obono, 2011; Holden & Rada, 2011). The following studies—Davis, 1989; Cassim & Obono, 2011; Holden & Rada, 2011; Park, 2009; Shroff, Deneen, & Ng, 2011; Almaiah, Jalil, & Man, 2016—all examined TAM theoretical frameworks to theorize users' acceptance of technological innovations. Overall, the studies concluded that users' acceptance of technology was mainly influenced by two determinants: ease of use and perceived usefulness. Perceived usefulness was identified as a major influential factor for user technology acceptance, as it significantly influences attitude, behavioral intention, or technology usage.

Since the development of TAM (Davis, 1989), researchers have thoroughly assessed human behavior in relation to technological innovations (Davis, 1989; Venkatesh & Davis, 2000; Venkatesh, Morris, Davis, & Davis, 2003) in an attempt to understand why system innovations were accepted or rejected within the educational environment. Because each study reviewed various factors influencing technological innovations and acceptance, the findings from the studies were applicable to the current research.

Considering that TAM can be extended and utilized to assess the instructors' behavioral intention to adopt and utilize mobile technology (iPads/laptops) within the educational environment, the theoretical model was used as a predictive tool to assess instructors' actual use of technology within the higher education learning environment.

The ability to effectively and efficiently utilize mobile technology throughout the learning environment is commendable. The successful adaptation and utilization of the current technological trend (mobile technology) within the higher education environment requires a holistic understanding of the variables that can impact the acceptance and adaptation of new

technology. The literature reviewed suggests that the variables can be easily associated with Davis's (1989) stated determinants that influence users' technological acceptance.

While mobile technology covers a vast area, the focus of this research study was the utilization of mobile (iPad/laptops) technological devices as recruitment and/or retention tools in the higher education environment. By utilizing the findings from research reviewed (Davis, 1989; Venkatesh et al., 2003), an attempt was made to understand if instructors' behavioral intentions of mobile technology will influence their actual use of the technological device. Because my predecessors reviewed various influential factors impacting technological adaptation and usage in the learning environment, the findings from these previous studies were applicable to this research.

Definitions

For the purposes of this research, key terms are defined as follows:

Actual Use of System (AU): The amount of usage over a fixed period of time.

Attitude towards Using System (ATU): is defined as the users' favorable or unfavorable opinions towards using technology that determines the extent to which they intend to use it.

Behavioral Intention to Use System (BI): is defined as the users' intention to use the technology (Ajzen, 1991).

DTpB: Decomposed Theory of Planned Behavior is an extension to TpB (Taylor & Todd, 1995b).

Facilitating Condition (FC): The degree to which an individual believes that an organizational and technical infrastructure exists to support use of the system (Fishbein & Ajzen, 1975).

Perceived Ease of Use (PEU): refers to "the degree to which a person believes that using a particular system would be free of effort" (Davis, 1989).

Perceived Usefulness (PU): is defined as "the degree to which a person believes that using a particular system will enhance his or her job performance" (Davis, 1989).

Perception of Support: For the purposes of this study, perception refers to how full-time faculty saw, felt about, or perceived the support and services received at TSU.

TAM: Technology Acceptance Model (TAM). TAM is rooted in the TRA, which has been applied to predicting and explaining users' behaviors across a wide variety of domains (Davis, 1989).

TpB: The Theory of Planned Behavior holds that only specific attitudes toward the behavior in question can be expected to predict that behavior (Ajzen, 1991).

TRA: Theory of Reasoned Action (TRA). TRA states that an individual's behavioral intention (BI) is developed from both the attitude (ATU) that the individual has towards the behavior and the subjective norm (SN) associated with the same behavior (SN). As a result, the actual behavior (B) is a result of the behavioral intention (Davis, 1989; Fishbein & Ajzen, 1975).

TRP: Perceived behavioral control directly affects intentions and behavior. PU and PEU will not fully mediate individual differences associated with behavioral control (Ajzen, 1991).

The State University: Referred to as TSU, is a four-year urban institution.

Subjective Norm (SN): A person's perception that most people who are important to him think he should or should not perform the behavior in question (Fishbein & Ajzen, 1975).

Assumptions

This researcher assumed the following:

- The participants completed the survey accurately and truthfully.
- The survey accurately measured behavioral intentions to use mobile technology.

Delimitations

This researcher identified the following delimitations:

- The survey looked only at full-time faculty from the current academic year and the population size, which was limited only to TSU.
- The population is not a random sample; the results were generalizable to a population exactly like the research population.
- The researcher is a member of the university being utilized in this study.

Limitations

This researcher determined the following limitations:

- The institution is not a technology-focused institution.
- Results may not reflect behavioral intentions of full-time faculty at community colleges or research universities.
- This research was only focused on whether college instructors' behavioral intentions to use mobile technology (iPads/laptops) were related to their perception and attitude.

Chapter 1 Summary

This chapter documented the relationship between educational technology and the higher education environment, while providing a brief history of mobile technology. The emergent trend of mobile technology is the most recent technological innovation within higher education environments. With this new trend, educators can equip students with the required skills for the 21st-century workforce, while developing a new medium for instructional methods (Kim et. al, 2006).

The theoretical framework for this study involves theories regarding the concepts of Davis's (1989) Technology Acceptance Model (TAM). TAM is an extension of Fishbein and Ajzen's (1975) Theory of Reasoned Action (TRA). Chapter 2 reviews the relevant literature on technological integration within the higher education environment, providing a wide exploration of the growing trend of mobile technology within the field of educational technology. The studies explored methods to improve technological adaptations within the learning environment. Utilizing findings from literature reviewed (Davis, 1989; Venkatesh et al., 2003), an attempt to understand if instructors' behavioral intentions of using mobile technology will influence their actual use of the technology in the learning environment.

CHAPTER 2

REVIEW OF LITERATURE

Integration of Mobile Technology

Educators and school administrators have integrated the use of technology to support teaching and explore different learning strategies in the educational environments (Giles, 2012; Grinager, 2006; Powell, 2012). The results of these studies may be used by policy makers in the individual regions and by the Council for Higher Education Accreditation to review, evaluate, and update the implementation process of the policy as well as shaping new policy. The results will allow policy makers to review and possibly incorporate the opinions of faculty affected by the guidelines. Attwell and Huges (2010) stated that empirical research about technological pedagogy for teaching and learning advocates the utilization of constructivist approaches and learning as an active process where knowledge and skills are constructed (p. 15).

Four theories addressing the notion of technological integration within the educational system include: (a) the Technology Acceptance Model (TAM; Davis, Bagozzi, & Warshaw, 1989), which is an extension of the Theory of Reasoned Action (TRA) that incorporated both human and social variables; (b) TRA (Fishbein & Ajzen, 1975); (c) the Theory of Planned Behavior (TPB; Ajzen, 1991); and (d) the Unified Theory of Acceptance and Use of Technology Model (UTAUT; Venkatesh et al., 2003). The UTAUT framework was the result of researchers' attempt to pursue enhanced technology acceptance models capable of delivering higher prediction successes.

Scholars have applied these theoretical frameworks to study technological innovations within the educational environment as higher education institutions increased the utilization of technology and mobile devices throughout the learning environment (Giles, 2012; Hung & Jeng, 2013; Ifenthaler & Schweinbenz, 2013; Mac Callum et al., 2014; Moon & Kim, 2001; Paver, Walker, & Hung, 2014a; Walker, & Hung, 2014b;Powell, 2012; Samms & Mozayani, 2012; Seliaman & Al-Turki, 2012; Teo, 2011).

Application of Technology Acceptance Model (TAM)

The overall goal of this study is to provide readers with the following: (a) an insight on instructors' behavioral intentions of technological integration, and their actual use of the technological tools at the tertiary level; (b) data that focuses on practices and learning experiences that contribute to effective and efficient technological implementations; (c) the types of activities and assessments that can be used when conducting a pre-adoption and adoption review of technological innovation at the tertiary level.

Despite the increased availability and support of technological innovations within the educational environment, incomplete technological integration is still being noted within the learning environment (Chong, 2012). This conclusion was developed due to ineffective implementation and use of the technological tools throughout the educational environment.

Besides contributing to the emergent literatures and information on technological implementation and utilization within the higher education environment, the data provided can be used by the executive team to strategically plan for desired educational outcomes and standards, and provide the necessary supporting data to assist universities in prioritizing funding for future technological integrations. The findings may also present information needed by

administrators to comprehend how emergent technologies are utilized by instructors, the extent of use, and training needs.

The growth of mobile technology has sparked the increased need for extended research on users' acceptance of technological innovations throughout the educational environment. Essentially, the research studies that were selected as a part of the literature review were those that can help future educational leaders make evidence-based decisions about the effectiveness of technological innovations at the tertiary level. The literatures reviewed were grounded within the theoretical framework of the Technology Acceptance Model (TAM). TAM is a model that provides researchers the necessary structure to examine users' acceptance or rejection of technological innovations. According to Davis (1989), external factors influence two main determinants: (a) perceived usefulness and (b) perceived ease of use (p. 343). As a result, Davis's (1989) research on perceived usefulness and perceived ease of use was reviewed and internalized.

TAM, created by Davis (1989), has been adapted and researched in various settings. Previous research has incorporated or extended TAM to include additional contributors; if extended, the conducted research would empirically validate the modification. The studies examined psychological (self-efficacy, behavioral intention) and/or technological (usability) factors that influenced users' acceptance of technological innovations.

Technological Integration in Higher Education Environment

Several related and essential studies reviewed include: (a) the role of moderating factors in user technology acceptance (Sun & Zhang, 2006); (b) understanding university students' behavioral intention to use e-learning (Park, 2009) and the examination of students' behavioral

intention to use an e-portfolio system (Shroff et al., 2011); (c) factors affecting the adoption of ICT for the teaching of word problems (Cassim & Obono, 2011); (d) understanding the influence of perceived usability and technology self-efficacy on teachers' technology acceptance (Holden & Rada, 2011); (f) the development and evaluation of an interactive mobile learning environment with shared display groupware (Yang & Lin, 2010); and (g) factors impacting teachers' adoption of mobile learning (Mac Callum et al., 2014). By referencing TAM (Davis, 1989) in conjunction with the literatures reviewed, the researcher intimately explored the stated research question.

The urgency for educational change is due to the increased need to keep abreast with the emerging technological trends. The ongoing need for educators to examine the determinants of technological acceptance, intentions, and expectations within the educational environment has increased over time (Oblinger, 2010, p. 44).

Scholars have employed the use of TAM, due to its ability to allow external variables that impact technological innovations to be factored during research. As technology emerges and new variables identified, Davis et al. (1989) stated that additional variables are expected, especially if they can alter a user's view of perceived usefulness and perceived ease of technology use. Some factors researched are: gender, intellectual capabilities, experience, and cultural background (Sun & Zhang, 2006). Examples of adopted extended theoretical models of TAM, utilized to assess the acceptance and adaptation of technology, included students' behavioral intentions to e-learning or e-portfolio system (Chang, Hajiyev, & Su, 2017; Park, 2009; Revythi & Tselios, 2017; Shroff et al., 2011), factors driving the adoption of mobile technology (Daungcharone, 2016; Sarrab, Al-Shih, & Badursha, 2016; Sung et al. 2016),

teachers' perceived usability and technology self-efficacy (Holden & Rada, 2011), and students' attitudes toward mobile technology (Jan, Ullah, Ali, & Khan, 2016; Yang & Lin, 2010). The studies all supported Davis's (1989) basic notion that evaluation and measuring users' acceptance to technology is important and necessary for the successful diffusion of technology (p. 319).

In the age of globalization, learning in today's educational system emphasizes the utilization of technology within the curriculum. Higher education environments have invested tremendously in an effort to enhance their technological system (Cochrane, 2014; Nguyen, Barton, & Nguyen, 2015; Mango, 2015). According to Siemens and Matheos (2010), there are two trends in education: learners having freedom to access, create, and recreate their learning content; and learners having opportunities to interact outside of a learning environment.

Sun and Zhang (2006) discussed the increased investment in new technology and the importance of understanding the influential variables on users' acceptance and adoption of technology. More specifically, the authors identified ten moderating factors that they perceived as pertinent empirical evidence. Once identified, these factors were grouped according to organizational, technological, and individual characteristics (p. 54). Similarly, Holden et al. (2011) stated that "user acceptance, satisfaction, and perceived usability of innovative technologies are crucial to the diffusion of those technologies" (p. 343). The authors recommended that TAM (Davis, 1989) be extended to include perceived usability. The extension offered additional findings that were relevant to the usability studies that investigated technology acceptance and usage behavior within the educational environment.

The increased usage of mobile devices has prompted the increased demand of mobile technology initiative programs within educational environments. Consideration of mobile technology as a learning resource in the educational setting is an important step for tertiary-level administrators and educators. The increased use of mobile technology is a clear representation that technological resources will continue to empower learners to create, share, and organize their personal learning environments. Mobile technology truly has revamped the learning environment from the traditional technology-integrated classroom into a truly mobile learning environment (Kim et al., 2006). Yang and Lin (2010) stated that while mobile devices may support the learning objective of the university, the "broader picture" is the stimulated issue—the sharing of information amongst learners. The authors further expressed their concerns with the trend and presented a possible solution. The concept presented was Shared Display Groupware (SDG), which allowed the instructors to retain control of information shared. The research focused on the implementation of SDG in a mobile learning environment. The empirical findings spoke to the evaluation of students' perceptions on the effectiveness of SDG in supporting mobile learning (p. 195).

Additional literature reviewed examined how various studies utilized TAM (Davis, 1989) as a benchmark for analyzing stakeholders' perceptions and actual use of technological systems. Studies by Shroff et al. (2011), Park (2009), and Revythi and Tselios (2017) examined the behavioral intentions of students concerning technology and e-learning. Shroff et al. (2011) utilized TAM as a theoretical framework to examine students' behavioral intention to utilize an electronic portfolio system. The research presented factors as well as barriers impacting instructional technology.

The emergent trend of e-learning and the opportunities it presents to the higher educational learning environment has increased tremendously (Park, 2009). Due to limited research, Park (2009) stated that additional research was needed to analyze the implementation process of e-learning at the tertiary educational level. The author concluded that e-learning self-efficacy was the most important factor, followed by subjective norm, as having the potential to influence users' acceptance to technology. To develop the technique employed to conduct this research, the researcher utilized TAM as a guided concept. The implementation process was captured using the structural equation modeling (SEM) method that examined the following variables: e-learning self-efficacy, subjective norm, system accessibility, perceived usefulness, perceived ease of use, attitude, and behavioral intention to use e-learning.

Park (2009), Revythi and Tselios (2017), and Shroff et al. (2011) concluded that the TAM theoretical framework was a valid assessment tool to examine users' acceptance of e-learning and e-portfolio systems. Shroff et al. (2011) concluded that Davis's (1989) main determinants to users' acceptance to technology were still valid. In addition, the author concluded that adaptation of e-portfolios within the curriculum is influenced by two specific variables: users' characteristics and technological factors.

Research by Revythi and Tselios (2017) modified TAM to examine students' behavioral intention to use a learning management system in Greece. The findings from this research found that the following factors influenced students' behavioral intention to use a learning management system: social norm, system access, and self-efficacy (Revythi & Tselios, 2017).

Engagement and interaction through technology are important in the educational environment. Researchers such as Cassim and Obono (2011) examined factors affecting the

adaptation of information and communication technology (ICT) within the curriculum. Their research found that the following factors influenced technological ICT adaptation: teachers' awareness of ICT, their attitude towards ICT, and their perceptions on the usefulness and on the ease-of-use of ICT.

Technological tools will continue to develop valuable roles in the educational environment as long as they are used appropriately, support the learning pedagogy, and do not detract or distract from the content structure and organization (Economist Intelligence Unit, 2008). According to Oblinger (2010), higher education pedagogical structures will continue to welcome new innovations, especially those that have a more individual approach to learning; as a result, educational revolution will continue to focus on the adaptation and innovation of technology within the learning environment.

Teachers' perceived usability and technology self-efficacy was explored by Holden and Rada (2011). The research extended TAM to study teachers' perceived usability and self-efficacy towards technological innovations. The authors held that perceived usability presents a more detailed explanation of the influential factors that impact the determinants of TAM. The authors also concluded that it is necessary to evaluate perceived usability when investigating users' acceptance of technological innovations. The data analysis revealed users' technology self-efficacy (TSE) was more beneficial to TAM than their computer self-efficacy (CSE); however, a variance may vary according to influential factors such as population and technological tool.

Research by Seliaman and Al-Turki (2012) extended TAM to examine the use of mobile devices (tablets and phones) by university students in Saudi Arabia for pedagogical processes

such as retrieval of course materials, web-based research (by discipline), cooperative learning, and completing course assignments.

The findings from this research confirmed students' receptiveness to the integration of emerging ICT technologies and new features of mobile devices. In addition, the results confirmed that students' have high behavioral intentions to use mobile learning, as they are very familiar with utilizing the technological tool (Seliaman & Al-Turki, 2012).

Factors impacting teachers' adoption of mobile learning was explored by Mac Callum et al. (2014). The research extended the technology acceptance model (TAM) with three new variables: digital literacy, ICT anxiety, and ICT teaching self-efficacy. The researchers concluded that instructors' behavioral intention to use mobile learning was determined by several important variables: perceived usefulness, ease of use, digital literacy, anxiety, and teaching self-efficacy. The findings of this research have added relevant literature to the field of educational technology. They have provided additional information regarding mobile learning and determinants that impact the integration of mobile technology within the educational environment.

Paver et al. (2014a) conducted research on the demographic predictors of intention to integrate technology into instruction by community college adjunct faculty. By applying Fishbein and Ajzen's (1975) users' intention theories, the researchers confirmed that the following demographic factors were key predictors of behavioral intentions to integrate technology: years of teaching experience, teaching discipline, hours of preparation time, and years of experience using computers.

In addition, the researchers concluded that additional empirical research is needed to determine if the following background factors are predictors of technology use by community college adjunct faculty: age, gender, and participation in professional development activities (Paver et al., 2014a).

The Decomposed Theory of Planned Behavior (DTpB) was adopted by Paver et al. (2014b) to research factors that predict the integration of technology for instruction by community college adjunct faculty. Overall, the findings confirmed that DTpB provided a great understanding of explaining the variables that contributed to adjunct faculty's behavioral intentions.

Based on their findings, the researchers concluded that the role of community college administrators are important factors when analyzing the success of technology integration and when determining the type of professional development programs required for successful integration (Paver et al., 2014b). The findings of this research have added relevant literature to the field of educational technology.

Factors influencing future educational technologists' intentions to participate in online teaching were explored by Hung and Jeng (2013). By adopting Ajzen's Theory of Planned Behavior (TpB), the researchers confirmed that the attitudinal and subjective norm constructs of TpB had significant impacts on prediction of participants' intentions to participate in online teaching. In addition, the researchers concluded that the following background characteristics were mediating factors of participants' attitude toward online teaching: age and online teaching experience.

The findings also revealed that issues related to personal dimension variables were key predictors for future educational technologists' intentions to participate in online teaching. They further suggested that collectively, both attitude and subjective norm factors played a critical role in predicting intention, while the perceived control factor was not a major contributor to the outcome (Hung & Jeng, 2013). The findings from this empirical research are important to the field of educational technology, as they provide pertinent information needed to address the efficiency and effectiveness of technology integration of online curricula.

As mobile technology trend continues to expand and dominate certain areas of the educational environment, the issue of mobile learning and the demands for the utilization of more practical pedagogical models within the educational environment will increase (Kim et al., 2006). Therefore, it is necessary to conduct extended empirical research on users' behavioral intentions and their relationship to the actual use of mobile technology within the educational environment.

The literatures reviewed helped inform this researcher's topic, research question, and methodology to measure instructors' behavioral intentions and their link to the use of mobile technology. Collectively, the literatures reviewed provided justification for the need of additional empirical research on the growing trends in the field of educational technology.

The literatures reviewed have all explored the technology acceptance model (TAM) because they seek to understand the correlation between perceptions (such as perceived usefulness and perceived ease of use of emerging technologies) and users' behavioral intention (BI). Results from the literatures reviewed prompted this researcher to explore a research

extension of the technology acceptance model (TAM) that investigated the relationship between users' behavioral intentions and actual technology usage.

The emergent trend of mobile technology is now becoming the most recent technological innovation within higher education environments. It has created a new paradigm shift within the learning environment, providing instructors with a new medium for instructional methods (Kim et al., 2006). Such mediums have created a path for instructors to utilize holistic teaching approaches; however, if not adopted and accepted in a viable way, the system can be underutilized and eventually create a financial issue for the university (Economist Intelligence Unit, 2008).

The literatures reviewed document the various ways that users adapt and utilize technology. To attain greater efficiency with the diffusion of technology within the educational environment, the authors explored the main determinants of user acceptance to technology: perceived usefulness and perceived ease of use. The studies reviewed provided a wide exploration of the growing trend within the field of educational technology. They explored methods to improve technological adaptations within the learning environment.

The findings from the studies are significant, as they can support or refute the paradigm shift within the higher educational environment. The data analyses all presented similar implications: advances in technology are likely to change the methods of teaching and learning in the higher education environment. In addition, it would be in their best interest for administrators to take a holistic approach when implementing any technological change, such as engaging instructors, as they have an important role in the successful adaptation of emerging technologies.

Analyzing technology within the field of higher education is important when there is a claim of efficiency and effectiveness. The rapid evolution of emergent technology requires the need for additional empirical research on the implications of college instructors' behavioral intentions to use mobile technology and if the implications are related to their perception and attitude.

Chapter 2 Summary

This chapter presented an exhaustive literature review of previous studies and theories related to determinants impacting successful technological integration within the educational environment. In addition, the empirical studies introduced the theories of TAM model as well as its application in the field of mobile technology within the educational learning environment. Similar to this research study, many of the researchers utilized users' intention theories and/or extended TAM by including additional variables to better understand the integration of mobile technology within the educational environment.

Chapter 3, the research methodology, will present as well as discuss the survey questionnaire designed and the research model for this study.

CHAPTER 3

RESEARCH METHODOLOGY

Chapter 3 is a presentation of the study's methodology, research design strategy, variables, population and sampling procedures, instruments, validity and reliability, data collection, ethical considerations, and the analytic methods used to examine the data collected. Chapter 3 provides the detailed guidelines that were used to accomplish the research investigation. At the core of the study is a survey questionnaire that was the foundational tool for the collection of the quantitative data (see Appendix C).

The participants of this quantitative study were full-time instructors from a fully accredited public, urban university located on the south side of Chicago. In an attempt to increase recruitment and retention, while allowing the university to move into a truly technological world, the university initiated several mobile technology initiative programs over the past years.

Methods and Population

The study was a cross-sectional survey based investigation that incorporated a statistical quantitative research design to investigate technological innovation within a state university. This study investigated if college instructors' behavioral intentions to use mobile technology were related to their perception and attitude.

Research Question and Research Hypotheses

The following question served as a guide for this research study:

Research Question: What factors influence university instructors' intention to use mobile devices to support teaching and instruction?

In accordance with the research objective and consistent with the related literatures, the research model, as shown in Figure 2, consists of TAM main constructs and additional predictors. The use of the TAM model for understanding instructors' behavioral intention to utilize mobile technology and the development of relevant research hypotheses are discussed below.

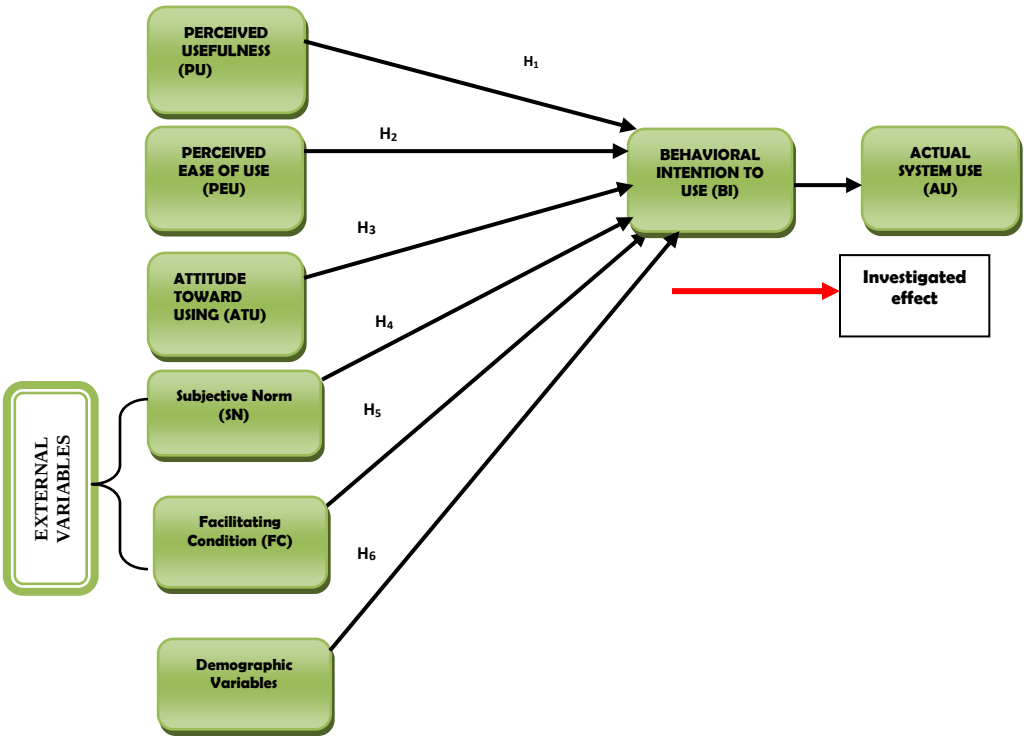

Figure 2. Research model (TAM).

According to the TAM model, an individual's attitude toward using new technology is predicted by both perceived ease of use and usefulness (Davis, 1989). Perceived usefulness is

defined as “the degree to which a person believes that using a particular system will enhance his or her job performance” (Davis, 1989). In other words, instructors who believe that using mobile technology could lead to positive outcomes will tend to have a more favorable attitude towards the new system.

There are empirical studies that support the relationship between perceived usefulness and attitude towards use (Chong, 2012; Goad, 2012). These studies also provide significant support on the direct or indirect effect of perceived usefulness on behavioral intention to use. Hence, it can be hypothesized that:

H_1: Perceived usefulness (PU) will have a relationship with the instructor’s behavioral intention to use (BI) mobile technology.

Perceived ease of use refers to “the degree to which a person believes that using a particular system would be free of effort” (Davis, 1989, p. 320). Prior studies have documented the effect of perceived ease of use on perceived usefulness (Fishbein & Ajzen, 1975; Teo, 2009). In addition, the TAM model suggests that perceived ease of use has a direct effect on attitudes towards using and a dual effect, direct as well as indirect, on behavioral intention to use (Davis, 1989). Therefore, it can be hypothesized that:

H_2: Perceived ease of use (PEU) will have a relationship with the instructor’s behavioral intention to use (BI) mobile technology.

In the TAM model, behavioral intention to use the system is directly determined by the user’s attitude toward using the system. Fishbein and Ajzen (1975) defined attitude towards using the system as “an individual’s positive or negative feelings (evaluative affect) about performing the target behavior” (p. 216). Prior studies have suggested that attitude has a direct

effect on the user's behavioral intention to use a particular technology (Fishbein & Ajzen, 1975; Jackson, Chow & Leitch, 1997; Shroff et al., 2011). Therefore, it is expected that a positive attitude toward the integration of mobile technology by full-time instructors will directly affect their behavioral intention. Consequently, it can be hypothesized that:

H_3: Attitude towards computer use (AU) will have a relationship with the instructor's behavioral intention to use (BI) mobile technology.

This study extended the Technology Acceptance Model (TAM) framework, with subjective norm and facilitating conditions acting as external variables. The utilization of subjective norm is an additional construct suggested by Fishbein and Ajzen (1975). Subjective norm refers to the "perceived social pressure to perform or not to perform the behavior" (Fishbein & Ajzen 1975, p. 188). Facilitating condition is defined as "the control beliefs relating to resource factors such as time and money and IT compatibility issues that may constrain usage" (Taylor & Todd, 1995b, p. 153). Positive relationships between the variables identified in the research hypotheses stated below have been identified in the existing literature (Karahanna & Straub, 1999; Taylor & Todd, 1995a; Taylor & Todd, 1995b; Teo, 2009).

Subsequently, it is expected that both subjective norm and facilitation conditions will have a direct effect on instructors' behavioral intention to utilize mobile technology within higher education environments. As a result, the following research hypotheses were developed:

H_4: Subjective norm (SN) will have a relationship with the instructor's behavioral intention to use (BI) mobile technology.

H_5: Facilitating conditions (FCs) will have a relationship with the instructor's behavioral intention to use (BI) mobile technology.

Fishbein and Ajzen defined behavioral intention to use the system as a measure of the strength of one's intention to perform a specific behavior (1975, p. 288); that is, utilization of a technological system. Prior studies have shown that behavioral intention has had significant positive effects on actual usage (Kuo & Yen, 2009; Venkatesh & Davis, 2000). Therefore, it is expected that a positive behavioral intention to integrate mobile technology into the learning environment by the university's full-time instructor should lead to actual utilization of the technology. Thus, it is hypothesized that the behavioral intention will influence actual use of technology:

H_6: There is a relationship between the instructors' demographic factors and their behavioral intention (BI) to use mobile technology.

Corresponding to each research hypothesis was a null hypothesis, which was formally tested in the regression analyses. Each of these null hypotheses posited no relationship between the relevant predictor (or set of predictors) and the outcome.

Two hundred and seventy-four (274) full-time instructors who currently work at The State University (TSU) were provided the opportunity to participate in the research study. A total of 274 (N=274) full-time instructors constituted a sufficient pool of available subjects, who fit well within the context and purpose of this study. The selection of full-time instructors was based on the following. First, full-time instructors are known to be responsible for upholding the educational philosophy of the institution. In addition, they are expected to utilize the available technological tools to enhance student learning. Full time status was granted to professors according to the total number of hours per week devoted to teaching responsibilities. With the assistance of the Institutional Review Board and the assistance of the deans and chairs of the

seven colleges, full-time instructors were identified and contact information was obtained. An invitation to participate in this study was sent to only full-time instructors at the university; they were contacted via email. The email contained detailed information about the purpose of the study and their right to withdraw from the study before, during, or after the survey questionnaire was completed (see Appendix D). In addition, participants were assured of the confidentiality of their responses, the protection of their privacy, and that all survey data will be destroyed after 3 years. All participants acknowledged the information sheet (consent) located on the first page of the survey prior to proceeding to the survey (see Appendix B).

To obtain the maximum response rate from participants, the survey questionnaire was designed to be as short as possible. Hence, it was anticipated that each participant took no more than 20-25 minutes to complete the questionnaire.

Variables

Outcome: The dependent variable in this study was the behavioral intention to use the system (mobile technology: iPads/laptops).

Predictor: The independent variables for this study were the major constructs of TAM. These constructs are: perceived ease of use, perceived usefulness, attitude towards using the system, and behavioral intention to use the system. Each predictor variable is discussed in the context of the survey questionnaire in the data analysis section.

Demographic Information: The mediating variables for this study were assigned college, instructional years, age, gender, and years of using mobile device.

Confounding (Demographic Information): Confounding variables for this study were educational level (impacts tolerance and age) and academic rank.

Data Collection, Processing and Analysis

Data Collection

After Northern Illinois University and The State University's Institutional Review Board granted research approval, prospective participants were sent an email with the link to the site and an invitation to participate in the study. The data collection period was open from May 8th through July 1st, 2015. All participants acknowledge the informed consent form located on the first page of the survey prior to proceeding to the survey.

The final survey instrument was in the form of an electronic questionnaire (see Appendix C), and was distributed to 274 full-time instructors at The State University (TSU). The survey was administered via Qualtrics; survey participants had the option to "Opt Out" or agree to take the survey. An information sheet that discussed the study and referenced participants' consent (Appendix B) was distributed via email to each survey participant.

Participants were given 55 days (approximately 7 weeks) to participate in the research study, by completing the survey. Four weeks after the initial email invitation was sent, a gentle reminder email was sent to participants, requesting their participation if they have not done so already (see Appendix D). On July 1st, 2015, the survey from the Qualtrics website was closed and the data were transferred to an external hard drive. The data were then uploaded to the SPSS application for further analysis.

Instrument

To address the research questions, a survey questionnaire comprised of previously validated items was administered to full-time instructors at TSU. The survey was utilized to collect information on participants' intentions to use mobile technology in the higher education environment. The survey questionnaire has undergone exploratory and confirmatory factor analysis and has been found to yield valid and reliable data in other studies such as Teo (2008, 2009) and Smarkola (2004, 2007); it has been confirmed to be accurate by a team of experts. Permission emails to utilize surveys for this study were received (see Appendix A).

To ensure that the questionnaire was easy to understand and not ambiguous, a pilot study was conducted prior to distribution to the study subjects. Content validity was established by pilot-testing the instrument with a random sample of 10 full-time instructors from TSU who were not involved in the actual study. The participants in the pilot study completed all approval forms before completing the questionnaire. The data were analyzed using SPSS. Cronbach's alphas were used to determine the reliability of the 24 items, four constructs and two external variables questionnaire.

The completed instrument consisted of three parts (see Appendix C). The instrument was composed of TAM's 4 constructs, 2 external variables and 24 statements on Perceived Usefulness (four items), Perceived Ease of Use (four items), Attitude Toward Mobile Use (four Items), Facilitating Conditions (four items), Subjective Norm (four items) and Behavioral Intention (four items). Part I was based on a prior study (Teo, 2009) with modifications to fit the specific context of instructors' behavioral intentions to use mobile technology; subsequently developed from TAM scales, adapted from Davis et al. (1989) and Venkatesh et al. (2003). Part

II was designed to identify demographic information of each participant. This included information such as instructors' age, gender, race, educational level, academic rank, assigned college, and instructional years. Part III utilized information captured from a prior study (Smarkola, 2004) with modifications to gather supplemental information on the instructors' mobile technology utilization.

Several criteria were used to assess the reliability and validity of the obtained data. The composite reliability (CR) of each construct was assessed using Cronbach's alpha; Values of Cronbach's Alpha can range from 0 to 1. As noted in previous studies (Cronbach, 1951; Teo, 2008) constructs were considered to have internal consistency reliability when the Cronbach Alpha value exceeds 0.70.

Responses (e.g., frequency of use) were consistent with those of the six-point Likert ordinal scale (Lam & Klockars, 1982). The following response scale and weights for all items were coded as: Strongly Agree - 6; Moderately Agree -5; Slightly Agree - 4; Slightly Disagree - 3; Moderately Disagree - 2; Strongly Disagree – 1.

The survey was available to the participants on the Internet using a survey tool called Qualtrics. The URL for the website containing the survey was emailed to the identified population through the university listserv. A total of 274 individuals received this email that solicited their participation in the research study. At the end of the specified survey period, the data collection survey on the Qualtrics website was closed and the data were transferred to an external hard drive that was only available to the researcher for use within this research context. The surveys utilized are outlined in Table 1 and the items utilized for each construct are noted in Table 2.

Table 1

Data Collection Instrument

Instrument	Original Instrument	Author(s)	Final Instrument
Acceptance	Technology Acceptance Measure for Pre-service Teachers (TAMPST)	Teo, T. (2009).	Mobile Technology (MTSU) Survey (PART I)
Demographic & Supplemental Information	Computer Technology Survey	Smarkola, C. (2004).	Mobile Technology (MTSU) Survey (PART II & III)

Table 2

List of Constructs and Corresponding Items

Construct	ITEM
Perceived Usefulness (adapted from Teo, 2009)	PU1: Using mobile devices will increase my productivity.
	PU2: Using mobile devices will enhance my effectiveness.
	PU3: Using mobile devices will improve my work.
	PU4: I find mobile devices a useful tool in my work.
Perceived Ease of Use (adapted from Teo, 2009)	PEU1: My interaction with mobile devices is clear and understandable.
	PEU2: I find it easy to get mobile devices to do what I want it to do.
	PEU3: I find mobile devices easy to use.
	PEU4: Integrating mobile devices into subject lessons is often frustrating.
Attitude Toward Computer Use (adapted from Teo, 2009)	ATU1: Mobile devices make work more interesting.
	ATU2: Working with mobile devices is fun.
	ATU3: I like using mobile devices.
	ATU4: I look forward to those aspects of my job that require me to use mobile devices.
Facilitating Conditions (adapted from Teo, 2009)	FC1: When I need help to use mobile devices, a specific person is available to provide assistance.
	FC2: When I need help to use mobile devices, specialized instruction is available to help me.
	FC3: When I need help to use mobile devices, guidance is available to me.
	FC4: Using mobile devices is compatible with my teaching methods.
Subjective Norm (adapted from Teo, 2009)	SN1: People whose opinions I value will encourage me to use mobile devices.
	SN2: People who are important to me will support me to use mobile devices.
	SN3: People who influence me will support me using mobile devices.
	SN4: At work, my colleagues who are important to me think that I should use mobile devices.
Behavioral Intention (adapted from Davis, 1989)	BI1: Assuming I have access to mobile devices, I intend to use it in the classroom.
	BI2: Given that I have access to mobile devices, I predict that I would use it.
	BI3: I plan to use mobile devices often.
	BI4: I will use mobile devices in the future.

Pre-analysis Data Screening

To avoid biased results and to ensure the validity of the data collected, a pre-analysis data screening was completed. According to Levy (2006), there are four key reasons for pre-analysis data screening: (a) to ensure accuracy of the data collected; (b) to deal with the issue of response-set; (c) to deal with missing data; and (d) to deal with extreme cases, or outliers. A random sample of the data entered in SPSS was checked for coding accuracy. In addition, a pilot study was conducted to test the measures to validate the questionnaire items and justify the objective of the study. Data collected and analyzed from the pilot study were excluded from the final study.

Data Analysis

This study employed the use of multiple regression analyses to understand and explore the functional relationship between the dependent variable and the independent variables. Also, the data were used to determine if college instructors' behavioral intentions to use mobile technology are related to their perception and attitude.

Data were collected from the survey website after respondents completed the survey. Data were then entered into the Statistical Package for Social Sciences (SPSS) application. The researcher used SPSS as a tool to complete descriptive and inferential statistical analyses and report the results in graphical and table formats. The tool was used to facilitate multiple regressions to explore data relationships, to assess reliability, and compute descriptive statistics such as means, standard deviation, frequency, and percentages. It was also used to compute correlations and generate plots to better understand the data pertaining to the research question

and research hypotheses. The primary purpose of collecting the data was to gain knowledge of instructors' behavioral intention toward the utilization of mobile technology.

The first stage of analysis utilized multiple regressions to analyze the research question and associated research hypotheses; in addition, standardized coefficients were generated to analyze the relative contributions and statistical significance of each construct in the model. This statistical method explored the relationship between the dependent variable and independent variables.

In the final stage, statistical results were examined to determine predictors of college instructors' behavioral intentions. Background factors, such as the demographic information, were individually explored to determine their ability or contribution to predict instructors' intentions to use technology for instruction.

Ethical Considerations

In this study, every full-time instructor was afforded the opportunity to partake in the study. Each full-time instructor who wished to participate in the research did so on a voluntary basis. All participants acknowledged the informed consent form located on the first page of the survey prior to proceeding to the survey. The survey questions were nonthreatening. There was no risk or negative consequences should a person who started to take the survey or already completed the survey wish to withdraw from participating. The researcher was the only person who had access to any identifying information, if provided. There was no risk of physical harm to any participant. There was a very small likelihood that any participant developed any mental distress as a result of completing the survey. Full-time instructors devoted their own time to

completing the survey for this research. The IRB requirements of Northern Illinois University (see Appendix E) were followed and approval was granted prior to conducting the study.

Chapter 3 Summary

Through a survey instrument, data were collected and analyzed to determine if full-time college instructors' behavioral intentions to use mobile technology are related to their perception and attitude. For the purposes of this study, the mobile devices addressed were portable devices such as iPads and laptops.

The data gathered from this study are significant to policymakers, school administrators, and mobile developers, as well as designers. Investigating the manners in which mobile technologies were being used by instructors in the higher education environment, can change the future of mobile technologies and present a clearer picture for policymakers, school administrators, and developers about instructors' behavioral intentions to utilize mobile technology within the higher education environment. The results of the data are presented in narrative and statistical form, and explained as an outcome of this study, in Chapter 4.

CHAPTER 4

ANALYSIS OF DATA

The primary purpose of collecting the data was to gain knowledge of instructors' behavioral intention toward the utilization of mobile technology. One central research question guided this study: What factors have relationships with university faculty members' intention to use mobile devices to support teaching and instruction? The research hypotheses for this study were as follows: H_1: Perceived usefulness (PU) will have a relationship with the instructor's behavioral intention to use (BI) mobile technology. H_2: Perceived ease of use (PEU) will have a relationship with the instructor's behavioral intention to use (BI) mobile technology. H_3: Attitude towards computer use (AU) will have a relationship with the instructor's behavioral intention to use (BI) mobile technology. H_4: Subjective norm (SN) will have a relationship with the instructor's behavioral intention to use (BI) mobile technology. H_5: Facilitating conditions (FCs) will have a relationship with the instructor's behavioral intention to use (BI) mobile technology. H_6: There is a relationship between the instructors' demographic factors and their behavioral intention (BI) to use mobile technology.

This chapter includes a description of the data as well as analysis of the research results. The chapter is organized into the following sections: Descriptive Data, Analysis and Findings , and Summary. Relevant descriptive data discussed includes mean values, standard deviations, and matrices of correlations among the six research constructs. Support for the six research hypotheses requires the behavioral intention to accept mobile technology ratings to

correlate significantly with the five constructs. SPSS version 23 was utilized for data analysis. Multiple regression analyses were used for hypotheses testing. The alpha was established *a priori* at the .05 level, as suggested in the literature.

The emphasis of this research was on the perceptions of full-time faculty members towards using technology as instructional tools. A survey was created to respond to the research question. Of the 274 participants emailed, 74 participants completed the survey for a 27% completion rate. Of these completed surveys, 70 were usable and considered for further analysis, representing 26% of all selected participants in the study.

Descriptive Data

Distribution of Participants by Gender

As shown in Table 3, of the participants who completed the survey, 39 (55.7%) were women, 28 (40.0%) were men and 3 (4.3%) participants did not respond to this question.

Table 3

Distribution of Participants by Gender

Gender	*N*	Percent
Male	28	40.0%
Female	39	55.7%
Missing	3	4.3%
Total	70	100.0%

Distribution of Participants by Ethnicity

As reflected in Table 4, of the participants who completed the survey, 28 (38.4%) were Caucasian (12 males and 16 females), 33 (45.2%) were African American (11 males and 22

females), 2 (2.7%) were Asian (2 males), 2 (2.7%) were Hispanic (2 males), 2 identified as Other (1 male and 1 female) and 3 (4.3%) participants did not respond to this question.

Table 4

Distribution of Participants by Ethnicity

Ethnicity	*N*	Percent
Caucasian (non-Hispanic)	28	41.8%
African American	33	49.3%
Asian/Pacific Islander	2	3.0%
Hispanic	2	3.0%
Other	2	3.0%
Total	67	100.0%

Distribution of Participants by Age Group

As shown in Table 5, of the participants who completed the survey, 10 (14.3%) were between the age group of 50-54 years, 12 (17.1%) were between the age group of 60-64 years, and 5 (7.0%) participants did not respond to this question. Almost half of the participants were over the age of 45 years (61.4%, *n*=43).

Distribution of Participants by College

Table 6 shows the results of the participants queried, by College. Of the 70 (*N* = 70*)* participants, 35 (50.0%) participants marked College of Arts & Sciences; 3 (4.3%) participants marked College of Business; 13 (19.0%) participants marked College of Education; 9 (13.0%) participants marked College of Health Sciences; 4 (6.0%) participants marked College of Pharmacy; 2 (3.0%) participants indicated Library, and 4 (6.0%) participants indicated Other.

Table 5

Distribution of Participants by Age Group

Age Group	*N*	Percent
25 - 29 years	1	1.4%
30 - 34 years	7	10.0%
35 - 39 years	7	10.0%
40 - 44 years	7	10.0%
45 - 49 years	9	12.9%
50 - 54 years	10	14.3%
55 - 59 years	8	11.4%
60 - 64 years	12	17.1%
Age 65 or older	4	5.7%
Total	65	92.9%
Missing	5	7.1%
Total	70	100.0%

Table 6

Distribution of Participants by College

College	*N*	Percent
College of Arts & Sciences	35	50.0%
College of Business	3	4.3%
College of Education	13	18.6%
College of Health Sciences	9	12.9%
College of Pharmacy	4	5.7%
Library	2	2.9%
Other:	4	5.7%
Total	70	100.0%

Distribution of Participants by Level of Courses Taught

Participants were queried by the level of courses they primarily taught. Results showed that 44 (62.9%) participants marked undergraduate credit courses; 19 (27.1%) marked graduate credit courses; 1 (1.4%) indicated non-credit courses, and 3 (4.3%) indicated Other. The distribution of course level is shown in Table 7.

Table 7

Distribution of Participants by Level of Courses Taught

Level of Courses	*N*	Percent
Undergraduate credit courses	44	62.9%
Graduate credit courses	19	27.1%
Non-credit courses	1	1.4%
Other	3	4.3%
Total	67	95.7%
Both grad and undergrad	2	2.9%
Librarian	1	1.4%
Total	70	100.0%

Distribution of Participants by Use of Mobile Device

The participants were asked to indicate the number of years they have used a mobile device. As shown in Table 8, participants were given the options of *have not used, 1-3 years, 4-6 years, 7-9 years*, and *10 or more years*. Of the 70 valid participants, 2 (2.9%) of the faculty members responded that they had not used mobile technology, and 3 (4.3%) reported that they have 1-3 years' experience using a mobile device. The majority of the full-time faculty members, 46 (65.7%), responded that they have 10 or more years' experience using a mobile device. Two (2.9%) participants did not respond to this question. (See Table 8.)

Table 8

Distribution Participants by the Number of Years Utilizing Mobile Device

Frequency	*N*	Percent
Have not used	2	2.9%
1-3 years	3	4.3%
4-6 years	11	15.7%
7-9 years	6	8.6%
10 or more years	46	65.7%
Total	68	97.1%
Missing	2	2.9%
Total	70	100.0%

Full-time faculty members responding to the different types of software they use on their mobile device for daily work, such as planning, teaching, and grading during their student teaching are reported in Table 9.

Table 9

Distribution of Participants by Software Used on Mobile Device

Software Used on Mobile Device	*N*	Percent
Word Processing	49	19.4%
Spreadsheets	38	15.0%
Database	28	11.1%
Multimedia/Presentation	39	15.4%
Internet	56	22.1%
Subject Specific Software	30	11.9%
Other	9	3.6%
None	4	1.6%
Total	253	100.0%

Table 10 shows full-time faculty members' responses to the frequency of use of different types of software they use on their mobile device for daily work, such as planning, teaching, and grading during student teaching.

Table 10

Distribution of Participants by Frequency of Work Assignments Completed on Mobile Device

Frequency	*N*	Percent
None	12	17.1%
1 - 6 times	11	15.7%
7-12 times	4	5.7%
13 - 18 times	6	8.6%
19 -24 times	10	14.3%
25 - 30 times	5	7.1%
More than 30 times	16	22.9%
Total	64	91.4%
System	6	8.6%
Total	70	100.0%

Distribution of Participants by Use of Technology with Students

Full-time faculty members' responses to the different types of software they asked their students to use on a mobile device in and out of school are reported in Table 11. Full-time faculty members' responses to the purposes of educational software used on a mobile device with their students in classroom/lab while teaching are reported in Table 12.

Table 11

Distribution of Participants by Use of Software with Students on Mobile Device

Software Used with Students	*N*	Percent
Word Processing	45	20.2%
Spreadsheets	30	13.5%
Database	17	7.6%
Multimedia/Presentation	39	17.5%
Internet	52	23.3%
Subject Specific Software	27	12.1%
Other	8	3.6%
None	5	2.2%
Total	223	100.0%

Table 12

Distribution of Participants by Use of Educational Software with Students on Mobile Device

Use of Educational Software with Students	*N*	Percent
Drill and practice	20	12.2%
Tutorial	25	15.2%
Problem Solving	24	14.6%
Games	15	9.1%
Simulations	19	11.6%
Research/Searches	43	26.2%
Other	7	4.3%
None	11	6.7%
Total	164	100.0%

Distribution of Participants by Frequency of Technology Use with Students

Full-time faculty members responded to the frequency of technology used with students for several educational activities. The participants were given seven choices including *none, 1*-6 *times, 7-12 times, 13-18 times, 19-24 times, 25-30 times,* or *more than 30 times*. Of the 70 (*N = 70*) faculty members who responded, 15 (21.4%) marked *none,* 19 (27.1%) of the faculty members marked *1*-6 *times,* 8 (11.4%) of the participants chose *7-12 times,* 9 (12.9%) marked *13-18 times,* 5 (7.1%) marked *19-24 times,* 4 (5.7%) marked *25-30 times,* and 5 (7.1%) of the participants indicated that they require students to work on mobile technology tools in and out of school *more than 30 times.* The responses are shown in Table 13.

Table 13

Distribution of Participants by Frequency of Student Assignments Using Mobile Device

Frequency	*N*	Percent
None	15	21.4%
1-6 times	19	27.1%
7-12 times	8	11.4%
13-18 times	9	12.9%
19-24 times	5	7.1%
25-30 times	4	5.7%
More than 30 times	5	7.1%
Total	65	92.9%
Missing	5	7.1%
Total	70	100.0%

Full-time faculty members responding to the frequency of conducting educational activities using a mobile device within the classroom are reported in Table 14. The Pearson correlations among the subscales are shown in Table 15. All except one pair of subscales

correlated significantly ($p < .02$) and the coefficients range from .23 to .72. Because correlations among these variables were not excessive, they were judged suitable to be used as predictor variables in regression analysis.

Table 14

Distribution of Participants by Use of Mobile Device within the Classroom

Frequency	*N*	Percent
None	15	21.4%
1-6 times	14	20.0%
7-12 times	10	14.3%
13-18 times	5	7.1%
19-24 times	7	10.0%
25-30 times	6	8.6%
More than 30 times	8	11.4%
Total	65	92.9%
Missing	5	7.1%
Total	70	100.0%

Table 15

*Correlation Matrix of the Subscales**

	Perceived Ease of Use	Perceived Usefulness	Attitude Toward Computer Usage	Facilitating Conditions	Subjective Norm	Behavior Intention
Perceived Ease of Use	1					
Perceived Usefulness	.520**	1				
Attitude Toward Computer Usage	.607**	.716**	1			
Facilitating Conditions	.342**	.353**	.472**	1		
Subjective Norm	.228	.590**	.575**	.440**	1	
Behavior Intention	.433**	.568**	.610**	.487**	.553**	1

***. Correlation is significant at the 0.01 level (2-tailed).*

In this study, meaningful analyses at the sub-scale level required reverse coding of the negatively worded items. Also, the total score for each construct was computed as the mean of the item scores for the construct. If the participant failed to respond to a particular item, the total score was computed as the mean of the remaining three items.

Cronbach's alpha was used to assess the composite reliability of each construct. DeVellis (2003) suggested that an alpha value of .70 is considered acceptable. Cronbach's alpha reliability coefficient normally ranges between 0 and 1. The closer the coefficient is to 1.0, the greater is the internal consistency of the items (variables) within the scale. The reliability coefficient for each subscale ranged from .81 to .96., exceeding the guidelines (>.70) set by DeVellis (2003).

In the first section of the survey, full-time faculty members were asked questions about perception of mobile technology. Participants were asked to mark their perceptions as *strongly disagree, somewhat disagree, disagree, agree, strongly agree* or *somewhat agree* on 24 questions. These questions were related to the major constructs of TAM. Seventy teachers completed this section of the survey, as detailed in Table 16.

The overall alpha for Perceived Ease of Use (PEU) is $\alpha = .812$, which indicates a high level of internal consistency. From the total data set of $N = 69$ participants, there were three missing values (4.28%) for the perceived ease of use variable. Table 16 presents the participants' mean scores with the standard deviations of the four subscales. To calculate the mean, at least three variables from the subgroup were available.

The mean values displayed in Table 16 on the research model seem to indicate that the participants had positive perceptions toward perceived ease of use (M=4.35) towards mobile technology usage. Perceived ease of use variable had a SD of 1.13. The shape of the perceived

Table 16

Matrix of the Subscales

	Construct/Construct Items	*N*	*M*	*SD*	Reliability (*alpha*)
	Perceived Ease of Use (PEU)	69	4.35	1.13	0.812
Q#1	My interaction with mobile devices is clear and understandable.	67	4.67	1.42	
Q#2	I find it easy to get mobile devices to do what I want it to do.	69	4.59	1.31	
Q#3	I find mobile devices easy to use.	69	4.59	1.31	
Q#4	Integrating mobile devices into subject lessons is often frustrating. *	70	3.50	1.58	
	Perceived Usefulness (PU)	68	4.60	1.14	0.951
Q#5	Using mobile devices will increase my productivity.	68	4.57	1.14	
Q#6	Using mobile devices will enhance my effectiveness.	69	4.58	1.12	
Q#7	Using mobile devices will improve my work.	68	4.46	1.24	
Q#8	I find mobile devices a useful tool in my work.	70	4.59	1.30	
	Attitude Toward Computer Use (AU)	69	4.25	1.03	0.877
Q#9	Mobile devices make work more interesting.	69	4.16	1.21	
Q#10	Working with mobile devices is fun.	69	4.29	1.13	
Q#11	I like using mobile devices.	70	4.50	1.35	
Q#12	I look forward to those aspects of my job that require me to use mobile devices.	69	3.74	1.26	
	Facilitating Conditions (FCs)	70	3.50	1.13	0.819
Q#13	When I need help to use mobile devices, a specific person is available to provide assistance.	70	3.10	1.52	
Q#14	When I need help to use mobile devices, specialized instruction is available to help me.	70	3.17	1.52	
Q#15	When I need help to use mobile devices, guidance is available to me.	69	3.26	1.42	
Q#16	Using mobile devices is compatible with my teaching.	69	4.14	1.19	

(Continued on following page)

Table 16 (continued)

	Construct/Construct Items	*N*	*M*	*SD*	Reliability (*alpha*)
	Subjective Norm (SN)	66	4.10	1.10	0.914
Q#17	People whose opinions I value will encourage me to use mobile devices.	65	4.14	1.18	
Q#18	People who are important to me will support me to use mobile devices.	65	4.28	1.21	
Q#19	People who influence me will support me using mobile devices.	66	4.12	1.17	
Q#20	At work, my colleagues who are important to me think that I should use mobile devices.	66	3.82	1.25	
	Behavior Intentions (BI)	67	4.47	1.23	0.956
Q#21	Assuming I have access to mobile devices, I intend to use it in my classroom.	67	4.28	1.25	
Q#22	Given that I have access to mobile devices, I predict that I would use it.	67	4.40	1.28	
Q#23	I plan to use mobile devices.	67	4.48	1.32	
Q#24	I will use mobile devices in the future.	67	4.67	1.30	

** Item for which scoring is reversed.*
Valid N (listwise)

ease of use distribution was negatively skewed (-0.65) with a relative lack of kurtosis (0.24). These results seemed to support the findings in the general technology acceptance studies (e.g., Davis, 1989, 1993; Davis et al., 1989).

The overall alpha for Perceived Usefulness (PU) is α =.951, which indicates a high level of internal consistency. From the total data set of N = 68 participants, there were three missing values (4.28%) for the perceived usefulness variable. Table 16 presents the participants' mean scores with the standard deviations of the four subscales. To calculate the mean, at least three variables from the subgroup were available.

The mean values displayed in Table 16 on the research model indicate that the participants had positive perceptions of perceived usefulness (*M*=4.60) towards mobile technology usage. Perceived usefulness variable had a *SD* of 1.14. The shape of the perceived usefulness distribution was negatively skewed (-0.87) with a relatively peaked kurtosis (1.00). These results supported the findings in the general technology acceptance studies (e.g., Davis, 1989, 1993; Davis et al., 1989).

The overall alpha for attitude towards computer use (AU) is α =.877, which indicates a high level of internal consistency. From the total data set of *N* = 69 participants, there were two missing values (2.85%) for the attitude towards computer use variable. Table 16 presents the participants' mean scores with the standard deviations of the four subscales. To calculate the mean, at least three variables from the subgroup were available.

The mean values displayed in Table 16 on the research model seem to tell us that the participants had positive attitude (*M* = 4.25) towards mobile technology usage. Attitude towards computer use variable had a *SD* of 1.03. The shape of the attitude towards computer use distribution was negatively skewed (-0.51) with a relative lack of kurtosis (0.50). These results supported the findings in the general technology acceptance studies (e.g., Davis, 1989, 1993; Davis et al., 1989).

The overall alpha for Facilitating Conditions (FCs) is α =.819, which indicates a high level of internal consistency. From the total data set of *N* = 70 participants, there were two missing values (2.85%) for the facilitating conditions variable. Table 16 presents the participants' mean scores with the standard deviations of the four subscales. To calculate the mean, at least three variables from the subgroup were available.

The mean values displayed in Table 16 on the research model indicate that the participants had moderate levels of Facilitating Conditions (M = 3.50). Facilitating conditions variable had a *SD* of 1.13. The shape of the facilitating conditions distribution was relatively unskewed (-0.15) with a relative lack of kurtosis (-0.17). These results were not supported by the findings in the general technology acceptance studies (e.g., Davis, 1989, 1993; Davis et al., 1989).

The overall alpha for Subjective Norm (SN) is α = .914, which indicates a high level of internal consistency. From the total data set of N = 66 participants, there were seven missing values (10%) for the subjective norm variable. Table 16 presents the participants' mean scores together with the standard deviations of the four subscales. To calculate the mean, at least three variables from the subgroup were available.

The mean values displayed in Table 16 on the research model indicate that the participants had positive perceptions of Subjective Norm (M = 4.10). Subjective norm variable had a *SD* of 1.10. The shape of the subjective norm distribution was negatively skewed (-0.54) with somewhat peaked kurtosis (0.50). These results supported the findings in the general technology acceptance studies (e.g., Davis, 1989; 1993; Davis et al., 1989).

The overall alpha for Behavioral Intention (BI) is α =.956, which indicates a high level of internal consistency. From the total data set of N = 67 participants, there were three missing values (4.28%) for the behavioral intention variable. Table 16 presents the participants' mean scores with the standard deviations of the four subscales. To calculate the mean, at least three variables from the subgroup were available.

The mean values displayed in Table 16 on the research model seem to tell us that the participants had great intention to use Mobile Technology (M = 4.47), since unit 4 on the 6-point

scale indicates positive agreement. Behavioral intention variable had a *SD* of 1.23. The shape of the behavioral intention distribution was negatively skewed (-1.11) with a peaked kurtosis (1.61). These results supported the findings in the general technology acceptance studies (e.g., Davis, 1989; 1993; Davis et al., 1989).

Analysis and Findings

Multiple linear regression analysis was utilized to examine the extent to which perceived usefulness, perceived ease of use, attitude towards computer use, subjective norm and facilitating conditions predict behavioral intention. Listwise deletion was used for missing data.

Results from the regression analyses indicated that 48.5% of the variance in the outcome variable behavioral intention use was explained by the predictor variables of perceived usefulness, perceived ease of use, attitude towards computer use, subjective norm, facilitating conditions, R^2 = .485, adjusted R^2_{adj} =.441. The relationship between the set of predictors and outcome variable was statistically significant, F (5, 58) =10.937, $p < .001$. Table 17 provides a summary of the analysis.

Table 17

Summary of Linear Regression Analysis for Behavioral Intention (N = 64)

	Variable	*B*	*SE(B)*	*β*	*t*	*Sig. (p)*
1	(Constant)	0.307	0.593		0.518	.607
	Subjective Norm	0.263	0.149	.229	1.764	.083
	Facilitating conditions	0.214	0.121	.196	1.766	.083
	Attitude Towards Computer Use	0.248	0.191	.208	1.303	.198
	Perceived Usefulness	0.174	0.158	.161	1.098	.277
	Perceived Ease of Use	0.113	0.137	.104	0.830	.410

Note: R^2 = .485, adjusted R^2_{adj} =.441, SEE = 0.92271, F (5, 58) = 10.937, p<0.05

Hypotheses Tested

Hypothesis 1 of this study stated that there is a relationship between perceived usefulness (PU) and the user's behavioral intention (BI) to use mobile technology. The results suggested that perceived usefulness (β = .161, *t(64)* = 1.098, *p* = .277), had no statistically significant relationship with behavioral intention. Hypothesis 2 of this study stated that perceived ease of use (PEU) will positively relate to the user's behavioral intention (BI) to use mobile technology. The results suggested that perceived ease of use (β = 0.104, *t(64)* = 0.830, *p* =.410), had no statistically significant relationship with behavioral intention. Hypothesis 3 of this study stated that attitude towards computer use (AU) will positively relate to the user's behavioral intention to use (BI) mobile technology. The results suggested that attitude towards computer use (β = 0.208, *t(64)* = 1.303, *p* =.198), had no statistically significant relationship with behavioral intention. Hypothesis 4 of this study stated that subjective norm (SN) will positively relate to the user's behavioral intention (BI) to use mobile technology. The results suggested that subjective norm (β = 0.229, *t(64)* = 1.764, *p* =.083), had no statistically significant relationship with behavioral intention. Hypothesis 5 of this study stated that facilitating conditions (FCs) will positively relate to the user's behavioral intention (BI) to use mobile technology. The results suggested that facilitating conditions (β = 0.196, *t(64)* = 1.766, *p* =.083), had no statistically significant relationship with behavioral intention. The estimated regression equation was $\hat{y} = 3.07 + 0.26(SN) + 0.21(FC) + 0.25(AU) + 0.17(PU) + 0.11(PEU)$.

As shown in Figure 3, the histogram of the standardized residuals showed some negative skewness. Using the Durbin-Watson statistic, the independence of the residuals was tested and the assumption was not violated (*d* = 2.082). As shown in Figure 4, the scatter plot of

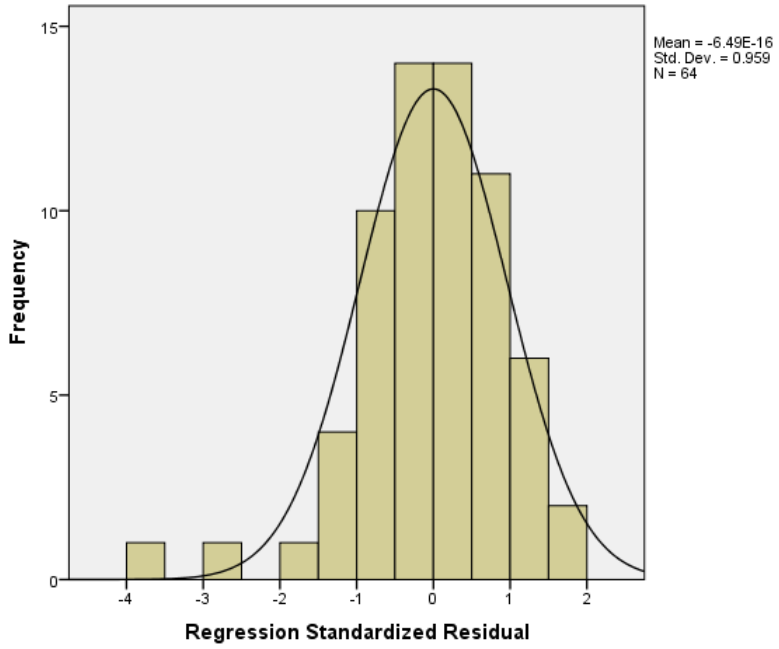

Figure 3. Histogram of the standardized residuals.

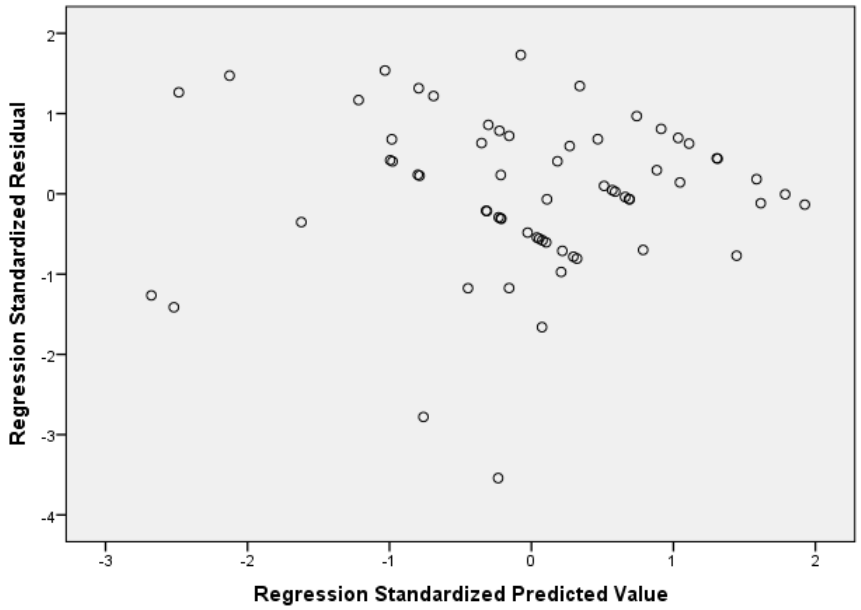

Figure 4. Scatter plot of standardized residual versus standardized predicted value.

standardized residual versus standardized predicted value indicates that there was no evidence of heteroscedasticity as the residuals were distributed evenly across predicted values. Figure 5 shows a scatter plot of the dependent variable on the predicted values.

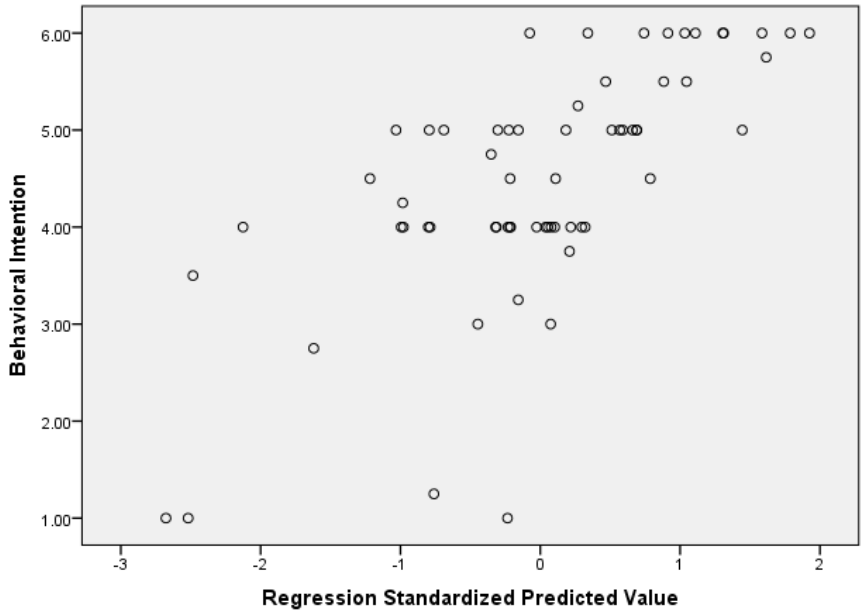

Figure 5. Scatter plot of the dependent variable on the predicted values.

The residuals were analyzed for regression outliers and one case (#59) was identified with standardized residual $z = 3.54$. Several cases had larger leverage values > .19; however, these cases did not show influence using other statistics e.g. Cook's Distance. Excessive multicollinearity was not an issue, as the correlations between the five independent variables were not high. The variance inflation factors (VIF) were less than 10, and tolerance statistics were close to 1.

Subjective Norm

Because one regression outlier was identified in the data, the regression analysis was carried out again omitting this case (#59). Results from the regression showed that the

relationship between the predictors and outcome variable was statistically significant, F (5, 57) =14.676, $p < .001$. A total of 56.3% of the variance in the outcome variable behavioral intention use was explained by the predictor variables of perceived usefulness, perceived ease of use, attitude towards computer use, subjective norm, facilitating conditions, $R^2 = .563$, adjusted $R^2_{adj} = .524$ which represented a strong effect. Table 18 provides a summary of the analysis.

Table 18

Summary of Linear Regression Analysis for Behavioral Intention (N = 63)

	Variable	*B*	*SE(B)*	*β*	*t*	*Sig. (p)*
1	(Constant)	0.327	0.515		0.634	.529
	Subjective Norm	0.395	0.133	.367	2.979	.004
	Facilitating conditions	0.028	0.113	.027	0.251	.803
	Attitude Towards Computer Use	0.235	0.165	.211	1.422	.160
	Perceived Usefulness	0.167	0.137	.165	1.214	.230
	Perceived Ease of Use	0.166	0.119	.163	1.395	.169

Note: $R^2 = .563$, adjusted $R^2_{adj} = .524$, SEE = 0.80129, F (5, 57) = 14.676, p<0.05

The results suggested that, considered individually, perceived usefulness ($\beta = .165$, *t(63)* = 1.214, $p = .230$), perceived ease of use ($\beta = 0.163$, *t(63)* = 1.395, $p = .169$), facilitating conditions ($\beta = 0.027$, *t(63)* = 0.251, $p = .803$), and attitude towards computer use ($\beta = 0.211$, *t(63)* = 1.422, $p = .160$) had no statistically significant relationship with behavioral intention. Subjective norm, however, had a statistically significant positive relationship with behavioral intention ($\beta = 0.367$, *t(63)* = 2.979, $p = .004$). The estimated regression equation was $\hat{y} = 0.33 + 0.40(SN) + 0.03(FC) + 0.24(AU) + 0.17(PU) + 0.17(PEU)$.

As shown in Figure 6, the histogram of the standardized residuals is close to normally distributed. Using the Durbin-Watson statistic, the independence of the residuals was tested and the assumption was not violated (d = .129). As shown in Figure 7, the scatter plot of standardized residual versus standardized predicted value indicates that there was no evidence of heteroscedasticity as the residuals were scattered evenly across predicted values. Figure 8 shows a scatter plot of the dependent variable on the predicted values.

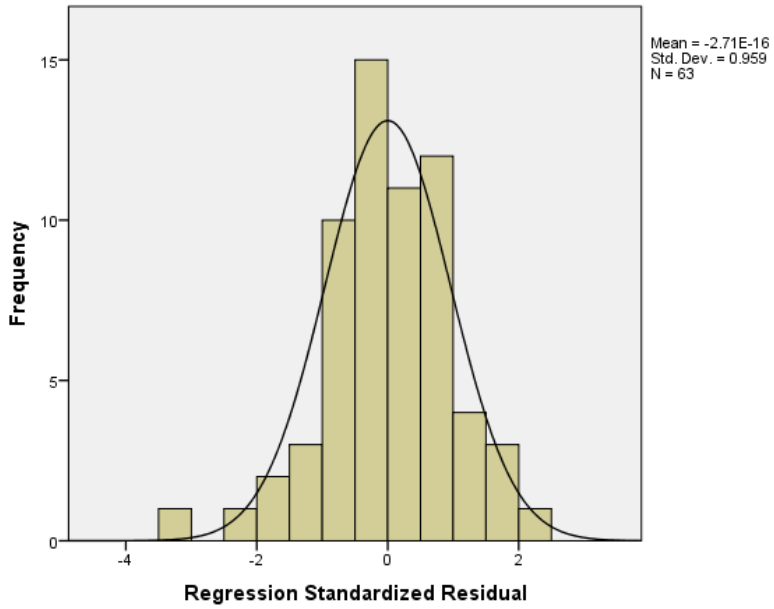

Figure 6. Histogram of the standardized residuals.

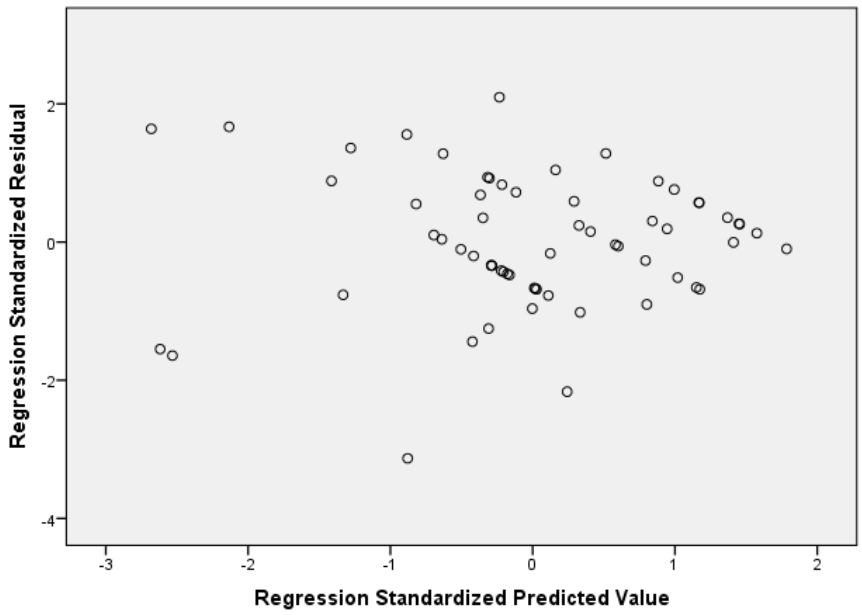

Figure 7. Scatter plot of standardized residual versus standardized predicted value.

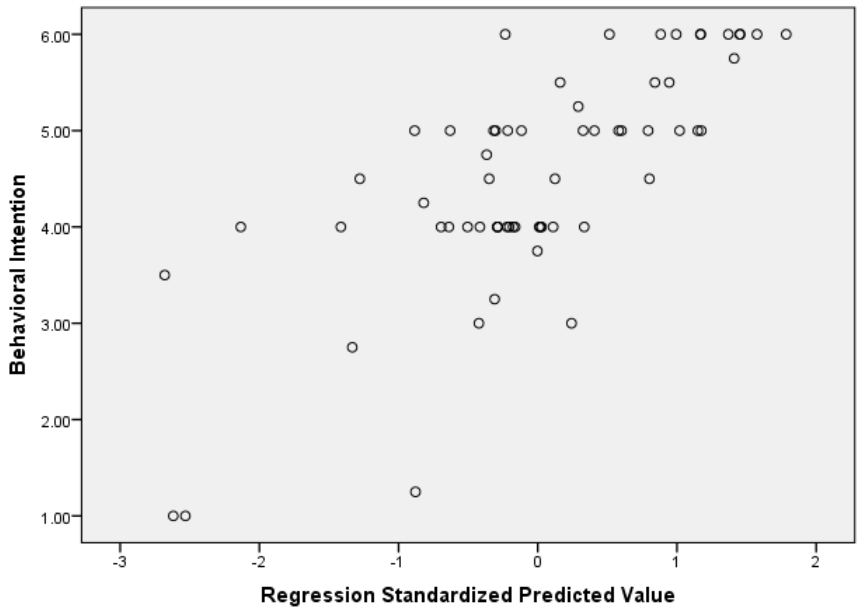

Figure 8. Scatter plot of the dependent variable on the predicted values.

The data were analyzed for regression outliers and no outlying cases were identified. Excessive multicollinearity was not evident, as the correlations between the five independent variables were not high. The variance inflation factors (VIF) were less than 10, and tolerance statistics were close to 1.

Demographic Factors

Demographic factors also were explored to determine their unique contribution towards instructors' behavioral intention to utilize mobile technology. The coding scheme of the categorical data aligned with categories employed in previous empirical research. The demographic factors coding scheme were as follows: *Age* had ten ordinal values: Under 25 years (1), 25-29 years (2), 30-34 years (3), 35-39 years (4), 40-44 years (5),45-49 years (6), 50-54 years (7), 55-59 years (8), 60-64 years (9), Age 65 or older (10). *Gender* had two (2) choices: Female or Male. *Faculty years of using mobile device* had five (5) ordinal options: have not used, 1-3 years, 4-6 years, 7-9 years, and 10 or more years.

From the total data set of $N = 70$ cases, there were 5 missing values (7.14%) for the age variable, 3 missing values (4.28%) for the gender variable, 2 missing values (2.86%) for the faculty years of using mobile device, and 3 missing values for the behavioral intention (4.28%) variable.

A two-stage hierarchical multiple regression analysis was performed to test hypothesis 6 that states there is a relationship between the instructors' demographic factors and their behavioral intention (BI) to use mobile technology. Listwise deletion was used to further control the treatment of missing data.

The relevant assumptions of the statistical analyses were tested before conducting the hierarchical multiple regression analysis. After initial analysis, a regression outlier (case #59) was identified and removed. Histogram and scatter plots indicated the assumptions of normality, linearity, and homoscedasticity were all satisfied (see Figures 9-11).

The demographic factors (*age, gender, and years of using mobile device*) were entered as the first block of predictors. The primary variables of interest (*perceived usefulness, perceived ease of use, attitude towards computer use, subjective norm and facilitating conditions*) were entered as the second block.

The correlations among the regression variables are reported in Table 19.

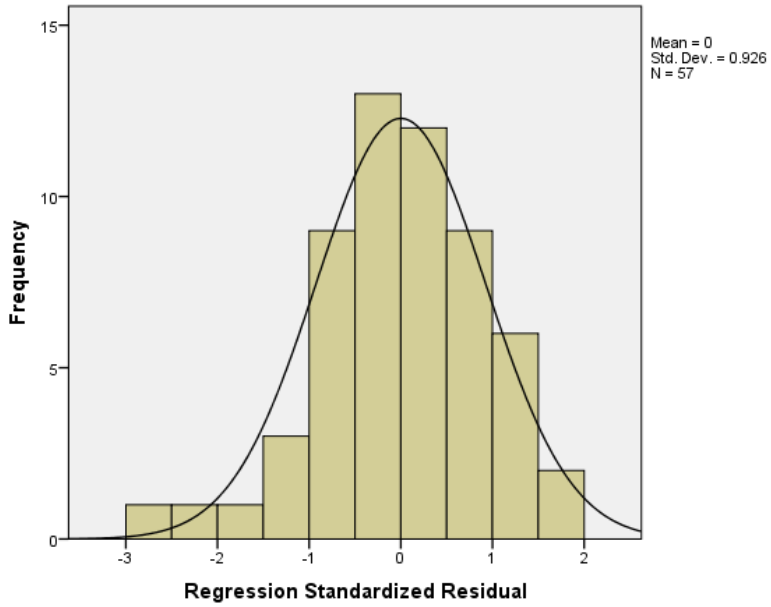

Figure 9. Histogram of the standardized residuals.

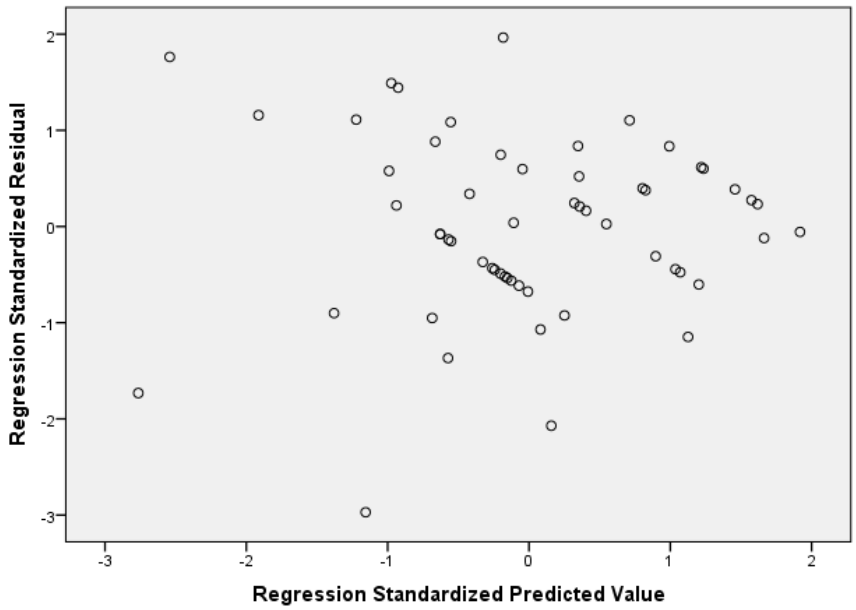

Figure 10. Scatter plot of standardized residual versus standardized predicted value.

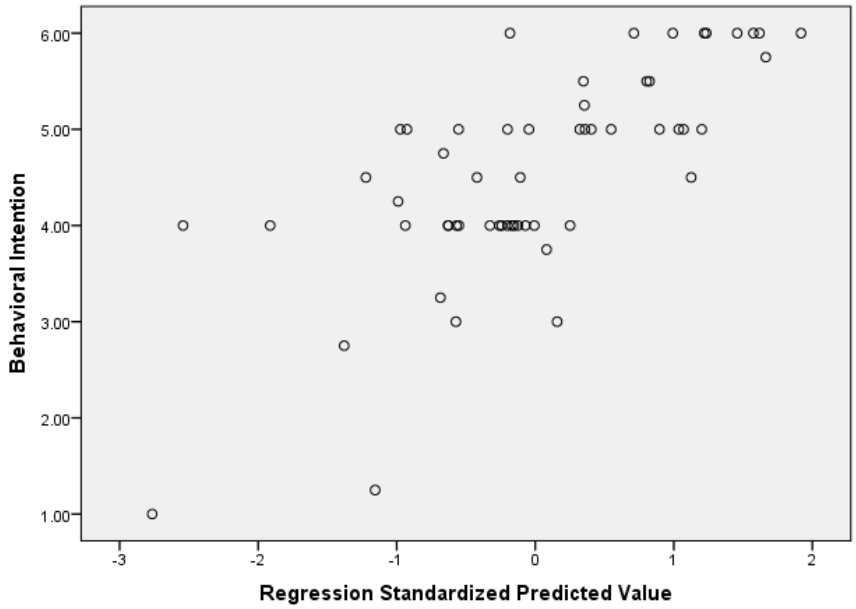

Figure 11. Scatter plot of the dependent variable on the predicted values.

Table 19

Correlation Matrix for Hierarchical Multiple Regression Analysis

	Behavioral Intention	Years of using mobile device	Gender	Age
Behavioral Intention	1.000			
Years of using mobile device	.337*	1.000		
Gender	.033	-.293*	1.000	
Age	.005	-.077	-.148	1.000
Subjective Norm	.603*	.144	.053	.047
Facilitating conditions	.386*	.326*	-.277*	.058
Attitude Towards Usage	.579*	.454*	-.006	-.069
Perceived Usefulness	.578*	.356*	.015	.000
Perceived Ease of Use	.382*	.477*	.040	-.275*

**Correlation is significant at the 0.05 level (1-tailed).* (Continued below)

Table 19 (continued)

	Subjective Norm	Facilitating conditions	Attitude Towards Computer Use	Perceived Usefulness	Perceived Ease of Use
Behavioral Intention					
Years of using mobile device					
Gender					
Age					
Subjective Norm	1.000				
Facilitating conditions	.460*	1.000			
Attitude Towards Usage	.481*	.447*	1.000		
Perceived Usefulness	.481*	.325*	.676*	1.000	
Perceived Ease of Use	.148	.312*	.597*	.455*	1.000

Results from the hierarchical multiple regression analysis indicated that the relationship between the predictors and outcome variable was statistically significant, F (3, 53) = 2.774, p = .050. A total of 13.6% of the variance in the outcome variable behavioral intention was explained by the demographic predictor variables of years of using mobile device, age and gender, R^2= .136, adjusted R^2_{adj} =.087.

The addition of perceived usefulness, perceived ease of use, subjective norm, facilitating conditions and attitude towards computer use at stage two explained an additional 38.3% of the variance in behavioral intention, ΔR^2 = .383. For the complete set of predictors (block 1 and block 2), the relationship between the predictors and outcome variable was statistically significant, F(5,48) = 7.656, p < .001, with 51.9% of the variance in behavioral intention explained. Table 20 provides a summary of the analysis.

Table 20

Summary of Hierarchical Regression Analysis for Variables Predicting Behavioral Intention (N = 57)

		B	*Std. Error*	*Beta*	*t*	*Sig.*
1	(Constant)	2.466	.866		2.485	.006
	Years of using mobile device	0.331	0.115	.387	2.872	.006
	Gender	0.335	0.294	.155	1.139	.260
	Age	0.033	0.076	.057	0.440	.662
2	(Constant)	-0.037	0.816		-0.046	.964
	Years of using mobile device	0.093	0.108	.109	0.862	.393
	Gender	0.108	0.248	.050	0.434	.666
	Age	0.021	0.062	.037	0.345	.731
	Subjective Norm	0.427	0.142	.393	2.999	.004
	Facilitating Conditions	0.023	0.124	.023	0.182	.856
	Attitude Towards Computer Use	0.153	0.183	.137	0.835	.408
	Perceived Usefulness	0.213	0.148	.205	1.436	.157
	Perceived Ease of Use	0.097	0.143	.097	0.683	.498

Hypothesis 6 of this study stated that there is a relationship between the instructors' demographic factors and their behavioral intention (BI) to use mobile technology.

At stage one, the results suggested that only years of using mobile device (β = 0.387, $t(57)$ = 2.872, p = .006), had a statistically significant positive relationship with behavioral intention. The results suggested that neither age (β = .155, p = .260) nor gender (β = .057, p = .662), had a statistically significant relationship with behavioral intention.

At stage two, the results suggested that, when controlling for demographic factors, only subjective norm (β = 0.393, $t(57)$ = 2.999, p =.004) had a statistically positive significant relationship with behavioral intention. Perceived usefulness (β = 0.213, $t(57)$ = 1.436, p = .408), Perceived ease of use (β = 0.097, $t(57)$ = 0.683, p =.498), attitude towards computer use (β = 0.137, $t(57)$ = 0.835, p =.408), and facilitating conditions (β = 0.023, $t(57)$ = 0.182, p = .856) had no statistically significant relationship with behavioral intention. The estimated regression equation was $\hat{y} = -0.04 + 0.09(years\ of\ using\ mobile\ device) + 0.11(gender) + 0.02(age) + 0.43\ (SN) + 0.02(FC) + 0.15(AU + \ 0.21(PU) + 0.10(PEU)$.

Chapter 4 Summary

This chapter includes description of the data as well as exploration of the research question results pertaining to the research hypotheses. Cronbach's alpha was used to assess the composite reliability of each construct. The reliability coefficient for each subscale was high, with values ranging from .81 to .96, exceeding the guidelines (>.70) set by DeVellis (2003). Therefore, implying and internal consistency of the items (variables) within the scale. A review of the histograms and scatter plots indicated that the assumptions of normality, linearity, and

homoscedasticity were all satisfied. One regression outlier was identified in the data; the regression analysis was carried out omitting this case (#59).

Results from the regression showed that the relationship between the complete set of predictors and the outcome variable was statistically significant. A total of 56.3% of the variance in the outcome variable behavioral intention use was explained by the predictor variables of perceived usefulness, perceived ease of use, attitude towards computer use, subjective norm, and facilitating conditions. With the exception of H_4 (subjective norm), the results suggested that perceived usefulness, perceived ease of use, facilitating conditions, and attitude towards computer use had no statistically significant relationship with behavioral intention.

The analysis of the data confirmed that, although the combined set of demographic factors (age, gender and, and years of using mobile device) was statistically significant, individual demographic predictors (with the exception of H_6 - years of using mobile device) did not emerge as statistically significant. However, years of using a mobile device was not statistically significant when controlling for the TAM constructs. The results of this study suggested that the demographic characteristics studied were not contributors to full-time instructors' behavioral intention to utilize mobile technology in the higher education environment. A total of 13.6% of the variance in the outcome variable behavioral intention use was explained by the demographic factors (years of using mobile device, age and gender).

The final model (perceived usefulness, perceived ease of use, attitude towards computer use, subjective norm, facilitating conditions, and demographic factors) explained 51.9% of the variance in behavioral intention. Results failed to reject the null hypothesis for four of the six research hypotheses, conversely contradicting this researcher prediction. This study found

statistical significance related to years of using a mobile device (H_6) and subject norm (H_4); however, the remaining variables in the analysis were not statistically significant ($p > .05$).

Chapter 5 includes the summary and discussion of the results, conclusions regarding the significant and non-significant results found, additional discussion on the descriptive data specifically related to mobile technology usage, and recommendations for the future use of this information.

CHAPTER 5

CONCLUSIONS, DISCUSSION, IMPLICATIONS, RECOMMENDATIONS, AND FUTURE RESEARCH

This chapter includes the summary of the research findings by presenting the results of the data analysis in narrative and statistical forms. It also includes conclusions drawn based on the results of the study and the implications this study has on the field of instructional technology. This chapter also includes several recommendations for future research and concludes with a discussion of the implications of this study for instructional technology.

Purpose of the Study

The purpose of this survey research was to investigate the determinants that predict college instructors' college instructors' behavioral intentions to use mobile technology. To empirically examine the relationships between the following constructs: perceived usefulness (PU), perceived ease of use (PEU), attitude towards computer use (ATU), subjective norm (SN), facilitating conditions (FCs), and behavioral intention (BI). Utilizing mobile technology as a vehicle that promotes and enhance learning is an emerging trend in educational environment; as a result, the integration of mobile technology within the higher education environment has been endorsed as an essential academic tool (Johnson, Adams, & Cummins, 2012; Kim et al., 2006; Mac Callum et al., 2014; Marmarelli & Ringle, 2011; Raths, 2012). This research focuses on the technological innovation of mobile technology within the higher education environment.

The research data were collected from full-time college instructors from a fully accredited public, urban university located on the south side of Chicago using a survey instrument that was adapted by the author from published guidelines and prior research surveys. The survey was delivered using Qualtrics, a web-based survey tool. The survey instrument included items based on the constructs of TAM model for understanding college instructors' behavioral intention to utilize mobile technology and the development of relevant research hypotheses. This study extends the Technology Acceptance Model (TAM) framework, with subjective norm and facilitating conditions acting as predictive variables.

One central research question guided this study: What factors have relationships with university faculty members' intention to use mobile devices to support teaching and instruction? The research hypotheses for this study are as follows: H_1: Perceived usefulness (PU) will have a relationship with the instructor's behavioral intention to use (BI) mobile technology. H_2: Perceived ease of use (PEU) will have a relationship with the instructor's behavioral intention to use (BI) mobile technology. H_3: Attitude towards computer use (AU) will have a relationship with the instructor's behavioral intention to use (BI) mobile technology. H_4: Subjective norm (SN) will have a relationship with the instructor's behavioral intention to use (BI) mobile technology. H_5: Facilitating conditions (FCs) will have a relationship with the instructor's behavioral intention to use (BI) mobile technology. H_6: There is a relationship between the instructors' demographic factors and their behavioral intention (BI) to use mobile technology.

To ensure that the questionnaire was easy to understand and not ambiguous, a pilot study was conducted prior to distribution to the study subjects. Content validity was established by pilot testing the instrument with a random sample of 20 full-time college instructors from TSU who

were not involved in the actual study. The participants in the pilot study completed all approval forms before completing the questionnaire. The data were analyzed using SPSS. Cronbach's alphas were used to determine the reliability of the 24 items, four constructs and two external variables questionnaire.

The completed instrument consisted of three parts (shown in Appendix C). The instrument composed of TAM's 4 constructs, 2 external variables and 24 statements on Perceived Usefulness (four items), Perceived Ease of Use (four items), Attitude Towards Computer Use (four Items), Facilitating Conditions (four items), Subjective Norm (four items) and Behavioral Intention (four items). Part I was based on a prior study (Teo, 2009) with modifications to fit the specific context of college instructors' behavioral intentions to use mobile technology; subsequently developed from the TAM scales, adapted from Davis, et al. (1989) and Venkatesh, et al. (2003). Part II was designed to identify demographic information of each participant. This includes information such as instructors' age, gender, race, educational level, academic rank, assigned college, and instructional years. Part III utilized information captured from a prior study (Smarkola, 2004) with modifications to gather supplemental information on college instructors' mobile technology utilization.

This study employed the use of multiple regression analyses in an attempt to understand and explore the functional relationship between the dependent variable and the independent variables. All full-time instructors from the Spring 2015 semester were identified; as a result, 274 full-time faculty members were selected to participate in the study. The compiled list included name, UID and e-mail address. Of the 274 participants emailed, 74 participants completed the

survey (N = 74) for a 27% completion rate. Of these completed surveys, 70(N = 70) were usable and considered for further analysis, representing 26% of all selected participants in the study.

Data collected from the survey after respondents completed the online survey was entered into SPSS version 23 to complete descriptive and inferential statistical analyses and report results in graphical and table formats. The tool was used to facilitate standardization of statistical calculation such as multiple regressions to explore data relationships and reliability test; descriptive statistical analyses such as means, standard deviation, frequency, percent and correlations test and develop graphs to better understand the data pertaining to the research question and research hypotheses. Multiple regression analyses were also used for hypotheses testing.

Alpha was established a priori at the .05 level, as suggested in the literature. The adjusted R^2 value for each regression was reported to indicate the percentage of variability in the outcome variable explained by the predictor variables. The standardized coefficient (β) was reported to describe the regression weight of each predictor variable.

Discussion of Results

Results fail to reject the null hypothesis for four of the six research hypotheses, conversely contradicting this researcher's prediction. In contrast, the study found statistical significance related to subjective norms and years of using mobile device technology; however, the remaining variables in the analysis were not statistically significant (p >.05). These results of this analysis are included in Table 21.

Table 21

Hypothesis Testing Results

Research Hypotheses	Relationship	Coefficient	Support for Research Hypothesis
H_1	(PU) → (BI)	.165	Not Supported
H_2	(PEU) → (BI)	.163	Not Supported
H_3	(ATU) → (BI)	.211	Not Supported
H_4	(SN) → (BI)	.027	Supported
H_5	(FC) → (BI)	.027	Not Supported
H_6	(DF) → (BI)	.387	Supported

Drawing upon the theory of Davis's Technology Acceptance Model (1989), the results showed that college instructors' behavioral intention to use mobile technology was influenced by two variables: subjective norms and facilitating years of using mobile devices (experience).

The results of the study failed to support previous research findings, all of the main predictors of TAM (perceived usefulness, perceived ease of use, and attitude towards using) were found to be not statistically significant. In addition, the research failed to support one (facilitating condition) of the two external variables (subjective norm and facilitating condition) identified from prior studies (Teo, 2009; Venkatesh & Davis, 2000) as predictors. Lastly, there were no statistically significant relationships found between the demographic variables (age and gender) and the dependent variable (behavioral intention).

From the analysis of the major findings, several conclusions are made regarding this study and its application to instructor's behavioral intention to utilize mobile technology within the higher education environment. The results of this study suggest that the behavioral intention of using mobile technology within the higher education environment may not work well when it is applied to TAM, and there may be other intervening variables affecting user's decision to utilize

mobile technology within the higher education environment. In contrast to previous studies, the TAM was not strongly supported the as indicated by the research findings.

Research Question

What factors have relationships with university faculty members' intention to use mobile devices to support teaching and instruction?

Research Hypotheses

H_1: Perceived usefulness (PU) will have a relationship with the instructor's behavioral intention to use (BI) mobile technology.

The results suggested that perceived usefulness had no statistically significant relationship with behavioral intention; therefore this hypothesis was not supported. This was not consistent with prior studies that confirmed that perceived usefulness had a statistically significant relationship with behavioral intention (Ajjan & Hartshorne, 2008; Findik & Ozkan, 2013; Kim & Garrison, 2009; Limayem & Cheung, 2008; Thong et al., 2002). In contrast, the results aligned with other empirical studies that confirmed that perceived usefulness does not have direct influence on behavioral intention to use technology (Amoako-Gyampah, 2007; Sanusi & Mohamed, 2012).

Although, at the sample level, perceived usefulness was positively correlated with Behavioral Intention, it did not result in a statistically significant relationship. This may be due to the users' experience and confidence level with mobile devices. By this, it is meant that emphasis on perceived usefulness of behavioral intent to utilize, or not, a particular technology may be becoming irrelevant because of the ways in which mobile technology has become embedded in the higher education environment.

H_2: Perceived ease of use (PEU) will have a relationship with the instructor's behavioral intention to use (BI) mobile technology.

The results suggested that perceived ease of use had no statistically significant relationship with behavioral intention; therefore, this hypothesis was not supported. These findings were not consistent with prior studies that provided evidence in support of a positive relationship among the constructs (Ajjan & Hartshorne, 2008; Teo, 2009; Teo, Chai, Hung, & Lee, 2008) or simply documented the relation between the constructs (Moon & Kim 2001). In contrast, similar studies found that there is no significant relationship between perceived ease of use and behavioral intention (Ayo, Mbarika, & Oni, 2015; Kashi & Zheng, 2013; Sanusi, 2012).

Although, at the sample level, perceived ease of use was positively correlated with behavioral intention it did not result in a statistically significant relationship. It can be inferred that the users' perception could have been influenced by their facilitating years of using mobile devices (experience). By this, it is meant that emphasis on perceived ease of use may be irrelevant in determining the users' behavioral intent due to the users' confidence and current knowledge of a particular technology. As a result, users are likely to be less driven by ease of use in their decision to use a particular technology.

H_3: Attitude towards computer use (ATU) will have a relationship with the instructor's behavioral intention to use (BI) mobile technology.

The results suggested that attitude towards computer use, had no statistically significant relationship with behavioral intention; therefore this hypothesis was not supported. This finding was not consistent with prior studies that suggested that attitude had a statistically significant relationship with the user's behavioral intention (Agrebi & Jallais, 2015; Chien, Wu, & Hsu,

2014; Paraskeva, Bouta, & Papagianni, 2008; Shroff et al., 2011; Teo et al., 2008; Teo & Noyes, 2014). On the other hand, this finding was consistent with prior studies that suggested that attitude did not have a direct statistically significant relationship with the user's behavioral intention (Masrom, 2007; Pavlou, 2003).

Hypothesis H_3 concerning attitude towards computer use was not supported due to the nonsignificant statistical results. In other words, in higher educational environments, users' attitude alone does not solely determine behavioral intentions to use a particular technology.

H_4: Subjective norm (SN) will have a relationship with the instructor's behavioral intention to use (BI) mobile technology.

The results suggested that subjective norm had a statistically significant positive relationship with behavioral intention; therefore, this hypothesis was supported. This finding was consistent with prior studies suggestion that subjective norm had a statistically significant relationship with behavioral intention (Motaghian, Hassanzadeh, & Moghadam 2013; Riquelme & Rios, 2010; Venkatesh & Zhang, 2010; Du, Zhu, Zhao, & Lv, 2012).

By this, it is meant that emphasis on social norms of behavioral intent to utilize, or not, a particular technology is important due to social influences. This also implies that utilization of mobile technology can be viewed from several perspectives due to the strong and positive relationships established within the university community. Also, it can mean that the study was conducted in an environment where there may be several hidden social pressures occurring. The findings of this study confirmed the role of social relationships and influences in behavioral intention to use mobile devices.

H_5: Facilitating conditions (FC) will have a relationship with the instructor's behavioral intention to use (BI) mobile technology.

The results suggested that facilitating conditions had no statistically significant relationship with behavioral intention; therefore this hypothesis was not supported. This finding was not consistent with prior studies that suggested that facilitating conditions had a statistically significant relationship with the user's behavioral intention (Hartshorne & Ajjan, 2009; Ngai, Poon, & Chan, 2007; Nor & Pearson, 2008; Zhang & Gutierrez, 2007).

Hypothesis H_5 concerning facilitating condition was not supported due to nonsignificant statistical results. One potential explanation Possibly, the users were not familiar with the supporting facilities that were available, thus, did not aligned a need for availability of facilitating conditions (facilities, training etc.) for using mobile technology as important. Another possible explanation is that the users had a considerable amount of experience using mobile technology, thus, they do not perceive the need for support if issues arise when facilitating the use of mobile technology.

H_6: There is a relationship between the instructors' demographic factors and their behavioral intention (BI) to use mobile technology.

Analysis confirmed that facilitating years of using a mobile device was a statistically significant positive predictor of behavioral intention; therefore, this hypothesis was supported. In contrast, the results showed that there was no statistical significant relationship between either age or gender and behavioral intentions.

The results of this study suggested that the demographic characteristics studied were negligible contributors to full-time college instructors' behavioral intention to utilize mobile

technology in the higher education environment. The results suggested that only facilitating years of using a mobile device had a statistically significant positive relationship with behavioral intention. The results suggested that age had no statistically significant relationship with behavioral intention. The results also suggested that gender had no statistically significant relationship with behavioral intention. The results were consistent with the varied results provided from prior studies exploring the impact of demographic factors on behavioral intentions.

According to Taylor and Todd (1995b), research studies have provided inconsistent data on the relationships between the constructs. As a result, the findings were consistent with the inconsistency regarding the statistical association between demographic factors and intention to use technology. Several research studies suggested that age (Ahmad Omar, & Ramayah, 2010; Meyer & Xu, 2009) and gender (Pierce & Ball, 2009) has statistically significant relationships with behavioral intention. Similarly, prior research studies suggested that computer proficiency (Inan & Lowther, 2010; Mukti, 2000) is a significant predictor of behavioral intentions. On the other hand, other empirical studies have suggested that no significant relationship exists (Ahmad et al., 2010; Glasgow & Keim, 2005; Lane & Lyle, 2011; Less, 2003; Marchewka, Liu, & Kostiwa, 2007; Panda & Mishra, 2007; Zhou & Xu, 2007).

We can infer that the users of this study were familiar with mobile devices, as 85 percent of the participants had at least two or more facilitating years of using mobile devices experience. Statically supporting the findings for Hypothesis H_3; participants' behavioral intention to utilize mobile device is influenced by their years of experience in using mobile devices. One possible explanation is that as the users gain facilitating years of experience, their self-confidence tends to

increase and therefore their intentions to utilize mobile technology increase. This variable should be further evaluated to determine if it is a predictor in other educational environments.

The results of this study also reaffirm the notion that researchers have yet to establish a consensus if age and gender are significant moderating factors affecting the adoption of technology.

In context of this research analysis, the non-significance of these variables (age and gender) may be due to the small sample size of this study that resulted in a limited age range of participants. By this, it is meant that the range of ages did not provide enough statistical power to study the differences caused by the age of the participants. In addition, the small sample size may have also impacted the ability to document gender differences. Research studies with more participants of different age groups that include equal sample size by genders may give different results.

The mixed research findings make it difficult to ascertain whether a lack of significant relationships between the variables and behavioral intent is really unusual, or if it is restricted for technology adoption within the higher educational settings. Due to the inconsistencies, additional research is still required to validate research hypotheses that were not supported; especially those results that contradicted previous research findings regarding predictors of behavioral intention to utilize mobile technology.

The final analysis of this study found that no matter what gender or age group an individual belonged to, those with facilitating years of using mobile technology experience and supporting social network will utilize mobile technology than those without.

Results from the regression indicated that 48.5% of the variance in the outcome variable behavioral intention use was explained by the predictor variables of perceived usefulness, perceived ease of use, attitude towards computer use, subjective norm, facilitating conditions, which represented a significant effect.

Implications for Technological Acceptance Model

The findings of this study suggest that despite the moderate predictive capacity of the overall model to the data, TAM is nonetheless useful for predicting college instructors' behavior intention to utilize mobile technology within the higher education environment.

An interesting theoretical finding was the strong role of subjective norms in the context of this study. While none of Davis' (1989) main predictors influenced the user's intent to utilize mobile technology, subjective norms provided the strongest prediction. It was the strongest predictor in explaining the variance which differed from majority of empirical research that employed TAM in mobile and other learning technology research.

Theoretically, this presents an interesting question: is this finding unique to the behavior intentions of college instructors, or are there larger theoretical implications for the Technology Acceptance Model? Possibly, this may indicate Davis' (1989) Technology Acceptance Model does not operate the same way in all technology acceptance environments, varying depending on setting and actual purpose studied. It is also possible other unknown variables could be influencing behavioral intent in the context of utilization of mobile technology.

While the researcher consciously framed this study using the constructs from TAM, other well-known technology acceptance theories may offer insight into the role of subjective norms and how they affect behavior intention. For instance, Theory of Planned Behavior (TPB; Ajzen,

1985; Ajzen, 1991), The Unified Theory of Acceptance and Use of Technology Model (UTAUT; Venkatesh et al., 2003), Diffusion of Innovations Theory (DoI; Rogers, 1983), and The Theory of Reasoned Action (TRA; Ajzen & Fishbein, 1977).

The review of the literature revealed scholars who have applied these validated theoretical frameworks to study technological innovations within the educational environment (Giles, 2012; Hung & Jeng, 2013; Ifenthaler & Schweinbenz, 2013; Mac Callum et al., 2014; Moon & Kim, 2001; Paver et al., 2014a, 2014b; Powell, 2012; Samms & Mozayani, 2012; Seliaman & Al-Turki, 2012; Teo, 2011). Empirical research has identified mediating and determining factors on technology acceptance.

Implications for Instructional Technology

Consideration of emerging technological tools, such as mobile technology, as an educational resource can be viewed as an important step for tertiary level administrators. Mobile technological tools can help transform classroom focus by changing the traditional way of teaching to a more conducive mobile learning environment. Examination of the relationship between current usage of mobile technology and college instructors' behavioral intentions to use the device can shed light on future adaption patterns of mobile technology in the higher education environment. Therefore, the data gathered from this study may be significant to policymakers, school administrators, mobile developers, as well as designers. The findings of this study have a number of implications. Firstly, by investigating the manners in which mobile technology is being used by instructors in the higher education environment, school administrators could use the findings to improve implementation and utilization strategies to support making decisions and regulations related to the use of mobile technology. In addition, the results of this study can be

used to make informed strategic decisions regarding technological integration within the higher education environment. In context of the findings of this study, recommended strategies for increasing college instructors' behavioral intention to utilize mobile technology are as follows:

a) Identify or increase social networking opportunities geared towards improving the use of technology by supporting or encouraging instructors to attend technology innovative summits. The goal is to increase usage through social influences, by increasing and encouraging professional dialogue that focuses on the importance of integrating technology within the learning environment.
b) Develop or enhance the use of a portal system that can provide additional support to the instructors. The portal would function as a technology community that promotes social interaction and knowledge sharing amongst the instructors and members of their social network. In the portal, instructors can solicit recommendations, share technological experience, discuss and examine educational practices using technological devices, and develop and share innovative lesson plans that have integrated technology within the curriculum. Finally, they can assess the effectiveness of technology or share strategies for the replacement or adoption of emerging technologies such as mobile technology.
c) Collaborate with instructors, those with facilitating experience, to develop technology adoption marketing campaigns gear to engaging new hires or obtaining buy-in from current college instructors. The instructors are a part of the social network and can help develop and promote technology activities amongst their peers. They can help ensure that the tool is a fit for instructional or learning purposes rather than an imposed change.
d) Prior to implementation, invest in a learning center dedicated to offering professional

development trainings that focus on the facilitation of technological tools. Recruit and utilize college instructors to assist with the planning, enhancement and facilitation of the trainings. This would provide instructors the opportunity to gain or increase facilitating experience.

By capitalizing on the significant relationships between subjective norms and facilitating years (experience) with college instructors' intention, administrators can creatively and effectively promote or increase use of technological tools in the higher education environment.

Facilitating learning in the 21st century requires the effective use of mobile technology. Hence the need for administrators to focus on creative solutions that supports and promotes college instructors use of technology within the classroom; specifically, utilizing subjective norms and facilitating years of experience using mobile technology as mediators to increase behavioral intention to use mobile technology.

Simply stated, administrators can no longer increase college instructors' behavioral intention to use mobile technology by merely providing easy to use or perceived useful technology. They must focus on the direct factors of college instructors' intention by using subjective norms and college instructors' facilitating years of using mobile technology experience as medians to increase behavioral intention. To accomplish this, school administrators should promote the use of mobile technology by using social influences amongst college instructors and their peers. Utilizing subjective norms is a great strategy that can be employed to attract new users or increase usage of mobile devices within the learning environment.

In the context of the findings of this study, social relationships help college instructors to decide whether or not to use mobile technology in their learning environment. Therefore, intent

to comply can be positively affected when their peers use mobile devices. It can also be infer that the opinions from family members, colleagues, or friends affect users' intention to use mobile technology. Therefore, school administrators should capitalize on this relationship by promoting activities that focuses on social interaction; building social communities that supports the use of mobile technology. In these communities, users can solicit recommendations and share their experience, while encouraging or recruiting new users to utilize mobile devices. By capitalizing on the significant relationship between subjective norms and college instructors' intention, administrators can creatively and effectively promote the use or increase use of mobile devices in the higher education environment.

Due to the significant correlation between the two variables, it can also be inferred that a user's behavioral intention to utilize mobile technology is impacted by facilitating years of using mobile technology. Therefore, school administrations should focus on soliciting assistance from college instructors with facilitating years of using mobile technology experience as advocates during the implementation of a new technological tool.

Indirectly, the findings from the study imply that there is an important need for learning centers where professional development trainings can be facilitated. During the implementation stages, school administrations could also consider investing in learning centers dedicated to offering professional development trainings that focuses on the facilitating the use of technological tools. This is an important strategy as it has the potential to increase users' intentions to use technology. Through professional development, the users will gain facilitating years of technology experience; thus, creating an environment where the users rely more on their experience when evaluating the use of a technology.

Secondly, the findings from this study can be use by mobile technology developers to expand the capacity and capability of mobile technology systems. In context of the findings, mobile developers could focus on the development of mobile systems that focuses on social platforms where users can share information and knowledge within their social network.

Lastly, findings of this study can be use by researchers of mobile technology. Future studies could compare the results of this study to other studies that identified additional variables that are equally important in enhancing mobile technology adoption in different context. In addition, the results of this study can be compared to other relevant model and add to the existing knowledge of user acceptance of mobile technology. Finally, the findings can be used as contributing information of applying TAM to the emerging literatures of mobile technology in the higher education learning environment.

With all things considered, the research findings significantly enhance understanding of users' intentions to use mobile devices. Drawing upon the theory of TAM, the results of the study reveal that college instructor' behavioral intentions to use mobile technology are influenced by subjective norms and facilitating years of using a mobile device. Consideration of the two predictors can have key roles in shaping users' behavioral intentions that can lead to more successful adoption of mobile technology within the higher education environment. By identifying these predictors, strategic implementation processes could lead to the instructors being more receptive to effectively and efficiently utilize mobile technology in their classroom.

It is important to consider that TAM's main constructs (perceived ease of use, perceived usefulness, and attitude to use) may function differently depending on other endogenous variables

included in this research setting. Regardless, TAM was shown to be a valid model in mobile technology research.

Assumptions, Delimitations and Limitations

The research study began with the assumption that participants completed the survey accurately and truthfully and the survey accurately measured behavioral intentions to use mobile technology.

This researcher identified the following delimitations: the survey looked only at full-time faculty from the current academic year and the population size which was limited only to TSU; the sample was not a random sample; the results were generalizable to a population exactly like the research population; and the researcher is a member of the university being utilized in this study.

There are several limitations evidenced in this study. These limitations should be considered for future research and improvement. This researcher identified the following limitations: the findings from this research come from a small sample. Surveys with larger sample size with more participants may give different results; the results could be due to self-reporting error or the survey instructions or questions; the institution is not a technology focused institution; results may not reflect behavioral intentions of full-time faculty at community colleges or research universities and should be interpreted with caution; and this research was only concerned with the general determinants of college instructors' behavioral intentions to use mobile technology (iPads/laptops).

Recommendations for Future Research

1. This study focused on full-time college instructors' behavioral intentions to use mobile technology within a state university. To increase the validity and generalizability of the model, future research could be conducted amongst several state universities. The results may vary based on increase utilization of mobile technology within the higher education environments due to the institutional policies and requirements for implementation and utilization of instructional technology.
2. The theoretical framework for this study involves theories regarding the concepts of Davis (1989) Technology Acceptance Model (TAM). Future research should compare existing theoretical frameworks that focus on technology acceptance. For instance, Theory of Planned Behavior (TPB; Ajzen, 1991) and The Unified Theory of Acceptance and Use of Technology Model (UTAUT; Venkatesh et al., 2003). These theoretical frameworks have been applied to study technological innovations within the educational environment as higher education institutions increased the utilization of technology and mobile devices throughout the learning environment (Giles, 2012; Hung & Jeng, 2013; Ifenthaler & Schweinbenz, 2013; Mac Cullum et al., 2014; Paver et al., 2014a, 2014b; Powell, 2012; Samms & Mozayani, 2012; Seliaman & Al-Turki, 2012; Teo, 2011). Comparison of results may enhance current models by identifying additional external variables that can add prediction of behavioral intentions to utilize technology or assess which model best helps to understand usage of information technology. In addition, the results can help the leadership team identify variables that are likely to influence systems use through the application of both design and implementation strategies.

3. This study focused on full-time college instructors' behavioral intentions to use mobile technology. It would benefit policy makers and the higher education administration team to duplicate the research and compare the results using the following populations: administrators, part-time and adjunct instructors, and students. Utilizing various stakeholders may offer a different perspective on intentions associated with integrating mobile technology within the higher education environment. In addition, may provide an insight on how to improve or implement effective strategies for technological integration.

Conclusion

In this study, TAM was found to be a valid model in predicting and help in understanding college instructors' behavioral intentions to use mobile technology. Adequately explaining the data; the model accounted for 48.5 percent of the variance in college instructors' intention to use mobile technology. Specifically, subjective norm and facilitating years of using a mobile device were found to be significant determinants of faculty members' intentions to use mobile technology.

The literature and data from this research indicate that social influence is a statistically significant predictor of behavioral intentions to utilize mobile device in a higher education learning environment. Simply stating that if the college instructors' peers, friends, or family members recommended using mobile devices, they're more than likely adopt and utilize the technology. In addition, facilitating years of using a mobile device (experience) is a statistically significant predictor of behavioral intentions to use mobile device in a higher education environment. By this, it is that instructors with facilitating years of mobile technology experience will use mobile devices more than those that have no facilitating experience.

Summary

This research focused on the technological innovation of mobile technology within the higher education environment. The following question served as a guide for this research: What factors have relationships with university faculty members' intention to use mobile devices to support teaching and instruction?

Chapter 1 documented the relationship between educational technology and the higher education environment, while providing a brief history of mobile technology. Chapter 2 provided an exhaustive review of relevant literatures from prior studies on technological integration within the higher education environment, providing a wide exploration of the growing trend of mobile technology within the field of educational technology. In addition, chapter two introduced the theories of TAM model as well as its application in the field of mobile technology within the educational learning environment. Chapter 3, which described the research methodology, presented as well as discussed the survey questionnaire designed and the research model for the research topic. It also provided the research variables, population and sampling procedures, instruments, validity and reliability, data collection, ethical considerations, and the analytic methods used to examine the data collected. It provided the detailed guidelines that were used to accomplish the research investigation. At the core of the study is a survey questionnaire that is the foundational tool for the collection of quantitative data. Chapter 4 provided an analysis of the data collected in the quantitative study to investigate the one research question. Full-time faculty members were queried through an electronic survey which provided the data for the study. Research question asked what factors influence university faculty members' intention to use the mobile devices to support teaching and instruction. A summary and discussion of the results were

presented in Chapter 5. Chapter 5 also included additional discussion on the descriptive data specifically related to mobile technology use and recommendations for future research.

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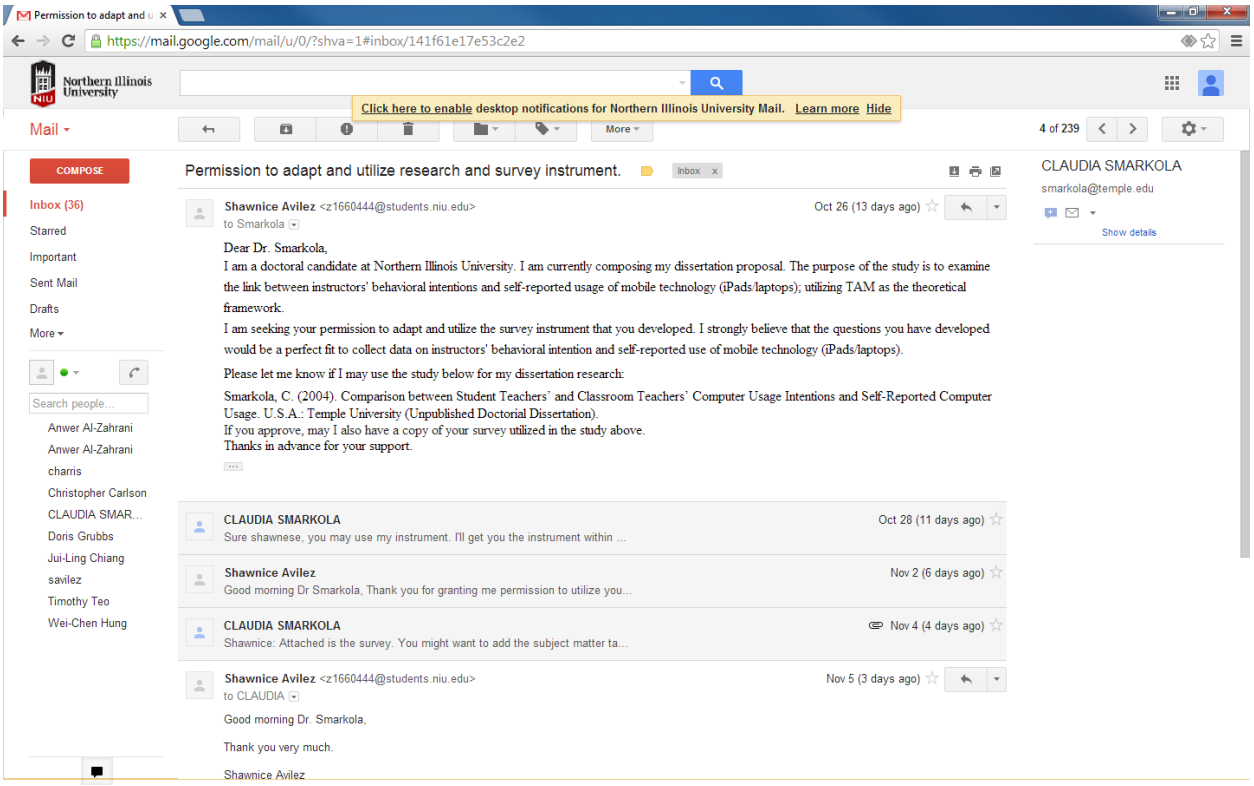
APPENDIX A

PERMISSION TO UTILIZE SURVEYS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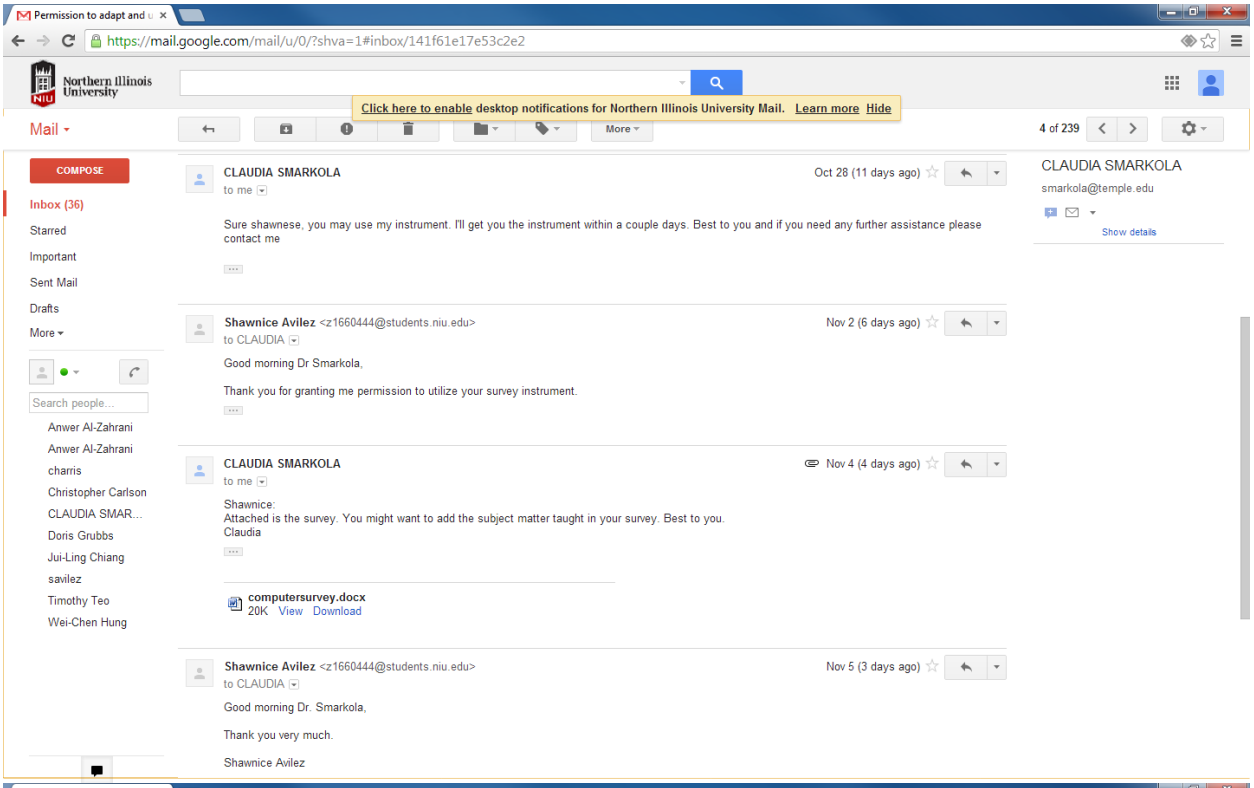
CLAUDIA SMAR...
Doris Grubbs
Jui-Ling Chiang
savilez
Timothy Teo
Wei-Chen Hung
Permission to adapt and utilize research and survey instrument.
Inbox
Shawnice Avilez <z1660444@students.niu.edu>
to Smarkola
Oct 26 (13 days ago)
Dear Dr. Smarkola,
I am a doctoral candidate at Northern Illinois University. I am currently composing my dissertation proposal. The purpose of the study is to examine the link between instructors' behavioral intentions and self-reported usage of mobile technology (iPads/laptops); utilizing TAM as the theoretical framework.
I am seeking your permission to adapt and utilize the survey instrument that you developed. I strongly believe that the questions you have developed would be a perfect fit to collect data on instructors' behavioral intention and self-reported use of mobile technology (iPads/laptops).
Please let me know if I may use the study below for my dissertation research:
Smarkola, C. (2004). Comparison between Student Teachers' and Classroom Teachers' Computer Usage Intentions and Self-Reported Computer Usage. U.S.A.: Temple University (Unpublished Doctorial Dissertation).
If you approve, may I also have a copy of your survey utilized in the study above.
Thanks in advance for your support.
CLAUDIA SMARKOLA
Sure shawnese, you may use my instrument. I'll get you the instrument within ...
Oct 28 (11 days ago)
Shawnice Avilez
Good morning Dr Smarkola, Thank you for granting me permission to utilize you...
Nov 2 (6 days ago)
CLAUDIA SMARKOLA
Shawnice: Attached is the survey. You might want to add the subject matter ta...
Nov 4 (4 days ago)
Shawnice Avilez <z1660444@students.niu.edu>
to CLAUDIA
Nov 5 (3 days ago)
Good morning Dr. Smarkola,
Thank you very much.
Shawnice Avilez
CLAUDIA SMARKOLA
smarkola@temple.edu
Show details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Christopher Carlson
CLAUDIA SMAR...
Doris Grubbs
Jui-Ling Chiang
savilez
Timothy Teo
Wei-Chen Hung
CLAUDIA SMARKOLA
to me
Oct 28 (11 days ago)
Sure shawnese, you may use my instrument. I'll get you the instrument within a couple days. Best to you and if you need any further assistance please contact me
CLAUDIA SMARKOLA
smarkola@temple.edu
Show details
Shawnice Avilez <z1660444@students.niu.edu>
to CLAUDIA
Nov 2 (6 days ago)
Good morning Dr Smarkola,
Thank you for granting me permission to utilize your survey instrument.
CLAUDIA SMARKOLA
to me
Nov 4 (4 days ago)
Shawnice:
Attached is the survey. You might want to add the subject matter taught in your survey. Best to you.
Claudia
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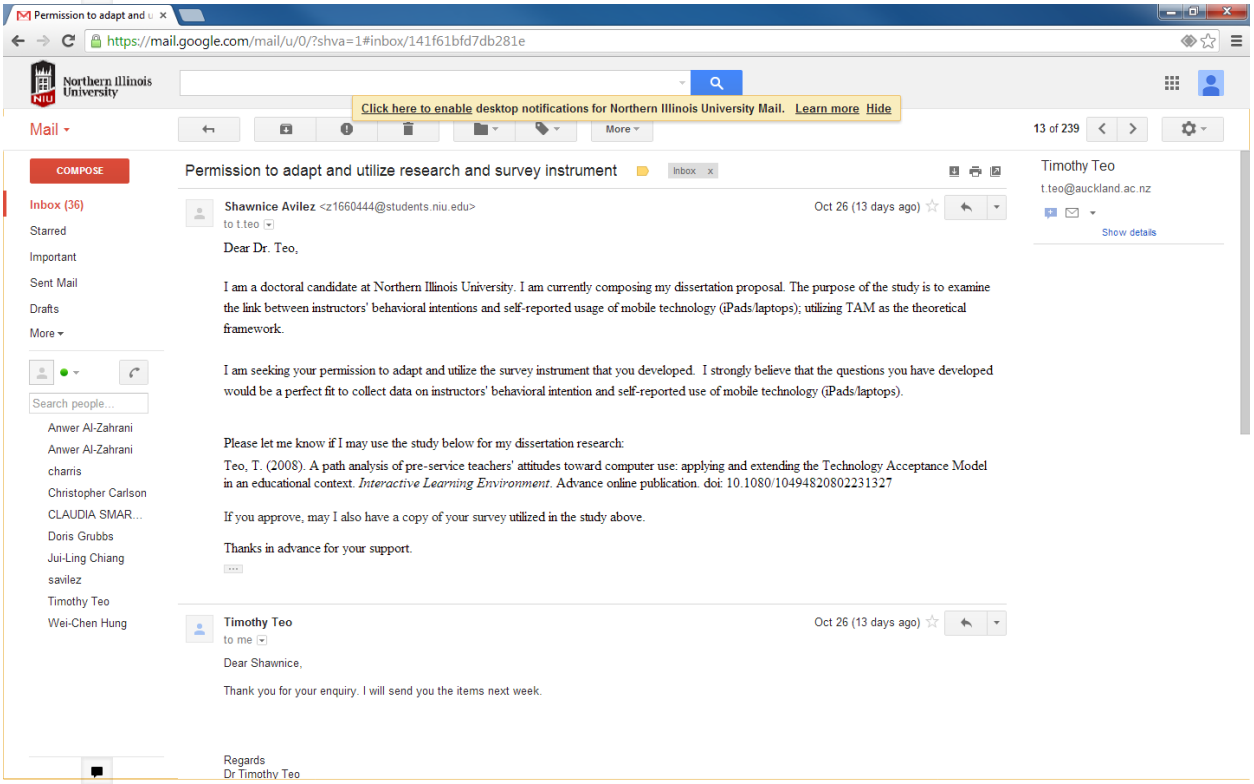
Shawnice Avilez <z1660444@students.niu.edu>
to CLAUDIA
Nov 5 (3 days ago)
Good morning Dr. Smarkola,
Thank you very much.
Shawnice Avilez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Click here to enable desktop notifications for Northern Illinois University Mail. Learn more Hide
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Anwer Al-Zahrani
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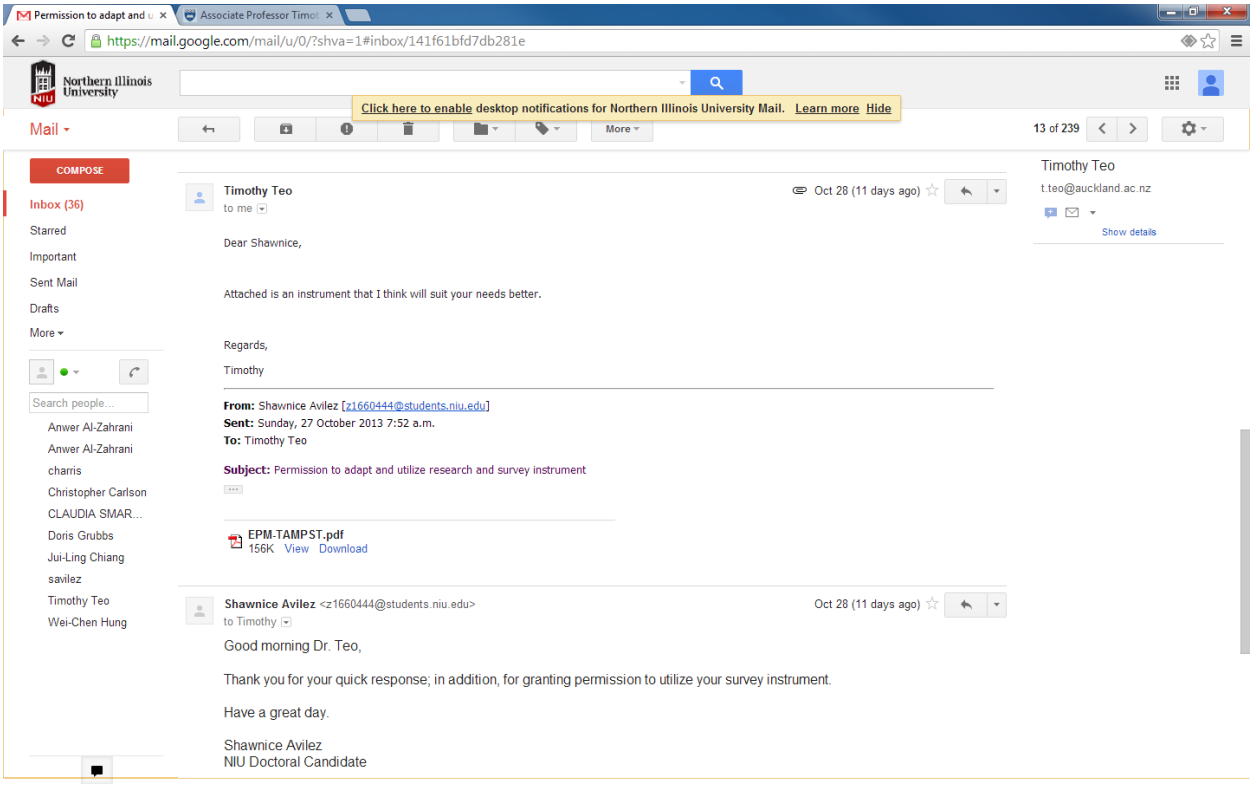
Christopher Carlson
CLAUDIA SMAR...
Doris Grubbs
Jui-Ling Chiang
savilez
Timothy Teo
Wei-Chen Hung
Permission to adapt and utilize research and survey instrument
Inbox
Shawnice Avilez <z1660444@students.niu.edu>
to t.teo
Oct 26 (13 days ago)
Dear Dr. Teo,
I am a doctoral candidate at Northern Illinois University. I am currently composing my dissertation proposal. The purpose of the study is to examine the link between instructors' behavioral intentions and self-reported usage of mobile technology (iPads/laptops); utilizing TAM as the theoretical framework.
I am seeking your permission to adapt and utilize the survey instrument that you developed. I strongly believe that the questions you have developed would be a perfect fit to collect data on instructors' behavioral intention and self-reported use of mobile technology (iPads/laptops).
Please let me know if I may use the study below for my dissertation research:
Teo, T. (2008). A path analysis of pre-service teachers' attitudes toward computer use: applying and extending the Technology Acceptance Model in an educational context. Interactive Learning Environment. Advance online publication. doi: 10.1080/10494820802231327
If you approve, may I also have a copy of your survey utilized in the study above.
Thanks in advance for your support.
Timothy Teo
to me
Oct 26 (13 days ago)
Dear Shawnice,
Thank you for your enquiry. I will send you the items next week.
Regards
Dr Timothy Teo
Timothy Teo
t.teo@auckland.ac.nz
Show details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Associate Professor Timot
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Northern Illinois University
Click here to enable desktop notifications for Northern Illinois University Mail. Learn more Hide
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Anwer Al-Zahrani
charris
Christopher Carlson
CLAUDIA SMAR...
Doris Grubbs
Jui-Ling Chiang
savilez
Timothy Teo
Wei-Chen Hung
Timothy Teo
to me
Oct 28 (11 days ago)
Dear Shawnice,
Attached is an instrument that I think will suit your needs better.
Regards,
Timothy
From: Shawnice Avilez [z1660444@students.niu.edu]
Sent: Sunday, 27 October 2013 7:52 a.m.
To: Timothy Teo
Subject: Permission to adapt and utilize research and survey instrument
EPM-TAMPST.pdf
156K View Download
Shawnice Avilez <z1660444@students.niu.edu>
to Timothy
Oct 28 (11 days ago)
Good morning Dr. Teo,
Thank you for your quick response; in addition, for granting permission to utilize your survey instrument.
Have a great day.
Shawnice Avilez
NIU Doctoral Candidate
Timothy Teo
t.teo@auckland.ac.nz
Show details

APPENDIX B

INFORMATION SHEET

INFORMATION SHEET

I agree to participate in the research project title, "Integration and Acceptance of Mobile Technology in the Higher Education Environment: Faculty Members' Perception," being conducted by Shawnice Avilez, a doctoral candidate at Northern Illinois University. I have been informed that the purpose of the study is to investigate the manners in which mobile devices are being used by faculty members in the higher education environment by studying faculty members' behavioral intentions.

I understand that if I agree to participate in this study, I will be asked to do the following: complete a short questionnaire survey, which will take about 20 - 25 minutes of my time.

I understand that NIU does not provide compensation nor does the university carry insurance to cover injury or illness incurred because of participation in university-sponsored research. I am aware that my participation is voluntary and may be withdrawn at any time without penalty or prejudice, and that if I have any additional questions concerning this study; you may contact Shawnice Avilez via email at keaiavilez@gmail.com or via phone at 708-297-8730 and you can email Dr. Hung at whung@niu.edu . I understand that if I wish further information regarding my rights as a research subject, I may contact the Office of Research Compliance at Northern Illinois University at (815) 753-8588. I understand that I may also contact the Dr. Janene Marshall, IRB Chair at Chicago State University (CSU) at (773) 995-5078.

I have been informed that there are no known risks of this study; however, some of the information collected may be personally sensitive. I understand that any point that I experience discomfort during this study, if I find a question or questions to be objectionable, I may either skip the question or totally terminate my participation without any consequence.

I understand that participating in this study is voluntary and that there are no personal benefits other than humanitarian value from participation in the study. I understand that publication of findings may generate interest by leaders of a university that have mobile technology initiatives.

I understand that all information gathered during this study will be kept confidential. I understand that the researcher will exercise care in preserving the privacy of my records to the maximum extent allowable by law. I also understand that although it is possible that my responses can be identify from the demographic information provided, the survey data will be stored on a hard drive that will only be available to the researcher. All data will be reported in aggregated form so that no individual participants can be identified.

I understand that my consent to participate in this project does not constitute a waiver of any legal rights or redress I might have as a result of my participation, and I acknowledge that I have received a copy of this information sheet.

By completing and returning the attached survey you are giving your voluntary consent to participate in research.

Please print a copy of the information sheet for your records.

APPENDIX C

ONLINE SURVEY

MOBILE TECHNOLOGY SURVEY

You and other full-time faculty members at the university are being asked to respond to the following survey. I am trying to learn about the processes through which faculty members actually utilize mobile technology in the classroom. *You are not being evaluated on the effectiveness of your school, and administrators will not have access to your individual responses.* The data collected from this research will generally help other institutions with mobile technology innovations.

Completing this survey indicates your consent as a participant in this study insofar as your responses will be analyzed. Participating in this study is voluntary, and all data collected will be kept confidential. Your privacy will be protected to the maximum extent allowable by law.

Your information will remain confidential by ensuring that the research data collected have no identifiers of any kind that can link data or information provided. The survey will be set so that email/IP addresses are not collected. In the final reports, no specific details that could identify particular participants will be utilized. All data will be reported in aggregated form so that no individual participants can be identified.

Please note that nothing will be published from the data collected until late 2015.

You may contact the Office of Research Compliance at Northern Illinois University at (815) 753-8588 or Dr. Janene Marshall (IRB Chair at Chicago State University) at (773) 995 - 5078, in case you have concerns or questions about your rights in participating in this human-subjects research.

If you have any questions or comments, please contact me at the contact information below. I appreciate you taking the time to respond to this survey.

Shawnice Avilez	Dr. Wei-Chen Hung	Dr. Janene Marshall
NIU Doctoral Candidate	Advisor/Committee Chair	Chair of IRB at CSU
Phone: (708) 297-8730	Phone: (815) 753-8175	Phone: (773) 995-5078
E-mail: z1660444@students.niu.edu	Email: whung@niu.edu	Email : irb@csu.edu

MOBILE TECHNOLOGY SURVEY

The purpose of this survey is to find out whether full-time college faculty members' behavioral intentions to use mobile technology are affected by their perception and attitude. Results from this survey will be used to help determine full-time faculty members' behavioral intention to utilize mobile technology tools.

Within this survey, the term "mobile technology" and "mobile devices "are defined as the use of computer technology such as iPads and laptops to perform specific tasks. Computer applications consist of software, such as, word processing (e.g. Microsoft Word and AppleWorks), spreadsheet (Excel), database (Access) and presentation (PowerPoint). Uses of the Internet, such as E-mail and online searches, are also considered a computer application use for the purposes of this survey.

Within this survey, the term "integrating" means to use tools in classroom-based learning activities to achieve your lesson plan objectives.

In making your ratings, please remember the following points:
* Never select more than one number on a single scale.

Part One – Mobile Technology Survey

PERCEIVED EASE OF USE

1. My interaction with mobile devices is clear and understandable.
   Strongly Disagree: __1__:__2__:__3__:__4__:__5__:__6__: Strongly Agree

2. I find it easy to get mobile devices to do what I want it to do.
   Strongly Disagree: __1__:__2__:__3__:__4__:__5__:__6__: Strongly Agree

3. I find mobile devices easy to use.
   Strongly Disagree: __1__:__2__:__3__:__4__:__5__:__6__: Strongly Agree

4. Integrating mobile devices into subject lessons is often frustrating.
   Strongly Disagree: __1__:__2__:__3__:__4__:__5__:__6__: Strongly Agree

PERCEIVED USEFULNESS

5. Using mobile devices will increase my productivity.
   Strongly Disagree: __1__:__2__:__3__:__4__:__5__:__6__: Strongly Agree

6. Using mobile devices will enhance my effectiveness.
   Strongly Disagree: __1__:__2__:__3__:__4__:__5__:__6__: Strongly Agree

7. Using mobile devices will improve my work.
   Strongly Disagree: __1__:__2__:__3__:__4__:__5__:__6__: Strongly Agree

8. I find mobile devices useful tools in my work.
   Strongly Disagree: __1__:__2__:__3__:__4__:__5__:__6__: Strongly Agree

ATTITUDE TOWARD COMPUTER USE

9. Mobile devices make work more interesting.
   Strongly Disagree: __1__:__2__:__3__:__4__:__5__:__6__: Strongly Agree

10. Working with mobile devices is fun.
    Strongly Disagree: __1__:__2__:__3__:__4__:__5__:__6__: Strongly Agree

11. I like using mobile devices.
    Strongly Disagree: __1__:__2__:__3__:__4__:__5__:__6__: Strongly Agree

12. I look forward to those aspects of my job that require me to use mobile devices.
    Strongly Disagree: __1__:__2__:__3__:__4__:__5__:__6__: Strongly Agree

FACILITATING CONDITIONS

13. When I need help to use mobile devices, a specific person is available to provide assistance.
    Strongly Disagree: __1__:__2__:__3__:__4__:__5__:__6__: Strongly Agree

14. When I need help to use mobile devices, specialized instruction is available to help me.
    Strongly Disagree: __1__:__2__:__3__:__4__:__5__:__6__: Strongly Agree

15. When I need help to use mobile devices, guidance is available to me.
    Strongly Disagree: __1__:__2__:__3__:__4__:__5__:__6__: Strongly Agree

16. Using mobile devices is compatible with my teaching.
    Strongly Disagree: __1__:__2__:__3__:__4__:__5__:__6__: Strongly Agree

SUBJECTIVE NORM

17. People whose opinions I value will encourage me to use mobile devices.
    Strongly Disagree: __1__:__2__:__3__:__4__:__5__:__6__: Strongly Agree

18. People who are important to me will support me to use mobile devices.
    Strongly Disagree: __1__:__2__:__3__:__4__:__5__:__6__: Strongly Agree

19. People who influence me will support me using mobile devices.
    Strongly Disagree: __1__:__2__:__3__:__4__:__5__:__6__: Strongly Agree

20. At work, my colleagues who are important to me think that I should use mobile devices.
    Strongly Disagree: __1__:__2__:__3__:__4__:__5__:__6__: Strongly Agree

INTENTIONS TO USE

21. Assuming I have access to mobile devices, I intend to use it in the classroom.
    Strongly Disagree: __1__:__2__:__3__:__4__:__5__:__6__: Strongly Agree

22. Given that I have access to mobile devices, I predict that I would use it.
    Strongly Disagree: __1__:__2__:__3__:__4__:__5__:__6__: Strongly Agree

23. I plan to use mobile devices often.
    Strongly Disagree: __1__:__2__:__3__:__4__:__5__:__6__: Strongly Agree

24. I will use mobile devices in the future.
    Strongly Disagree: __1__:__2__:__3__:__4__:__5__:__6__: Strongly Agree

Part Two – Supplemental Information on Mobile Devices

25. Select the different types of software you asked your students to use on the mobile device in and out of school during your student teaching (you may select more than one answer):

A.	Word Processing	E.	Multimedia/Presentation
B.	Spreadsheets	F.	Subject Specific Software
C.	Database	G.	Other _____
D.	Internet	H.	None

26. Select the different types of software you used on the mobile device for your daily work, such as, planning, teaching, and grading during your student teaching (you may select more than one answer):

A.	Word Processing	E.	Multimedia/Presentation
B.	Spreadsheets	F.	Subject Specific Software
C.	Database	G.	Other _____
D.	Internet	H.	None

27. Select the different purposes of educational software used on the mobile device with the students in your classroom/lab while teaching (you may select more than one answer):

A.	Research/Searches	E.	Games
B.	Drill and practice	F.	Simulations
C.	Tutorial	G.	Other_____
D.	Problem solving	H.	None

28. In the current semester, how often have you included the following activities in your classes (please check [√] <u>one</u> answer for each of the three questions below)?

Activity	1-6 times	7-12 times	13-18 times	19-24 times	25-30 times	More than 30 times	None
28a. Assign tasks that require students to work mobile technology tools in and out of class.							
28b. Teach a lesson to the students using mobile technology tools (e.g., showing multimedia demos, using simulations, displaying Internet information)							
28c. Work on mobile technology tools to complete work assignments and projects, such as, lesson planning, grading, making multimedia demos, and internet research for lesson development.							

Part Three – Demographic Information

29. Please select your Gender:
    Female Male

30. Please indicate your racial/ethnic background:
    Caucasian (non-Hispanic) African American Hispanic

    Native American Asian/Pacific Islander Other_____

31. What is your age?
    Under 25 years 25 – 29 years 30 – 34 years 35 – 39 years

    40 – 44 years 45 – 49 years 50 – 54 years 55 – 59 years

    60 – 64 years Age 65 or older

32. Please select the current level of education obtained:
    Bachelor's Master's J.D. MFA Ph.D. Ed.D.

    Other: _____

33. Do you have a mobile device(s) at home? (please select)
    No Yes

34. Please select how would you describe your mobile technology tool(s) at home:
    Older technology (4 years or older) Newer technology (1-3 years old)

35. Please indicate the platforms you are skilled on:
    Neither MacIntosh nor PC MacIntosh PC Both MacIntosh and PC

    Other_____

36. Select which one most contributed to your computer skill development (please select one):
    Self-Taught Took College-Level Course(s) On the Job

    Took Seminar(s)/Workshop(s) Other_____

37. Please indicate the number of years you have been using a mobile device:
    Have not used Less than 1 year 1-3 years 4-6 years 7-9 years

    10 or more years

38. Please indicate the number of years teaching:
    1-3 years 4-6 years 7-9 years 10 – 19 20 or more years

39. What level of courses do you primarily teach? (select one)
    Undergraduate credit courses Graduate Courses Non-Credit Courses

    Other: _____

40. Does your institution make mobile technology resources readily available to you? (please select)
    No Yes Not Applicable

41. Please indicate where do you see yourself in 5-7 years:
    Department Chair College Dean (including Associate or Assistant)

    Provost Other Not Applicable

42. Please indicate your academic rank at this institution?
    Adjunct Instructor Assistant Professor

    Associate Professor Professor Emeritus

43. Are you considered to be a full-time employee at this institution?
    Yes No

44. Please indicate your assigned College:
    College of Arts & Sciences College of Business College of Education

    College of Health Sciences Non-Traditional Programs College of Pharmacy

    Other: _____

APPENDIX D

PARTICIPANT RECRUITMENT EMAILS

RECRUITMENT LETTER FOR PROSPECTIVE SURVEY PARTICIPANTS

SUBJECT: DISSERTATION RESEARCH STUDY

TO:

FROM:

Dear Sir or Madam:

My name is Shawnice Avilez; I am a doctoral candidate currently enroll in an Ed.D. Program, Instructional Technology, at Northern Illinois University (NIU) in DeKalb, Illinois (www.niu.edu).

I am conducting a research study and seeking participants to complete an online survey for my dissertation at NIU regarding instructors' behavioral intentions to utilize mobile technology. This should take you approximately 20-25 minutes to complete and must be completed in one sitting.

The title of my dissertation is the "Integration and Acceptance of Mobile Technology in the Higher Education Environment: Faculty Members' Perception."

You are being asked to complete a questionnaire survey as part of my dissertation research because you have been identified by your university as a full-time faculty. If this is not the case, please disregard this request.

Please review the information sheet for details. If you have any questions or concerns regarding this research, please contact me at 708-297-8730 or via email at keaiavilez@gmail.com.

You may also contact Dr. Wei-Chen Hung, committee chair, at 815- 753-8175or via email whung@niu.edu or Dr. Janene Marshall, IRB Chair at Chicago State University (CSU) at (773) 995-5078.

Thank you in advance for your time and effort.

By clicking on the link: https://niu.az1.qualtrics.com/SE/?SID=SV_7UneVF4KrzPIacl to participate in the survey, you verify that you have read the information sheet.

Thank you for your consideration.

Sincerely,
Shawnice Avilez
NIU Doctoral Candidate

DISSERTATION RESEARCH STUDY

Dear Sir or Madam:

My name is Shawnice Avilez; I am a doctoral candidate currently enroll in an Ed.D. Program, Instructional Technology, at Northern Illinois University (NIU) in DeKalb, Illinois (www.niu.edu).

I just wanted to send a gentle reminder that I am still in great need of participants to complete my survey study regarding instructors' behavioral intentions to utilize mobile technology.

Please disregard this message if you have already completed the survey or no longer interested in participating.

Please review the information sheet for details (Information sheet avilez mobiletechnology csu). If you have any questions or concerns regarding this research, please contact me at 708-297-8730 or via email at keaiavilez@gmail.com.

You may also contact Dr. Wei-Chen Hung, committee chair, at 815- 753-8175 or via email whung@niu.edu or Dr. Janene Marshall, IRB Chair at Chicago State University (CSU) at (773) 995-5078.

Thank you in advance for your time and effort.

By clicking on the link: https://niu.az1.qualtrics.com/SE/?SID=SV_7UneVF4KrzPIacl to participate in the survey, you verify that you have read the information sheet.

The password for the survey is: **mobile**

Thank you for your consideration.
Sincerely,
Shawnice Avilez
NIU Doctoral Candidate

Follow this link to the Survey: Take the Survey

Or copy and paste the URL below into your internet browser:
https://niu.az1.qualtrics.com/WRQualtricsSurveyEngine?SID=SV_7UneVF4KrzPIacl&Preview=Survey

Follow the link to opt out of future emails:
Click here to unsubscribe

APPENDIX E

NIU IRB APPROVAL

NORTHERN ILLINOIS UNIVERSITY
Office of Research Compliance and Integri
Lowden Hall 301 · DeKalb, IL 60115-2584
815-753-8588 · Fax 815-753-1631 · www.niu.edu/orci

Approval Notice
Initial Review

03-Apr-2015

TO: Shawnice Avilez
Educational Technology, Research, and Assessment

RE: Protocol # HS15-0103 "**Integration and acceptance of mobile technology in the higher education environment: Instructors' perception**"

Your **Initial Review** submission was reviewed and approved under **Expedited** procedures by Institutional Review Board #1 on **03-Apr-2015**. Please note the following information about your approved research protocol:

Protocol Approval period: **03-Apr-2015 - 02-Apr-2016**

If your project will continue beyond that date, or if you intend to make modifications to the study, you will need additional approval and should contact the Office of Research Compliance and Integrity for assistance. Continuing review of the project, conducted at least annually, will be necessary until you no longer retain any identifiers that could link the subjects to the data collected. Please remember to use your **protocol number** (**HS15-0103**) on any documents or correspondence with the IRB concerning your research protocol.

Please note that the IRB has the prerogative and authority to ask further questions, seek additional information, require further modifications, or monitor the conduct of your research and the consent process.

Unless you have been approved for a waiver of the written signature of informed consent, this notice includes a date-stamped copy of the approved consent form for your use. NIU policy requires that informed consent documents given to subjects participating in non-exempt research bear the approval stamp of the NIU IRB. This stamped document is the only consent form that may be photocopied for distribution to study participants.

It is important for you to note that as a research investigator involved with human subjects, you are responsible for ensuring that this project has current IRB approval at all times, and for retaining the signed consent forms obtained from your subjects for a minimum of three years after the study is concluded. If consent for the study is being given by proxy (guardian, etc.), it is your responsibility to document the authority of that person to consent for the subject. Also, the committee recommends that you include an acknowledgment by the subject, or the subject's representative, that he or she has received a copy of the consent form. In addition, you are required to promptly report to the IRB any injuries or other unanticipated problems or risks to subjects and others. The IRB extends best wishes for success in your research endeavors.

APPENDIX F

CSU IRB APPROVAL

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Institutional Review Board
FWA# 00002654
IRB # 00000807

9501 S. King Drive/NAL-421
Chicago, IL 60628
773.995.5078
irb@csu.edu

May 8, 2015

Shawnice Avilez
Northern Illinois University
savilez@csu.edu

Re: Integration and Acceptance of Mobile Technology in the Higher Education Environment: Faculty Member's Perception (IRB protocol # 032-04-15)

Dear Ms. Avilez,

The above referenced application has been reviewed by the university's IRB. As research involving the use of educational tests, survey procedures, interview procedures, or observation of public behavior, it is exempt from further IRB review according to federal regulations on human subjects' research (CFR 46.101[b]2). The IRB has also received a letter of approval from Northern Illinois University and a letter of permission from the Office of Institutional Effectiveness and Research, Chicago State University. This approval is good for one year, through May 7, 2016. Please note that any changes to this protocol must be approved by the IRB. You must also report any adverse events to the IRB.

Good luck with your work.

Sincerely,

Janene Marshall, Pharm.D.
Chair, Institutional Review Board

Scholarship and Responsibility