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An Analysis of the Current Use and Future Intentions to Use Mobile Learning Strategies Among Full-Time Community College Faculty

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AN ANALYSIS OF THE CURRENT USE AND INTENTIONS TO USE MOBILE LEARNING STRATEGIES AMONG FULL-TIME COMMUNITY COLLEGE FACULTY

by

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DEDICATION

I dedicate this work to the following architects who have given me a strong foundation, cemented with endless love, support, and encouragement:

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2 Timothy 1:7

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ABSTRACT

This quantitative study examined how full-time community college faculty members in southern states use mobile learning (m-Learning) strategies as tools for student engagement. Specifically, research questions were designed to measure the current use of six key m-Learning strategies: augmented reality, file/resource sharing, gaming/simulation, reference/research applications, social media, and text messaging. This study also probed into faculty attitudes and beliefs in four areas: performance expectancy, effort expectancy, social influence, and facilitating conditions. Statistical analyses were conducted to determine existing relationships between these four determinants and the intentions of faculty members to use m-Learning strategies in the forthcoming academic year. Additionally, research analyzed whether relationships were modified by the presence of faculty age, gender, and years of teaching experience.

Data collection involved the analysis of responses to a 21-item, self-administered, online survey. Twelve colleges were randomly selected from the Level-One institutions that are accredited by the Southern Association of Colleges and Schools Commission on Colleges. Their full-time faculty members were then surveyed. Results found that approximately two-thirds of the 546 respondents used one or more of the m-Learning strategies during the 2012-13 academic year. The most frequently used strategy was file/resource sharing, and the least used strategy was augmented reality. Respondents indicated the lack of student access to equipment, limited institutional support, minimal

training, and shortages of time as barriers to use. Several respondents also perceived the strategies as disruptive to the learning process.

Each of the four determinants was found to have positive associations with the intended use of six m-Learning strategies, but accounted for a relatively low variance in the prediction of future use. Age was found to have moderating effects on the intended use of augmented reality and text messaging. Gender had no moderating effects, and the total years of experience slightly modified one relationship.

Given the increased emphasis on community colleges to educate today's workforce, it is essential for educators to assess effective models for student engagement. This research offers timely insight into the factors driving m-Learning adoption, and adds to discussion about the role of m-Learning in meeting the needs of a uniquely diverse student demographic.

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LIST OF ABBREVIATIONS

AACC	American Association of Community Colleges
SACS COC	Southern Association of Colleges and Schools Commission on Colleges
HERI	Higher Education Research Institute
MLPS	Mobile Learning Perception Scale
UTAUT	Unified Theory of the Acceptance and Use of Technology

CHAPTER 1

NATURE AND SCOPE OF THE STUDY

"Every new generation of learning technology brings with it a new deep conceptual issue that learning technologists must untangle in order to unlock the learning value of raw technological potential" (Roschelle, 2003).

In 2004, George Boggs, immediate past president of the American Association of Community Colleges (AACC), penned an article using the opening lines of a Charles Dickens classic to describe the current state of community colleges. As does Dickens of the time surrounding the French Revolution in *A Tale of Two Cities*, Boggs presented the argument that it was indeed both the best of times and the worst of times for community colleges. During a time of decreased funding for postsecondary schools at both the federal and state levels, enrollment demands were steadily rising and student needs were changing even more quickly. In the face of declining funding, administrators were still expected to provide enhanced programming to a growing student population (Boggs, 2004).

Nearly a decade later, many would argue that community colleges still find themselves in the midst of a perfect storm. Enrollment levels are beginning to stabilize, and there is increased emphasis on the role of career and technical education in preparing America's citizens for the workforce. Community colleges are at the center of countless national initiatives targeting student access, retention, and degree completion. In 2010, the Obama administration convened the first-ever White House Summit on Community Colleges, bringing renewed prominence and public awareness to the sector. However, notwithstanding their increased visibility, these establishments remain woefully underfunded by state and local governments (Brown, 2012).

As community college administrators continue to assess methods for institutional sustainability, their faculty members are simultaneously challenged with engaging a student body that is considerably more diverse than other sectors within higher education (Brown, 2012). The student demographic at two-year colleges varies significantly not only by age, but by ethnicity, enrollment patterns, and socioeconomic status. Community colleges are known traditionally as open access institutions with a core mission of career and vocational training. According to the AACC (2013), the average age for a community college student is 29. However, two-year institutions also serve as the gateway for an increasing number of high school graduates planning to transfer into a baccalaureate degree program. More than half of the students who receive a bachelor's degree have attended a community college at some point during their undergraduate studies (AACC, 2013). As a result, community college faculty are responsible for managing a wide range of learning styles and technical skill proficiencies, including those students who require developmental coursework (Brown, 2012).

Despite the differences that exist among the student demographic, the literature speaks consistently to shared expectations among today's community college students for flexibility, responsiveness, and innovation in their educational experiences (Oblinger, 2005). Consequently, ongoing discussions among key stakeholders explore the best approaches for meeting multi-faceted student demands.

The use of mobile devices in the classroom repeatedly surfaces at the center of such discussions, primarily because of the surge in mobile device ownership among students in the past decade. The Pew Internet and American Life Project reported that approximately 66% of Americans aged 18-29 own a smartphone and 33% of all persons who owned a tablet in 2012 were aged 18-24 (2012). In 2012, the ECAR National Study of Undergraduate Students and Information Technology reported that most students come to campus with multiple technology devices that are used for a broad assortment of personal and academic activities. The majority of respondents owned about a dozen devices each including a laptop (86%), smartphone (62%), tablet (15%), and e-Reader (12%). Since the development of the first ECAR study in 2004, researchers noted a clear and distinct decline in the ownership of desktop computers and traditional cell phones in favor of small, mobile devices like smartphones and tablets. Moreover, most of the respondents noted that the use of technology makes them feel connected to their instructors, other students, and what is happening on campus.

The growing access to mobile devices has the potential to transform instruction, in the classroom and remotely, by providing unprecedented access to educational resources anytime, anywhere (Ingerman &Yang, 2011). Some consider mobile technologies to possess the educational potential for today's generation much like the television did some forty decades ago (Pachler, Bachmair, Cook, 2010). In contrast, others believe that mobile technologies have no real chance of sustained, wide-scale institutional deployment in higher education if they are not properly introduced within the context of the institutional culture and available resources. Understanding organizational values and practices, as well as the expectations and standards of staff, especially faculty, are key components to determining the role of mobile devices in higher education (Traxler, 2007).

Purpose of the Study

This quantitative study was designed to strengthen the voice of community college faculty in conversations about mobile computing. Specifically, the study measured the current usage levels of select mobile learning (m-Learning) strategies among a random sample of community college faculty. The study also explored the general beliefs and attitudes of community college faculty about m-Learning. Furthermore, the study examined the relationships between faculty beliefs about m-Learning and their usage patterns of the selected strategies. Questions were intended to assess the extent to which community college educators view mobile learning activities as viable strategies for student engagement.

Research Questions

In support of the aforementioned purpose, this study will seek to answer the following research questions:

1. How extensively are full-time community college faculty members in Southern states using mobile learning strategies to engage students in the learning process?

2. What attitudes and beliefs exist among these faculty members about the use of mobile learning strategies in community college instruction?
3. Are there statistically significant relationships between the existing attitudes and beliefs about mobile learning strategies and the intentions of community college faculty to use them in the future?
4. If relationships exist, how are they modified by age, gender, and years of experience?

M-Learning Defined

In many respects, m-Learning is a new concept that has familiar connotations. Similar to distance or e-Learning, m-Learning takes the learning process away from the four walls of a classroom. What makes m-Learning different is that it allows further breakout, "untethering learners from their desks, from their dwellings, from buildings altogether" (Oller, 2012). Clark Quinn, professor, author, and expert in computer-based education, defines mobile learning as the marriage between mobile computing (the application of small, portable, and wireless computing and communication devices) and e-learning (learning facilitated and supported through the use of information and communications technology) (Corbeil & Valdes-Corbeil, 2007). Quinn (2012) provides further clarification for m-Learning by defining it specifically as:

> Any activity that allows individuals to be more productive when consuming, interacting with, or creating information, mediated through a compact digital portable device that the individual carries on a regular basis, has reliability connectivity, and fits in a pocket or purse. (p. 9)

In its most basic form, m-Learning is associated with podcasting lectures or instructor posts to a social networking site. Other examples of m-Learning activities include geo-tagging of historical landmarks through mobile phones, dissecting via virtual biology labs, open-channel class polling via text messaging, or trading stock via simulated mobile applications.

A 2013 New Media Consortium report on the technology outlook for community, technical, and junior colleges asserts that mobile learning, in some form, will likely tip into mainstream use within the next year (Johnson, Adams Becker, Cummins, Estrada, Freeman, & Ludgate, 2013). Researchers argue that:

> Tablets, smartphones, and mobile apps have become too capable, too ubiquitous, and too useful to ignore, and their distribution defies traditional patterns of adoption, both by consumers, where even economically disadvantaged families find ways to make use of mobile technology, and at education institutions, where the tide of opinion has dramatically shifted when it comes to mobiles. Because of their portability, flexibility, and natural, intuitive interfaces, a growing number of colleges see tablets especially as a cost-effective strategy. (Johnson et al, 2013, p. 18)

The report also found that more students are becoming interested in using their own technology for learning because it is an extension of their personality and learning style. Using their own device makes the learning experience personal, and brings a level of comfort that fosters creativity and informal learning (Johnson et al, 2013).

M-Learning in Higher Education

Student ownership of mobile devices should not lead to assumptions that m-Learning strategies are utilized on college campuses. The 2010 Campus Computing survey showed that only 13.1% of institutions have developed or enabled m-Learning strategies, and only another 10.1% had plans to do so in the next year. For those that have embraced m-Learning, it is not clear that the concept is being implemented in pedagogically-appropriate ways (McGreen & Sanchez, 2005).

Some attribute the slow adoption of m-Learning in higher education to a huge disconnect between faculty instructional methods and student demands. Hartman, Dziuban, and Bophy-Ellison (2007) explain that, for the first time in their careers, faculty members are expected to teach in ways differing from how they were taught when they were students. A paradigm shift has occurred, focusing less on teacher-centered instruction and more on a learner-centered model. As a result, faculty need to become more and more like master jugglers, addressing not only course content, design, and execution, but also various technologies, such as the course website, multimedia equipment, and instructional software.

Mobile technology and m-Learning strategies add an additional layer of complexity and preparation, making it essential for higher education administrators to adopt strategies fostering faculty development and supporting technology integration (Brown & Diaz, 2010). It is also relevant to note that numerous faculty members perceive mobile phones, in particular, as disruptive to the learning process and often ban them from the classroom for fear of inappropriate use (McGreen & Sanchez, 2005). Other cited barriers to implementation include concerns about information security, small screen size, accessibility (McGreen & Sanchez, 2005), and effective evaluation (Diaz, 2012).

M-Learning in Community Colleges

Mark David Milliron, former president of the League for Innovation in the Community College, offers further reasoning for the slow adoption of m-Learning strategies. He affirms the use of new, high-impact technologies in the classroom as a consistently present trend for two-year institutions and states that concerted efforts are in place to find the right blend of traditional and mobile instruction. However, for community college leaders, the challenge extends beyond determining how to best use technology in the classroom. Milliron explains that students may migrate through the community college system multiple times, prompting the need to structure planning and services differently (Mooney, 2008).

Community colleges are challenged to meet the needs of adult learners who have increasing demands on their time and are often forced to study on their lunch breaks, in the evenings, on weekends, at work, on the bus, train, or in the car (Uzunboylu and Ozdamli, 2011). Del Favero and Hinson (2007) further explains that contexts of learning for today's community and technical college students, in particular, require technological competencies for all involved. The numerous responsibilities of these students in addition to school demand that they have ready, remote access to curricular and course-related information. For many, round-the-clock access to learning materials is essential in order for them to experience success as learners, given their other commitments (Brown & Diaz, 2010).

Although many students have access to mobile technology in their purses and pockets, it is important to understand that hands-on accessibility to technology does not guarantee digital literacy. There are two levels of a digital divide: a divide in access and a divide in knowledge. The first level is a divide in access to hardware, software and broadband Internet connections and the second level is a divide in knowledge in digital literacy on how to use the technology (Caverly, Ward, and Caverly, 2009). Taking both levels into consideration, faculty cannot build curricular activities that assume all owners can send or access large amounts of data (Brown & Diaz, 2010). Additionally, faculty must understand that students' general comfort level with technology may not match their competency with technology used in an educational environment, as their underlying understanding of technology may be shallow (Bajt, 2011).

Milliron presents another factor for consideration. He explains that, "students who enroll in community college don't always have the extensive backgrounds in technology that college officials expect from younger generations. In fact, some students come in having never used a computer in their lives" (Carnevale, 2007). Varying student populations, coupled with varying faculty demographics make for an interesting recipe as community colleges strategize the best way to respond to demands from students and faculty in the midst of a mobile technology revolution.

Mobile Skills in the Workplace

In many regards, mobile technology has visibly revolutionized business and industry. An emerging number of employee training programs are being customized for mobile delivery (e.g., Wal-Mart, Xerox, Sonic, and CISCO). In fields such as manufacturing and logistics, employment trends highlight the use of mobile devices for supply chain management including the tracking of production, inventory, and shipping (Edwards, 2005). Other examples include the use of mobile applications in diagnostic imaging for patient assessment and consultation (Slabodkin, 2013) and in agriculture for weather forecasting or pest management (Hopkins, 2012). Furthermore, a Mobile Marketing and Commerce study reported that 69% of Fortune 500 companies have launched mobile solutions (Kony, 2010). Similarly, a 2013 poll by AT & T found that 82 percent of small business owners use a smart phone or tablet to support their operations (AT &T, 2013). Mobile devices are quickly penetrating the workforce and forcing businesses to assess their current processes.

As such, if community colleges wish to remain true to their mission of responding to workforce demands, the exploration of m-Learning initiatives will become inevitable. As companies prepare for redesigned employee training programs, they are expecting that potential job candidates will enter the workforce with knowledge of mobile app development and design (Johnson et al, 2013). More employers are also expecting graduates, even those not involved in programming, to have a basic level of comfort with mobile devices. Digital literacy, including the use of mobile technology, is becoming an essential element for success in the workplace (Preston, 2012).

Significance of the Study

The United States is continuously seeking ways to remain globally competitive amidst high unemployment rates and a struggling national economy. Moving forward, the strength of the American economy will rely heavily on the quality of the educational system and the training of workers that will sustain the middle class. As a result, the misalignment between current workforce demands and worker skillsets remains in the forefront of political discussions. The Obama administration has repeatedly identified the community college sector as a key player in preparing workers for high-skill, high-wage jobs. By 2018, it is estimated that approximately 30% of all new jobs will require an associate degree (Carnevale, 2010). By 2020, approximately 65% of all jobs will require some form of a postsecondary degree (Lumina, 2013).

In light of these statistics, conversations about access to higher education have shifted to conversations about student success. While access remains important, goals have become more focused on student persistence and degree completion versus mere entrance into postsecondary programming (Tschechtelin, 2011). To that end, organizations such as the Lumina Foundation have established aggressive completion goals. In an effort to equip 60% of Americans with a high-quality degree, certificate or other credential by 2025, Lumina has challenged institutions to award 500,000 more associate and bachelor degrees each year (Lumina, 2013). A redirected emphasis on student success and completion complements the theme of quality often cited in the community college mission. Nevertheless, the push to improve student success rates brings added pressure to community college leaders as they must identify ways to improve student performance with limited resources (Tschechtelin, 2011).

Jamie P. Merisotis, president of the Lumina Foundation, posits that we cannot expect American citizens to meet the demands of the 21st century workforce without a 21st century education (Lumina, 2013). Despite historical successes of community colleges to educate the American workforce, recent assessments have determined that community colleges need to be rebranded for new times. President Obama (2010) asserts that:

> Now is the time to build a firmer, stronger foundation for growth that will not only withstand future economic storms, but one that helps us thrive and compete in a global economy. It's time to reform our community colleges so that they provide Americans of all ages a chance to learn the skills and knowledge necessary to compete for the jobs of the future. (p.2)

Technology has been identified as an essential element for assisting in this transformative process (21st Century Initiative, 2012). It is illogical to assume that m-Learning will serve as the single solution to delivering or supporting revamped learning experiences for current and future students. The concept is still developing and many possible combinations of technology and pedagogy exist which may, or may not, be appropriate to effectively engage students in the learning process (Attewell, Savill-Smith, & Douch, 2009). However, the rapid developments of mobile technology, their increasing presence on college campuses, demands from business and industry, and global communication make m-Learning a phenomenon that is impossible for community college administrators to ignore (Johnson et al, 2013).

When beginning to research m-Learning strategies, community college administrators will find limited research about the factors driving m-Learning adoption (Liu, Lsi, & Carlsson, 2010). This study begins to fill a gap in the literature as it relates to understanding the role of m-Learning specifically in community colleges and factors influencing its potential growth among faculty. To date, much of the research on m-Learning remains ephemeral and is typically reported in the form of unpublished papers or conference presentations (Pachler et al, 2010). The majority of published research that does exist explores mobile technology adoption in either secondary settings (Uzunboylu & Ozdamli, 2011), four-year university settings (Fraga, 2012), or from student perspectives (Wang, Wu, and Wang, 2009; Akour, 2009).

Given the nontraditional population of community college students, as well as the unique mission of the two-year institution, this study provided data to faculty, staff, and administrators as they weigh the pros and cons of implementing m-Learning initiatives. Understanding faculty attitudes and beliefs about m-Learning will be useful in developing strategies to manage the inevitable presence of mobile devices on college campuses. This study also provided a quantitative research model that may be duplicated by community college administrators in other regions to inform educational technology policy and practice.

Key Concepts

Mobile devices.

Quinn (2012) defines a mobile device as one that has the following characteristics:

- Has a processor and memory onboard
- Has an operating system
- Supports a suite of supplied or customized applications to run on the operating system

- Provides a way for the device to communicate to the user, whether audio, screen, or vibration (or all of the above)
- Has a way for the user to communicate to the device, whether audio, touch screen, physical inputs, or a combination
- Possesses a way for the device to communicate to the digital world, whether through mobile phone networks, Wi-Fi, or occasional synchronization via cables
- Frequently has ways for the device to sense the ambient environment such as with camera, microphone, or global positioning system (GPS).

During their initial market releases, laptops and netbooks were often identified as mobile devices based primarily on their portability and ability to connect to wireless networks. However, laptops and netbooks are no longer considered mobile. Instead, they are associated with a group of devices that utilize a cursor-based interface as opposed to the touch-based interface commonly used with handheld devices. As a result, recent listings of mobile devices are typically narrowed to a specific set of core handheld devices in one of four categories: e-Readers, MP3/Audio Players, smartphones, and tablets (Oller, 2012). These categories were chosen for the purposes of this study.

m-Learning Strategies

The researcher identified six m-Learning strategies, listed alphabetically in Table 1.1. Strategies were defined using Quinn's (2012) list of practical applications for m-Learning activity. Existing literature does not offer any consistent prioritization of the strategies. The 2013 New Media Consortium Horizon Report does, however, identify augmented reality and gaming/simulation as two of six key teaching and learning trends that will be adopted over the next six years in higher education (New Media Consortium, 2013).

Table 1.1

Key m-Learning Strategies Guiding the Study

m-Learning Strategies	Definition	Examples
Augmented Reality	The use of a mobile device to track a learner's location and provide custom information about the location based on a set of predetermined rules.	• Mobile scavenger hunt to discover hidden facts about a specific location (e.g., museum artifacts, public health data, historical facts)
File/Resource Management	The use of mobile devices to access files or learning resources from any location through the use of wireless or cloud services	• Online journaling via Evernote • Collaborative document creation via Google Docs • File sharing via Dropbox (e.g., homework assignments, videos, lecture notes, etc.) • Posting of podcasts or recorded lectures
Gaming/ Simulation	The use of a mobile device to create artificial experiences that mimic real-world environments and situations in order to provide practical application of classroom instruction.	• Simulated genetics lab • SimCity in the study of business/economic development • Virtual heart sound diagnosis • Virtual trading in a simulated stock market
Mobile Reference Applications	The use of a mobile device to download an application for access to a specific learning resource	• Anatomy reference manual • Medical dictionary • Foreign language vocabulary drills
Social Media	The use of mobile devices to promote synchronous or asynchronous collaboration among students and/or the instructor. Social media tools are searchable, linkable, subscribable, taggable, & editable.	• Class Facebook or Twitter page • Virtual discussions/meetings via Skype, FaceTime, etc. • Blogs or wikis that encourage collaborative online discussion
Text Messaging	The use of a cell phone, smart phone, or online service to send and receive short messages (one-to-one or one-to-many).	• Class polling • Assignment reminders • Performance feedback

- Electronic office hours

Key Definitions and Terms

In addition to the m-Learning strategies, the following definitions and terms will guide the study:

Community colleges are two-year institutions, public or private, that are regionally accredited to award the associate in arts or the associate in science as its highest degrees. Community colleges are often referred to as junior or technical colleges (Cohen and Brawer, 2003).

Digital native - Persons who have spent their entire lives surrounded by and using computers, videogames, digital music players, video cams, cell phones, and all the other toys and tools of the digital age. As a result of the sheer volume of their interaction with technology, digital natives *think and process information fundamentally differently* from their predecessors. (Prensky, 2001).

Digital immigrant - Persons who were not born into the digital world but have, at some later point in their lives, become fascinated by and adopted many or most aspects of new technology (Prensky, 2001).

Effort Expectancy refers to the degree of ease associated with the use of an information technology system (Venkatesh, 2003).

e-Learning – The use of Internet technologies to deliver a broad array of solutions that enhance knowledge and performance. E-Learning is based on three fundamental principles: 1) it is networked, 2) it is delivered to the end user via a computer using standard technology, and 3) it focuses on the broadest view of learning solutions that go beyond the traditional paradigms of training (Rosenburg, 2001).

Facilitating Conditions refers to the degree to which an individual believes that an organization and technical infrastructure exists to support use of an information technology system (Venkatesh, 2003).

Mobile Learners (m-Learners) are students who participate in m-Learning activities. These students may be classified as digital natives or digital immigrants.

Mobile Learning (m-Learning) refers to any activity that allows individuals to be more productive when consuming, interacting with, or creating information, mediated through a compact digital portable device that the individual carries on a regular basis, has reliable connectivity, and fits in a pocket or purse" (Quinn, 2012).

m-Learning technology refers to the computing devices, generally produced for the public, that facilitate the m-Learning process. These devices may include smartphones, personal digital assistants, media players, and similar handheld devices. M-learners typically view content and/or lessons in small, manageable forms that can be utilized when laptop or fixed station computers are unavailable (McConatha et al, 2008).

Performance Expectancy refers to the degree to which an individual believes that using an information technology system will help him or her to attain gains in job performance (Venkatesh, 2003).

Social Influence refers to the degree to which an individual perceives that important others believe he or she should use the new information technology system (Venkatesh, 2003).

Summary

For a remarkably diverse student population, community colleges have long served as the bridge to higher education and thus to the middle class (21st Century Initiative, 2012). In the midst of an American economy struggling to recover, community colleges have responded to calls for reform. Partnerships with business and industry have been the catalyst in efforts to retread the American workforce and retool displaced workers.

The emergence of mobile technology is an important part of the conversation as administrators consider programming options and ways to engage current and future students. The decisions facing institutions of higher education as it relates to m-Learning are captured vividly through the following example, shared at a recent forum of the EDUCAUSE Learning Initiative community:

> Two different villages in China explored the problem of water runoff when the snow melted in the spring. One village opted to try to fend off and contain the water by building dams; the other accepted the fact of the water movement and so built channels to guide the runoff right through the village, so that it did no damage. There's no way to say which village made the "right" decision. If the volume of water is modest, then constructing dams is likely feasible and prudent;

if that volume is large, channeling the water might be the better option (Brown and Diaz, p. 3).

Similar to the volume of water makings its way to the two villages, the momentum of mobile technology is unavoidable. Therefore, many would argue that the best approach is that of developing channels to direct mobile technology usage in constructive directions.

This study offers data that may be useful in constructing such channels at two-year institutions. The researcher measured the current usage levels of m-Learning strategies by community college faculty and examined their attitudes and beliefs about the phenomenon. Finally, the study analyzed relationships between faculty attitudes and beliefs about m-Learning and their usage patterns. The chapters that follow provide a critique of related literature (Chapter 2), explain the methodology used in this study (Chapter 3), present the study results (Chapter 4), and offer narrative on the study findings, recommendations, and implications for future practice.

CHAPTER 2

LITERATURE REVIEW

"Even as technology use and application advances at an almost logarithmic pace, many of the issues related to technology use remain remarkably constant. These include properly trained staff, adequate equipment, ongoing funding, and successful integration of technology in order to maximize learning" (Al-Batainch and Brooks, 2003).

Cohen and Brawer (2003), leading authorities on the history of community colleges, assert that computer technology has had a role in managing student records, administering tests, and assessing student progress since the 1970s. Early millennial studies by the Higher Education Research Institute (HERI) offer continued evidence of such claims. Results from the 2001-2002 and 2004-2005 surveys found that technology use in the classroom is more prevalent among community college faculty than their four-year counterparts. Additionally, higher percentages of community college respondents reported adequate support for integrating technology into their instruction. Data showed that faculty at two-year colleges were rewarded for their efforts to use instructional technology more than faculty at senior institutions.

Similar to HERI reports, data presented in the annual Campus Computing Project demonstrate consistent technology use in the community college sector. Two-year colleges have repeatedly indicated increases in the use of learning management systems (2001, 2005, & 2010), wireless networks (2003, 2005, 2006), and open source systems

(2004, 2007) over the past decade. Furthermore, the New Media Consortium (2013) predicts that online learning, flipped classrooms, social media, and the bring-your-own device movement are emerging technology trends that will be adopted by community colleges in one year or less. These trends are a direct result of mounting student demands for more personalized and m-Learning opportunities.

Despite these reports, the literature provides minimal evidence that community colleges are adequately prepared to manage m-Learning on their campuses. A growing number of articles and books offer examples of m-Learning in higher education (Pachler, 2007; Bowman, 2009; Quinn, 2012). However, myriad questions still remain about the relatively new concept, primarily because researchers and practitioners are still seeking to establish a definitive community of practice (Traxler, 2007). This chapter offers an analysis of the existing literature related to mobile learning in higher education. Specifically, the narrative includes an overview of the varying definitions for m-Learning and suggested frameworks for its effective use. Potential factors driving adoption of the m-Learning by higher education faculty members are also explored. Finally, a review of the Unified Theory of the Acceptance and Use of Technology (UTAUT) is given in relation to m-Learning acceptance.

m-Learning versus e-Learning

The definition of m-Learning is one that remains at the center of much debate in higher education. Gilbert (2013) countered the assumptions that m-Learning is simply the use-e of Learning activities on a mobile device, explaining that they are two distinctly separate concepts that require different approaches to implementation. In contrast, Osman and Cronje (2010) posited that m-Learning is the intersection of mobile computing and e-Learning, asserting that sophisticated mobile devices can deliver e-Learning content by means of web connections, infrared and Bluetooth transmissions. Ozuorcun and Tabek (2012) also acknowledged the relationship between the two concepts. However, they positioned m-Learning as a direct and natural extension of e-Learning, and stated that there are notable differences in the two concepts. The most important difference is found in the formal and informal learning processes of e-Learning and m-Learning, respectively. e-Learning is considered to be tethered, and presented in a formal, structured format. Conversely, m-Learning is typically untethered, self-paced, and promotes the idea of learning from any location (Motiwalla, 2007). Table 2.1 details the major differences in e-Learning and m-Learning as offered in the literature.

Table 2.1
Differences in e-Learning and m-Learning

e-Learning	m-Learning
Formal	Informal
Distance Learning	Situated Learning
Private Location	No Geographic Boundaries
Dedicated Time for Feedback	24/7 Instant Feedback
Use of Attachments, Email, or Web Forms	Instant Messaging

Adapted from Ozuorcun and Tabek (2012)

The presence of a mobile device is unarguably one of the key distinctions between e-Learning and m-Learning. However, Osman and Cronje (2010) placed additional emphasis on the mobility of the learner and the learning content. They claimed that the m-Learning experience is less about the use of a smartphone or tablet, and more about the ability to "enhance a learner's sense of individuality and community as well as his or her motivation to learn through participation in collaborative learning" (Osman &

Cronje, 2010, p. 19). To that end, m-Learning is completely individual and different from the rigid structure of the traditional classroom, lecture, or laboratory experience.

A Framework for m-Learning in Higher Education

Although there has been much discussion about the true meaning of m-Learning, no conclusive theory, concept, or framework has been widely accepted in the field. As a result, educators have been uncertain about how to design effective m-Learning models for their campuses. Consequently, an emergence of experimental studies and small-scale pilots has attempted to contribute to the development of a framework or definitive concept theory (Pachler, 2007). The problem with these projects, however, is the theoretical underpinnings appeared to be either non-existent or primarily behaviorist in nature (Patten, Arnedillo, & Tangey, 2006). Many were utilized within a predominantly teacher-centered paradigm, as opposed to a more learner-centered paradigm (Herrington & Herrington, 2007). Moss (2002) offered an explanation of the two concepts, illustrated in Figure 2.1. While there may be agreement that an effective teaching model should comprise a balance of the four quadrants, it is uncertain, however, where and how m-Learning fits into the fold.

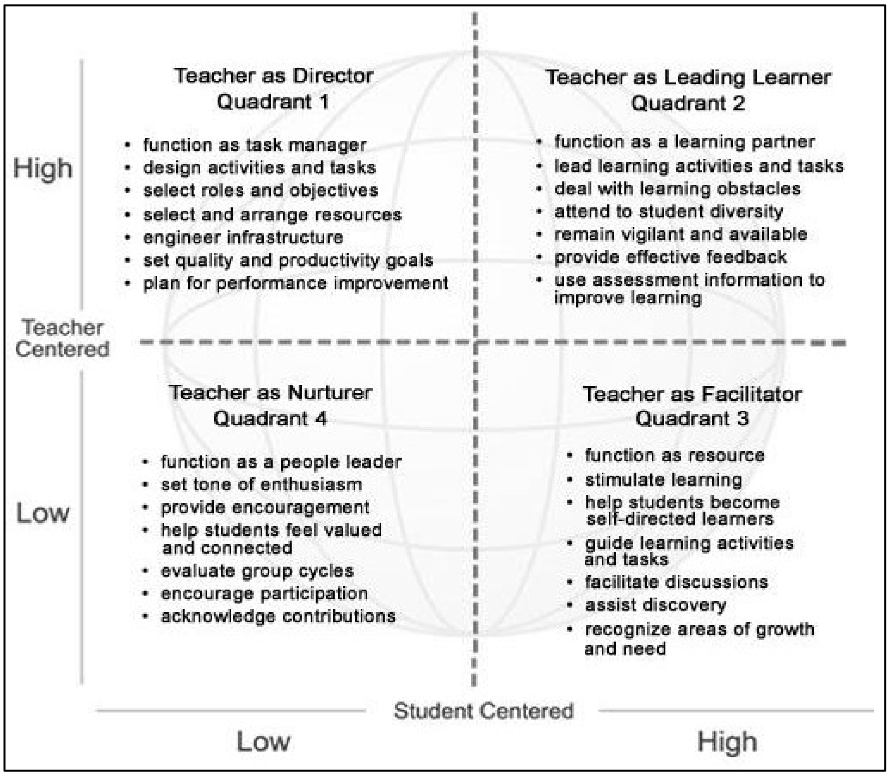


Figure 2.1 Teacher-centered versus student-centered instruction (Moss, 2002)

In an attempt to provide some clarity, Naismith et al (2005) provided extensive guidance regarding the use of m-Learning within the context of six activity-based theories. Table 2.2 details their crosswalk of each of the six theories with examples of possible m-Learning activities for each.

Table 2.2

Cross reference of activity-based theories and related m-learning strategies

Theme	Key Theorists	Related m-Learning Strategies
Behaviorist Learning	Skinner, Pavlov	• Drill and feedback • Classroom Response Systems
Constructivist Learning	Piaget, Bruner, Papert	• Participatory Simulations
Situated Learning	Lave, Brown	• Problem and Case-based Learning • Context Awareness
Collaborative Learning	Vygotsky	• Mobile computer-supported collaborative learning
Informal and Lifelong	Eraul	• Supporting intentional and accidental

Learning		learning episodes
Learning and Teaching Support	N/A	• Personal Organization • Support for Administrative Duties

Anecdotal narrative about each theory and related m-Learning strategies served as a supplement to the aforementioned crosswalk. An overview of projects such as the MIT Games-to-Teach project or the European Mobilearn initiative was inserted as relevant examples of success. The majority of the examples was international in scope and supported through grant projects. None of the examples included community colleges, although a somewhat comparable example might be the description of m-Learning strategies to target disengaged youth, aged 16-24, in Europe. This project was designed to measure the effects of text messaging, interactive quizzes, digital literacy activities on student attitudes and interest in learning. Participants were those deemed "at risk" because they were either outside of formal education, in low-skilled employment, or unemployed. At the time of publication, the project was still in its pilot phase with no results available.

While the details of each project are not fully disclosed in Naismith's work, the authors provided foundational information for effective m-Learning implementation, Diaz (2012) recognized the prior work of her colleagues as a suitable framework for college administrators. Diaz (2012) further added to the discussion, and introduced three levels of m-Learning deployment for consideration. Though the sample activities given in her recommendations are even less comprehensive than others, the suggested levels prompt continued discussion about the potential for m-Learning.

Table 2.3

Proposed organization levels for implementing mobile learning activity

Level	Type	Activities
1	Service-related mobile content	• Access to the schedule or course offerings • Library Resources and Services • Campus Tram Whereabouts
2	Generic mobile instructional applications	• Student – Response Systems • Twitter • Learning Management System
3	Discipline-specific, customized mobile learning	• Mobile applications or tools that are developed to support a particular set of learning objectives within a discipline

Digital Faculty

Before a theoretical framework can be universally accepted in the field of m-Learning, it is important to conduct more research on the factors driving its adoption among faculty. Most faculty members did not enter their profession because of a strong love for technology. Yet they find themselves in the midst of rapidly changing learning environments where technology proficiency is becoming the norm (Hartman, Dziuban, & Brophy-Ellison, 2007). Initiatives like the HERI surveys and the Campus Computing Project mentioned at the beginning of this chapter provide some insight into general technology use among faculty. However, those studies include little mention of faculty attitudes about digital teaching and learning strategies such as social media, simulation, e-textbooks, and lecture capture.

Digital strategies did comprise the focus of a 2013 study completed by *Inside Higher Ed* and funded by Pearson, Deltak, CourseSmart, and Sonic Foundry (Jaschik & Lederman, 2013). The project involved nearly 5,000 faculty members at institutions across all educational sectors including two-year, four-year, for-profit, nonprofit, private, and public. The results presented a compelling picture of faculty acceptance of digital learning strategies. Forty-three percent of instructors indicated that they create their own digital teaching materials on a regular basis. Responses acknowledged that the creation of personal digital content was accompanied by concerns about the time and effort that it requires to do so. Furthermore, there were concerns that their efforts are not well respected or rewarded by their institution. Respondents also indicated that intellectual property rights were a concern for those wishing to protect their digital content. A small percentage strongly agreed that there was an effective policy in place on their campuses to address this issue. Nevertheless, the use of digital resources, even if not personally created, was attributed to increases in faculty productivity and creativity by nearly half of the respondents. Additionally, the majority of respondents felt their institutions provided excellent training and support for the use of digital tools in the classroom.

The positive responses about digital tools in the classroom were contrasted by minimal interest in the use of social media for communication with students and peers. Almost half of the respondents stated that they never use social media to interact with students. Similarly, nearly 40% reported that they never use social media to communicate with their peers. A rationale for this pattern was not offered; however, high usage of learning management systems was reported, thus leading to the assumption that it may be one of the preferred primary methods for communication with students.

The study shared a few characteristics of the sample. The slight majority of respondents was female, and most were full-time faculty. Thirty-five percent had been in their positions for 10 to 20 years. About 16% of the respondents indicated that their institution did not have tenure. Most taught in the humanities and arts discipline, while those in mathematics and computer science were the least represented. No information was given about the institution type; therefore, it is difficult to make conclusions specific to various sectors. Furthermore, there was not an opportunity for open responses which could have offered additional insight into some of the data patterns.

Technology Adoption among Faculty

The study by *Inside Higher Ed* offered a large body of evidence about faculty behavior as it relates to emerging trends in digital technology. Still, though there was mention of e-textbooks and social media, the survey never explicitly referenced the term m-Learning. Moreover, the study was not designed to measure factors influencing adoption and, thus, elaborate discussion of potential influences (e.g., gender, tenure, age) was not included. Few examples in the literature, do, however, reveal specific factors that seem to frequently appear in conversations about faculty adoption of technology in general, as well as the adoption of m-Learning. A discussion of each follows.

Generational differences.

In 2001, Prensky coined the term “digital natives” in recognition of individuals that have never known a world in which computers and the Web did not exist. Digital natives are commonly referred to as members of the Net Generation (Net Gen). Net Gen learners do not think in terms of technology. Instead they think in terms of the activity that technology enables. The Internet is an access tool and a medium for the distribution of resources rather than a resource within limitations (Oblinger and Oblinger, 2005).

A dichotomy has emerged between Net Gen learners and the faculty that teach them. Many instructors are “digital immigrants” who, unlike a large number of their students, have come to use technology later in life (Hartman, Dziuban, and Brophy-Ellison, 2007). Further complicating matters is the fact that some faculty members entering the profession are now also considered digital natives.

van der Kaay and Young (2012) provide one of the only studies available that look specifically at the influence of age on technology use by community college faculty. A survey of 246 respondents from five Florida community colleges found that older faculty members, identified as age 55 or older, considered technology to be a minor source of stress. Older participants responded similarly to their younger counterparts in many areas, acknowledging that technology is an effective tool for improving student learning and that it improves communication between their students and colleagues. However, unlike their younger colleagues, older faculty members felt the need for more professional development addressing the applicability of technology resources.

The results of this study were not largely generalizable because the sample was not random and was limited to faculty at five schools in one Southern state. Additionally, the survey was conducted via mail and the researchers indicated that the length (unknown) could have impacted the response rate.

Organizational Culture.

Though van der Kaay and Young (2012) found that age has some influence on use of technology by community college faculty, other factors such as organizational culture have also been examined. Mars and Ginter (2007) conducted a very small qualitative study of 16 community college faculty in three colleges to examine the relationship between organizational structure and the use of instructional technology. Methodology included in-person interviews and document analyses of course syllabi, Web pages, college policies, and faculty vitae. Findings concluded that organizational structure has a high level of influence on the extent to which faculty members incorporate technology into their instruction. Environmental factors influencing use included opportunity for career advancement, response to student demands, sporadic administrative mandates, and encouragement from peers. This study does not focus on faculty perceptions about technology, but rather about the degree to which their institution encouraged use. It was also difficult to gauge the specific types of technology that were used by faculty, but it was clear that each participant was already very comfortable with technology use. Nevertheless, the study offered good foundation for discussions about the relationship between organizational structure and technology use.

Academic Discipline.

The Mars and Ginter study (2007) also offers some discussion about the role of the academic unit in providing mentoring and modeling opportunities for faculty as it relates to technology use. The sixteen participants included representatives from library sciences, humanities and languages, education, and social services. The specific faculty distribution among the disciplines is not provided. However, researchers surprisingly note no clear distinctions between any of the disciplines as it related to technology use. In fact, cross-disciplinary projects were frequently referenced and driven by faculty interest at the departmental level.

Amey and VanDerLinden (2003) assert that differences in academic discipline do exist and that individuals in the arts and sciences are less likely to use technology than those in nursing or business fields. These assertions are based on survey results from a sample of 1,700 community college staff and administrators. Data showed that efficient use of technology was a higher priority among respondents in occupational programs. Interestingly, though the study includes a large sample, faculty members are not identified in the sample. Instead, most of the respondents hold administrative or support positions including the chief academic officer, librarian, distance education officer, or even the president. The degree to which their perceptions align with the faculty at their respective institutions is unknown. Cohen and Brawer (2003) address faculty disciplines in very brief anecdotal comments contending that faculty in developmental studies and language courses have traditionally been the more frequent users of technology in the classroom. Their rationale for these claims is not provided.

Faculty development.

Regardless of faculty discipline, the presence of efficient training and professional development has been identified in the literature as critical components of successful technology adoption. Quick and Davies (1999) conducted a qualitative study of 18 community college faculty members and inquired about the necessary tools for their ideal course design. The majority of participants indicated that access to the latest software, along with technical support and staff development were the primary resources they would require. Staff development should fit their class schedules and campus location. A mentor or primary point of contact would be helpful for follow-up questions. Additionally, respondents wanted adequate time to develop their ideas and to incorporate them in their instruction. Furthermore, they noted fiscal support as an important part of their ideal curriculum development plan.

While this study does offer several practical implications for practice, it was conducted more than a decade ago. A replicative study might reveal deeper analysis about what staff development models should look like for faculty given the advancements in technology and training since the start of the new millennium. Findings should also include demographic data for the participants in this study, as it was difficult to do comparisons between any groups.

Performance incentives.

As mentioned by the respondents in the Quick and Davies (2007) study, faculty development models should be supplemented with follow-up activities to ensure appropriate use of technology. Del Favero and Hinson (2007) offer a performance evaluation matrix incorporating the principles of the Concerns Based Adoption Model (CBAM) and Howery's (1997) model for technology integration in community colleges. The technology matrix measured the intersection of technology use by faculty with the institutional mission. Six levels were designed to determine faculty skill levels and intensity of use. Researchers recommended that the matrix is useful to reward faculty for technology use with salary increases, travel funds, or promotions. Furthermore, the matrix could be used to determine necessary areas for professional development. No examples of practical application were given, and limited suggestions were provided for faculty who were not fully integrating technology. The matrix offers vast opportunities for empirical testing in the community college setting.

m-Learning as a disruptive tool.

Even as institutions make efforts to effectively incorporate technology and emerging m-Learning strategies, there still remains the belief among some faculty that the use of technology disrupts the learning process. Two recent studies looked specifically at the effects of mobile phone use and student multitasking on the learning process. Kuznekoff and Titsworth (2013) conducted an interesting experiment with 54 communication majors at a large Midwestern university. Participants were assigned to one of three groups - one control group, one group with low-distractions, and the final group with high distractions. During the lecture, two of the groups received varying amounts of simulated text messages during a class lecture. The text messages asked random questions such as “What are your dinner plans?” or requested comments on a photo. Results found that students in the high distractions group performed lower on their exams than those who had fewer distractions.

Similarly, Kraushaar and Novak (2010) assessed the performance of 97 junior-level computer science students at the University of Vermont. Student scores over the semester were correlated to the tasks they completed while multitasking on a laptop. Custom software measured every email, web browser, instant message, or general computer operation that was performed on the student laptop during class. Results found that those who had high frequencies of multitasking performed lower in the class.

Both studies provide thoughtful counter arguments to claims that m-Learning strategies can enhance the learning experience. However, the sample sizes are relatively small and the prior academic performance of participants is unknown. Furthermore, questions remain about the teaching style of the instructors or the institutional culture and policies as it relates to mobile devices. Additionally, the target populations are students at senior institutions which are vastly different from the traditional community college demographic. Future research might do a comparative study to see if student age and educational sector have any effects on overall performance.

Measuring m-Learning Acceptance and Use

The aforementioned literature provides evidence that technology adoption remains at the forefront of discussions in higher education. Still, existing research offers little discussion about faculty perceptions and attitudes specifically towards m-Learning. Two existing instruments that have attempted to measure faculty perceptions about m-Learning, as well as the factors driving adoption. One has several limitations for use among community college faculty; however, the other provides a useful framework that has been slightly modified for the purposes of this study.

Mobile learning perception scale.

Uzunboylu and Ozdamli (2011) conducted a survey of approximately 1,500 secondary education teachers in Northern Cyprus. Data were gathered using the *Mobile Learning Perception Scale*, a 26-item, Likert-scale instrument developed by the researchers. Results found that male respondents perceived m-Learning more favorably than their female colleagues. They found it to remove limitations of time and space, and also a convenient way to share knowledge with colleagues and students. While results may provide some insight, the instrument does not assess user intention to implement m-Learning strategies, nor does it offer any data on the extent to which these teachers are currently using m-Learning strategies in their instruction. Furthermore, a few of the items seemed to measure student interaction with m-Learning, which was not the stated purpose of the instrument.

Unified Theory of Acceptance and Use of Technology.

A number of existing theoretical models seek to identify the factors that influence individual use and acceptance of new information technologies. As illustrated in Figure 2.2, the models utilize a basic conceptual framework linking attitudes and perceptions about a specific type of information technology to an individual's intention to use and actual use of that information technology (Venkatesh, Morris, Davis, & Davis, 2003).

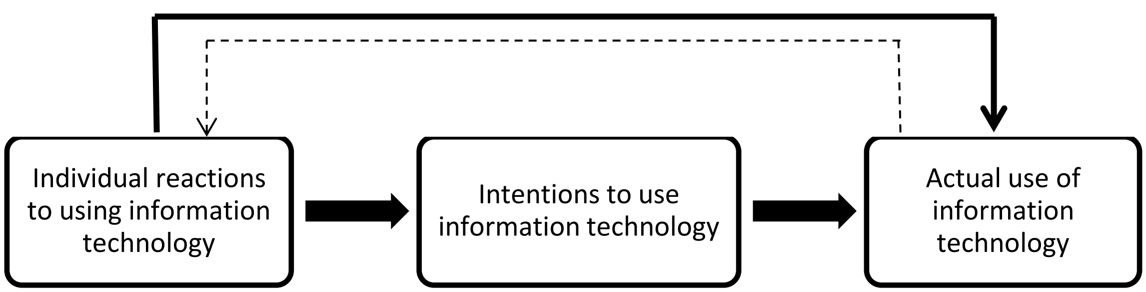


Figure 2.2 Basic framework for technology user acceptance models (Venkatesh, 2003)

Eight theories of technology acceptance and use are prominent in the literature as listed in Table 2.4. A total of 32 core determinants of acceptance such as extrinsic motivation, perceived ease of use, anxiety, job fit, and several others are measured across the eight models. While similarities exist in the core constructs of each theory, researchers typically choose a cafeteria option of constructs from several models, or repeatedly use a favored model. In either instance, the contributions from alternative models are often ignored (Venkatesh, et al, 2003).

Table 2.4

Eight prominent theories of technology acceptance

No	Theory	Abbreviation
1	Theory of Reasoned Reaction	TRA
2	Technology Acceptance Model	TAM
3	Motivational Model	MM
4	Theory of Planned Behavior	TPB
5	Combined TAM and TPB	C-TAM-TPB
6	Model of PC Utilization	MPCU
7	Innovation Diffusion Theory	IDT
8	Social Cognitive Theory	SCT

In an attempt to create a more synthesized and uniform approach to the study of user acceptance of information technology, Venkatesh, et al (2003) developed the Unified Theory of Acceptance and Use of Technology (UTAUT). The UTAUT framework combines key components of the eight aforementioned technology acceptance theories into four core determinants of IT use behavior:

1. *Performance Expectancy* is the degree to which an individual believes that using the system will help him or her to attain gains in job performance.
2. *Effort Expectancy* is the degree of ease associated with the use of the system.
3. *Social Influence* is the degree to which an individual perceives that important others believe he or she should use the new system.
4. *Facilitating Conditions* are the degree to which an individual believes that an organization and technical infrastructure exists to support use of the system.

Venkatesh et al (2003) assert that performance expectancy, effort expectancy, and social influence have a direct relationship to an individual's intention to use an identified type of information technology system. In contrast, when performance expectancy and effort expectancy constructs are present, facilitating conditions are not a strong predictor of intention. Furthermore, the UTAUT model includes gender, age, experience and voluntariness as four potential moderators of the four core determinants. The UTAUT model has been proven to account for approximately 70% of the variance in usage intention.

Table 2.5 cross references the core determinants of the UTAUT model with the core constructs of the eight models from which it was derived.

Table 2.5
UTAUT Core Determinants

Determinant	Core Constructs	Origin of Construct
Performance Expectancy	Perceived Usefulness	TAM, C-TAM-TPB
	Extrinsic Motivation	MM
	Job-Fit	MPCU
	Relative Advantage	IDT
	Outcome Expectations	SCT
Effort Expectancy	Perceived Ease of Use	TAM
	Complexity	MPCU
	Ease of Use	IDT
Social Influence	Subjective Norm	TRA, TAM,TPB, C-TAM-TPB
	Social Factors	MPCU
	Image	IDT
Facilitating Conditions	Perceived Behavioral Control	TPB, C-TAM-TPB
	Facilitating Conditions	MPCU
	Compatibility	IDT

Adapted from Venkatesh (2003)

The UTAUT model was created to assess the factors influencing the potential use of new information technology systems, with a specific focus on the workplace. The measured intention would then serve as a predictor for actual use. For the purposes of this study, m-Learning strategies were considered comparable to a new IT system. Therefore, the UTAUT model provided an appropriate framework for exploring the factors that influence usage patterns of m-Learning strategies by community college faculty in their workplace (Wang, Wu, & Wang, 2009).

The researcher altered the UTAUT design model to explore the relationships between the four core determinants and both the current usage levels and future use intentions for each of the six identified m-Learning strategies. Voluntariness of use was removed as a potential moderator because m-Learning is still a fairly new concept that is currently used in a voluntary context. Additionally, the researcher changed the definition of experience so that it references the years of teaching experience instead of the years of experience with the IT system. Figures 2.3 and 2.4 provide a comparison between the Venkatesh (2003) model and the research model tested during this study.

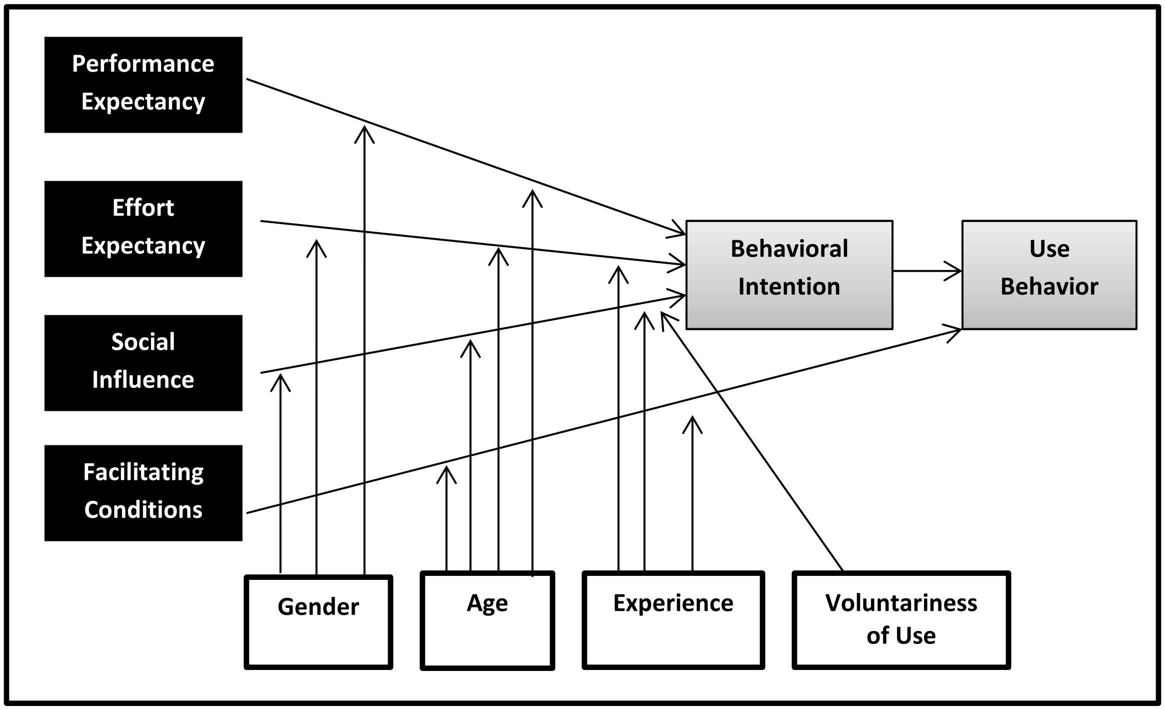


Figure 2.3 UTAUT conceptual framework (Venkatesh, 2003)

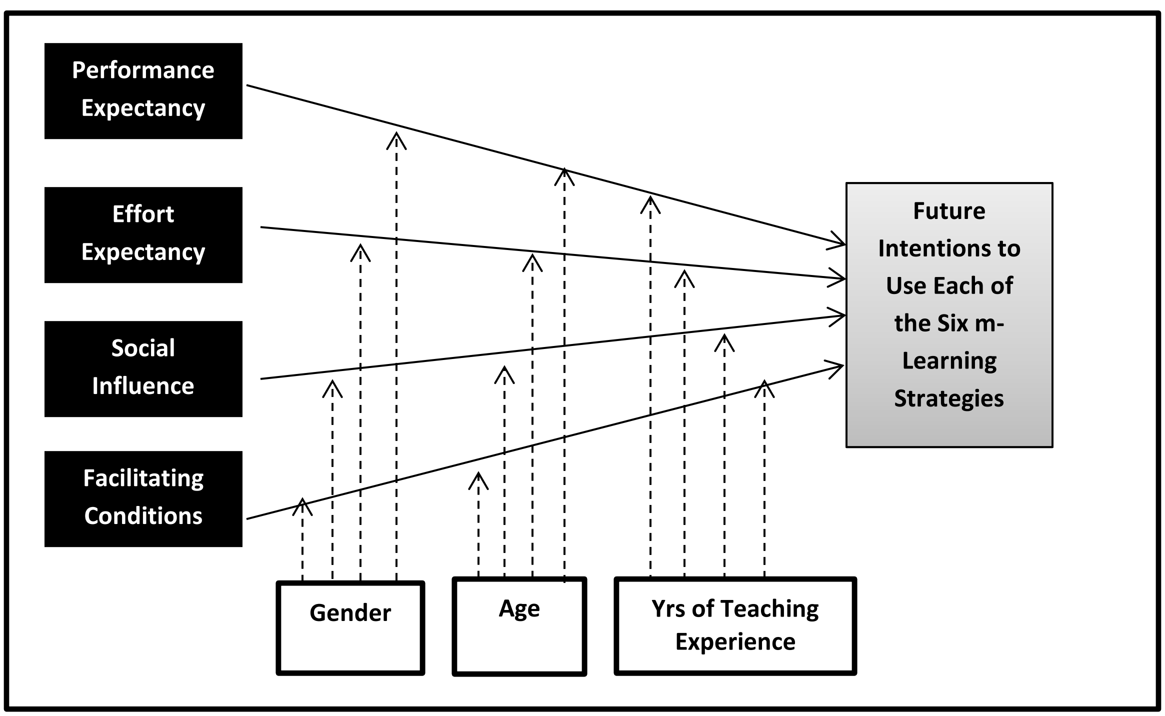


Figure 2.4 Conceptual framework tested for this study

The framework illustrated in Figure 2.4 allowed the researcher to test the following null hypotheses:

> *H_{01}: Performance expectancy will not have any influence on the intentions of faculty to use any of the six m-Learning strategies in the coming academic year.*
>
> *H_{02}: Effort expectancy will not have any influence on the intentions of faculty to use any of the six m-Learning strategies in the coming academic year.*
>
> *H_{03}: Social influence will not have any influence on the intentions of faculty to use any of the six m-Learning strategies in the coming academic year.*
>
> *H_{04}: Facilitating conditions will not have any influence on the intentions of faculty to use any of the six m-Learning strategies in the coming academic year.*
>
> *H_{05}: Age will have no moderating effects on the relationships between the four core determinants and the intentions of faculty to use any of the six m-Learning strategies in the coming academic year.*
>
> *H_{06}: Gender will have no moderating effects on the relationships between the four core determinants and the intentions of faculty to use any of the six m-Learning strategies in the coming academic year.*
>
> *H_{07}: Years of experience will have no moderating effects on the relationships between the four core determinants and the intentions of faculty to use any of the six m-Learning strategies in the coming academic year.*

Wang, Wu, and Wu (2009) developed a modified version of the UTAUT and validated the instrument through testing of 330 students in Taiwan. This version of the UTAUT focused more on intentions to use m-Learning. Consequently, facilitating conditions was removed as a variable and replaced with perceived playfulness. Selfmanagement of learning was also added as a construct. Modifications were made because the UTAUT had been developed primarily from research completed in the context of workplaces and did not apply perfectly to the context of higher education and mobile learning in particular. Results from this study found that that performance expectancy, social influence, perceived playfulness of learning, and voluntariness of use were all significant determinants of behavioral intention to use m-Learning.

Donaldson (2011), however, utilized the modified version by Wang, Wu, and Wu (2009) in a mixed-methods study of students at a North Florida community college. This study was the only one found to date utilizing the modified version of the UTAUT within the United States. Results indicate that performance expectancy, social influence, perceived playfulness of learning, and voluntariness of use were all significant determinants of behavioral intention to use m-Learning. Additionally, males were more likely to accept m-Learning than female and age was found not to be a significant factor of intended usage. While the researcher provided a definition of m-Learning, no specific examples of m-Learning activities were given to respondents, so it is unclear if they were all responding with the same level of understanding about the topic. Most of the published studies offer a definition, but no examples or uniform standard for m-Learning. Furthermore, this study was limited to students in one community college, and are not generalizable to the general population.

To date, no studies measure the intention to use m-Learning among community college faculty. The UTAUT in its original form, however, offers a solid framework to analyze the current usage and the intention to use m-Learning in the community college setting.

Summary

The literature provides evidence that community colleges have traditionally embraced the use of technology as an important part of instruction. Extensive narrative exists to support the growth of mobile device ownership, the changing nature of the Internet, and the need to access information ubiquitously. Yet it is clear that the role of m-Learning in higher education, specifically in community colleges, is still being defined. Few studies look at student adoption of m-Learning, and in such cases, the definition of m-Learning is often very general, prompting additional questions about whether respondents truly identify with the concept.

CHAPTER 3

RESEARCH DESIGN AND METHODOLOGY

"Educational technology can be a key component of success, but only if it leverages the results and methodologies of learning science" (Thille, 2010, p. 73).

Overview of Study

This study was designed to strengthen the voice of community college faculty in conversations about mobile computing on their campuses. Specifically, the study measured the current use of six m-Learning strategies in the community college classroom. Research probed into the attitudes and beliefs held by community college faculty about m-Learning, and examined the statistical relationships between their beliefs and their usage patterns of the m-Learning strategies. Additionally, questions examined the intentions of community college faculty to use m-Learning strategies in the forthcoming academic year. Finally, the study analyzed the moderating effects of age, gender, and years of teaching experience on the statistical relationships.

The University of South Carolina Institutional Review Board (IRB) approved the proposal for this quantitative study on May 10, 2013 (see Appendix A). After receiving IRB approval, the researcher commenced with completing the study, using the following research questions as a guide:

1. How extensively are full-time community college faculty members in Southern states using mobile learning strategies to engage students in the learning process?
2. What attitudes and beliefs exist among these faculty members about the use of mobile learning strategies in community college instruction?
3. Are there statistically significant relationships between the existing attitudes and beliefs about mobile learning strategies and the intentions of community college faculty to use them in the future?
4. If relationships exist, how are they modified by age, gender, and years of experience?

A quantitative research design was used as it provided a means for testing objective theories and examining the relationships among independent and dependent variables (Creswell, 2008). The researcher deployed a self-administered survey because they are most useful in describing the characteristics of a large population such as the number of community college faculty in the target population (Fowler, 2009). In survey research, when large sample sizes are feasible, results may be statistically significant, even when analyzing multiple variables.

The large population and sample size involved in this study also provided justification to collect survey responses electronically via an online survey management tool. Evans and Mathur (2005) assert that online surveys are flexible, convenient, and can be administered in a time-efficient manner, minimizing the time that it takes to disseminate an instrument and collect data. Furthermore, online surveys yield low administrative costs, and offer easier methods for follow up in an effort to increase response rates (Evans and Mathur, 2005).

General Population

Full-time community college faculty members constitute the general population for this study. During 2011-12, a reported 118,317 full-time faculty were employed across the nation. Slightly more than half (54.6%) were women and approximately 13% belonged to an ethnic minority group (SREB, 2013). In regards to educational degree attainment, the most recent available data from the National Center for Education Statistics (2003) reported that the majority of the population held a master's degree (71%), while a much smaller proportion held a bachelor's degree (11%) or a doctoral degree (13%). That same report found that the average age for full-time community college faculty in 2003 was 50. The majority were aged 45-54 (34%), 22% were aged 35-44, and 7% were younger than age 35 (NCES, 2004).

Target Population

Although limited demographic data are available for the general population, it was important to consider the number of external factors that contribute to varying profiles of community college faculty. In an effort to increase the validity of data results, the researcher further defined the target population to implement control variables based on faculty employment status, in addition to the location, regional accreditation, and level of highest degree awarded for each institution included in the sample.

Employment status.

Community colleges depend on a blend of part-time and full-time faculty to fulfill their instructional needs. Part-time faculty are typically individuals that work full-time in their field of technical expertise and are teaching because they have an interest in sharing their knowledge with students. Yet, despite their contributions to academic programming, limited data exists about this group. In many instances, their employment patterns are inconsistent and they often feel less ethical responsibility to the profession and to the institution. Part-time faculty members are less likely than their full-time counterparts to maintain office hours, attend professional development activities, and foster active relationships with their peers on campus (AACC, 2013). Consequently, the researcher chose to remove part-time faculty from the sample.

Institution location.

According to 2011-2012 data reported by the Southern Region Education Board, full-time faculty at public, two-year institutions in Southern states comprise the largest percentage (i.e., approximately 40%) of all faculty in this same classification across the nation (SREB, 2013). Therefore, research targeted faculty in the Southern region as they provided solid representation of the general population.

Regional accreditation.

Each public community college must be accredited by a regional accrediting body. These entities are responsible for monitoring the quality of the educational services provided by its member institutions. The Southern Association of Colleges and Schools Commission on Colleges (SACS COC) serves as the accrediting body for eleven states that comprise the Southern region. After initial accreditation, colleges are assigned to a ten-year cycle which includes a fifth-year interim report and a more extensive reaffirmation process during the tenth year. SACS COC has established standardized principles of accreditation and core requirements that regulate the quality review procedure. One requirement is that community college faculty members teaching at SACS COC-accredited institutions share the same minimum teaching credentials (SACS COC, 2013). This requirement afforded the researcher an opportunity to implement another control variable among the target population.

Degree award level.

As the regional accreditor, SACS COC also classifies each accredited institution into one of four levels based on the highest degree awarded. Community colleges may be categorized as either Level One (i.e., associate degree is highest award) or Level Two (i.e., bachelor's degree is highest award). A growing number of community colleges are now able to confer a baccalaureate degree and not just partner with others for baccalaureate programming (Floyd, Skolnik, & Walker, 2005). However, an analysis of all SACS COC-accredited institutions listed on the organization's web site found that the majority of community colleges were accredited as Level One (SACS COC, 2013). These findings are consistent with the core community college mission to offer an associate degree (Cohen and Brawer, 2003). Therefore, for the purposes of this study, the researcher included only those schools that are designated as Level One by SACS. Doing so provided a target population that represents approximately 90% of all full-time community college faculty members in SACS COC-accredited states.

Use of the aforementioned controls resulted in a target population comprising full-time, community college faculty teaching at Level-One institutions that are COC-accredited. Table 3.1 provides aggregate data on the target population, segmented by state, including the total number of community colleges (n = 269) and the number of full-time faculty (n = 35,762) as reported to the National Center for Education in Statistics for the Fall 2012 semester.

Table 3.1

Number of Community Colleges and Faculty in the Target Population Grouped by State

State	Number of Level One SACS-Accredited Institutions	Number of Full-Time Faculty in Fall 2012	Percentage of Target Population
Alabama	22	1763	4.93
Georgia	26	2897	8.10
Florida	6	915	2.56
Kentucky	16	1971	5.51
Louisiana	11	1292	3.61
Mississippi	14	2297	6.42
North Carolina	58	6889	19.26
South Carolina	16	1965	5.49
Tennessee	13	1785	4.99
Texas	64	11,648	32.57
Virginia	23	2340	6.54
Totals	269	35762	100

Sample Selection

Given the known size of the target population (n=35762), a sample size of 381 faculty members was needed in order to estimate a confidence level of 95% with a margin of error of 5%.

A stratified random sampling technique was utilized to identify the sample frame for the study. Fowler (2009) explains that, “almost all populations of geographic areas are stratified by some regional variable so that they will be distributed in the same way as the population as a whole” (p. 26). He further states that stratification is a desirable feature in sample design because it only adds to the precision of estimates of variables that are related to the stratification variables and can reduce the error identified with simple random sampling (Fowler, 2009). For the purposes of this study, institutions were stratified by state. Sampling was disproportionate to the target population and, consequently, may not provide generalizable results. Stratification was conducted to ensure representation from each of the states in the Southern region. However, this study was not intended to conduct a comparison of m-Learning use between the states, but rather, the region as a whole.

As the sample frame was constructed, the researcher considered the potential for low response rates that are commonly associated with online survey. Though online surveys offer a convenient format for collecting responses and communicating with participants, responses vary greatly depending on the target audience, topic, and survey design. Research suggests that employee response rates to online surveys are traditionally low, especially in cases where the researcher is not directly linked to their organization (Nulty, 2008). Therefore, it was determined that the sample would need to include additional institutions in one or more of the states. Initially, the researcher attempted to include additional randomly selected colleges from Texas and North Carolina, based on their larger percentages of faculty in the region. Unfortunately, these attempts were unsuccessful either due to non-response from additional colleges or refusal for their faculty to participate in the study.

As a result, the stratification technique led to the selection of one college from each state, as well as one additional college from the researcher's home state of South Carolina. It was acknowledged that this selection might introduce bias into the study;

however, this methodology was deemed appropriate as the researcher had zero to minimal interaction with the majority of faculty participants include in the sample. A total of twelve colleges and 2,254 faculty participants were included in the sample. The names of participating institutions and the number of individuals surveyed in each state have been withheld to ensure the anonymity and confidentiality of respondents.

Survey Instrument

Once the target population was determined, the researcher began development of the survey instrument. A review of existing literature found notable examples of instruments that targeted m-Learning. Uzunboylu and Ozdamli (2011), for example, developed a Mobile Learning Perception Scale (MLPS) to assess perceptions of m-Learning among secondary educators. While the MLPS includes a number of items that may be useful in understanding faculty attitudes and beliefs about mobile learning, it does not examine current usage levels or intentions to use m-Learning strategies.

Venkatesh (2003) does, however, offer a validated framework for predicting usage intentions of information technology systems with the Unified Theory of Acceptance and Use of Technology (UTAUT). Wang, Wu, and Wang (2009) used a modified version of the UTAUT to measure the intentions of business professionals and faculty members to use m-Learning. The instrument designed by Wang et al (2009) does not include all of the original tenets of the UTAUT model and also introduces a factor titled “perceived playfulness” which is not relevant to the current study.

The researcher was interested in learning not only about faculty beliefs about m-Learning, but also about the specific ways in which the six identified m-Learning strategies are being used on community college campuses. All of the related research models defined m-Learning in an aggregate form, and did not offer any distinction between the types of m-Learning strategies that could be used by faculty. None measured the current usage patterns of m-Learning strategies.

To address the research questions, a survey instrument was created including a mix of multiple choice, Likert scale, and open-ended questions. Items were developed following the principles of effective survey design as outlined by Fowler (2009) and Fink (2001). Table 3.2 below cross-references each survey item to one or more of the research questions. A copy of the final instrument is available in Appendix B.

Table 3.2

Survey Instrument and Related Research Question(s)

Item(s)	Description	Related Research Question(s)
1	General Comfort Level with Technology	1
2	Mobile Device Ownership	1
3	Use of m-Learning Strategies	1
4	Frequency of Use of m-Learning Strategies	1
5	Performance Expectancy	2, 3,4
6	Effort Expectancy	2, 3,4
7	Social Influence	2, 3,4
8	Facilitating Conditions	2, 3,4
9, 11	Intention to Use m-Learning Strategies	3,4
10, 12	General Comments	2
13 – 21	Demographics	1, 2, 3,4

Items 1 and 2.

The first two survey items were included to provide contextual information about the mobile device ownership of respondents, as well as their general comfort level with technology. Participants first selected the best statement from five multiple choice options that described their comfort level with technology. They then indicated whether they owned an e-Reader, MP3/Audio player, smartphone, and/or tablet. Additionally, respondents specified whether their device was their own personal device purchased with their own money, one their institution provided, or both.

Items 3 and 4.

The next item inquired about the use of the six m-Learning strategies. Respondents were provided with a description of each strategy and asked to indicate if they used one or more of the strategies as a part of their instruction during the current academic year. If one or more of the strategies were used, participants were then asked to indicate the frequency of use for each strategy. Table 3.3 lists the response options for the frequency item.

Table 3.3

Response Options for Frequency of Use for Each m-Learning Strategy

Response Code	Response Option	Description
1	Never	Not applicable
2	Minimally	Once or twice with little emphasis
3	Occasionally	Three to five times with some emphasis
4	Often	More than five times with much emphasis

Items 5 through 8.

After indicating the frequency of use for each strategy, respondents then proceeded to the next section which captured their attitudes and beliefs about m-Learning. The four items in this section were derived from the core determinants in the original UTAUT instrument (Venkatesh, 2003) with some consideration given to the modified UTAUT model developed by Wang et al (2009). Each core determinant consisted of Likert scale items prompting respondents to indicate the level to which they agreed with the statements. A four-point Likert scale was used to eliminate the option for a neutral response (Johnson, 2012). The expert panel described later in this chapter assisted with the development of each set of statements. Some of the statements used in previous scales were found to be confusing or irrelevant to the research questions. Table 3.4 describes each of the core determinants and illustrates the differences in the number of items on the original UTAUT instrument and the instrument used in this study.

Table 3.4

# of Likert Scale Items Used by Venkatesh (2003), Wang et al (2009), & Frazier (2013)

Core Determinant	Description	2003	2009	2013
Performance Expectancy	Degree to which an individual believes that using the system will help him or her to attain gains in job performance.	4	4	5
Effort Expectancy	Degree of ease associated with the use of the system	4	4	3
Social Influence	Degree to which an individual perceives that important others believe he or she should use the new system.	4	4	5
Facilitating Conditions	Degree to which an individual believes that an organization and technical infrastructure exists to support use of the system.	4	N/A 5 items for perceived playfulness	4

Reliability testing was conducted on each of the four scales since the researcher used modified scales to measure each of the four core determinants. During pilot testing, the number of responses was insufficient to calculate reliability. Upon data collection, reliability testing for Cronbach's alpha determined each scale to be reliable (i.e., >.7). Table 3.5 details the reliability statistic for each scale.

Table 3.5

Reliability Test for Each Likert Scale		
Scale	Number of Scale Items	Cronbach Alpha
Performance Expectancy	5	.739
Effort Expectancy	3	.836
Social Influence	5	.815
Facilitating Conditions	4	.804

Items 9 and 11.

The next section of the survey included another four-point Likert scale to determine the intentions of respondents to use any of the six m-Learning strategies in the coming academic year. Initially, the researcher used the three Likert scale questions from the original UTAUT model that questioned whether respondents intended, predicted, and planned to use m-Learning. Feedback from the expert panel found the wording to be very confusing and not specific enough for the stated research questions. As a result, the researcher revised the item to include a Likert scale that measured the likelihood of respondents to use each of the strategies in the coming academic year.

Individuals that indicated they did not use any of the m-Learning strategies in question three were directed to question 11. The wording was identical to question 9. Skip logic was used during survey development to separate the responses for this question between those that used m-Learning and those who did not.

Items 10 and 12.

Questions ten and twelve provided an opportunity for open-ended comments. Participants were asked to provide any comments they felt were relevant to the discussion about m-Learning in their classroom and/or community colleges. Skip logic was used once more to separate the responses based on whether or not the respondents had used m-Learning.

Items 13 – 21.

The last section of the survey captured demographic data for respondents including their content area, gender, age, highest educational level, years of teaching experience at their current institution, total years of teaching experience, and state. The content area was grouped into two categories: transfer/arts and sciences/general education disciplines as defined by SACS COC and 2) career and technical education areas as defined by the sixteen national career clusters. Age was grouped into four categories based on generational labels: 1) Millennials (21-32); 2) Generation X (33-48); Baby Boomer Group 1 (49-55); and 4) Matures (56 and older) (Oblinger, 2005).

Expert review panel.

The initial draft of the survey was sent via email to an expert panel of five persons for review. The items were examined for content validity prior to pilot testing. Summarized feedback from the panel is available in Appendix C. Each panel member offered expertise in the fields of educational technology, institutional research, or faculty development at community colleges (see Table 3.6). One individual has experience working with mobile learning initiatives at the national level through EDUCAUSE, a leading non-profit organization, whose mission is to advance higher education through the use of information technology.

Table 3.6

Expert Review Panel for Survey Instrument

Name	Title	Institution/Organization	Credentials
Ms. Cathy Almquist	Director, Institutional Effectiveness	Trident Technical College	Over 15 years of experience in institutional research
Dr. Kathleen Plinske	President	Valencia College – Oceola and Lake Nona Campuses	Ph.D., Educational Technology
Dr. Mary Beth Schwartz	Director, Institutional Effectiveness	York Technical College	Ph.D., Higher Education Administration
Ms. Shannon Smith	Former Associate Director of Teaching, Learning, and Professional Development	EDUCAUSE	Principal Investigator for the annual Study of Undergraduate Students and Information Technology

Pilot Testing

Once the researcher made adjustments based on feedback from the expert panel, the survey was entered into SurveyMonkey (www.surveymonkey.com). Informal field pretesting was then conducted with faculty members participating in an academic leadership program in the researcher's home state. A total of 16 individuals received a personal invitation from the researcher to complete the questionnaire and offer comments on the instrument design (see Appendix D). The pilot sample included faculty members representing diverse institutions, academic disciplines, demographics, thus making them ideal to provide feedback on the feasibility of the instrument. One additional open-ended question was added to the pilot instrument giving participants an opportunity to provide feedback about the feasibility of the instrument. The test link was open for one week total and a total of 11 individuals responded. Feedback was helpful in determining the estimated time for survey completion, and also assisted with the correction of any typos and errors with the skip logic.

Data Collection

Upon completion of pilot testing, the formal data collection process began. Data were collected over a four-month period from May – September 2013. The researcher searched the web to identify the appropriate contact for each college in the sample. An email was then sent requesting permission for their faculty to participate in the study (see Appendix E). The email message was supplemented with an overview of the research, a copy of the survey instrument, and the informed consent notice. The researcher also requested an endorsement email from the primary contact, if possible. For eight of the colleges, the Chief Academic Officer was the primary contact; three were managed through the Chief Institutional Effectiveness Officer and one was managed directly by the president. Five of the participating institutions required completion of a formal research application in order for their faculty to be included in the study. These applications were reviewed by the respective research committees at each college and were separate from the initial IRB process required for the researcher to proceed with the study.

Survey invitations were disseminated at various times throughout the summer based on each college's academic calendar and recommendations from the institution's point of contact. Seven of the colleges determined that they would be responsible for distributing survey invitations to their faculty. Regardless of who sent the invitation, all participants received three email messages including an initial invitation, second reminder, and final reminder. Invitations and reminders included a copy of the informed consent notice which outlined the research procedures and assurances of confidentiality. The informed consent notice also assured participants that there were no monetary costs or foreseeable risks associated with the study (See Appendix G). Each participant could opt out of the study, if desired, by choosing an option on the front page of the electronic survey. Table 3.7 provides a summary of the data collection process by state.

Table 3.7

Data Collection Process by State

State	Formal IRB Process	Survey Invitation & Follow up	Source of Faculty Email Address
Alabama	No	College Liaison	Not applicable
Florida	Yes	Researcher	Web
Georgia	No	Researcher	Web
Kentucky	No	College Liaison	Not applicable
Louisiana	No	College Liaison	Not applicable
Mississippi	No	College Liaison	Not applicable
North Carolina	Yes	College Liaison	Not applicable
South Carolina	No	Researcher	College Provided
Tennessee	Yes	Researcher	College Provided
Texas	Yes	College Liaison	Not applicable
Virginia	Yes	College Liaison	Not applicable

A small incentive was offered in an effort to increase the response rate. Participants had the option to enter a randomized drawing for one of two $50 Amazon gift card by providing their name and email address. The drawing was conducted at the end of the study, and all respondents were assured that their email addresses will not be shared with a third party and will only be used for purposes of the drawing. Approximately 15% of the respondents completed the drawing entry.

Data Analysis

Data analysis procedures included a mix of descriptive and inferential statistical treatments using the Statistical Package for the Social Sciences (SPSS) software, version 21. Frequency distributions were used to provide a demographic profile of the respondents using the responses to the first two questions, as well as each of the demographic questions at the end of the survey. The process for answering each of the research questions is provided in the narrative that follows.

Research question one.

How extensively are full-time community college faculty in Southern states using m-Learning to engage students in the learning process?

Usage was measured through questions 3 and 4 on the survey. A frequency distribution illustrated the percentages of responses to question 3 which simply asked whether the participants used one or more of the listed m-Learning strategies. Cross tabulation tables were used to show disaggregated comparisons of usage based on demographics (e.g., percentage of male respondents that indicated use versus those who did not).

The fourth survey question captured the frequency of use for each of the six m-Learning strategies. A frequency distribution provided the level of use for each of the six m-Learning strategies (e.g., percentage of respondents that used augmented reality never, minimally, occasionally, or often). Open-ended responses were included in this section as appropriate.

Research question two.

What attitudes and beliefs exist among these faculty members about the use of mobile learning strategies in community college instruction?

Faculty attitudes and beliefs were captured in their responses to survey questions 5 through 8, as well as in the open-ended responses. Questions 5 through 8 comprised a modified version of the core determinants identified in the UTAUT model (i.e., performance expectancy, effort expectancy, social influence, and facilitating conditions). Respondents indicated the level to which they agreed with statements about m-Learning in each of the four categories.

A frequency distribution conveyed the responses to the four-point Likert scale for each statement associated with the four categories. A total score was then calculated for each core determinant based on the values assigned to each Likert scale item (i.e., Strongly Disagree = 1, Disagree = 2, Agree = 3, and Strongly Agree = 4). Measures of central tendency were then analyzed for each score (i.e., mean, median, mode, and standard deviation). Table 3.8 illustrates the total number of attitude and belief statements included for each of the core determinants, as well as the maximum score.

Table 3.8

Total Possible Score for Each Core Determinant

Core Determinant	Description	# of Items	Max Score
Performance Expectancy	Degree to which an individual believes that using the system will help him or her to attain gains in job performance.	5	20

Effort Expectancy	Degree of ease associated with the use of the system	3	12
Social Influence	Degree to which an individual perceives that important others believe he or she should use the new system.	5	20
Facilitating Conditions	Degree to which an individual believes that an organization and technical infrastructure exists to support use of the system.	4	16

Upon completion of the statistical analysis, the researcher conducted a review of the open-ended responses, which offered general comments from all participants about the use of m-Learning and their experiences with any of the strategies. Recurring themes were used to develop a coding system for each response. The frequency of major themes was included in a bar chart, along with any comments that offered striking support of the themes. All open-ended comments are included in Appendix H.

Research question three.

Are there statistically significant relationships between the attitudes and beliefs about mobile learning strategies and the intentions of community college faculty to use them in the future?

The intentions of respondents to use each of the six m-Learning strategies in the coming academic year were introduced through the inclusion of frequency tables. An ordinal regression then examined the relationship between the four core determinants and future use intentions for each strategy. Ordinal regressions allow researchers to model the dependence of an ordinal response (level of use for each m-Learning strategy) on a set of predictors (four core determinants), which can be factors or covariates (McCullagh, 1980). The following null hypotheses were tested.

H_{01}: Performance expectancy will not have any influence on the intentions of faculty to use any of the six m-Learning strategies in the coming academic year.

H_{02}: Effort expectancy will not have any influence on the intentions of faculty to use any of the six m-Learning strategies in the coming academic year.

H_{03}: Social influence will not have any influence on the intentions of faculty to use any of the six m-Learning strategies in the coming academic year.

H_{04}: Facilitating conditions will not have any influence on the intentions of faculty to use any of the six m-Learning strategies in the coming academic year.

Research question four:

If relationships exist, how are they modified by age, gender, and years of experience?

An ordinal regression was also used to address the fourth research question. This type of analysis allowed the researcher to test the moderating effect of age, gender, and years of teaching experience (factors) on the relationships between the four core determinants (independent continuous variables) on the future intentions to use each strategy (ordinal dependent variables). The following null hypotheses were tested:

H_{05}: Age will have no moderating effects on the relationships between the four core determinants and the intentions of faculty to use any of the six m-Learning strategies in the coming academic year.

H_{06}: Gender will have no moderating effects on the relationships between the four core determinants and the intentions of faculty to use any of the six m-Learning strategies in the coming academic year.

H_{07}: Years of experience will have no moderating effects on the relationships between the four core determinants and the intentions of faculty to use any of the six m-Learning strategies in the coming academic year.

Researcher Subjectivity and External Threats

Even though this study was quantitative in nature, it is important to note the existing subjectivities. First, the researcher is an administrator at the System Office for the South Carolina Technical College System. In this role, the researcher is responsible for coordinating curriculum development and management activities for each of the sixteen public two-year colleges in the System. Furthermore, the researcher has taken concerted efforts to implement training and information sharing in areas related to educational technology and mobile learning strategies. Such activities require frequent interaction with college staff, primarily administrators, through meetings and professional development activities.

In addition to researcher subjectivity, another external threat might include the previous experiences of respondents with technology in general. Extremely positive or negative experiences with other types of technology might have influenced their current views about m-Learning as well as their usage patterns.

Moreover, the inability of the researcher to verbally explain the purpose of the study and the m-Learning strategies also posed external threats. Responses were dependent upon the interpretation of each participant which may have varied depending on their comfort level with technology as well as their individual learning style.

The researcher worked diligently to remove any potential bias related to subjectivity and other external threats. The previously described review of the instrument by an expert panel, as well as the informal field testing, were both conducted to address any concerns about content validity. Furthermore, the study findings and coding of the open-ended responses were reviewed by colleagues of the researcher who could offer objective feedback on the analysis.

Limitations of the Study

In addition to the external threats, some limitations also exist. This study was designed to research faculty attitudes and beliefs of m-Learning in the eleven southern states affiliated with the SACS COC accrediting region. While some results may be generalizable to all community and technical colleges, it is important to consider the location, size, and accreditation requirements of the institutions involved in the study. Furthermore, due to the availability of data, research targeted full-time community and technical college faculty. Additional studies should target the growing number of part-time or adjunct faculty within two-year institutions.

The option to conduct this study as a quantitative study also provides some limitations. While a quantitative approach provides an opportunity to reach a large amount of faculty, a survey instrument does not yield the deep rich descriptions and background information often captured when subjects are interviewed or surveyed (Glesne, 2006). Qualitative research would provide an opportunity to customize focus groups and interviews to more deeply explore the environmental factors affecting faculty acceptance of m-Learning.

Summary

This chapter provided a summary of the research design and methodology for the study. The rationale for selecting full-time community college faculty in Level-One, SACS COC-accredited colleges was offered, and sampling techniques were explained. In addition, a description of the survey instrument development using background literature, existing frameworks, and an expert review panel was provided. Narrative also gave a detailed explanation of the data collection and data analysis processes including the descriptive and inferential procedures. Finally, the chapter gave a study of the potential external threats and limitations associated with the study.

CHAPTER 4

FINDINGS

"m-learning can surely enhance the educational experience by showing how education and technology can advance together in the classroom"(Survey Respondent)

Proponents of m-Learning argue that it has huge potential to transform the educational process. Yet, limited evidence exists to support its use in higher education, especially in the community college sector. This quantitative study examined the use of m-Learning strategies in community college instruction. Specifically, the study explored faculty use of six key m-Learning strategies, as well as their perceptions about the benefits of m-Learning. The following research questions guided the study:

1. How extensively are full-time community college faculty members in Southern states using mobile learning strategies to engage students in the learning process?
2. What attitudes and beliefs exist among these faculty members about the use of mobile learning strategies in community college instruction?
3. Are there statistically significant relationships between the existing attitudes and beliefs about mobile learning strategies and the intentions of community college faculty to use them in the future?
4. If relationships exist, how are they modified by age, gender, and years of experience?

Target Population and Sample Respondents

The target population comprised community college faculty in the eleven states that belong to the SACS COC accrediting region. The population was further defined to include only full-time faculty at institutions offering the associate degree as its highest award. A total of 35,762 faculty members meeting these criteria were included in the sampling frame. After completing the stratified sampling procedure described in the previous chapter, a total of 2,254 faculty members were identified as the final sample.

The overall response rate for the self-administered survey was 28% (n=625). A total of 56 individuals opted out of completing the survey for various reasons (i.e., no longer full-time faculty, retiring, or did not wish to participate). The researcher removed an additional 23 responses because they were missing several items and found to be insufficient to answer the research questions. Removal of these responses resulted in a total of 546 responses that were deemed appropriate for data analysis, yielding a final response rate of 24%.

Because the complete demographic profiles for faculty members are only available as self-reported by survey participants, it is difficult to compare respondents and non-respondents. Several respondents elected not to report some or all of the demographic data that was requested. However, based on reported data, the majority of the respondents were female (60.8%), which is consistent with SREB data reported for 2011-12 at the national level (54.6% were women) and regional level (56% were women). The age of respondents appeared to fall primarily within two age groups:

Generation Xers - those aged 33-48 (37.9%) and Matures - those aged 56 and older (29.7%). Table 4.1 provides the frequency distribution for respondents' gender and age.

Table 4.1

Demographic Profile of Respondents – Gender and Age

Variable	Frequency	% (n)	% (Total)
Gender (n=510)			
Male	178	34.9	32.6
Female	332	65.1	60.8
Age (n=510)			
21-32	47	9.2	8.6
33-48	207	40.6	37.9
49-55	94	18.4	17.2
56-older	162	31.8	29.7

Several attempts were made to identify age and gender information for all faculty members in the target population. However, upon the completion of the research study, only three colleges provided disaggregate data for their faculty. In these instances, the faculty demographics were overwhelmingly consistent with the data reported in Table 4.1. Less than 10% of the faculty belonged to the millennial age group and approximately 40% were aged 33-50. More than half of the faculty members were female. Without the data from the other institutions, it is impossible to generalize these patterns to the entire target population.

In addition to their gender and age, respondents were asked to identify their primary area of study. The proportion of faculty teaching career and technical education courses is slightly more than those teaching transfer/art and sciences/general education (50.9% and 44.3%, respectively). SACS COC requires that faculty members teaching transfer courses must have a master's degree, in addition to 18 hours of graduate credit in their content area. Therefore, it is understandable that more than half of the participants hold a master's degree (57.7%). In comparison, a considerably smaller percentage of respondents reported the doctoral degree (14.8%) or bachelor's degree (13.6 %) as their highest degree. Findings are somewhat consistent with national demographics. The AACC reported that 71% of all full-time faculty hold master's degrees, 13% hold a doctorate, and 11% hold a bachelor's (AACC, 2013). Table 4.2 provides a frequency distribution of the academic discipline and educational level for respondents.

Table 4.2

Demographic Profile of Respondents – Academic Discipline and Educational Level

Variable	Frequency	% (n)	% (Total)
Academic Discipline (n=520)			
Transfer/Arts & Sciences/General Education	242	46.5	44.3
Career and Technical Education	278	53.5	50.9
Educational Level (n=506)			
Associate Degree	36	7.1	6.6
Bachelor's Degree	74	14.6	13.6
Master's Degree	315	62.3	57.7
Doctoral Degree	81	16	14.8

Table 4.3 provides the frequency distribution for the respondents' years of employment. The majority of respondents have longevity within the community college system. Nearly 30% of all respondents indicated employment at their current institution for more than ten years. An even larger proportion (38.8%) has been employed in the community college setting for ten years or more. Conversely, the smallest percentages were among those that were employed in a community college setting for less than one year (4.1%).

Table 4.3

Demographic Profile of Respondents – Years Employed

Variable	Frequency	% (n)	% (Total)
Yrs Employed at Current Institution (n=493)			
Less than 1 year	58	11.8	10.6
1 to less than 5 years	147	29.8	26.9
5 years to less than 10 years	129	26.2	23.6
10 years or more	159	32.3	29.1
Total Yrs Employed in Community College (n=508)			
Less than 1 year	21	4.1	3.8
1 to less than 5 years	127	25	23.3
5 years to less than 10 years	148	29.1	27.1
10 years or more	212	41.7	38.8

Response rates varied greatly among the states, further supporting the decision to exclude comparisons between these strata. The majority of participants indicated location in North Carolina (26%) and South Carolina (25.8%). A minimal number of respondents indicated location in Texas (n=6), Florida (n=11), and Virginia (n=16). Justification for the varied response rates in each state is debatable. Most would assume that the researcher's relationship with the sample colleges prompted the high response rates in South Carolina. In North Carolina, the high response rate could be attributed to the fact that primary communication with respondents came from an institutional representative. However, institutional representatives also served as the primary communicators in Texas and Virginia. Conversely, the researcher served as the primary communicator in Georgia and Tennessee, where the response rates were higher. It should also be noted that 37 of the respondents did not indicate their state, so it is unknown if the actual response rates in Texas, Florida, or Virginia were higher than reported. Table 4.4 provides the frequency distribution of the respondents' location by state.

Table 4.4

Demographic Profile of Respondents – State where Institution is Located

Variable	Frequency	% (n)	% (Total)
State (n=509)			
Alabama	15	2.9	2.7
Florida	11	2.2	2.0
Georgia	44	8.6	8.1
Kentucky	53	10.4	9.7
Louisiana	28	5.5	5.1
Mississippi	23	4.5	4.2
North Carolina	142	27.9	26.0
South Carolina	141	27.7	25.8
Tennessee	30	5.9	5.5
Texas	6	1.2	1.1
Virginia	16	3.1	2.9

As indicated in Table 4.2, a slight majority indicated that they taught courses primarily in career and technical education (50.9%) versus transfer/arts and science/general education (44.3%). Tables 4.5 and 4.6 provide disaggregate data for the academic disciplines within these two areas. For respondents teaching primarily transfer/arts and science/general education courses, the majority answered that they teach in English/Communications (27.2%), followed by mathematics (17.3%), and science (14.4%). For those teaching primarily career and technical education courses, the overwhelming majority answered that they teach in Health Science (34.5%), followed by information technology (11.4%).

Table 4.5

Demographic Profile of Respondents – Transfer/Arts & Sciences/General Education

n = 243	Frequency	% (n)	% (Total)
Behavioral Science	20	8.2	3.7
English/Communications	66	27.2	12.1
Foreign Language	8	3.3	1.5
Humanities/Fine Arts	18	7.4	3.3
Mathematics	42	17.3	7.7
Science	35	14.4	6.4

Social Science	26	10.7	4.8
Other	28	11.5	5.1

Table 4.6

Demographic Profile of Respondents – Career and Technical Education

n = 281	Frequency	% (n)	% (Total)
Agriculture, Food, & Natural Resources	3	1.1	.5
Architecture and Construction	4	1.4	.7
Arts, AV Technology, & Communications	11	3.9	2.0
Business	21	7.5	3.8
Education and Training	17	6.0	3.1
Finance	1	.4	.2
Health Science	97	34.5	17.8
Hospitality and Tourism	7	2.5	1.3
Human Services	13	4.6	2.4
Information Technology	32	11.4	5.9
Law, Public Safety, Corrections & Security	14	5.0	2.6
Manufacturing	2	.7	.4
Marketing, Sales, & Service	1	.4	.2
Science, Technology, Engineering, & Math	23	8.2	4.2
Transportation, Distribution, & Logistics	5	1.8	.9
Other	30	10.7	5.5

When examining the target population as a whole, the 546 respondents well exceed the required 381 responses needed to represent the region. However, the aforementioned reasons, coupled with the disproportionate sampling technique, make it difficult to determine whether the sample is fully representative of the target population. Nevertheless, in sum, these findings present a substantial body of evidence supporting the current use and future use intentions of m-Learning strategies by community college faculty in the SACS COC accrediting region.

Comfort Level with Technology and Mobile Device Ownership

In addition to the demographic questions, the survey included items about respondents' general comfort level with technology, as well their mobile device ownership. As illustrated in Figure 4.1, most of the faculty members indicated high comfort levels with technology. Nearly 64% answered that they either: a) could work independently with technology and could usually figure out related problems on their own (35%) or b) were very proficient in technology, so much so that others often seek their advice (28.4%). In contrast, less than one % of the faculty members (n=2) reported that they are unable to figure out technology, even if given instructions.

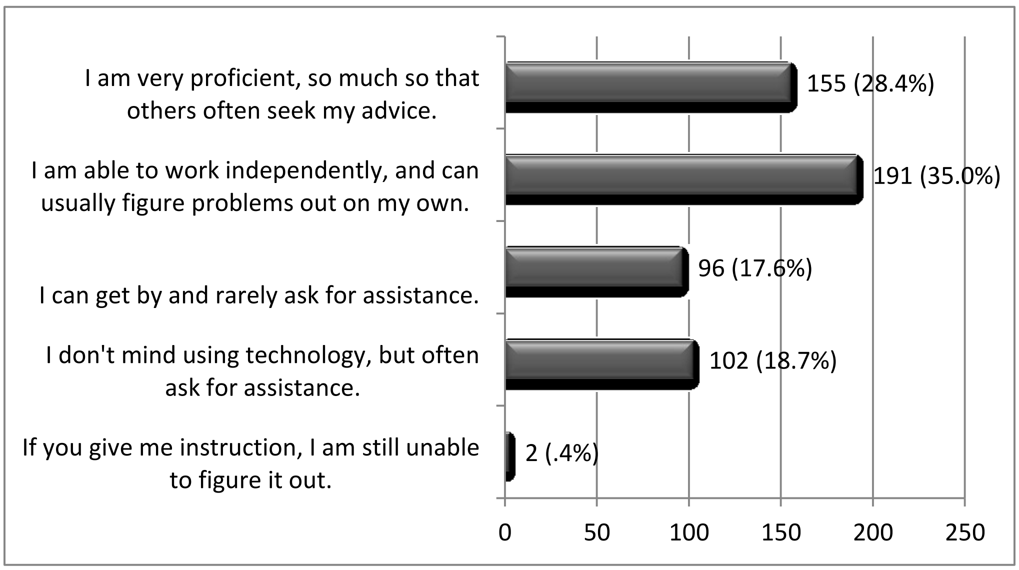
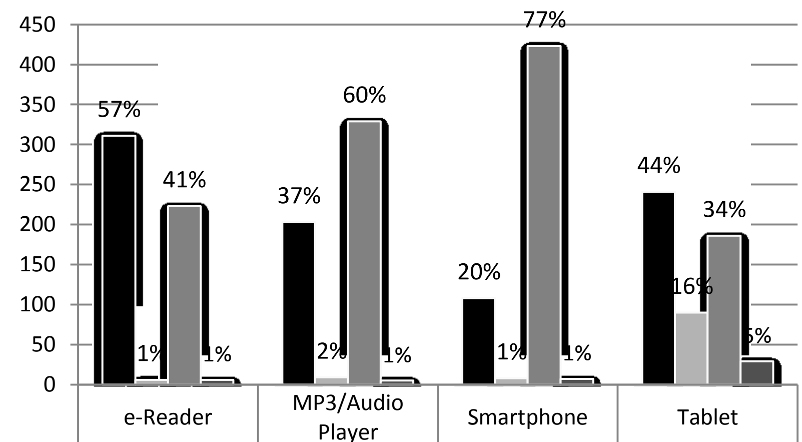


Figure 4.1 Question one responses - general comfort level with technology (N=546)

The general comfort with technology is somewhat evident in the mobile device ownership patterns of respondents. Only a small percentage of faculty members (7.1%) owned none of the mobile devices listed in the survey. In contrast, 12.8% owned all four devices and purchased them with their own money. Smartphone ownership was the highest overall (77.5%), followed closely by a MP3/Audio Player (60.3%). In both instances, the devices were purchased with personal funds.

An examination of institutional purchases revealed very limited acquisitions in this category. For the e-reader, MP3/audio player, and smartphone, less than ten respondents indicated institutional purchase (n=6, 9, and 8 respectively). There was, however, a larger amount of tablets purchased by institutions (n=90). In two instances, participants reported that their institution had purchased all four devices for them, and they had also personally purchased each of the four devices. Figure 4.2 provides the frequency distribution of responses related to mobile device ownership.



	e-Reader	MP3/Audio Player	Smartphone	Tablet
■ I do not own	311	203	108	241
■ My Institution Purchased for Me	6	9	8	90
■ I Purchased with My Own Money	223	329	423	186
■ Both (Insitution & Personal Ownership	6	5	7	29

Figure 4.2 Question two responses – mobile device ownership (N=546)

Research Question One

How extensively are full-time community college faculty members in Southern states using m-Learning strategies to engage students in the learning process?

Overall use.

Descriptive statistics were used to analyze the first research question. Respondents were asked to identify whether they used one or more of the following six m-Learning strategies during the 2012-13 academic year: 1) augmented reality, 2) file/resource sharing, 3) gaming/simulation, 4) research/references, 5) social media, and 6) text messaging. Two-thirds of the faculty members (n=360) reported that they used one or more of the strategies (see Figure 4.3). Table 4.4 provides disaggregate data for overall use of m-Learning based on the respondents that provided demographic data.

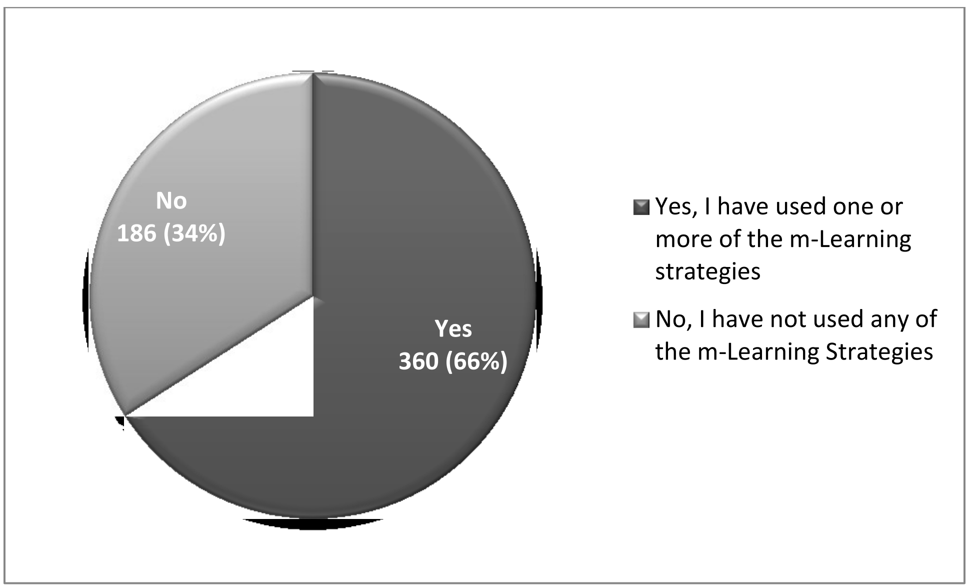


Figure 4.3 Question 3 responses – use of m-Learning strategies (N=546)

Tables 4.7 provides disaggregate demographic data for respondents based on those that used one of the six m-Learning strategies in comparison to those who did not.

Table 4.7

Usage of m-Learning Disaggregated by Demographic Data

Variable	Yes	No
Gender (n=510)		
Male	110	68
Female	222	110
Age (n=510)		
21-32	37	10
33-48	135	72
49-55	63	31
56-older	96	66
Academic Discipline (n=520)		
Transfer/Arts & Sciences/General Education	155	87
Career and Technical Education	181	97
Educational Level (n=506)		
Associate Degree	17	19
Bachelor's Degree	47	27
Master's Degree	215	100
Doctoral Degree	49	32
Yrs Employed at Current Institution (n=493)		
Less than 1 year	36	22
1 to less than 5 years	95	52
5 years to less than 10 years	93	36
10 years or more	99	60
Total Yrs Employed in Community College (n=508)		
Less than 1 year	12	9
1 to less than 5 years	87	40
5 years to less than 10 years	98	50
10 years or more	132	80
State (n=509)		
Alabama	14	1
Florida	7	4
Georgia	31	13
Kentucky	25	28
Louisiana	17	11
Mississippi	21	2
North Carolina	79	63
South Carolina	99	42
Tennessee	22	8
Texas	5	1
Virginia	11	5

Frequency of use.

Once use of one or more of the strategies was indicated, respondents were then asked to identify their frequency of use for each strategy. Response options for frequency, including the code they were assigned in SPSS, are detailed in Table 4.8.

Table 4.8

Response Options for Frequency of Use for Each m-Learning Strategy

Response Code	Response Option	Description
1	Never	Not applicable
2	Minimally	Once or twice with little emphasis
3	Occasionally	Three to five times with some emphasis
4	Often	More than five times with much emphasis

Figure 4.4 illustrates the percentage of faculty respondents that used each m-Learning strategy at least once during the 2012-13 academic year. The majority of faculty used file/resource sharing at least once (71%), followed by research/reference applications (65.5%). Social media and text messaging followed closely in third place, both equally distributed at 63%. The percentages of faculty that used gaming or augmented reality in their instruction were substantially less (35% and 26.5%, respectively).

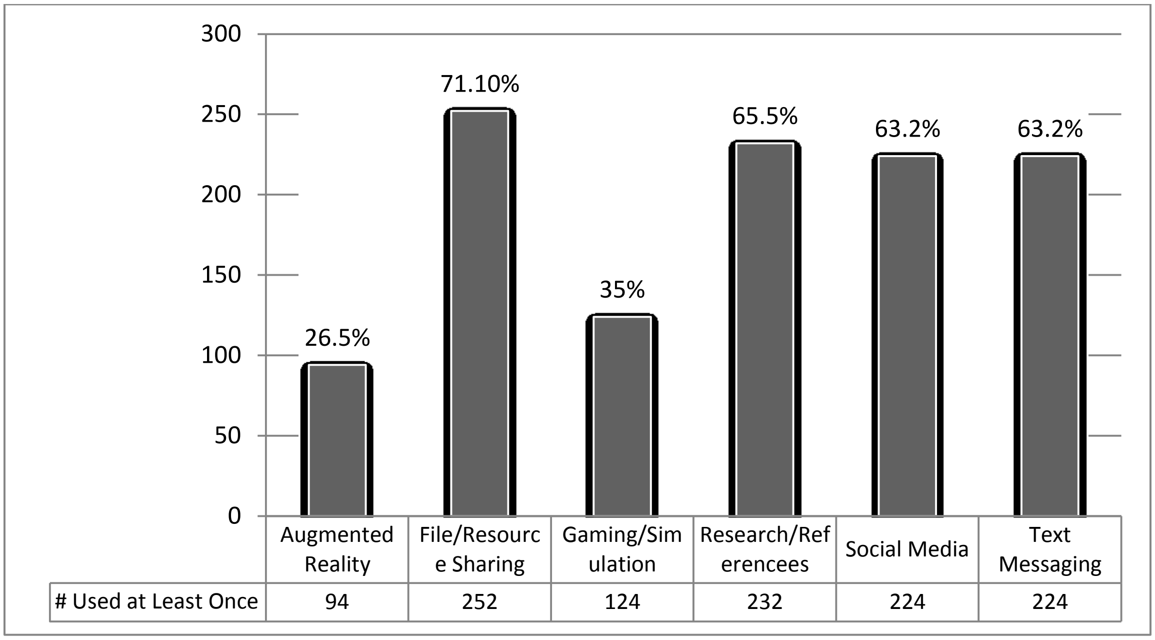
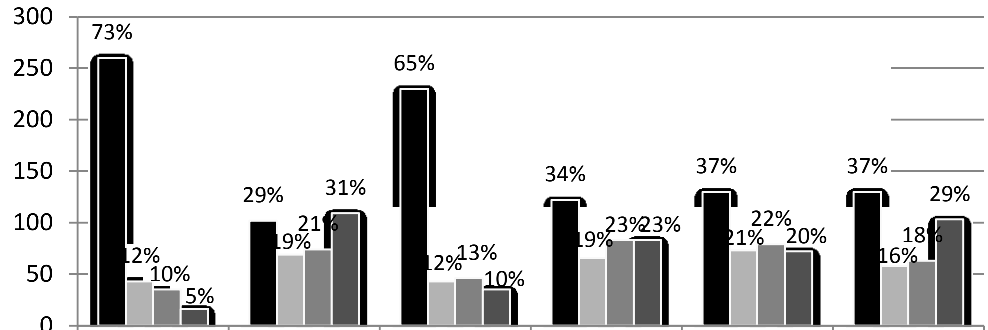


Figure 4.4 Percentage using each strategy at least once during 2012-13 academic year.

Figure 4.5 illustrates the frequency distribution for responses indicating frequency of use. Data analysis revealed that three respondents used of all six strategies often during the 2012-13 academic year. One was a female belonging to the 21-32 age group, and one was a male belonging to the 33-48 age group. One respondent did not provide demographic data. Four faculty members, two that were male and two that were female, used all of the six strategies occasionally. One male respondent, grouped in the 49-55 age category, used all of the six strategies minimally. A discussion on each of the six m-Learning strategies follows in order of the frequency of use.



	Augmented Reality	File/Resource Sharing	Gaming/Simulation	Research/References	Social Media	Text Messaging
Never	260	102	230	122	130	130
Minimally	43	69	43	66	73	58
Ocassionally	35	74	46	83	79	63
Often	16	109	35	83	72	103

Figure 4.5 Question 4 responses – frequency of strategy use during 2012-13 academic year

File/resource sharing.

File/resource sharing refers to the use of mobile devices to access files or learning resources from any location through the use of wireless or cloud services. Examples of file/resource sharing include online journaling via Evernote, collaborative document creation via Google Docs, file sharing via Dropbox, or the posting of podcasts or recorded lectures. The majority of respondents reporting use (approximately 31 %) indicated that they used file/resource sharing often. One respondent offered feedback on the definition of this category, stating that it was broader than what was described in the survey.

> I wouldn't limit some of the categories (i.e. file/resource & research, etc.) to specifically m-learning. Blackboard, Moodle, even ftp and webpages contain much of what you mention and would be accessible using most any smartphone, tablet or PC.

This comment provides evidence of one of the external threats referenced in chapter 3. The respondent has misunderstood file/resource sharing to be any website that can be accessed on a mobile device. Instead, this category is meant to describe the use of mobile devices to facilitate the sharing of information or collaborative learning. While some learning management systems have supplemental mobile applications, not all do. One respondent explained:

> Currently the online platform that is used at my college – MOODLE does not support mobile applications. There is no plan to implement the strategy in the near future.

Unlike a learning management system, tools like Evernote or Google Docs allow users to create resources on any device and upload or sync them in one central location so that they are always accessible and possibly accessible by multiple users.

Research/reference applications.

The second most frequently used strategy was research/reference applications which was defined as the use of a mobile device to download an application for access to a specific learning resource. Approximately 24% used it often. One respondent offered details on the use of this strategy in an English class, noting:

> I use Socrative in class as a way to pre-test students on their grammar knowledge before reviewing the material – they love it because they get to use their phones and it shows them just how much they don't know and what they need to focus on more before we review, so they tend to pay more attention.

Other examples of research/reference applications include the use of mobile devices to access an anatomy reference manual, medical dictionary, or foreign language vocabulary drills. Such examples are behaviorist in nature, but offer students instant access to practical and relevant content in their respective areas.

Text messaging.

Text messaging was defined as the use of a cell phone, smartphone, or online service to send and receive short messages (one-to-one or one-to-many). Examples include class polling, assignment reminders, performance feedback, or electronic office hours. Less respondents used this strategy overall in comparison to research/reference applications. Contrasting views about this strategy appeared in the open-ended responses. A few stated interest in this strategy, but were hesitant for a number of reasons.

> I think that text messaging would be great to use, but I do not want students to have my personal cell phone number.

> I do not have the ability to text without using my personal phone which I want to keep personal. If I had a texting capacity, I would use it, but not on my own personal device.

One respondent offered a solution to faculty concerns about sharing their personal information.

> Remind101 is a great app to text students without giving your personal phone number.

Others found no value in the strategy.

> I discourage all texting in my classroom as you cannot ensure students are sticking to class projects and not talking to friends.

> I won't pay 20 cents for a text message from somebody whom I didn't select to hear from.

> Most students receive email and Blackboard announcements on their smart phones, so I don't believe that texting would add anything additional.

Although opinions on text messaging in the classroom varied, more respondents indicated use of this strategy often (n=103). Therefore, it can be assumed that once faculty members buy into the concept, they find it to be a useful strategy.

Social media.

Social media refers to the use of mobile devices to promote synchronous or asynchronous collaboration among students and/or the instructor. Social media tools are searchable, linkable, subscribable, taggable, and editable. Examples include a class Facebook or Twitter page, and virtual discussions via Skype and FaceTime. One respondent shared the following advantages of using Twitter.

> Twitter helps in connecting online and on-campus students. They can use the hash tags to reference popular threads of interest to get answers to frequently asked questions. Also a great way to communicate to all students simultaneously.

The majority of respondents that indicated use of this strategy reported use on an occasional basis. Unlike the other strategies, social media requires monitoring and is likely to be more time intensive than the other strategies because of the need to facilitate conversations and interaction between students. Furthermore, as referenced in the faculty comments, social media connects students with popular culture, so there may be extra pressure for faculty to maintain a safe environment for students to communicate with one another.

Gaming/simulation.

Gaming/simulation refers to the use of mobile devices to create artificial experiences that mimic real-world environments and situations in order to provide practical application of classroom instruction. Examples include virtual heart sound diagnosis, a simulated genetics lab, or virtual trading in a simulated stock market. The majority of respondents that indicated use of this strategy reported use on an occasional basis, although there is a noticeable decrease in the number of respondents that use this strategy in comparison to the four strategies already discussed. Still, one respondent detailed her use of simulation in a business course.

> I teach Business/Computer Science classes traditionally and online. I currently use SAM (Skills Assessment Manager) which is a simulation software for my computer classes. I use Stock Market simulation and Interactive Business Plan software for my Business classes The use of these m-[learning] strategies have greatly increased the interest and initiative of students to participate in certain assignments.

Investigation determined that the software referenced in the example above (i.e., SAM) includes support for the completion of simulation activities on a mobile device.

Augmented reality.

Augmented reality refers to the use of a mobile device to track a learner's location and provide custom information about the location based on a set of predetermined rules. An example might include a mobile scavenger hunt with students to discover hidden facts about a specific location (e.g., museum, artifacts, public health data, etc.). This strategy was used the least of the six strategies. The majority of respondents indicating use reported that it was used on a minimal basis. One respondent described augmented reality as an option for m-Learning that was not included in the survey.

> To me m-learning would be a narrower focus covering texting, use of devices [or] cameras for image searches, custom apps that utilize a phone or table for channeled communication (i.e. aim camera or use of other internal sensors to say overlay information about some object while viewing it on the screen.

This response was another example of how respondents may not have clearly understood the strategies targeted in the survey. The user seemed to have experience with sensory overlays, which is the main technology utilized in augmented reality.

Research Question Two

What attitudes and beliefs exist among these faculty about the use of mobile learning strategies in community college instruction?

The attitudes and beliefs of faculty members were captured through their responses to the Likert scale items about performance expectancy, effort expectancy, social influence, and facilitating conditions. Respondents indicated the level to which they agreed with each of the statements (1=Strongly Disagree, 2=Disagree, 3=Agree, 4=Strongly Agree). Additionally, open-ended responses were coded and grouped into themes. Appendix H provides a cumulative summary of the responses. Comments were also included as deemed appropriate to support results on the Likert scales.

Performance expectancy.

Performance expectancy measures the degree to which an individual believes that use of the strategy leads to gains in job performance. Table 4.9 displays the measures for central tendency for each of the items in the performance expectancy scale.

Table 4.9
Measures of Central Tendency for Performance Expectancy Scale

Item	Mean	Median	Mode	SD
The use of m-learning strategies can enhance the overall quality of instructional content I deliver to my students. (n=349)	3.243	3.000	3.000	.547
Using m-learning strategies can increase my ability to meet the learning objectives for my course(s). (n=350)	3.148	3.000	3.000	.551
The use of m-learning strategies can enable me to accomplish instructional-related tasks more quickly. (n=347)	3.054	3.000	3.000	.667
The use of m-learning strategies can increase my chances of getting a raise. (n=349)	1.862	2.000	3.000	.832
The use of m-learning strategies can increase my chances of getting a promotion. (n=347)	1.965	2.000	2.000	.856

Mean scores were highest in response to the ability of m-Learning to enhance the overall quality of instructional content (3.243). Respondents also seemed to have positive beliefs about the ability of m-Learning strategies to meet learning objectives (3.148) and to accomplish instructional-related tasks more quickly (3.0254). In contrast, faculty members did not agree as positively with the ability of m-Learning strategies to earn a raise (1.862) or a promotion (1.965). Respondents indicated that raises and promotions were based solely on longevity. Two respondents implied that a link between m-Learning use and promotions or raises might encourage use:

> Everyone gets promoted equally, regardless of effort or innovation.
>
> The time factor to be trained is a barrier and there is no professional incentive (e.g., promotion, increases in pay, benefits such as release time) associated in doing so.

As the age of the faculty workforce begins to shift, and employers increase their use of mobile devices, it may become inevitable for institutions to explore incentives for encouraging their use in the classroom.

Effort expectancy.

Effort expectancy measures the degree of ease associated with the use of m-Learning. Table 4.10 displays the measures of central tendency for the effort expectancy scale.

Table 4.10

Measures of Central Tendency for Effort Expectancy Scale

Item	Mean	Median	Mode	SD
It is easy to learn how to operate a mobile device. (n=347)	3.123	3.000	3.000	.603
It is easy to develop the skills necessary to incorporate m-learning strategies into my instruction. (n=347)	2.928	3.000	3.000	.630

It is easy to incorporate m-learning strategies into my instruction. (n=345)	2.831	3.000	3.000	.661

Mean scores were highest in response to the belief that it is easy to learn how to operate a mobile device (3.123). These scores are further supported in the ownership patterns of mobile devices that were previously described. Although respondents believed it was easy to operate a mobile device, they did not agree as much with the ease in developing the skills necessary to incorporate m-Learning strategies (2.928) into their instruction. One respondent offered:

> It is certainly possible to learn to use m-Learning strategies in my teaching, but it is not easy. It takes lots of commitment on my part to teach and learn on my own and then to teach students who have no idea how to maximize the power of the devices they already own.

Such comments provide further justification for professional development and training as it relates to m-Learning use among faculty.

Social influence.

Social influence refers to the degree to which an individual perceives that important others believe he or she should use m-Learning. Table 4.11 illustrates the measures of central tendency for the social influence scale.

Table 4.11

Measures of Central Tendency for Social Influence Scale

Item	Mean	Median	Mode	SD
My colleagues currently use m-learning strategies in their instruction. (n=341)	2.689	3.000	3.000	.630
My colleagues encourage me to incorporate m-learning strategies into my instruction. (n=342)	2.251	2.000	2.000	.688
My friends and/or family encourage me to incorporate m-learning strategies into my instruction. (n=343)	2.251	2.000	2.000	.726
My dean and/or department head encourages faculty to use m-learning strategies. (n=340)	2.668	3.000	3.000	.748
In general, my institution encourages faculty to use m-learning strategies. (n=342)	2.792	3.000	3.000	.707

Mean scores on this scale were slightly lower than the scores in the previous two scales, indicating that faculty members do not believe that their social circle has considerable influence on their use of m-Learning. The highest mean score related to general institutional support of m-Learning (2.792). The lowest scores were related to encouragement from friends and family (2.251), as well as colleagues (2.251). Frustrations about the lack of m-Learning strategies by colleagues were described in the following comments:

> This is a great concept, too bad that many in the education field are locked into old school.

> Most instructors in my department are older, and technology isn't being embraced as much as it could be.

Facilitating conditions.

Facilitating conditions refers to the belief that an organization and technical infrastructure exists to support use of the system. Table 4.12 illustrates the measures of central tendency for the facilitating conditions scale. Scores on this scale were relatively low, indicating that faculty do not believe adequate support exists for the use of m-Learning. A plethora of open-ended responses supported these low mean scores and concerns about the lack of institutional support for m-Learning use.

Table 4.12

Measures of Central Tendency for Facilitating Conditions Scale

Item	Mean	Median	Mode	SD
I have the knowledge necessary to incorporate m-learning strategies into my teaching. (n=340)	2.935	3.000	3.000	.662
I have the resources necessary to incorporate m-learning strategies into my teaching. (n=339)	2.746	3.000	3.000	.710
I have received specialized instruction concerning the implementation of m-learning strategies. (n=340)	2.485	2.000	2.000	.796
A specific person (or group) is available on my campus for assistance with difficulties in using m-learning strategies. (n=339)	2.867	3.000	3.000	.812

Open-ended responses.

A total of 193 open-ended responses were collected. Approximately 10 % of the responses (n=20) offered positive feedback about the use of m-Learning. Most of these respondents indicated that m-Learning was useful in engaging students and in preparing them for the workforce. Respondents also thought that m-Learning increased their productivity as shared in the following comments:

> Students live and breathe technology these days. In order to catch and keep their interest, you MUST incorporate technology options into the learning process.

> m-Learning has made my job as an instructor easier, and I feel m-Learning has better prepared my students for the real world. I can safely say we are ALL more successful.

> It is a wonderful way to reach the largest amount of students and puts everyone on an equal playing field. Constant interaction is essential.

Of those that shared positive feedback, two spoke specifically of the support that was available on their campus, either from administration or their colleagues.

> Our community college has provided great resources for faculty support to help us use m-Learning with our students. Students do enjoy it.

> We had a special group devoted to sharing these techniques as we changed portions of our classes during a given semester. We reported back what worked, did not work, and asked for advice. Then we modeled to each other and presented our data and findings at a symposium for all faculty. Poll anywhere and blogging are fantastic!

Respondents indicated an interest in learning more about the strategies listed in the survey (n=11). Three faculty members were new to their institution and shared that their curriculum was already set for the upcoming semester. However, they felt the strategies could be useful in their classroom. One respondent shared specific interest in incorporating social media and in learning more about augmented reality for a scavenger hunt activity:

> I'm a relatively new faculty member. I plan to integrate some m-Learning strategies this year, specifically social networking, probably using Facebook…When reading the survey, I was intrigued by the scavenger hunt and may try to incorporate something like that into one of my classes. Thanks for the idea ☺

Respondents also seemed very interested in understanding how to apply the strategies to their specific academic disciplines (n=8). Comments included a mix of examples illustrating how strategies were used in a content area:

> I like to use mobile devices to enhance very small areas of the subject matter. I also use online gaming as a large project and demonstrate some very basic uses of mobile devices as it would relate to business.

Other comments indicated the need for effective models related to use of m-Learning in their respective disciplines.

> I teach culinary and do not have the resources to utilize all of the aspects of m-Learning, but am quite open to it all.

One respondent shared initial fear and frustration with the use of m-Learning, but has become more comfortable due to use of the resources and campus training.

> As I use more mLearning strategies, I become more confident. The lack of access and basic frustration of "more technology" inhibited my use in the past. This is becoming less of a problem due to campus instruction for teachers and students.

Although many of the survey participants shared positive comments, the overwhelming majority of the responses emphasized the barriers to implementing m-Learning strategies in the classroom. Figure 4.6 illustrates a frequency distribution of the major barriers revealed through the open-ended responses. Responses are disaggregated between those that reported current use one or more of the strategies (n=64) and those that do not (n=73). Faculty members in either group indicated that student access to mobile devices was the largest barrier to using m-Learning strategies in the classroom. Other barriers included limited institutional support, no time to learn or implement the strategies, lack of professional development, and lack of student technology skills.

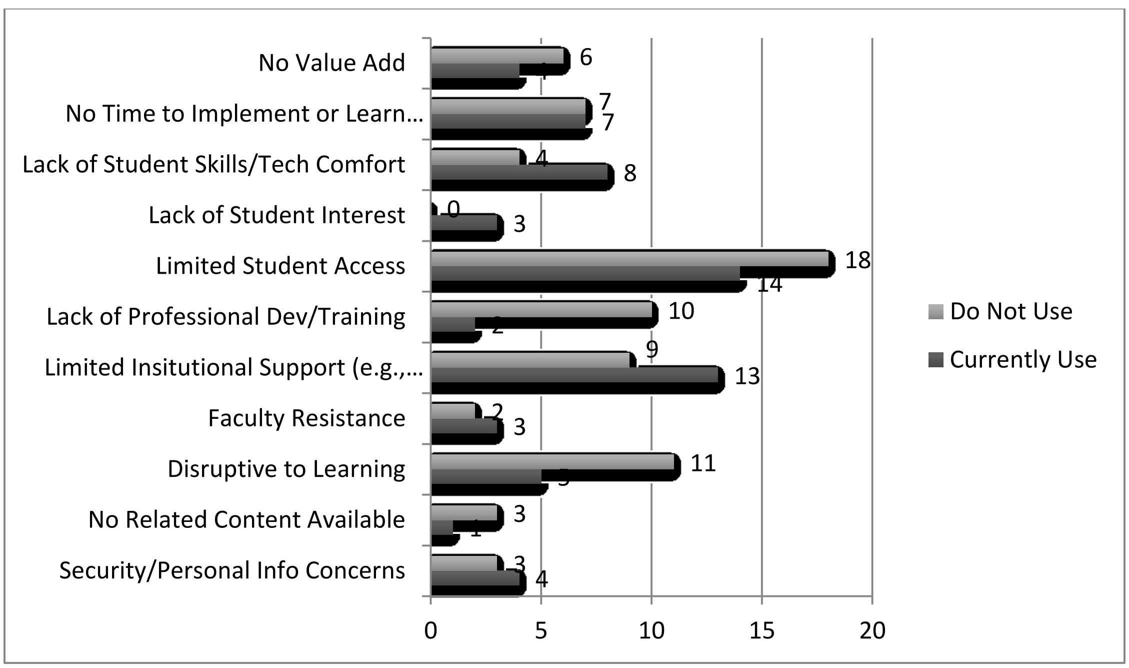


Figure 4.6 Number of open-ended responses describing barriers to m-Learning use

Student access.

Comments regarding student access negated assumptions that all students own a smart phone or mobile device. In fact, 32 respondents indicated that a number of their students still do not own a smart phone, making it difficult to do any kind of class activities as a whole. Such sentiments are captured in the following comment:

> The perception is that our students have the technology skills needed. That is not true. The institution that I work for has a very large low income population and most of the students don't even own a computer. I tried to do a polling survey in class last semester and about 20% of my students didn't own a smart phone.

Not all respondents allowed the lack of student access to hinder them from incorporating m-Learning into their instruction. One respondent indicated the use of social media since poorer students could still access the resources through the college's library. Another bought personal devices from home. One respondent explained the results of a paired programming approach due to the limited number of devices:

> Some students don't have access to mobile devices. In my classroom, we solved this problem by forming teams for mobile learning quizzes, but I still sensed that students who didn't have smart phones or tablets sometimes felt awkward, as though they couldn't fully participate.

Disruptors of learning.

In cases where all of their students do have access to mobile devices, faculty still may choose not to include them as part of their instruction, because they cause major distractions to the learning process. In two instances, the faculty respondents recognize the role of technology in their respective fields, but still choose to prohibit the use of mobile devices, cell phones in particular, from the classroom.

> I am an aircraft maintenance instructor the aircraft industry is going to tablets for the maintenance people to have the maintenance manuals work instructions etc. with them an all-time. They are very timesaving items. The problem I have with them in school is the students are not paying attention to what they should be instead they're surfing the Internet both on tablets and smart phones which is not acceptable.

> I have yet to find a student who does what they are supposed to be doing with a smart phone or laptop in class at all times. In almost every case, it is at best a distraction, or at worst an outright way to be physically present but mentally absent. Some few use it to take notes or download relevant apps, but most do not.

Time.

The amount of time required by faculty to effectively manage m-Learning was referenced in several comments (n=14). Respondents felt that they did not have time to either acquire the skills or to incorporate them into their lesson plans.

> No development time is given to research or coordinate m-learning into the classrooms. There is no time available to add content even if desired. Therefore, it is unlikely that teachers or instructions will spend what little personal time they have to research and incorporate m-learning into their classrooms.

Professional development.

Twelve respondents expressed that more professional development and training was needed before attempting use of any of the strategies. One respondent noted that he/she would be attending a regional training and was eager to learn more. Three felt that the training was not quality or that there were no opportunities for follow-up training after the initial introduction.

Institutional support.

Professional development and training offer little value without the presence of institutional support. Twenty-one comments spoke to the lack of equipment, available wireless technology, or staff person to assist with implementation. One respondent also shared that college policies prohibited use of some of the m-Learning strategies included in the survey. The comments below speak to the limited support available within one department, followed by the inability for interested faculty to receive advanced training.

> Although we have training on some of the technologies mentioned in your survey, very few iPads etc have been purchased for faculty and/or are available for faculty or in class use. When requested, our department chair says funds are not available or chooses to use the funds on other expenses.

> Although we have a department for faculty support, and they are very knowledgeable and helpful, they are busy with helping less technical faculty with the "BASICS" of technology…I would love to have someone available to turn to who has done the research best practices and share more information on this topic.

Student interest/skill.

The assumption by m-Learning advocates is that most students have a general interest in technology, even if they do not have access to it. However, two respondents provided evidence of the opposite. Both noted that students do not utilize the technology when it is introduced and get more excited about traditional lecture.

Appendix H provides a summarized listing of all open-ended comments, grouped by those that currently use m-Learning and those that do not.

Research Question Three

Are there statistically significant relationships between the existing attitudes and beliefs about mobile learning strategies and the intentions of full-time community college faculty to use them in the future?

The third research question examined whether the core determinants (i.e., performance expectancy, effort expectancy, social influence, and facilitating conditions) had any influence on the intentions of faculty members to use each m-Learning strategy in the coming academic year. Statistical analyses included scores from each of the attitude and belief scales (independent variables) in tandem with the data from the Likert scale items about the likelihood of respondents to use each m-Learning strategy (dependent variables).

Attitude and belief scores.

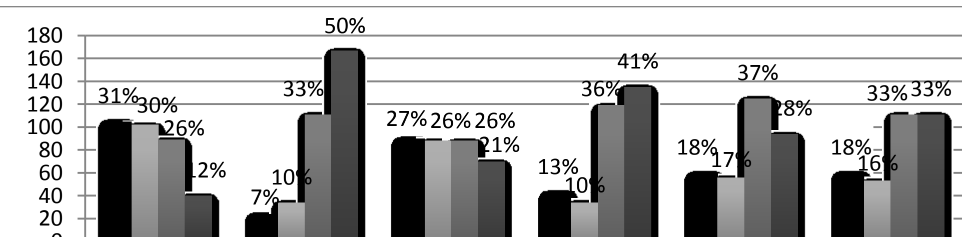
SPSS was used to calculate a sum of the scale items for each of the four core determinants. The sum for each scale is hereafter referred to as the score. Table 4.13 displays the measures of central tendency for each score, in addition to the possible range of scores available for each scale.

Table 4.13

Measures of Central Tendency for Total Attitude and Belief Scores						
	Mean	Median	Mode	SD	Min	Max
PE Score (n=344)	13.2820	13.0000	13.00	2.46234	5.00	20.00
EE Score (n=345)	8.8783	9.0000	9.00	1.64324	3.00	12.00
SI Score (n=339)	12.9145	13.0000	15.00	2.66276	5.00	20.00
FC Score (n=338)	11.0296	11.0000	12.00	2.37301	4.00	16.00

Intentions to use m-Learning strategies.

Figure 4.7 shows the frequency distribution for the Likert scales that measured the likelihood of respondents to use each m-Learning strategy. The distribution only includes those who indicated current use of one or more of the strategies. Data revealed that respondents were most likely to use file and resource sharing (83%), followed by research/reference applications (78%), text messaging (65%) and social media (63%). Faculty members were much less likely to use gaming/simulation (47%) and augmented reality (38%), most likely because of the time associated with skill acquisition and classroom management for these two strategies.



	Augmented Reality	File/Resource Management	Gaming/Simulation	Research/Reference Apps	Social Media	Text Messaging
Not at All Likely	105	24	90	43	60	60
Not Very Likely	102	34	88	34	56	53
Somewhat Likely	89	111	88	119	125	111
Very Likely	40	167	70	135	94	111

Figure 4.7 Likelihood to use m-Learning strategies in the coming academic year.

Data analysis.

An ordinal regression including the data in Table 4.13 and Figure 4.7 was used to answer the third research question. Four null hypotheses were tested and all four were rejected. Each of the four core determinants had a positive effect on the likelihood that faculty members would use each strategy in the future. While the relationships varied depending on the strategy, a few patterns emerged from data analysis. In three of the four cases, the most positive relationships were found among the four determinants and the intention to use augmented reality, as well as file/resource sharing. The determinants were least influential in determining the intention to use text messaging and social media.

In general, each model accounted for a low percentage of variance in the predicted usage of the m-Learning strategies. The lowest account of variance was found among the relationship between social influence and social media use (r^2=.032). The highest account of variance was found in the relationship between facilitating conditions and the intentions to use research/reference applications (r^2 = .138). The following additional models accounted for more than 10% of the variance of intended use:

- Social influence and augmented reality (r^2 = .128)
- Social influence and gaming (r^2 = .117)
- Performance expectancy and augmented reality (r^2 = .116)
- Facilitating conditions and file/resource sharing (r^2 = .113)

Hypothesis one.

H_{01}: Performance expectancy will not have any influence on the intentions of faculty to use any of the six m-Learning strategies in the coming academic year.

Performance expectancy was found to have a positive association with the level of use for each of the m-Learning strategies. Among the six categories, performance expectancy had the largest association with the intentions to use augmented reality. For every one point increase in the performance expectancy score, the likelihood to use augmented reality is increased by 30.3% (*B* = .265). Conversely, performance expectancy had the least influence on text messaging. For every one point increase in the performance expectancy score, the likelihood to use text messaging is increased by only 12.1% (*B* = .114).

Table 4.14 provides the regression coefficients (*B)*, standard error (SE *B*), odds (e^B) and levels of variance (R^2) for each relationship. Those with p values less than .05 were determined to be statistically significant.

Table 4.14

Summary of Ordinal Regression Analyses for Performance Expectancy as a Predictor of Intentions to Use m-Learning Strategies

Strategy	*B*	SE *B*	e^B	R^2
Augmented Reality	.265*	.044	1.303	.116
File/Resource Sharing	.138*	.043	1.148	.033
Gaming/Simulation	.182*	.041	1.199	.060
Research/Reference Applications	.149*	.042	1.160	.041
Social Media	.180*	.042	1.197	.060
Text Messaging	.114*	.041	1.121	.025

Note. $^*p < .05$

Hypothesis two.

H_{02}: Effort expectancy will not have any influence on the intentions of faculty to use any of the six m-Learning strategies in the coming academic year.

Effort expectancy was found to have a positive association with the level of use for each of the m-Learning strategies. For every one point increase in the effort expectancy score, the likelihood to use augmented reality are increased by 37% (*B* = .315). As was the case with performance expectancy, effort expectancy had the least influence on text messaging. For every one point increase in the effort expectancy score, the likelihood to use text messaging are increased by only 17% (*B* = .157). The variances in these models were slightly than those for performance expectancy, with the exception of text messaging.

Table 4.15 provides the regression coefficients (*B)*, standard error (SE *B*), odds (e^B) and levels of variance (R^2) for each relationship. Those with p values less than .05 were determined to be statistically significant.

Table 4.15

Summary of Ordinal Regression Analyses for Effort Expectancy as a Predictor of Intentions to Use m-Learning Strategies

Strategy	*B*	SE *B*	e^B	R^2
Augmented Reality	.315*	.064	1.370	.075
File/Resource Sharing	.266*	.065	1.305	.056
Gaming/Simulation	.180*	.060	1.197	.053
Research/Reference Applications	.253*	.063	1.288	.041
Social Media	.272*	.062	1.313	.060
Text Messaging	.157*	.061	1.170	.022

Note. $^*p < .05$

Hypothesis three.

H_{02}: Social influence will not have any influence on the intentions of faculty to use any of the six m-Learning strategies in the coming academic year.

Social influence was found to have a positive association with the level of use for each of the m-Learning strategies. The largest association was with intentions to use augmented reality. For every one point increase in the social influence score, the likelihood to use augmented reality increased by 29.8% (B = .261). Interestingly, social influence had the least influence on the predicted use of social media. For every one point increase in the social influence score, the likelihood to use social media increased by only 12.6% (B = .119).

Table 4.16 provides the regression coefficients (*B)*, standard error (SE *B*), odds (e^B) and levels of variance (R^2) for each relationship. Those with p values less than .05 were determined to be statistically significant.

Table 4.16

Summary of Ordinal Regression Analyses for Social Influence as a Predictor of Intentions to Use m-Learning Strategies

Strategy	B	SE B	e^B	R^2
Augmented Reality	.261*	.041	1.298	.128
File/Resource Sharing	.203*	.042	1.225	.075
Gaming/Simulation	.245*	.040	1.278	.117
Research/Reference Applications	.218*	.041	1.244	.090
Social Media	.119*	.038	1.126	.032
Text Messaging	.143*	.038	1.154	.045

Note. *$p < .05$

Hypothesis four.

H_{04}: Facilitating conditions will not have any influence on the intentions of faculty to use any of the six m-Learning strategies in the coming academic year.

Facilitating conditions was found to have positive association with the level of use for each of the m-Learning strategies. The largest association was with intentions to use research and reference applications. For every one point increase in the facilitating conditions score, the likelihood to use research and reference applications increased by 35.4% (*B* = .303). As was the case with social influence, facilitating conditions had the least influence on social media. For every one point increase in the facilitating conditions score, the likelihood to use social media increased by only 16.3% (*B* = .151).

Table 4.17 provides the regression coefficients (*B*), standard error (SE *B*), odds (e^B) and levels of variance (R^2) for each relationship. Those with p values less than .05 were determined to be statistically significant.

Table 4.17

Summary of Ordinal Regression Analyses for Facilitating Conditions as a Predictor of Intentions to Use m-Learning Strategies

Strategy	*B*	SE *B*	e^B	R^2
Augmented Reality	.234*	.044	1.264	.087
File/Resource Sharing	.281*	.048	1.324	.113
Gaming/Simulation	.189*	.043	1.208	.063
Research/Reference Applications	.303*	.047	1.354	.138
Social Media	.151*	.043	1.163	.040
Text Messaging	.174*	.043	1.190	.053

Note. *$p < .05$

Research Question Four

If relationships exist, how are they modified by age, gender, and years of experience?

The third research question used ordinal regression models that included only the core determinant and the m-Learning strategy. To answer the fourth research question, age, gender, and years of teaching experience were added collectively to each model. Interactions between each core determinant (covariates) and the three factors (i.e., age, gender, and years of experience) were included to assess the moderating effects. Appendix I provides the raw data for the 24 ordinal regression models developed for each m-Learning strategy. Three null hypotheses were tested for each model and the findings are discussed in the narrative that follows.

Hypothesis five.

H_{05}: Age will have no moderating effects on the relationships between the four core determinants and the intentions of faculty to use any of the six m-Learning strategies in the coming academic year.

This null hypothesis was rejected. In five instances, age was found to have moderating effects on the relationships between each of the core determinants and the likelihood of respondents to use text messaging. The moderating effects of age, particularly in younger faculty members categorized as Millennials or Generation Xers, were negative in all cases:

- The influence of performance expectancy on the intention to use text messaging will be moderated by age, such that the effect will be significantly weaker among individuals aged 21-32 (α=.001, B = -.094).
- The influence of effort expectancy on the intention to use text messaging will be moderated by age, such that the effect will be significantly weaker among individuals aged 21-32 (α=.000, B = -.155) and 33-48 (α=.033 B = -.067)
- The influence of social influence on the intention to use text messaging will be moderated by age, such that the effect will be significantly weaker among individuals aged 21-32 (α=.003, B = -.091).
- The influence of facilitating conditions on the intention to use text messaging will be moderated by age, such that the effect will be significantly weaker among individuals aged 33-48 (α=.021, B = -.058).

Age did not have a significantly moderating effect on the intended use of the other m-Learning strategies, with the exception of one instance related to the use of research/reference applications:

- The influence of facilitating conditions on the intention to use research/reference application will be moderated by age, such that the effect will be significantly weaker among individuals aged 33-48 (α=.011, B = -.068).

Hypothesis six.

H_{06}: Gender will have no moderating effects on the relationships between the four core determinants and the intentions of faculty to use any of the six m-Learning strategies in the coming academic year.

This null hypothesis was accepted. Gender was not found to have any moderating effects on the relationships between the core determinants and levels of use for any of the six m-Learning strategies.

Hypothesis seven.

H_{07}: Years of experience will have no moderating effects on the relationships between the four core determinants and the intentions of faculty to use any of the six m-Learning strategies in the coming academic year.

This null hypothesis was rejected in four instances, all related to the intended use of gaming/simulation:

- The influence of effort expectancy on the intention to use gaming/simulation will be moderated by years of experience, such that the effect will be significantly stronger among individuals with five to less than ten years of experience (α=.016, B = .075).
- The influence of social influence on the intention to use gaming/simulation will be moderated by years of experience, such that the effect will be significantly

stronger among individuals with five to less than ten years of experience (α=.007, *B* = .058).

- The influence of facilitating conditions on the intention to use gaming/simulation will be moderated by years of experience, such that the effect will be significantly stronger among individuals with one to less than five year of experience (α=.024, *B* = .057) and those with five to less than ten years of experience (α=.004, *B* = .071).

Summary

A total of 546 responses offered insight into the use of m-Learning strategies at randomly selected community colleges in the SACS COC region. Demographic data were provided for the respondents, including their general comfort level with technology, and their mobile device ownership patterns. Data on the use of m-Learning strategies was also presented, revealing that approximately two-thirds of the respondents had used one or more of the six m-Learning strategies targeted in this study. A frequency distribution illustrated how extensively each strategy was used during the 2012-13 academic year.

A mixed-methods approach of quantitative and quantitative analysis highlighted faculty attitudes about m-Learning. Measures of central tendency (i.e., mean, median, mode, and standard deviation) were used to present responses to each of the Likert scale items related to the four independent variables (i.e., performance expectancy, effort expectancy, social influence, and facilitating conditions). Additionally, themes that emerged from the open-ended responses were included as they related to use or non-use of the m-Learning strategies.

Finally, the results of several ordinal regression models were included to note any statistically-significant relationships between the four core determinants and the intentions of respondents to use the six m-Learning strategies in the coming academic year (i.e., 2013-14). The regression analysis also examined the moderating effects of age, gender, and years of teaching experience on any statistically-significant relationships.

CHAPTER 5

DISCUSSION AND CONCLUSIONS

"Any sufficiently advanced technology is indistinguishable from magic."

Arthur Clarke, British author

In 2008, the Louisiana Community and Technical College System became one of the nation's first programs to design online courses specifically for a mobile platform (Community College Week). Blackfeet Community College in Montana will debut the state's first Native American language application for smartphone users in 2013 (Tribal College Journal, 2013). As of 2010, approximately 40 community colleges offered programing in gaming (Community College Week, 2010). These examples provide evidence that, though sparsely represented in the literature, there are community colleges who serve as active participants in the m-Learning movement. The findings in this study offer further evidence of the use of m-Learning in community colleges.

Overview of Key Findings

Moreover, data analysis provided insight into faculty attitudes and beliefs about m-Learning in four categories: performance expectancy, effort expectancy, social influence, and facilitating conditions. Those attitudes and beliefs were explored for their potential influence on faculty intentions to use m-Learning in their classes. Understanding the factors that drive faculty adoption is an essential, but loosely addressed, element in conversations about the role of m-Learning in community college instruction. Several key findings were revealed during data analysis.

The limited presence of m-Learning in community college classrooms does not seem to be rooted in a fear of the technology.

Consistent with prior research on technology use in community colleges, the overwhelming majority of faculty respondents in this study indicated high levels of comfort with technology. Approximately two-thirds of the faculty members felt they were very proficient in technology, and were usually able to figure out problems on their own. Even further, only a small percentage of the participants (7.1%) did not own at least one of the mobile devices included in the survey (i.e., e-Reader, MP3/Audio Player, Smartphone, or Tablet). It is important to note that at least half of the respondents in this survey were aged 49 or older. Consequently, the ownership patterns of mobile devices, coupled with high levels of self-efficacy regarding technology use, present a strong counter argument to frequent claims in the literature that digital immigrants (older faculty) are less interested or less comfortable with using technology.

Institutions have not consistently offered training and support for m-Learning.

Although the study provided strong evidence of personal device ownership, very few respondents indicated the purchase of a device by their institution. Among those devices that were purchased by an institution, the majority were tablets. Purchasing tablets can be costly; however, they combine the functionalities of an e-Reader and MP3/Audio Player, making the purchases more justifiable. The number of tablets purchased by institutions was significantly higher than the other devices, but was still relatively low in comparison to those purchased with personal funds.

Furthermore, measures of central tendency on the Likert scale items related to facilitating conditions were low in comparison to the other scales. Results indicated that respondents were less positive about the support and resources available from their institutions to support m-Learning implementation.

Social influence does not have a major impact on m-Learning use.

The lack of institutional support is further demonstrated in the attitudes of respondents about the influence their peers have in their use of m-Learning. Despite large numbers reporting use of the m-Learning strategies, respondents disagreed in large part with statements related to social influence. They did not believe that their colleagues, department head, or the institution in general encouraged them to use m-Learning. Therefore, it can be assumed that the primary reasons for use were either intrinsically motivated based on general interest in the strategies or externally motivated by demands from students.

Faculty members are hesitant to intersect their personal and professional lives as it relates to technology use.

Survey comments support the need for purchases of mobile devices for faculty where feasible. Several respondents indicated that they saw the value of m-Learning, but did not feel they should have to use their personal devices to incorporate the strategies into their instruction. For example, participants repeatedly expressed interest in text messaging, but did not want to share their personal number with students. One respondent offered a mobile solution that allows instructors to use their personal phones for student reminders without sharing their number with students. Although this still may not provide an ideal alternative, it does demonstrate the need for faculty and administrators to become more informed about the mobile solutions available to them.

m-Learning strategies rooted in behaviorism are used more prevalently.

Nearly two-thirds of the faculty respondents indicated use of at least one or more of the six m-Learning use during the 2012-13 academic year. Among those that reported use, the majority (71.10%) used file/resource sharing at least once. A large percentage also used research/reference applications (65.50%), followed by social media and text messaging (63.20% each). Significantly fewer proportions used augmented reality (26.50%) and gaming/simulation (35%). These findings mirror assertions that, even when faculty members use m-Learning strategies, they are behaviorist in nature, offering opportunities for drill and response, but not engaging students in higher-order thinking skills.

There is further support for claims that that m-Learning strategies can increase quality and productivity.

Measures of central tendency revealed that faculty agreed most positively with statements in the performance expectancy scale, which included statements about the ability of m-Learning to lead to gains in job performance. Respondents primarily believed that m-Learning enhanced the overall quality of instructional content that was delivered to students. They also viewed m-Learning as a method for increasing their ability to meet their course learning objectives. Positive scores also supported the belief that m-Learning can assist faculty members with accomplishing instructional-related tasks more quickly.

The use of m-Learning is not generally linked with opportunities for faculty to receive a raise or promotion.

In contrast to scores related to production and instructional enhancement, respondents agreed the least with statements about the ability of m-Learning to assist them in receiving a raise or promotion. Open-ended responses offered commentary on the need for technology to be included as a part of the promotion process, even if it is used in promoting part-time faculty to full-time status.

Performance expectancy, effort expectancy, social influence, and facilitating conditions are positively associated with the intended use of m-Learning strategies.

Findings are consistent with the original testing of the UTAUT model (Venkatesh, 2003), which asserted that performance expectancy, effort expectancy, and social influence were associated with the intended use of a new information technology system. However, it is important to note that two major differences exist in the findings of this study and those of Venkatesh (2003). First, facilitating conditions was found to be a predictor of use in this study at levels that are consistent with the other three determinants. The original testing found that facilitating conditions was not a predictor of intended use. Second, the original UTAUT model accounted for approximately 70% of the predicted use of a new information technology system. The variance levels for the models in this study were relatively low, with none exceeding 20%.

The moderating effects of age and years of teaching experience are specific to select strategies.

Although the four determinants were associated with future use intentions, results from multiple ordinal regression analyses found that age and years of experience were moderators only in the predicted use of text messaging, gaming/simulation, and one instance of research/reference applications. For text messaging, age was negatively associated with intended use of younger individuals. This may mean that younger faculty members view text messaging as an easy m-Learning solution and are likely to use it even if none of the four determinants are present. In contrast, for gaming/simulation, years of experience were positively associated with those who have five to ten years of experience. These findings support claims that faculty members who have some tenure in the classroom are more likely to integrate advanced m-Learning strategies into their instruction.

Unlike age and years of experience, gender had no moderating effects on any of the relationships. This is vastly different from Venkatesh's (2003) assertions that gender was a significant modifier, specifically for relationships involving performance expectancy, effort expectancy, and social influence.

Implications for Future Practice

The key findings in this study offer several implications for future practice.

Administrators must acknowledge the factors influencing m-Learning use and develop strategic plans for addressing faculty needs.

Data offers evidence that a large number of community college faculty members are using m-Learning. Those that reported use believe strongly that the m-Learning strategies have positively impacted their productivity in the classroom. These faculty members also believe that while some m-Learning are easy to use, more advanced strategies require much more effort which may not be feasible given available time and campus resources. Another set of faculty members are interested in the use of m-Learning, but stated that they have limited training opportunities, limited access to equipment, and few models for effective use.

If faculty members are going to effectively incorporate m-Learning strategies, institutional support will become an increasingly important factor in their implementation and management. Understandably, m-Learning may not be a top priority for administrators as they work to combat decreasing financial support for their respective institutions. However, support for small, targeted m-Learning pilots might offer some added value to campus instruction. Findings could assist institutions with choosing strategies that complement their campus culture. Determining an appropriate course of action will require conversations among the campus leadership, specifically between representatives from the academic and information technology departments.

Professional development and training should introduce m-Learning applications that are content specific.

As community colleges consider ways to manage m-Learning, they must also explore applications that are specific to academic disciplines. Several respondents noted that they felt m-Learning was an interesting concept, but that it was not relevant to their content area. In contrast, other respondents noted that employers were shifting to the use of mobile devices to complete work-related tasks. Additionally, a plethora of mobile applications and resources are developed daily. To that end, instructional designers and faculty development trainers should make concerted efforts to provide faculty with resources and models that may assist them with student engagement.

Colleges should spotlight those faculty members that have embraced m-Learning.

The use of peer training could lessen the burden on professional development coordinators who must respond to myriad training needs from faculty and staff. Assessing the current use of m-Learning strategies on campus could lead to a sharing of best practices among colleagues. It could also open dialogue about the pros and cons of specific strategies and foster planning among faculty for future use. Furthermore, it creates an opportunity for faculty leadership and could help to create buy-in among those who would be otherwise hesitant to use m-Learning. Peer training also provides an easy way to incentivize faculty adoption of technology. Furthermore, peer training and technology use could be incorporated into performance planning for employees.

Faculty must create an open dialogue with students to understand their learning and technology needs.

Though this study analyzes faculty acceptance of m-Learning, it is important to note that their adoption of the concept is meaningless if students are not interested or do not have access to the equipment. The literature states that a growing number of students, of varied demographics, are bringing mobile devices to campus. Moreover, the literature states that students are expecting colleges to meet their demands for responsiveness and flexibility. Yet the survey respondents in this study reported a lack of student interest or access to equipment as one of the primary barriers to m-Learning use. It is difficult to determine whether some of the responses are based solely on fact as opposed to general assumptions of faculty members about their student population. Nevertheless, it is essential for faculty members to have conversations with their students about technology-related expectations and make adjustments accordingly. Some respondents offered solutions such as paired programming or use of campus equipment for students who do not have a mobile device. In some instances, students may not know what they expect and could embrace m-Learning if introduced successfully.

The use of m-Learning strategies will inevitably impact campus operations.

As campuses consider student and faculty needs, decisions about m-Learning use could ultimately influence campus infrastructure and college policies. If students are bringing mobile devices to class, and expecting their use in instruction, this decreases the need for elaborate smart classrooms. Instead, it will require campuses to ensure that wireless networks are equipped to handle large amounts of traffic. Even further, colleges will need to consider the importance of implementing mobile device training for students, perhaps as a part of freshman orientation or seminar. Consideration must also be given to the accessibility needs of disabled students who require learning accommodations. Finally, faculty members and administrators will also need to ensure that campus policies are clear regarding the use of mobile devices in class and on campus.

Limitations

The implications for future practice must be considered within the context of this study's limitations. Research design targeted full-time faculty members at Level One colleges within the SACS COC accrediting region. While some results may be viewed as generalizable, it is important to consider that control variables were implemented based on faculty employment status, location, and accrediting region. Additionally, the overall response rate was 24%, which is average for online surveys, but still relatively low, despite numerous follow-up communications with sample participants. Comparison of respondents and non-respondents was not feasible, primarily because demographic profiles were self-reported by those that chose to participate in the survey. Moreover, not all of the participants completed every demographic question. Therefore, it is difficult to determine whether responses are fully representative of the target population or the diverse body of full-time community college faculty members across the nation.

The decision to include only full-time community college faculty also presents a limitation. Adjunct or part-time faculty members play a significant role in community college instruction, but are managed differently depending on the institution. Consequently, their voice is not included in this conversation though they may be active users of m-Learning strategies.

Furthermore, the study is limited by the inclusion of only six key m-Learning strategies. The researcher attempted to construct clear definitions and examples derived from existing literature. However, responses to the open-ended questions provided evidence that some faculty members were still confused about the concept of m-Learning or felt that the definitions provided were not consistent with their own understanding of the strategies. Future scholars may determine that these strategies do not present a clear picture of m-Learning in higher education.

Additional limitations are present because of the conceptual framework and statistical treatments used to conduct data analysis. Those that did not indicate use of m-Learning had an opportunity to provide feedback through open-ended comments and questions about their likelihood to use m-Learning in the future. However, the bulk of data analysis pertaining to faculty attitudes and beliefs about m-Learning involved those who reported use.

Implications for Future Research

No other existing study to date has conducted a regional analysis of m-Learning use among community college faculty members. Information collected through this research process provides substantive data about the attitudes and beliefs driving the adoption of m-Learning strategies on two-year campuses. Findings also introduce numerous possibilities for future study in an area that is still being defined in the higher education landscape.

One concern that continuously appeared in the open-ended comments was the lack of m-Learning content in varied academic disciplines. Respondents shared interest in using m-Learning, but were not aware of content in their area. Although this study included the academic disciplines of respondents, it did not focus on the academic disciplines as a factor in m-Learning use. Future studies could offer more extensive analysis of specific disciplines and their use of m-Learning.

A focus on academic disciplines could also be coupled with a streamlined emphasis on one of the six m-Learning strategies. The current study was designed to gauge general use of m-Learning, because there was limited data available regarding this topic. For this reason, a wide range of strategies were included in an effort to identify whether faculty members are familiar with the emerging trends. However, future studies might examine more specific questions about the most frequently used strategies, or possibly the least frequently used strategies. Topics could include methods of assessment, student training, or management techniques when using multi-platform devices. All were shared in the survey responses as areas of interest. Community college faculty members serve a unique population and have indicated a desire, through their voice in this survey, to know what m-Learning should look like in their classrooms.

As community college educators seek effective models for m-Learning, it is also important to understand the administrative processes related to its implementation. The role of technology as a part of the faculty promotion process may be nonexistent on some campuses. However, the concept presents an opportunity to explore differences in campuses that do incorporate technology use as a part of employee performance planning and those who do not. Furthermore, faculty respondents mentioned college policies on m-Learning use, in addition to the need for professional development. Investigative comparisons about m-Learning perceptions among IT managers, academic administrators, or even presidents might be an important area of inquiry. If priorities and interests are misaligned among key campus stakeholders, then there will never be much forward movement in managing the presence of mobile devices on campus.

Lastly, there is a need to conduct additional research about mobile skills in the workplace. Specifically, future research might target the expectations of business and industry in regards to the mobile competence of recent community college graduates. Since community colleges have rooted their reputations in being responsive to business and industry, it may be useful to know how extensively graduates are expected to be comfortable with mobile devices or m-Learning strategies as they enter the workplace. If there is a growing need, such investigations could give birth to extended partnerships or support from business and industry for training and resources.

Summary and Conclusion

On any given college campus – public or private, two-year or four-year, for-profit or not – students may be found checking email on an iPhone, videoconferencing on a tablet, listening to favorite songs on an iPod, or watching a video for class on YouTube. Student ownership of technology devices among students is consistently on the rise and most have come to expect that their educational experiences will afford the same opportunities for flexibility that they receive in their personal lives. In tandem, the workforce is becoming increasingly dependent on the use of mobile devices for productivity.

Given the recent emphasis on community colleges to educate today's workforce, it is essential for two-year educators to assess effective models for student engagement. Findings from this study indicated that a large number of faculty members are interested in exploring m-Learning, but may not have the appropriate time, training, or financial resources to implement it adequately. As expected, there are those who do not believe it offers any value to the learning process.

This research offers timely insight into the factors driving m-Learning adoption, and adds to discussion about the role of m-Learning in meeting the needs of a uniquely diverse student demographic.

REFERENCES

21st Century Initiative. American Association for Community Colleges. Retrieved from http://www.aacc.nche.edu/aboutcc/21st_century/Pages/default.aspx.

Adkins, S. (2008). The US market for mobile learning products and services. 2008-2013 forecast and analysis. Ambient Insight, LLC.

Akour, H. (2009). Determinants of mobile learning acceptance: an empirical investigation in higher education. Oklahoma State University.

Ally, M., & Stauffer, K. (2008). *Enhancing mobile learning delivery through exploration of the learner experience.* Paper presented at the Fifth IEEE International Conference on Wireless, Mobile, and Ubiquitous Technology in Education.

American Association of Community Colleges (2013). Retrieved from http://www.aacc.nche.edu/Pages/default.aspx.

Amey, M. J. & VanDerLinden, K. E. (2003). The Use of Technology: Institutional Issues. *NEA Almanac of Higher Education,* 85-96.

Attewell, J., Savill-Smith, C., & Douch, R. (2009). The impact of mobile learning: examining what it means for teaching and learning. LSN Learning.

Bajt, S. (2011, Summer). Web 2.0 technologies: Applications for community colleges. *New Directions for Community Colleges*, 154, 53-62.

Brown, M. & Diaz, V. (2010, May). Mobile learning: Context and prospects: A report on the ELI focus session. EDUCAUSE Learning Initiative.

Campus Computing Project (2013). Retrieved from http://www.campuscomputing.net.

Carnevale, D. (2007, November 23). Community colleges bridge a tech gap with cellphones and summer camps. *The Chronicle of Higher Education*. Retrieved from, http://chronicle.com/weekly/v54/i13/13a02201.htm.

Caverly, D., Ward, A., Caverly, M. (2009). Techtalk: Mobile learning and access. *Journal of Developmental Education*, *33*(1), 38.

Cohen, A. M., & Brawer, F. (2003). *The American community college* (4th ed.). San Franciso, CA: Jossey-Bass.

Creswell, J. (2008). Research design: Qualitative, quantitative, and mixed methods approaches**.** (3rd ed.). Thousand Oaks, CA: Sage Publication.

Croop, F. J. (2009). *Student perceptions related to mobile learning in higher education.* Unpublished Dissertation, Northcentral University, Prescott Valley, Arizona.

Dahlstrom, E., de Boor, T., Grunwalk, P., & Vockley, M (2011, October). ECAR study of undergraduate students and information technology. EDUCAUSE Center for Applied Research. Retrieved from http://www.educase.edu/ecar.

Dalstrom, E., Walker, J.D., & Dzluban, C. (2013). ECAR study of undergraduate students and information technology, 2013. EDUCAUSE Center for Analysis and Research. Retrieved from http://www.educause.edu/ecar.

Del Favero, M. and Hinson, J.M. (2007). Evaluating instructor technology integration in community and technical colleges: a performance evaluation matrix. *Community College Journal of Research and Practice*, *31*(5), 389-408.

Diaz, V. (2012, October). Framing mobile initiatives to measure impact. EDUCAUSE Learning Initiative Brief.

Donaldson, R. (2011). Student acceptance of mobile learning. *Electronic Thesis, Treatises, and Dissertations*. Paper 716.

El-Hussein, M., & Cronje, J. (2010). Defining mobile learning in the higher education landscape. *Educational Technology & Society*, *13*(3), 12-21.

Fink, A. (2009). *How to conduct surveys: A step-by-step guide* (4th ed.). Thousand Oaks, CA: Sage Publications.

Floyd, D.L., Skolnik, M.L, and Walker, D.A. (eds) Community college baccalaureate: emerging trends and policy issues. Sterling, VA.: Stylus, 2005.

Fowler, F. J. (2009). *Survey research methods* (4th ed.). Thousand Oaks, CA: Sage Publications.

Friedman, T. (2005). *The world is flat*. New York: Farrar, Straus and Giroux.

Gilbert, S. (2013, July). Mobile learning 101. *T+D*, *67*(7), 30-34.

Glesne, C. (2006). *Becoming a qualitative researcher (3rd ed.)*. Boston, MA: Pearson Education.

Hartman, J.L., Dziuban, C., & Brophy-Ellison, J. (2007, September/October) Faculty 2.0. *EDUCAUSE Review*, *42*(5), 62-77.

Herrington, A. & Herrington, J. (2007). Authentic mobile learning in higher education. International Education Research Conference.

Jaschik, S. & Lederman, D. (2013). The 2013 Inside Higher Ed survey of faculty attitudes on technology. Retrieved from http://www.insidehighered.com/news/survey/survey-faculty-attitudes-technology.

Johnson, L., Adams Becker, S., Cummins, M., Estrada, V., Freeman, A., Ludgate, H. (2013). *Technology Outlook for Community, Technical and Junior Colleges 2013-2018: An NMC Horizon Project Sector Analysis*. Austin, Texas: The New Media Consortium.

Kony (2010). Kony Mobile Marketing and Commerce Survey. Retrieved from http://www.kony.com/content/kony-releases-survey-fortune-500-companies-plan-expand-mobile-offerings.

Kraushaar, J. & Novak, D. (2010). Examining the affects of student multitasking with laptops during the lecture. *Journal of Information Systems Education*, *21*(2), 241-251.

Kuznekoff, J. & Titsworth, S. (2013). The impact of mobile phone usage on student learning. *Communication Education*, *62*(3), 233-252.

Little, J. & Page, C. (2009, May/June). The EDUCAUSE top teaching and learning challenges, 2009. *EDUCAUSE Review*, 31-44.

Liu, Y., Li, H., & Carlsson, C. (2010). Factors driving the adoption of m-learning: An empirical study. *Computers and Education*, 55, 1211-1219.

Lumina Foundation (2013). Goal 2025. Retrieved from http://www.luminafoundation.org/goal_2025.html.

Mars, M.M., & Ginter, M.B. (2007). Connecting organizational environments with the instructional technology practices of community college faculty. *Community College Review*, *34*(4), 324-343.

McConatha, D., Praul, M., & Lynch, M. (2008, July). Mobile learning in higher education: An empirical assessment of a new educational tool. *The Turkish Online Journal of Educational Technology*, 7(3).

McGreen, N. & Sanchez, I. (2005). Mobile phones: Creative learning tools. International Conference for Mobile Learning Proceedings.

Moss, C. (2002). *Finding balance: the vices of our "versus."* Retrieved from http://firstmonday.org/ojs/index.php/fm/article/view/924/846#m3.

Motiwalla, L. (2007). Mobile Learning: A framework and evaluation. *Computers & Education*, *49*(3), 581-596.

Naismith, L., Lonsdale, P., Giasemi, V., Sharples, M. (2005). *Literature review in mobile technologies and learning*. Futurelab Series, University of Birmingham.

Oblinger, D., & Oblinger, J.L. (2005). *Educating the net generation*. EDUCAUSE.

Oller, R., (2012). The future of mobile learning (research bulleting). EDUCAUSE Center for Applied Research. Retrieved from http://www.educause.edu/ecar.

Osman, M., & Cronje, J. (2010). Defining mobile learning in the higher education landscape, *Educational Technology & Society*, *13*(3), 12-21.

Pachler, N., Bachmair, B. and Cook, J. (2010) *Mobile learning: structures, agency, practices*. New York: Springer.

Pachler, N. (2007). Mobile learning: towards a research agenda. *The WLE Centre, Institute of Education.*

Patten, B., Arnedillo-Sánchez, I., &Tangney, B. (2006). Designing collaborative, constructionist and contextual applications for handheld devices. *Computers & Education*, 46, 294-308.

PEW Internet Research Center (2013). Mobile learning. Retrieved from http://www.pewinternet.org/topics/Mobile.aspx?typeFilter=5.

Prensky, M. (2001, October). Digital natives, digital immigrants. http://www.marcprensky.com.

Preston, J. (2012). If Twitter is a work necessity. *The New York Times*, February 29. Retrieved from http://www.nytimes.com/2012/03/01/education/digital-skills-can-be-quickly-acquired.html?pagewanted=all.

Quick, D. & Davies, T. (2010). Community college faculty development: bringing technology into instruction, *Community College Journal of Research and Practice*, *23*(7), 641-653.

Quinn, C. (2012). The mobile academy: mLearning for higher education. San Franciso, CA: John Wiley & Sons, Inc.

Roschelle, J. (2009). Keynote paper: Unlocking the learning value of wireless mobile devices. *Journal of Computer Assisted Learning*, 19, 260-272.

Rosenburg, M.J. (2001) *E-learning: Strategies for delivering knowledge in the digital age*. New York: McGraw-Hill.

Ryland, J. (2012). Technology and the future of community college. American Association of Community Colleges.

Southern Association of Colleges and Schools Commission on Colleges (2013). Retrieved from http://www.sacscoc.org.

Traxler, J. (2007, June). Defining, discussing, and evaluating mobile learning: The moving finger writes and having writ. *International Review of Research in Open and Distance Learning,* 8(2).

Tschechtelin, J. (2011, Winter). Increased enrollment + student success-funding=?, *New Directions for Community Colleges*, *156*, 49-59.

Uzunboylu, H. & Ozdamli, F. (2011). Teacher perception for m-learning: scale development and teachers' perceptions. *Journal of Computer Assisted Learning*, 27, 544-556.

van derKaay, C. & Young, W. (2012, May). Age-related differences in technology usage among community college faculty. *Community College Journal of Research and Practice*, 36(8), 570-579.

Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User acceptance of information technology: Toward a unified view. *MIS Quarterly, 27*(3), 425-478.

Wagner, E. (2005). Enabling mobile learning. *EDUCAUSE Review*, 41-51.

Wang, Y., Wu, M., & Wang, H. (2009). Investigating the determinants and age and gender differences in the acceptance of mobile learning. *British Journal of Educational Technology*, *40*(1), 92-118.

APPENDIX A: IRB APPROVAL LETTER

UNIVERSITY OF
SOUTH CAROLINA

OFFICE OF RESEARCH COMPLIANCE

May 10, 2013

Ms. Stephanie Frazier
College of Education
Education Leadership & Policies
Columbia, SC 29208

Re: **Pro00025276**
Study Title: *An Analysis of the Current use and Intentions to use Mobile Learning Strategies Among Full-Time Community College Faculty*

FYI: University of South Carolina Assurance number: FWA 00000404 / IRB Registration number: 00000240

Dear Ms. Frazier:

In accordance with 45 CFR 46.101(b)(**2**), the referenced study received an exemption from Human Research Subject Regulations on **5/10/2013**. No further action or Institutional Review Board (IRB) oversight is required, as long as the project remains the same. However, you must inform this office of any changes in procedures involving human subjects. Changes to the current research protocol could result in a reclassification of the study and further review by the IRB.

Because this project was determined to be exempt from further IRB oversight, consent document(s), if applicable, are not stamped with an expiration date.

Research related records should be retained for a minimum of three years after termination of the study.

The Office of Research Compliance is an administrative office that supports the USC Institutional Review Board. If you have questions, please contact Arlene McWhorter at arlenem@sc.edu or (803) 777-7095.

Sincerely,

Lisa M. Johnson
IRB Manager

cc: Christian Anderson

APPENDIX B: SURVEY INSTRUMENT

An Analysis of the Current Use and Intentions to Use Mobile Learning Strategies among Full-time Community College Faculty

For the purposes of the study, m-Learning is defined as follows:

> "Any activity that allows individuals to be more productive when consuming, interacting with, or creating information, mediated through a compact digital portable device that the individual carries on a regular basis, has reliable connectivity, and fits in a pocket or purse" (Quinn, 2012).

You will be asked to respond to a series of questions and opinion statements about your current access to and use of mobile devices and m-learning strategies.

The survey should take approximately 10-15 minutes to complete.

INCENTIVE FOR COMPLETION

Your participation in this survey allows you to enter into a random drawing for a $50 Amazon gift card. Your information will not be shared with any third parties and you will only be contacted if your email address is selected as the winner. You are eligible for the prize whether or not you complete the survey.

PARTICIPANT RIGHTS & CONSENT

Your participation in this study is voluntary.

Clicking on the "Continue with Survey" button indicates that:

- You have read the entire informed consent notice.
- You voluntarily agree to participate in the study and may withdraw at any time without prejudice.
- You are a full-time faculty member at your community/junior/technical college.

General Comfort Level with Technology

1. Please choose the statement that *most closely* aligns with your overall comfort level when it comes to using technology.

a. If you give me instructions, I am still unable to figure it out, so I don't even try.
b. I don't mind using technology, but often ask for assistance.
c. I can get by and rarely ask for assistance.
d. I am able to work independently and can usually figure out problems on my own.
e. I am very proficient, so much so that others often seek my advice.

Mobile Device Ownership

2. Indicate whether you currently own any of the mobile devices listed below. For all devices that you own, indicate whether it is because: a) your institution purchased for you, b) you purchased with your own money or c) both.

	My Institution Purchased	I Purchased with My Own Money	Do Not Own
a. eReader (e.g., Nook, Kindle)	☐	☐	☐
b. MP3/Audio Player (e.g., iPod)	☐	☐	☐
c. Smart Phone (e.g., iPhone, Blackberry)	☐	☐	☐
d. Tablet (e.g., iPad)	☐	☐	☐

Use of m-learning Strategies

3. Have you used one or more of the six m-Learning strategies listed below as part of your instruction during the 2012-2013 academic year?

M-LEARNING STRATEGY	EXAMPLES
Augmented Reality	Mobile scavenger hunt to discover hidden facts about a specific location (e.g., museum artifacts, public health data, historical facts)
File/Resource Management	Online journaling via Evernote, file sharing via Dropbox, posting of podcasts or lectures accessible via a mobile device
Gaming/Simulation	Virtually simulated genetics lab, SimCity in the study of business/economic development, or virtual trading in a simulated stock market
Research/Reference Applications	Anatomy reference manual, plain language medical dictionary, foreign language vocabulary drills
Social Media	Class Facebook or Twitter page, virtual discussions/meetings via Skype, FaceTime, etc., Blogs or wikis that encourage collaborative online discussion
Text Messaging	Class polling, assignment reminders, general

	discussion/performance feedback, electronic office hours

☐ Yes, I have used one or more of the m-Learning strategies listed above.
☐ No, I have not used any of the m-Learning strategies listed above (*skip to question 9*).

4. Indicate how often you have used any of the m-learning strategies listed below as a part of your instruction during the 2012-2013 academic year.

M-LEARNING STRATEGY	EXAMPLES
Augmented Reality	Mobile scavenger hunt to discover hidden facts about a specific location (e.g., museum artifacts, public health data, historical facts)
File/Resource Management	Online journaling via Evernote, file sharing via Dropbox, posting of podcasts or lectures accessible via a mobile device
Gaming/Simulation	Virtually simulated genetics lab, SimCity in the study of business/economic development, or virtual trading in a simulated stock market
Research/Reference Applications	Anatomy reference manual, plain language medical dictionary, foreign language vocabulary drills
Social Media	Class Facebook or Twitter page, virtual discussions/meetings via Skype, FaceTime, etc., Blogs or wikis that encourage collaborative online discussion
Text Messaging	Class polling, assignment reminders, general discussion/performance feedback, electronic office hours

	Never	Minimally (Once or twice w/little emphasis)	Occasionally (Three to five times w/some emphasis)	Often (More than five times w/much emphasis)
a. Augmented Reality	☐	☐	☐	☐
b. File/Resource Sharing	☐	☐	☐	☐
c. Gaming/Simulation	☐	☐	☐	☐
d. Research/References	☐	☐	☐	☐
e. Social Media	☐	☐	☐	☐
f. Text Messaging	☐	☐	☐	☐

Performance Expectancy

5. Please rate the level to which you agree with the following statements related to the potential benefits of using m-Learning strategies.

	Strongly Disagree	Disagree	Agree	Strongly Agree
The use of m-learning strategies can enhance the overall quality of instructional content I deliver to my students.	☐	☐	☐	☐
Using m-learning strategies can increase my ability to meet the learning objectives for my course(s).	☐	☐	☐	☐
The use of m-learning strategies can enable me to accomplish instructional-related tasks more quickly.	☐	☐	☐	☐
The use of m-learning strategies can increase my chances of getting a raise.	☐	☐	☐	☐
The use of m-learning strategies can increase my chances of getting a promotion.	☐	☐	☐	☐

Effort Expectancy

6. Please rate the level to which you agree with the following statements related to the ease of use associated with m-Learning strategies.

	Strongly Disagree	Disagree	Agree	Strongly Agree
It is easy to learn how to operate a mobile device.	☐	☐	☐	☐
It is easy to develop the skills necessary to incorporate m-learning strategies into my instruction.	☐	☐	☐	☐
It is easy to incorporate m-learning strategies into my instruction.	☐	☐	☐	☐

Social Influence

7. Please rate the level to which you agree with the following statements related to the extent that others around you encourage the use of m-Learning strategies.

	Strongly Disagree	Disagree	Agree	Strongly Agree
My colleagues currently use m-learning strategies in their instruction.	☐	☐	☐	☐
My colleagues encourage me to incorporate m-learning strategies into my instruction.	☐	☐	☐	☐
My friends and/or family encourage me to incorporate m-learning strategies into my instruction.	☐	☐	☐	☐
My dean and/or department head encourages faculty to use m-learning strategies.	☐	☐	☐	☐
In general, my institution encourages faculty to use m-learning strategies.	☐	☐	☐	☐

Facilitating Conditions

8. Please rate the level to which you agree with the following statements related to the organizational infrastructure in place to support the use of m-Learning strategies.

	Strongly Disagree	Disagree	Agree	Strongly Agree
I have the knowledge necessary to incorporate m-learning strategies into my teaching.	☐	☐	☐	☐
I have the resources necessary to incorporate m-learning strategies into my teaching.	☐	☐	☐	☐
I have received specialized instruction concerning the implementation of m-learning strategies.	☐	☐	☐	☐
A specific person (or group) is available on my campus for assistance with difficulties in using m-learning strategies.	☐	☐	☐	☐

Intention to Use m-Learning Strategies

9. Indicate how likely you are to use any of the m-Learning strategies below as a part of your instruction during the upcoming academic year.

M-LEARNING STRATEGY	EXAMPLES
Augmented Reality	Mobile scavenger hunt to discover hidden facts about a specific location (e.g., museum artifacts, public health data, historical facts)
File/Resource Management	Online journaling via Evernote, file sharing via Dropbox, posting of podcasts or lectures accessible via a mobile device
Gaming/Simulation	Virtually simulated genetics lab, SimCity in the study of business/economic development, or virtual trading in a simulated stock market
Research/Reference Applications	Anatomy reference manual, plain language medical dictionary, foreign language vocabulary drills
Social Media	Class Facebook or Twitter page, virtual discussions/meetings via Skype, FaceTime, etc., Blogs or wikis that encourage collaborative online discussion
Text Messaging	Class polling, assignment reminders, general discussion/performance feedback, electronic office hours

	Not at All Likely	Not Very Likely	Somewhat Likely	Very Likely
a. Augmented Reality	☐	☐	☐	☐
b. File/Resource Sharing	☐	☐	☐	☐
c. Gaming/Simulation	☐	☐	☐	☐
d. Research/References	☐	☐	☐	☐
e. Social Media	☐	☐	☐	☐
f. Text Messaging	☐	☐	☐	☐

General Comments

10. Share any comments that you think are relevant to the discussion about m-learning strategies in your classroom and/or community colleges. Feel free to talk about your experiences, positive or negative, with using m-learning.

____

Note: Skip to question 13. Questions 11 and 12 are for faculty who do not use any m-learning strategies.

Intention to Use m-Learning Strategies

11. Indicate how likely you are to use any of the m-Learning strategies below as a part of your instruction during the upcoming academic year.

M-LEARNING STRATEGY	EXAMPLES
Augmented Reality	Mobile scavenger hunt to discover hidden facts about a specific location (e.g., museum artifacts, public health data, historical facts)
File/Resource Management	Online journaling via Evernote, file sharing via Dropbox, posting of podcasts or lectures accessible via a mobile device
Gaming/Simulation	Virtually simulated genetics lab, SimCity in the study of business/economic development, or virtual trading in a simulated stock market
Research/Reference Applications	Anatomy reference manual, plain language medical dictionary, foreign language vocabulary drills
Social Media	Class Facebook or Twitter page, virtual discussions/meetings via Skype, FaceTime, etc., Blogs or wikis that encourage collaborative online discussion
Text Messaging	Class polling, assignment reminders, general discussion/performance feedback, electronic office hours

	Not at All Likely	Not Very Likely	Somewhat Likely	Very Likely
g. Augmented Reality	☐	☐	☐	☐
h. File/Resource Sharing	☐	☐	☐	☐
i. Gaming/Simulation	☐	☐	☐	☐
j. Research/References	☐	☐	☐	☐
k. Social Media	☐	☐	☐	☐
l. Text Messaging	☐	☐	☐	☐

General Comments

12. Share any comments that you think are relevant to the discussion about m-learning strategies in your classroom and/or community colleges. Feel free to share why you have chosen not to use m-Learning strategies in your classroom.

____

Demographics

13. Do you *primarily* teach courses in transfer/general education or career and technical education at your college?

☐ Transfer/Arts and Sciences/General Education (*please respond to question 14*)
☐ Career and Technical Education (*skip to question 15*)

14. What general education content area *most closely* aligns with the courses that you are currently teaching during the 2012-2013 academic year?

☐ Behavioral Science
☐ English/Communications
☐ Foreign Language
☐ Humanities/Fine Arts
☐ Mathematics
☐ Science
☐ Social Science
☐ Other ______________________________

15. What career and technical education cluster *most closely* aligns with the courses that you are currently teaching during the 2012-2013 academic year?

☐ Agriculture, Food, & Natural Resources
☐ Architecture and Construction
☐ Arts, AV Technology & Communications
☐ Business
☐ Education and Training
☐ Finance
☐ Government and Public Administration
☐ Health Science
☐ Hospitality and Tourism
☐ Human Services
☐ Information Technology
☐ Law, Public Safety Corrections and Security
☐ Manufacturing
☐ Marketing, Sales and Service
☐ Science, Technology, Engineering and Mathematics
☐ Transportation Distribution and Logistics
☐ Other ____________________________________

16. Please indicate your gender.

- ☐ Male
- ☐ Female

17. Please indicate your age group.

- ☐ 21 – 32
- ☐ 33 – 48
- ☐ 49 – 55
- ☐ 56 or older

18. Please indicate the highest level of education you have obtained?

- ☐ Associate Degree
- ☐ Bachelor's Degree
- ☐ Master's Degree
- ☐ Doctoral Degree

19. How long have you been a full-time faculty member at the college where you are currently employed?

- ☐ Less than 1 year
- ☐ 1 to less than 5 years
- ☐ 5 years to less than 10 years
- ☐ 10 years or more

20. What is the total number of years that you been a faculty member in the community college setting?

- ☐ Less than 1 year
- ☐ 1 to less than 5 years
- ☐ 5 years to less than 10 years
- ☐ 10 years or more

21. Please select the state in which your institution is located.

- ☐ Alabama
- ☐ Florida
- ☐ Georgia
- ☐ Kentucky
- ☐ Louisiana
- ☐ Mississippi
- ☐ North Carolina
- ☐ South Carolina
- ☐ Tennessee
- ☐ Texas
- ☐ Virginia

APPENDIX C: EXPERT PANEL REVIEW OF SURVEY INSTRUMENT

TO: Expert Panel Members
DATE: January 2, 2013/March 2, 2013
RE: Review of Survey Instrument for Dissertation Study

Thank you for agreeing to serve as an expert reviewer for my dissertation study. As discussed, I am examining the current use and intentions to use mobile learning strategies among community college faculty.

The draft survey instrument is attached for your review. I also included the research questions, letter to college presidents, and informed consent notice to provide some contextual/background information. The survey begins on page 5. I left it in MS Word format so that you can insert comments if you prefer.

I am requesting feedback no later than January 21, 2013/March 15,2013. Please let me know if you have any questions.

Feedback Received from Reviewers as of March 15, 2013
Note that due to revisions to the survey instrument, the items numbers noted below do not necessarily correspond to the final draft of the survey instrument.

Items 1.1 and 1.2 - I had to read this twice to see that you are asking about personal funds in the first question and institutional funds in the second. You'll want to avoid making the responder read a question ahead to get the "big picture."

Also, this type of "table" format for responses, while easy to navigate, tends to make responders feel like they should respond to every question. When that's the case, you can end up with "false positives" when responders click in a box just to answer the question.

I have two suggestions:

1. You might consider adding headings to the question. You could format your first question like this:

    1.1 Mobile Devices Purchased with Personal Funds. Indicate whether you currently have access to . . .

2. For the sake of clarity, you might add a third column, "Do not own or plan to purchase."

Item 2.3 – This implies, I think, that the assessment would be different. It might be helpful to know how the faculty members assess student learning in general, and if they change their assessment strategies when implementing m-learning strategies. Perhaps assessment is more natural? Perhaps it is more challenging. I'm not clear on what you're trying to get at here.

Sections 3 and 4 – These statements are written, it seems, with the expectation that a faculty member does not use m-learning strategies. Are these questions only for those faculty who answered that they do not use m-learning? The construction of the phrase "I would find…" almost seems to exclude those faculty who DO find the strategies useful as they are already using them. Might want to consider rewording the statements in this section.

Item 5.1 – Do you want to ask if any of their colleagues DO use m-Learning? It might be interesting if faculty decide to use m-Learning once they see examples of it from their colleagues.

Item 6.2 – I wonder if you'd want to get at whether or not the STUDENTS have the resources necessary to incorporate m-Learning strategies. For example, there might be a fantastic way to incorporate an iPad app into a course, but if the students don't have access to iPads, it's less than helpful.

Item 6.3 - This statement is a bit of an odd duck. All of the other statements in this and previous sections were positive with regard to learning/implementing m-learning (i.e. a "Strongly Agree" response indicates favorable conditions for m-learning). This statement is framed in the negative; a "strongly agree" response would indicate the conditions are not favorable for m-learning. Sometimes survey developers purposefully mix positive and negative statements in order to keep the responders "on their toes." But I don't think that's what you were trying to do. (If you are, you should have a few more negative statements.) I recommend re-phrasing this statement.

I'm not sure what you mean by this statement. Are you asking if, for example, the content developed for m-learning could be accessed via something like a computer or Blackboard.

Section 7 – Are you interested in which m-Learning strategies the faculty intend or plan to use? To me, it would be a very different level of commitment to plan to use Facebook as opposed to augmented reality.

Items 8.1 - It's always nice to let respondents know how much they can say before they start typing. For example, "(1500 character maximum)."

Item 9.1 – Under General Education/Transfer option, I would add the direction "Please respond to question 9.2).

Item 9.2 – I think you need to add English, Speech (or English/Communications), Science and Math to this list.

Item 9.3 – You might make this “Humanities/Fine Arts” as they often go together.

Item 9.5 – You may want to decide if you want to use categories like you do for years of experience or whether you wish to leave years of experience open as well. Some people are hesitant to give their age, and are more comfortable checking ranges. Since your survey is anonymous, it may not matter. I’d check with your committee.

Item 9.8 – You may want to ask how long respondents have been teaching at a community college period. We have some faculty who were part-time faculty for decades before becoming full-time.

APPENDIX D: EMAIL TO INFORMAL FIELD TESTING PARTICIPANTS

TO: Faculty Sample for Pilot Testing
DATE: Varied
RE: Assistance with Dissertation Research Pilot

Good evening!

I am writing to request your assistance with my dissertation study. I need several community college faculty to review my survey and provide feedback before I distribute it to the masses.

Would you be so kind as to click on the link below, take the survey, and offer any feedback? Space is provided in the last question of the instrument.

Survey Link: [withheld]

I need to determine:

- Average time of completion
- Any items that are confusing
- Is the survey easy to follow and aesthetically pleasing

I greatly appreciate your time and consideration of this request! If possible, I'd like some feedback no later than [date withheld].

Please don't hesitate to let me know if you have any questions.

Have a wonderful week!
Stephanie

APPENDIX E: EMAIL AND MEMORANDUM TO COLLEGES REQUESTING FACULTY PARTICIPATION

TO: Primary contact
DATE: May [day] 2013
RE: Assistance with Dissertation Research from SC Technical College System

Hi [contact name] – I am the [position withheld] at the SC Technical College System. I am also a doctoral candidate for higher education leadership program at the University of South Carolina.

I am writing to request assistance with my dissertation research which is assessing the use of mobile learning among community college faculty. [College name] was chosen from my random sample as one of the colleges for [state].

Do you have any objections to me including your faculty in my study?

I have attached the following documents related to the study:

- Memo to your president (in case he/she has to approve)
- Email invitation to participants
- Informed consent notice
- Survey Instrument

Please let me know if you have any questions. Thank you in advance for your review and consideration.

Warmest Regards,
Stephanie

Stephanie Denise Frazier, M.Ed.
Doctoral Candidate, University of South Carolina
[STREET ADDRESS WITHHELD]
[EMAIL ADDRESS WITHHELD]

MEMORANDUM

TO: College President
DATE: May [day] 2013
RE: Dissertation Study: An Analysis of the Use and Intentions to Use Mobile Learning Strategies among Community College Faculty

I am a candidate for the Ph.D. in Higher Education Administration Degree at the University of South Carolina. For my dissertation research, I will investigate the current use and behavioral intentions to use mobile learning strategies among full-time community college faculty in the Southern region.

To complete the objectives of my study, I will conduct online survey research to gauge faculty perceptions about mobile learning at selected community colleges. Your institution was chosen as part of the study through a stratified random sample because it met the following predetermined criteria:

- Public, two-year community/junior/technical college
- Accredited by the Southern Association for Colleges and Schools Commission on Colleges (SACS COC)
- Designated as Level-one institution by SACS COC

This study has received the approval of the Institutional Review Board at the University of South Carolina, and there are no known risks or costs to participants. Information collected during this study will remain confidential. Only broad demographic information will be summarized and published as part of the results.

The online survey instrument that will be used to gather data can be completed in 15 minutes, and participants may skip questions they prefer not to answer. The findings of this study can be shared with you directly once the final analysis data is complete, if you would like.

If, for any reason, you do not wish for the full-time faculty members at your institution to be involved in this study, please contact me via email at [EMAIL ADDRESS WITHHELD] **no later than [varied].**

Thank you for your time and consideration.

APPENDIX F: INTRODUCTORY EMAIL TO SURVEY PARTICIPANTS

TO: Faculty Sample
DATE: Varied
RE: Action Requested: [College Name] and Mobile Learning

Good afternoon [College Name] Faculty!

Do your students own smart phones or tablets? Do you use them in your classroom? Would you like to know more about how to use them but can't seem to find the time? If you fit into any of these categories, I'd like to hear from you!

I invite you to participate in my dissertation study by completing the brief survey at [survey link withheld].

I am investigating the use of mobile learning strategies among community college faculty. The study has received full approval by [primary contact] and the PHCC administration. The informed consent notice is attached.

You could win a $50 Amazon gift card for participating!

Please contact me at this email address if you have questions or if you need additional information about this study. I appreciate your consideration of my request very much, and look forward to receiving your responses.

Warmest Regards,
Stephanie

APPENDIX G: INFORMED CONSENT NOTICE

An Analysis of the Current Use and Future Intentions to Use Mobile Learning Strategies among Full-time Community College Faculty

OVERVIEW OF THE STUDY

This survey is a part of a dissertation study exploring faculty current use and future intentions to use mobile learning (m-learning) strategies in community college instruction. Specifically, the research is designed to assess behavioral intentions of full-time community college faculty in the Southern region. To date, no known published study has been conducted around this concept.

You have been asked to participate in this study because you have been identified as a full-time faculty member at your community college.

PROCEDURES

You will be asked to respond to a series of questions and opinion statements about your current access to and use of mobile devices and m-learning strategies. Survey items are based on a modified version of the Unified Theory of Acceptance and Use of Technology instrument (Venkatesh, 2003).

The survey should take approximately 10-15 minutes to complete.

Your participation in this survey allows you to enter into a random drawing for a $50 Amazon gift card. Your information will not be shared with any third parties and you will only be contacted if your email address is selected as the winner. You are eligible for the prize whether or not you complete the survey.

CONFIDENTIALITY

Information collected during this study will be confidential and anonymous. When the results of this study are published, only broad demographic information will be summarized. All raw data will be exported from Survey Monkey and housed on a password-protected computer accessible only by the researcher.

POTENTIAL RISKS AND COSTS

There are no monetary costs or foreseeable risks associated with this study.

INVESTIGATOR INFORMATION

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PARTICIPANT RIGHTS & CONSENT

Your participation in this study is voluntary.

Once you enter the survey, clicking on the "Continue with Survey" button indicates that:

- You have read the above information.
- You voluntarily agree to participate in the study.
- You are a full-time faculty member at your community/junior/technical college.

If you do not wish to participate in this study, please decline by clicking on the "Opt Out" button upon entering the survey.

THANK YOU FOR YOUR TIME!

APPENDIX H: OPEN-ENDED RESPONSES

Table H.1

Responses to open-ended comments by faculty members that indicated m-learning use

#	Response
1	I am attending a conference in Atlanta this fall to learn about how to incorporate m-learning technology in the classroom.
2	No development time is given to research or coordinate m-learning into the classrooms. There is no time available to add content even if desired. Therefore, it is unlikely that teachers or instructions will spend what little personal time they have to research and incorporate m-learning into their classrooms.
3	I feel training is essential to be provided to faculty to incorporate m-learning into the curriculum to be effective.
4	Your survey does not offer enough choices. It is certainly possible to learn to use m-learning strategies in my teaching, but it is not easy. It takes lots of commitment on my part to teach and learn on my own and then to teach students who have no idea how to maximize the power of the devices they already own. Most of my students use m-learning strategies because they are required to - not because they see the potential for learning in their own lives. I doubt that most of them continue to use the strategies after they finish the class.
5	I'm especially interested in the use of technology as a tool for thinking about my discipline. This is far more possible now with current technology.
6	Students need better access to technical support for issues pertaining to their particular computer. It would be great if we could determine whether it is their computer, the server, etc so that we could advise them to either use another computer (on campus), download java, and so on. This is especially true for online classes.
7	As much I as enjoy playing with M-learning and enjoy trying to incorporate it in my classes, I am hindered by the level of knowledge and skill of my students. The average age of students in my academic program is 35, and many students are not digital natives.

8 I still have many students who do not have easy access to the web, etc. I am concerned at the emphasis we are placing on this technology when all students are not equal. The fact that they can use labs on campus ignores their level of technological knowledge and responsibilities where free time is involved.

9 There are often issues with older learners and their comfort level with and acceptance of these learning tools.

10 Our younger students would respond well, but we also have a good number of returning students who are overwhelmed with simple computer use, such as email or checking assignments/grades online.

11 I believe that m-learning maybe a good strategy for supplement some traditional methods. Part of the challenge is that as a society some of these technologies have been to impede student success because of living in this "age of distraction". Use of these tools must be well balanced.

12 I receive very positive feedback from students.

13 I think mobile learning is an effective way to reach students, however faculty can be difficult to train or resistant to new technologies.

14 I have access to my courses in my Android device which is helpful but I find the convenience limited by a sometimes poor signal on campus even with wireless. Also, I don't like the small screen of my smartphone although it is larger than some. Also, my Android browser sometimes won't allow the number of windows opened that I need in order to access my course.

15 I feel that m-learning is an innovative approach to teaching and learning. Many of today's students are digital natives and prefer this type of learning medium.

16 Everyone gets promoted equally, regardless of effort or innovation.

17 I think a stronger explanation of m-learning up front might have helped me answer these questions. I think that many of these strategies CAN be beneficial, but only if they are implemented thoughtfully and strategically. Simply using technology for the sake of using technology will likely NOT be beneficial to learning.

18 just another set of tools among many. can be used for good or ill.

19 I believe that students at a community college come from such diverse backgrounds and economic situations that an instructor cannot assume that students have these mobile devices or experience with mobile devices.

20 My biggest resistance is that many of these strategies assume students have access to technology. While many students do, [college name withheld] has a very diverse population, and emphasizing technology that is not provided by the institution runs the risk of excluding the specific students we are set up to serve. So, I primarily use social media, since poorer students can still access the materials through our library computers.

21 M-learning has made my job as an instructor easier, and I feel m-learning has better prepared my students for the real world. I can safely say we are ALL more successful!

22 Not all disciplines have content available to use with mobile devices yet. Online classes also do not lend themselves to mobile devices other than as reference material or simulation that is done individually. Online classes are asynchronous and you cannot require students to be online together at the same time.

23 I am an older professor and did not "grow up" with technology When I took physics in college, were used a slide ruler and not a hand held calculator.

24 I believe this could be very valuable as I believe in this fast paced world of technology, we could gain more students. Potential students are sometimes left out because the need this type of learning to include education in their life. I do believe that we need to have recognition of having those skills when considered for promotions i.e. part-time to full-time. Also, add a training that is hands-on for each of these activities; otherwise for many it is overwhelming to learn it.

25 I try to incorporate m-learning into my teaching but the student has to participate. I put info out there and get no response.

26 A major obstacle for our college--and I would wager many, if not most, other community colleges--is that many students lack the funds to purchase devices and/or have little experience with them. If the learning curve for the technology gets in the way of the course content, there's little benefit, if any.

27 m-learning can be a valuable resource, but many of my students do not have the finances and/or resources to fully utilize. I would never require this of students because it causes an even bigger gap between the haves and have-nots.

28 other than desktop computers, PowerPoint projectors, and some wall-mounted tv screens connected to the computer, we have no school-supplied equipment. We only have a couple of smartboards on this campus

29 It is a wonderful way to reach the largest amount of students and puts everyone on an equal playing field. Constant interaction is essential.

30 The main issue I have us equity. I teach early college start in a high school. Not everyone has smart phones and tablets.

31 I am released from teaching for the next year. Question 10 did not have a NA choice.

32 I am relatively new to teaching in a community college setting. I am interested in using m-learning strategies more. I certainly think it could be beneficial for my students.

33 We use MyMathLab (an online learning environment) for most of our mathematics and statistics classes. The use of this environment allows our math faculty to provide immediate feedback to students. Increased use of other m-learning strategies are being incorporated as faculty increases their knowledge.

34 I have noticed that students actually grow tired of technology -- when I give a straight lecture with no use of technology -- the students get excited because that is what has become novel now.

35 I have noticed that some of the students at our community college are not at the stage of their education to use m-learning fully. This could be related to the fact that all students that need remedial classes must go through the community college before applying to a 4 year college in our state.

36 I feel like m-learning strategies will enhance student performance and that it will be relatively easy to incorporate into the classroom. When I say easy, I am referring to the level of difficulty to create and implement these strategies. What I think will be difficult is the time constraints to actually develop or put these strategies into place. Being employed in a 12 month program leaves little time for prep work during the actual business day; therefore, planning & implementing new strategies can be difficult in the beginning. However, once it is in place, it can be very beneficial to our students.

37 There are a few apps i have played with including edmodo, it may possibly serve as a bridge between being able to open files in ANGEL through using edmodo on the phone. It is accessible on the computer as well. also Remind101 is a great app to text students without giving your personal number!

38 Love it and really think it makes the learning environment more positive for students. Do not always have support from the college and would have to drop m-learning if I was not able to be assigned to a smart classroom.

39 Every student is very different, so for example when I say "learning to use a handheld device, etc is easy" its not 100% the case. Some student have a very difficult time even sending an email, so new technologies can be very daunting for them.

40 NA

41 My concern, and the concern of faculty and administrators in my department (College and Career Readiness) is that many of students still do not have the types of mobile technology needed to make use of m-learning strategies. Ours is the most socio-economically disadvantaged population in the college. We are actively looking for ways to incorporate technology in our instruction, though.

42 The only problem that I see with using the m-learning strategies is keeping the student focused on what they should actually be focused on. I find that cell phones are often a distraction in class due to the easy ability to view Facebook and text. How are we to know that they are actually doing what they should with this technology?

43 Students are very much into using technology. My non-traditional students especially ones in my generation (57 YO) have the most challenges. There is an app for the textbook in one of my courses which the use all th time. I also use online study tools such as quizlet.com which all students use and find to be an extremely helpful study tool.

44 I simply do not have the time to figure out how to use it in the class room and have not read much about its use. Yet I use it in my personal life all the time.

45 I wouldn't limit some of the categories (i.e. file/ resource & research, etc) to specifically m-learning. Since blackboard, moodle, even ftp and webpages contain much of what you mention and would be accessible using most any smartphone, table or PC. To me m-learning would be a narrower focus covering texting, use of devices camera for image searches, custom apps that utilize a phone or table for channeled communication (i.e. aim camera or use of other internal sensors to say overlay information about some object while viewing it on the screen) or other functions which do not require excessive interaction with a device you would likely be carrying on ones person, excluding the traditional clam shell style laptop.

46 Most instructors in my dept are older, and technology isn't being embraced as much as it could be. The college has plenty of resources available, but finding the time to take classes to learn to use the software, and then getting it set up, is arduous. Our studnet body tends to be older. In informal polls I've conducted with students, they like having m-learning as supplements, but still want a printed book. However, the younger students want to do everything on their mobile device.

47 m-learning can surely enhance the educational experience by showing how education and technology can advance together in the classroom and in the future

48 I discovered with my Nook tablet, I can purchase some textbook and use it for Microsoft Office 2010 docs.

49 none---

50 I have been involved with Blackboard classes for 13 years. There are some classes that it does not fit well.

51 It can be difficult to evaluate student outcomes as it relates to using Twitter and Facebook (social media) in the classroom. While I appreciate the engagement in the course content outside of class, I am not sure that students value it and it can be difficult to track to see if students are using it properly. It is not something that can be evaluated with ease (it is time consuming).

52 One area of concern I have is with the availability of technology resources for ALL students. While most students have access to mobile technology, there are many student who do not. When making required assignments, this is a concern I actively consider.

53 Currently the online platform that is used at my college - MOODLE does NOT support mobile applications. There is no plan to implement the strategy in the near future.

54 While many students do, not all students in our classes have access to their own mobile devices, so using them for official class projects can be problematic. The iPad I currently use is temporarily assigned to me, and that state has caused me to be less creative in exploring options for using it long term. I do use Facebook, but mainly via programs related to my courses, not for the courses themselves. We rely heavily on Blackboard on campus for distributing and housing materials for class.

55 The perception is that our students have the technology skills needed. That is not true. The institution that I work for has a very large low income population and most of the students don't even own a computer. I tried to do a polling survey in class last semester and about 20% of my students didn't own a smart phone. Luckily I brought both of mine to class and one student had a tablet and smart phone so we were still able to do the activity. I worried about the ones who didn't have a smart phone feeling bad about it. But it helped that is was a small class and they knew each other. I acted like it was no big deal.

56 Re the question on getting a raise or promotion - at my institution rank promotion is a matter of longevity, nothing else; raises are state mandated. Student are very actively engaged in using e sources in and out of class; some students are intimidated (our school has had to institute a pre-Intro to Computers course), but once they get the hang of things, they get very involved. I cannot count on all students having access to mobile devices and so have had to be sure to have students work in group or be sure there are adequate resources for students who don't have devices - as well as develop strategies so as not to embarrass students who may not have mobile devices.

57 I am currently in a faculty learning community at [college name withheld] on mobile learning. My study is on the use of Blackboard Mobile by students. I could share my results if you like. [email address withheld]

58	We had a special group devoted to sharing these techniques as we changed portions of our classes during a given semester. We reported back what worked, did not work, and asked for advice. Then we modeled to each other and presented our data and findings at a symposium for all faculty. Poll anywhere and blogging are fantastic!
59	Many students do not possess the necessary tools to access m-learning activities, including smart phones or tablets. Incorporating these skills would often alienate older students or those without the capabilities to procure the necessary equipment. Without the school providing the devices, an unrealistic idea, I do not see how to incorporate them into classes.
60	Some students don't have access to mobile devices. In my classroom, we solved this problem by forming teams for mobile learning quizzes, but I still sensed that students who didn't have smart phones or tablets sometimes felt awkward, as though they couldn't fully participate.
61	There are not many individuals on campus that have knowledge how to implement m-learning strategies on campus therefore I feel like a guinea pig. There needs to be support readily available or professional development funds dedicated to assisting the initiative on campus for the instructors.
62	I use Socrative in class as a way to pre-test students on their grammar knowledge before reviewing the material--they love it because they get to use their phones and it shows them just how much they don't know and what they need to focus on more before we review, so they tend to pay more attention.
63	This is a great concept, t oo bad that many in the education field are locked into old school. They should take what they do and incorporate these new concepts. Make school more enjoyable and more exciting for the students.
64	The problem with facebook, Twitter, blogging, etc. is that not all students are proficient with technology. I would also add that I would never text my students or give them my personal cell. Teachers are not meant to be on-call 24/7.
65	Beneficial
66	You can always incorporate a lot more knowledge, entertainment, and graphics into the program.

67 I know how to use the m-learning strategies mentioned, but I have trouble with two things: figuring out exactly how to incorporate these strategies into my courses in terms of exactly what content I will deliver using m-learning and which strategy to use, and secondly, finding the TIME to incorporate the strategies. It's not enough to throw these resources out there generically and assume that people will automatically know where and how they fit into their courses. We need to see real course examples and see them in action, how they work, and the pros and cons. I would think this would be a very publishable point to make and a grant-fundable endeavor to establish a publicly available site to publish award-winning distance ed courses, so the rest of us can see real example of how it's done effectively and the pros and cons of the strategies without each having to reinvent the wheel.

68 no comment.

69 I think that text messaging would be great to use, but I do not want students to have my personal phone number.

70 I use m-learning purely for convenience, not for the enhancement of teaching. I do not believe that m-learning enhances teaching or learning. The incorporation of most m-learning strategies can quickly become superfluous or faddish, as an instructor may use it just to say he/she knows it's "popular," or may think that just because students enjoy PLAYING with their iPad that they would enjoy doing classwork on an iPad. Teaching is only as effective as the instructor. Adding m-learning strategies doesn't make it more or less effective. In fact, if the m-learning isn't clearly purposeful, it may be distracting or pointless. As a student, if an instructor tells me to pull out the iPhone to complete a poll, I would immediately be distracted by everything except the poll, namely if I had missed some text messages. Technology can be an excellent resource or addition if used purposeful and carefully, but much of it is gimmicky and should be used with caution. It will not magically enhance instruction. A quality instructor is who enhances instruction, even if that means straight lecture. Engaging students needs to be done through the instructor's teaching forte, not through the latest fad. Just my honest and most humble opinion.

71 Class development and management is very time consuming. Interactive features require much more time than a face to face class.

72 I have had a positive experience using m-learning.

73 Classes are web enhanced. CaMpus lab has simulation manikins and electronic charting.

74	Our community college has provided great resources for faculty support to help us use m-learning with out students.. Students do enjoy it
75	The IT department at our institution is very concerned about security and not always open to allowing certain applications.
76	Particular apps can be extremely engaging for students. Many new software programs (e.g. ResponseWare) are available through apps. Many other instructional strategies (e.g., flipped classroom) rely on or encourage the use of mLearning. mLearning also supports learning outside the classroom or extends classroom learning to outside the classroom. Many apps encourage active learning in students by giving students the opportunity create content (e.g., EduCreations) and simultaneously provides ways for alternate means of assessment.
77	I teach culinary and do not have the resources to utilize all of the aspects of m-learning, but am quite open to it ALL!!
78	College discourages using any contact with students except thru LMS.
79	Since I come from an information technology and manufacturing industry background I have a bit of an edge when it comes to technology in the classroom. I am a strong opponent of allowing students to have smart phones on during class unless I okay it. Oftentimes smart phone/texting in class is just too distracting to the learning environment. In my class it is smart to have your smart phone off during class. I do, however, often assign group projects in class where students are using m-technology.
80	I feel that most of the younger students are into the technology so in order to get their attention you must stay up with the times.
81	My experience has been that I am more prepared to use such methods than my students are able to use them.
82	Fiscal issues and availability of hardware are a limiting factor.
83	I like the idea of using these resources, but am sometimes limited by the availability of technology (computers/phones/internet) to my students while they are away from campus.
84	There are strategies other than those mentioned that work better in my subject area.
85	Mostly positive experiences. works much better when there is a person to help when the technology doesn't work as it should.

86	Students live and breathe technology these days. In order to catch and keep their interest, you MUST incorporate technology options into the learning process!
87	Controlling students use of their personal devices to keep them on task can be a challenge in some situations. Some students are almost distracted by their phones and devices. However controlling the parameters of use and being aware and alert will avert problems.
88	NA
89	I teach Business/Computer Science classes traditionally and online. I currently use SAM(Skills Assessment Manager) which is a simulation software for my computer classes. I use Stock Market simulation and Interactive Business Plan software for my Business classes. The use of these m-strategies have greatly increased the interest and initiative of students to participate in certain assignments.
90	in general, value added is not worth the time they take.
91	I like to use mobile devices to enhance very small areas of the subject matter. Where I also use on line gaming as large project and demonstrate some very basic uses of mobile devices as it would relate to business. I normally use free online tools that limit my use.
92	While I embrace certain technologies to assist my in-class and out-of-class connection to students, many of the mobile, social-media technologies referred to in this survey are, I believe, wrong-headed endorsements of de-personalizing behaviors that are in fact detrimental to true education. For instance, I think online information repositories and discussion boards in course management software (such as D2L) are very valuable, and I use these tools frequently to support my traditional class-room instruction. However, I see more harm than good in encouraging even a single student to use social media for supposed "educational" purposes. The loss of language skills associated with all forms of social media of which I am aware has been rapidly followed by a loss of analytical skills. Students using social media ignore each other as they text away, and the content of their thought has become quick-hit sound bites. I believe these devices degrade a student's ability to focus long enough to construct anything resembling a well-reasoned, effective, and comprehensive analysis. It is perhaps possible to construct a grammatically correct sentence (and a valid thought) using social media devices, but the reality is that these devices have established a standard which is anathema to the type of critical analysis I am trying to instill in my students. Thus, I see no practical difference between championing the use of social media in education and abandoning the critical heart of education that has brought whatever progress we've achieved to this point: critical analysis.

93	Although we have training on some of the technologies mentioned in your services, very few ipads etc have been purchased for faculty and/or are available for faculty or in class use. When requested, our department chair says funds are not available or chooses to use the funds on other expenses.
94	Technology failure causes me to be discouraged with implementing new m-learning strategies.
95	As I use more mlearning strategies, I become more confidant. The lack of access and basic frustration of "more technology" inhibited my use in the past. This is becoming less of a problem due to campus instruction for teachers and students.
96	i would incorporate m-learning MORE if i had TIME! we are not relieved of any course load, and that, paired with no financial support for the equipment necessary, severely limits what I am willing to personally contribute to this effort. If the college isn't willing to support it, why should I bend over backwards with my own time and money to get it employed? It's tough to justify...
97	I am a math instructor. Some strategies listed do not apply to me,, however I do show and use several apps that are available as part of class my class.
98	I wish faculty could have virtual office hours and leave campus early. We all answer our students' emails and questions 24/7 but we don't get any credit for it.
99	Online presentations tend to work very well, but for my online classes, the problem I encounter is getting students to participate in any sort of synchronous activity. Their argument is that online classes should not have structured meeting times for discussions, etc. because they took the class for the flexibility and convenience of online instruction.
100	For me personally, the biggest "obstacle" in my utilizing social media (facebook, twitter, text messaging) is separating personal use of social media from instructional use of social media. Colleagues who adopted these media when they first became available blurred personal use with instructional use in my opinion.
101	There are issues on our campus with WiFi availability and cell reception so some options are not available in certain classrooms (polling for example at end of class).
102	We are encouraged to use technology and to teach online courses or supplement live courses with an online element. However, the time factor to be trained is a barrier and there is no professional incentive to do so (e.g. promotion, increases in pay, benefits such as release time) associated in doing so. Hence many of us don't use these strategies because they take to much in time and resources when you already teach 5 classes and address other professional commitments.

103	Although we have a department for faculty support, and they are very knowledgeable and helpful, they are busy with helping less technical faculty with the "BASICS" of technology. For example, how to use the college LMS (Desire2Learn), to create a gradebook and attendance sheet. I would love to have someone available to turn to who has done the research best practices and share more information on this topic
104	I've discovered that students don't learn in the same manner. Students must be provided with more than one method of learning. This has led me to use traditional methods and m-learning to keep my students engaged in class, grasp concepts more quickly, and enhance their overall learning experience.

Table H.2

Responses to open-ended comments by faculty members that did not use m-Learning

#	Response
1	Personally, I see this as a learning gimmick. Students should not need gimmicks, and gimmicks only dumb them down. They need to read more, write more, and put down technology.
2	I utilized the learning management system provided by the college, Blackboard. Within my courses, I do provide links to valuable resources that benefit my students.
3	While these devices can be a great asset, there is still no substitute for the good old read, lecture, lab format that has been in use for ever. Everyone seems to think this is the next magic bullet that will solve all the problems in education. Those problems will be solve when we value and have teachers that are content experts in the classrooms, require student to be properly prepared, set high expectation and hold student accountable.
4	My equipment, my plan, my cost. No time to learn and problem solve before going into the class.
5	I have not had time to really experiment with some of these due to other obligations associated with my job.
6	different devices can lead to confusion
7	I love the idea of incorporating electronic devices and social media into a classroom setting. However, due to limited time available for these extracurricular activities to be used within class instruction, I am currently unable to participate. I am open to suggestion and how to incorporate some outside activities, such as the mobile scavenger hunt.
8	Not all students have access to the technology

9	Many of our students come from very limited income home settings, and while most students do have mobile devices available to them, some do not, and I do not want to limit a student's ability to participate or succeed in class because they are not as financially able as another student. We do utilize Black board and many of our students can access their class information from their mobile device through that route, but it can also be accessed from multiple computer labs on campus as well as their home computers. This allows a more even access to the material by all students.
10	While I selected that I do not use or plan to use file sharing, I do want to clarify that we use Blackboard which does have a mobile component. I do post a lot of short videocasts for students, however I do not know if these are viewed specifically with a mobile device. While I've received training with poll everywhere and other tools that rely on mobile devices and I like the idea, my focus during the past academic year was to develop active learning components that encourage student interaction and critical thought relating to the topic.
11	My classes are continuing ed and are made up of people from all ages and life situations. Many do not have the financial means to have access to mobile devices.
12	Not all students have the ability (equipment or intelligence) to be able to use this in class.
13	biggest hurdle is connectivity and student access to tools
14	I allow students to use tablets in class to view online versions of their textbooks. This allows them to save money compared to the cost of the printed textbook.
15	I don't feel that the selected m-Learning strategies would work in my classes or enhance the education
16	Some subject matter lends to better strategies for mobile devices; while Smart Boards, Calculators and Course management systems are great tools for the math classroom some of these activities listed for the mobile devices not so much so.
17	It is still difficult to get multiple platform technologies to interface with one another well. Yet another log-in, password, or simply another site to check adds additional management challenges to faculty who already juggle multiple technologies to facilitate curriculum delivery.
18	I have vision impairment, when I attend these workshops on using the computers, I am out as I can't see the small font. I am frustrated with this. I hope someone will come to my classroom at Goodwill Industries as there is a large screen here that I can read. Thank you....
19	I have just purchased my iPad and would like to have some hands-on classes on how to use it in the classroom.
20	1. it takes too much time to prepare substantive, meaningful activities to use with these devices 2. not every student has access to computers, much less smart phones, e-readers, etc. Some students have computer but no Internet connection at home; 3. I

	barely have time to teach the basic content of my course; I cannot devote class time to anything not content-related 4. I don't have time to learn the technology. For example, I've been trying for 2 years to get someone to teach me a specific technology - and there's no one at my College to do it...and I don't have time to take a course.
21	The platform that we use for online classes allows for discussion, blogs, chats, etc. However, I do see a place for m-learning strategies in my classes in the future.
22	I will start by saying that m-learning is a great concept. It will bring instruction to a whole new level. With that said, we are making a big assumption that all students have access to phones with data and text. We are also making the assumption that they have access to computers other than on campus. I am still shocked at how many students I have that do not have a home computer. As to why I have not incorporated it into my teaching is because I teach Accounting and there is so much content that we have to cram in a semester, I feel that it takes away from the critical stuff. I do intend to do some type of recording and upload it to JOULE so that students can review lectures.
23	I would love to use m-learning, but I need more than random training to understand and get comfortable with new technology.
24	I do not have a smart classroom. I still have chalk boards.
25	I am gradually incorporating technology as I become more familiar with the various aspects. I am not proficient enough to teach my students how to use these in order to access on-line material. Many do not use computers at home. I am also concerned that they will use class time on these to do what they want, not what the instruction calls for.
26	This is my first time teaching a course. the curriculum is set
27	I am a new instructor...this is my second semester. I am still learning the range of electronic services available at my institution. I have used Dropbox for a long time in my former job and in volunteer roles. I am very open to m-Learning strategies in the classroom and expect that I will be using them within the next couple of semesters.
28	I have found several Aps that have helped students in our labs
29	I think this is a good way to connect with this generation of students.
30	Cannot rely on m-learning strategies. Cannot assume that all students have smart phones, ipods, ipads, etc.
31	Part-time Adjuncts have difficulty making themselves available for hands on training which is overly needed in our fast changing techno world.

32	My classes are geared toward the adult refugee population and are located in off-campus communities. The majority of these students are not literate in any language and have limited exposure to technology. Classrooms are very basic and the locations tend to change from time to time. I can use a projector but do not own a laptop computer - only an iPad, which I do use in the classroom. I would like to incorporate more technology in the future.
33	I do not have the ability to text without using my personal phone which I want to keep personal. If I had a texting capacity, I would use it, but not on my own personal device.
34	I agree with reaching the students with various modalities. However, there are curves and expenses, in both time and money, that often hold back individual instructors from moving forward with these processes.
35	We are developing a new Quantitative Literacy course for math that will encourage use of
36	This is my second semester teaching; during the first semester I was used to utilize lesson plans and delivery already in place. Currently, I am making a few changes and plan to utilize as much technological tools available to maximize student interaction and engagement. Of note, the curriculum in which I teach is 100% online.
37	I teach mainly ESL in the free program and they tend to be technologically behind other students, many don't have internet at home.
38	I have to use m-learning strategies but am not opposed to doing so in the future should there be appropriate training, help with applications, etc
39	-Most of the professors/teachers do not allow any use of electronics in the classroom except for ipads or laptop computers so there's no need to even have anything other than these devices in class. I am able to use my ebook, but most of the school books are not available to upload so I log into my blackboard or moogle for assignments, etc..
40	It is just not viable right now given then the great variance in students I have. Some own technology and others do not.
41	The skills taught in my subject do not translate well to a web environment.
42	I have yet to find a student who does what they are supposed to be doing with a smart phone or laptop in class at all times. In almost every case, it is at best a distraction, or at worst an outright way to be physically present but mentally absent. Some few use it to take notes or download relevant apps, but most do not.
43	I do not have a class assignment this semester.
44	My students frequently access eLearning applications (BlackBoard/Moodle) via mobile devices both inside and outside of the classroom. I like this and will continue to encourage it.

45 I have diverse student population and some students do not have access to technology or do not have technical skills.

46 I discourage all texting in my classroom as you cannot ensure students are sticking to class projects and not talking to friends.

47 Each of these types of m-learning would take more time to prepare than I have at my disposal.

48 Our community college uses Blackboard; I house everything needed within Blackboard. Also, I send emails to the students. Between Bb, email, skype, and phone, I am very available to students... the other stuff is there but would be over-kill. I know about FaceBook but do not use in classroom setting. Since the school supports Bb, I stay within the parameters of what is offered in Bb and embed videos and audio and we also utilize embedded librarians. I do not think the students are lacking for mobile learning; if anything - maybe overload.

49 I do not have class Facebook pages because of the college policies on communication through specific accounts (e.g. college e-mail account). Related to this, we are not allowed to correspond through personal (e.g. yahoo) e-mail accounts when students use them to contact us.

50 There is an over abundance of social media interference that exists today in the classroom and lab facilities. Most of it, irrelevant to course work.

51 I have not pursued because of ignorance on my part.

52 I am using blackboard to share grades, post assignments, receive assignment homework, answer questions, etc. My strategies need to be different because the students need to demonstrate they can MS Office. We also use a Skills Assessment Manager program online. That is enough technology to throw at some students in one semester who have very limited technology skills and are overwhelmed by blackboard and SAM as it is.

53 I think these technologies often seem to take up more class time for the benefit it gives (I've seen this to be true, I'm not sure of the other technologies). I don't think that educators are informed enough about what options are available specific to their discipline. If I found an application that I think would be highly useful to my discipline I would be willing to incorporate it.

54 Mediated communication allows the individual to avoid interpersonal communication. Some, myself included, view this as a problem which will become more apparent in the future.

55 In my limited experience with most of the mobile learning strategies, I find they encourage a superficial engagement in the course content and inhibit the more substantive interaction I expect from students in a class.

56 My class is hands-on intensive and I have not seen a good fit for the strategies as of yet.

57 I am not sure how to make the technology equally accessible to all. Much of the m-learning strategies seem to be a solution looking for a problem; if they are not relevant to the lesson, I am not interested in using them.

58 Not all students have access to Smart Phones and tablets, so it is not fair to build classroom activities around them. I am going to forbid the use of electronics in my classes this coming semester because of the problem with students surfing the internet and spending time on Facebook during class.

59 this is all very relevant and I need to learn

60 I have not used them because I do not fully understand how to utilize them and would not be sure of the legalities in their use.

61 Not every student has access to these kinds of devices, so requiring participation is unfair.

62 Many of our students come from very low economic home situations and we do not want them to feel burdened with additional expenses above the fees already required to obtain their physicals, immunizations, and uniforms for clinical. Many have electronic resources as you mentioned, but many do not, and we do not want to make any student feel they are at a disadvantage by not being able to afford these devices. We do have computer labs available, and laptops that can be checked out from our libraries to use at home. We use Blackboard and often imbed video images and links there. If a student has a mobile device they can use the Blackboard mobile app, but we do not require it.

63 They don't fit with the curriculum and the college is highly unlikely to purchase mobile devices for every faculty member to use strictly for work purposes.

64 Since I don't have unlimited texting on my phone and not paid for by college, I will not use texting. I see using all social media avenues to communicate with students outside class. Currently communicate with others using WebX and similar platforms. Also students send me confidential requests for help on work projects using what they learned. Currently use simulations both electronic and physical, just not ones you mentioned.

65 I think, for the most part, that our technologies are hindering creative and critical thinking. Current students (again, the majority thereof) do not read at-length anymore; most of the information they "find" is spoon-fed at the touch of a button, and I believe they are losing research/critical thinking skills. It is instant gratification at its finest, and very little work is involved on the students' part.

66 I am not very familiar with the m-learning strategies discussed. In fact, this is the first time I have heard the term 'm-learning'. I believe using these strategies is important for reaching our tech-savvy students. My hesitancy in using new technology is a result of my lack of time to 'learn' or 'get comfortable with' the technology. We have some training on how to use new technologies, often a quick workshop (1-2 hours) during professional development days. As an over-50 instructor, most technologies I hear about are new to me. I need time practice using

the hardware and software we hear about. Unfortunately, time to spend on these tasks is limited, especially since I not only teach, but also assume several administrative duties. Between working a 40-45 hour work-week, then going home to family responsibilities (including two middle-schoolers), there is little time to devote to practice. Often, by the time I get a few minutes to try something out, I have forgotten most of what was demonstrated on PD day.

I believe that m-learning strategies must be continually updated to keep up with the
world that most students live in, and it is also a way to stay abreast of latest
technological strategies. I have only taught hybrid courses, but if I teach a total m-
learning course in the future, I would certainly consider incorporating these
67 strategies, provided that our IT depatment has necessary software and also provides
the necessary instruction or help with said software appilcation. One additional note:
face-to-face classes usually have an "m-learning" type of component, which is great
for freeing up valuable class time so that the instructor can be more devoted to
actually teaching and have better interaction.

It is primarily about engaging a newer generation who is primarily technology
68 driven. If you can get on their level and engage them on the topic that you are
discussing, the instructor's task is about 75% complete.

69 Not all students have ownership of these devises.

I haven't used any m-Learning strategies yet due to my lack of knowledge. However,
70 I am eager to learn some of these techniques. I would definitely benefit from hands-
on training.

71 I need a little extra training to do so. I am not averse at all with technology, but do
not have a mentor that is competent in my Division.

One of my key problem areas are that there are few tools for actually developing
programs on a mobile devices that run on a mobile device. There is a lack of tools to
72 teach programming skills other that resources that you access through a browser and
at that point if you are using a PC to develop mobile products then the actual use of
the mobile technology is usually not worth the time invested

Twitter helps in connecting online and on-campus students. They can use the has
73 tags to reference particular threads of interest to get answers to frequently asked
questions. Also a great way to communicate to all students simultaneously.

Students use their devices in these manners whether the course has assignments
directing them to or not. I have not thought of some of the m-learning strategies
mentioned here and I will consider their use in the future. One of my objections to
74 this is that students do not engage enough within the REAL classroom and with
REAL people. This has become apparent this semester with my students at
externship. Several of the younger students simply cannot, or do not want to, carry
on a conversation with another human being face-to-face. They're not being hired
because of it.

75 My classes are very hands-on and I do encourage the use of smart phones for
research in the classrooms.

76	We have become very connected via electronic devices, but disengaged from society. I so often see people in groups who are supposed to be "together" , but they are all involved with their devices to the point that they have disengaged from interaction with the people they are with. They are so tunnel-visioned on the little screen in front of them that they are missing the world around them. If I text a student it is because I cannot reach him/her on the phone. We are losing some of our social skills due to our relying on a quick text or voicemail. I prefer to have my students (hopefully) engaged in eye-to-eye contact and open discussion.
77	Do to the nature of my class, interpersonal contact has the highest priority. Face to face presentations. Information gathering for this communication activity is left to the student.
78	I am it aircraft maintenance instructor the aircraft industry is going to tablets for the maintenance people to have the maintenance manuals work instructions etc. with them an all-time. They are very timesaving items. The problem I have with them in school is the students are not paying attention to what they should be in stead they're surfing the Internet both on tablets and smart phones which is not acceptable we are a FAA mandated school with very strict regulations to follow. So it makes it very difficult to use smart phones tablets etc. in the teaching environment in our case our students have got to have 50 minutes per hour in class if they're surfing the Internet they are not in class and we have no way to monitor this.
79	I do not use any technological crutches in my classroom except films and "educational' videos.
80	I cannot require students to have these devices, so i don't feel i should create assignments or interactions that require them.
81	It is tough to find the time to learn--I keep learning about each new device and option, but rarely get enough time to really master it so that I can adopt and deploy. Sometimes it gets exhausting, though I wish I could do more of it. Not afraid of technology, just very very short on time for the learning curve.
82	I am a relatively new faculty member. I plan to integrate some m-Learning strategies this year, specifically social networking, probably using Facebook. Most students receive email and Blackboard announcements on their smart phones, so I don't believe that texting would add anything additional. When reading the survey, I was intrigued by a scavenger hunt & may try to incorporate something like that into one of my classes. Thanks for the idea :)
83	-teaching mathematics is more of a hands on course; I use technology through online programs -don't want to talk with my students 24/7; I am available through phone, email, office hrs.
84	A step I have need to take is to create a class social media
85	We don't have wifi available on our campus, or it is very difficult to connect to it. Also, I haven't found apps or strategies to use.

86	I am too traditional and see these aids as a distraction when they do not work right.
87	M-Learning is relatively a new option in my classes. I intend to explore a little more in the next term.
88	I won't pay 20 cents for a text message from somebody whom I didn't select to hear from. Facebook and other social media are too public and can get one in trouble. We have had students kicked out of school because of what they loaded onto facebook. I have used Youtube for alternative lectures in math.
89	I can't afford the technology devices, and my college is not providing them.

APPENDIX I: ORDINAL REGRESSION ANALYSES DEMONSTRATING THE MODERATING EFFECTS OF AGE, GENDER, AND YEARS OF EXPERIENCE

Table I.1

Performance Expectancy and Intentions to Use Augmented Reality

		Estimate	Std. Error	Wald	df	Sig.
Threshold	[ARINTENTION = 1.00]	2.740	.636	18.555	1	.000
	[ARINTENTION = 2.00]	4.161	.658	39.943	1	.000
	[ARINTENTION = 3.00]	5.789	.696	69.161	1	.000
Location	PESCORE	.266	.055	23.319	1	.000
	[GENDER=1.00] * PESCORE	.005	.016	.094	1	.759
	[GENDER=2.00] * PESCORE	0[a]	.	.	0	.
	[AGE=1.00] * PESCORE	-.024	.029	.708	1	.400
	[AGE=2.00] * PESCORE	.027	.021	1.635	1	.201
	[AGE=3.00] * PESCORE	.028	.024	1.458	1	.227
	[AGE=4.00] * PESCORE	0[a]	.	.	0	.
	[YRS_TOTAL=1.00] * PESCORE	.009	.042	.043	1	.835
	[YRS_TOTAL=2.00] * PESCORE	-.005	.022	.060	1	.807
	[YRS_TOTAL=3.00] * PESCORE	-.017	.020	.712	1	.399
	[YRS_TOTAL=4.00] * PESCORE	0[a]	.	.	0	.

Note. R^2=.127

Table I.2

Performance Expectancy and Intentions to Use File/Resource Sharing

		Estimate	Std. Error	Wald	df	Sig.
Threshold	[FILEINTENTION = 1.00]	-.514	.644	.635	1	.426
	[FILEINTENTION = 2.00]	.495	.631	.616	1	.432
	[FILEINTENTION = 3.00]	2.126	.640	11.030	1	.001
Location	PESCORE	.161	.055	8.551	1	.003
	[GENDER=1.00] * PESCORE	.013	.017	.522	1	.470
	[GENDER=2.00] * PESCORE	0[a]	.	.	0	.
	[AGE=1.00] * PESCORE	.012	.030	.163	1	.686

		Estimate	Std. Error	Wald	df	Sig.
	[AGE=2.00] * PESCORE	.002	.022	.012	1	.914
	[AGE=3.00] * PESCORE	.023	.025	.826	1	.363
	[AGE=4.00] * PESCORE	0[a]	.	.	0	.
	[YRS_TOTAL=1.00] * PESCORE	-.058	.043	1.803	1	.179
	[YRS_TOTAL=2.00] * PESCORE	-.019	.023	.667	1	.414
	[YRS_TOTAL=3.00] * PESCORE	-.016	.022	.526	1	.468
	[YRS_TOTAL=4.00] * PESCORE	0[a]	.	.	0	.

Note. R^2=.051

Table I.3

Performance Expectancy and Intentions to Use Gaming Simulation

		Estimate	Std. Error	Wald	df	Sig.
Threshold	[GAMINGINTETNION = 1.00]	1.213	.601	4.078	1	.043
	[GAMINGINTETNION = 2.00]	2.377	.610	15.158	1	.000
	[GAMINGINTETNION = 3.00]	3.649	.629	33.608	1	.000
Location	PESCORE	.153	.052	8.567	1	.003
	[GENDER=1.00] * PESCORE	.010	.016	.374	1	.541
	[GENDER=2.00] * PESCORE	0[a]	.	.	0	.
	[AGE=1.00] * PESCORE	.009	.028	.107	1	.743
	[AGE=2.00] * PESCORE	.004	.021	.044	1	.833
	[AGE=3.00] * PESCORE	.012	.023	.271	1	.603
	[AGE=4.00] * PESCORE	0[a]	.	.	0	.
	[YRS_TOTAL=1.00] * PESCORE	.034	.041	.682	1	.409
	[YRS_TOTAL=2.00] * PESCORE	.007	.021	.101	1	.751
	[YRS_TOTAL=3.00] * PESCORE	.022	.020	1.252	1	.263
	[YRS_TOTAL=4.00] * PESCORE	0[a]	.	.	0	.

Note. R^2=.065

Table I.4

Performance Expectancy and Intentions to Use Research/Reference Applications

		Estimate	Std. Error	Wald	df	Sig.
Threshold	[RESEARCHINTENTIONS = 1.00]	.487	.619	.620	1	.431
	[RESEARCHINTENTIONS = 2.00]	1.237	.617	4.027	1	.045
	[RESEARCHINTENTIONS = 3.00]	2.873	.634	20.520	1	.000
Location	PESCORE	.226	.055	17.026	1	.000
	[GENDER=1.00] * PESCORE	-.015	.017	.824	1	.364

		Estimate	Std. Error	Wald	df	Sig.
	[GENDER=2.00] * PESCORE	0[a]	.	.	0	.
	[AGE=1.00] * PESCORE	-.029	.029	.948	1	.330
	[AGE=2.00] * PESCORE	-.015	.022	.496	1	.481
	[AGE=3.00] * PESCORE	.003	.025	.017	1	.896
	[AGE=4.00] * PESCORE	0[a]	.	.	0	.
	[YRS_TOTAL=1.00] * PESCORE	-.034	.043	.611	1	.434
	[YRS_TOTAL=2.00] * PESCORE	-.036	.023	2.571	1	.109
	[YRS_TOTAL=3.00] * PESCORE	-.039	.021	3.321	1	.068
	[YRS_TOTAL=4.00] * PESCORE	0[a]	.	.	0	.

Note. R^2=.065

Table I.5

Performance Expectancy and Intentions to Use Social Media

		Estimate	Std. Error	Wald	df	Sig.
	[SMINTENTIONS = 1.00]	.757	.605	1.564	1	.211
Threshold	[SMINTENTIONS = 2.00]	1.716	.608	7.958	1	.005
	[SMINTENTIONS = 3.00]	3.362	.630	28.501	1	.000
	PESCORE	.178	.053	11.387	1	.001
	[GENDER=1.00] * PESCORE	-.026	.016	2.467	1	.116
	[GENDER=2.00] * PESCORE	0[a]	.	.	0	.
	[AGE=1.00] * PESCORE	-.019	.029	.459	1	.498
	[AGE=2.00] * PESCORE	.003	.021	.016	1	.898
Location	[AGE=3.00] * PESCORE	.001	.024	.003	1	.959
	[AGE=4.00] * PESCORE	0[a]	.	.	0	.
	[YRS_TOTAL=1.00] * PESCORE	.062	.043	2.014	1	.156
	[YRS_TOTAL=2.00] * PESCORE	.019	.022	.741	1	.389
	[YRS_TOTAL=3.00] * PESCORE	.011	.020	.300	1	.584
	[YRS_TOTAL=4.00] * PESCORE	0[a]	.	.	0	.

Note. R^2=.074

Table I.6

Performance Expectancy and Intentions to Use Text Messaging

		Estimate	Std. Error	Wald	df	Sig.
	[SMSINTENTIONS = 1.00]	.514	.603	.727	1	.394
Threshold	[SMSINTENTIONS = 2.00]	1.411	.604	5.458	1	.019
	[SMSINTENTIONS = 3.00]	2.869	.620	21.385	1	.000

		Estimate	Std. Error	Wald	df	Sig.
	PESCORE	.185	.053	12.273	1	.000
	[GENDER=1.00] * PESCORE	.001	.016	.008	1	.928
	[GENDER=2.00] * PESCORE	0^a	.	.	0	.
	[AGE=1.00] * PESCORE	-.094	.029	10.816	1	.001
	[AGE=2.00] * PESCORE	-.026	.021	1.549	1	.213
Location	[AGE=3.00] * PESCORE	-.014	.024	.374	1	.541
	[AGE=4.00] * PESCORE	0^a	.	.	0	.
	[YRS_TOTAL=1.00] * PESCORE	.069	.044	2.431	1	.119
	[YRS_TOTAL=2.00] * PESCORE	-.003	.022	.024	1	.878
	[YRS_TOTAL=3.00] * PESCORE	-.012	.020	.353	1	.553
	[YRS_TOTAL=4.00] * PESCORE	0^a	.	.	0	.

Note. R^2=.078

Table I.7

Effort Expectancy and Intentions to Use Augmented Reality

		Estimate	Std. Error	Wald	df	Sig.
	[ARINTENTION = 1.00]	1.751	.602	8.476	1	.004
Threshold	[ARINTENTION = 2.00]	3.144	.619	25.824	1	.000
	[ARINTENTION = 3.00]	4.691	.649	52.292	1	.000
	EESCORE	.249	.075	10.993	1	.001
	[GENDER=1.00] * EESCORE	.015	.024	.384	1	.536
	[GENDER=2.00] * EESCORE	0^a	.	.	0	.
	[AGE=1.00] * EESCORE	-.014	.043	.104	1	.747
	[AGE=2.00] * EESCORE	.024	.031	.604	1	.437
	[AGE=3.00] * EESCORE	.043	.034	1.578	1	.209
	[AGE=4.00] * EESCORE	0^a	.	.	0	.
Location	[YRS_CURRENT=1.00] * EESCORE	.063	.042	2.222	1	.136
	[YRS_CURRENT=2.00] * EESCORE	.029	.033	.782	1	.376
	[YRS_CURRENT=3.00] * EESCORE	.026	.031	.685	1	.408
	[YRS_CURRENT=4.00] * EESCORE	0^a	.	.	0	.

Note. R^2=.087

Table I.8

Effort Expectancy and Intentions to Use File/Resource Sharing

		Estimate	Std. Error	Wald	df	Sig.
Threshold	[FILEINTENTION = 1.00]	-.250	.630	.157	1	.692
	[FILEINTENTION = 2.00]	.800	.617	1.684	1	.194
	[FILEINTENTION = 3.00]	2.412	.629	14.698	1	.000
Location	EESCORE	.273	.079	12.003	1	.001
	[GENDER=1.00] * EESCORE	.024	.026	.856	1	.355
	[GENDER=2.00] * EESCORE	0[a]	.	.	0	.
	[AGE=1.00] * EESCORE	.017	.047	.129	1	.720
	[AGE=2.00] * EESCORE	-.004	.033	.011	1	.915
	[AGE=3.00] * EESCORE	.026	.038	.462	1	.497
	[AGE=4.00] * EESCORE	0[a]	.	.	0	.
	[YRS_CURRENT=1.00] * EESCORE	-.004	.046	.008	1	.929
	[YRS_CURRENT=2.00] * EESCORE	-.024	.035	.464	1	.496
	[YRS_CURRENT=3.00] * EESCORE	-.011	.033	.105	1	.746
	[YRS_CURRENT=4.00] * EESCORE	0[a]	.	.	0	.

Note. R^2=.070

Table I.9

Effort Expectancy and Intentions to Use Gaming/Simulation

		Estimate	Std. Error	Wald	df	Sig.
Threshold	[GAMINGINTETNION = 1.00]	.449	.580	.598	1	.439
	[GAMINGINTETNION = 2.00]	1.651	.586	7.937	1	.005
	[GAMINGINTETNION = 3.00]	2.908	.601	23.408	1	.000
Location	EESCORE	.119	.073	2.695	1	.101
	[GENDER=1.00] * EESCORE	.016	.024	.448	1	.503
	[GENDER=2.00] * EESCORE	0[a]	.	.	0	.
	[AGE=1.00] * EESCORE	.008	.043	.033	1	.855
	[AGE=2.00] * EESCORE	-.016	.031	.266	1	.606
	[AGE=3.00] * EESCORE	.026	.034	.562	1	.454
	[AGE=4.00] * EESCORE	0[a]	.	.	0	.

		Estimate	Std. Error	Wald	df	Sig.
	[YRS_CURRENT=1.00] * EESCORE	.082	.042	3.760	1	.052
	[YRS_CURRENT=2.00] * EESCORE	.063	.033	3.799	1	.051
	[YRS_CURRENT=3.00] * EESCORE	.075	.031	5.802	1	.016
	[YRS_CURRENT=4.00] * EESCORE	0[a]	.	.	0	.

Note. R^2*=.058*

Table I.10

Effort Expectancy and Intentions to Use Research/Reference Applications

		Estimate	Std. Error	Wald	df	Sig.
	[RESEARCHINTENTIONS = 1.00]	.275	.608	.204	1	.651
Threshold	[RESEARCHINTENTIONS = 2.00]	1.020	.605	2.839	1	.092
	[RESEARCHINTENTIONS = 3.00]	2.661	.622	18.329	1	.000
	EESCORE	.291	.077	14.137	1	.000
	[GENDER=1.00] * EESCORE	-.020	.025	.612	1	.434
	[GENDER=2.00] * EESCORE	0[a]	.	.	0	.
	[AGE=1.00] * EESCORE	-.071	.045	2.504	1	.114
	[AGE=2.00] * EESCORE	-.053	.032	2.670	1	.102
	[AGE=3.00] * EESCORE	-.014	.036	.149	1	.699
	[AGE=4.00] * EESCORE	0[a]	.	.	0	.
Location	[YRS_CURRENT=1.00] * EESCORE	.052	.045	1.316	1	.251
	[YRS_CURRENT=2.00] * EESCORE	.008	.034	.059	1	.808
	[YRS_CURRENT=3.00] * EESCORE	-.005	.032	.028	1	.868
	[YRS_CURRENT=4.00] * EESCORE	0[a]	.	.	0	.

Note. R^2*=.067*

Table I.11

Effort Expectancy and Intentions to Use Social Media

		Estimate	Std. Error	Wald	df	Sig.
Threshold	[SMINTENTIONS = 1.00]	.704	.589	1.427	1	.232
	[SMINTENTIONS = 2.00]	1.655	.592	7.814	1	.005
	[SMINTENTIONS = 3.00]	3.294	.614	28.812	1	.000
Location	EESCORE	.231	.074	9.692	1	.002
	[GENDER=1.00] * EESCORE	-.035	.024	2.086	1	.149
	[GENDER=2.00] * EESCORE	0[a]	.	.	0	.
	[AGE=1.00] * EESCORE	-.014	.044	.103	1	.748
	[AGE=2.00] * EESCORE	.002	.031	.005	1	.943
	[AGE=3.00] * EESCORE	.015	.035	.181	1	.670
	[AGE=4.00] * EESCORE	0[a]	.	.	0	.
	[YRS_CURRENT=1.00] * EESCORE	.075	.043	3.034	1	.082
	[YRS_CURRENT=2.00] * EESCORE	.047	.033	2.031	1	.154
	[YRS_CURRENT=3.00] * EESCORE	.048	.031	2.362	1	.124
	[YRS_CURRENT=4.00] * EESCORE	0[a]	.	.	0	.

Note. R^2=.076

Table I.12

Effort Expectancy and Intentions to Use Text Messaging

		Estimate	Std. Error	Wald	df	Sig.
Threshold	[SMSINTENTIONS = 1.00]	.171	.587	.084	1	.772
	[SMSINTENTIONS = 2.00]	1.069	.587	3.314	1	.069
	[SMSINTENTIONS = 3.00]	2.484	.601	17.068	1	.000
Location	EESCORE	.214	.074	8.342	1	.004
	[GENDER=1.00] * EESCORE	.003	.024	.014	1	.906
	[GENDER=2.00] * EESCORE	0[a]	.	.	0	.
	[AGE=1.00] * EESCORE	-.155	.044	12.357	1	.000
	[AGE=2.00] * EESCORE	-.067	.031	4.539	1	.033
	[AGE=3.00] * EESCORE	-.032	.035	.869	1	.351
	[AGE=4.00] * EESCORE	0[a]	.	.	0	.

		Estimate	Std. Error	Wald	df	Sig.
	[YRS_CURRENT=1.00] * EESCORE	.080	.042	3.573	1	.059
	[YRS_CURRENT=2.00] * EESCORE	.030	.033	.844	1	.358
	[YRS_CURRENT=3.00] * EESCORE	.045	.031	2.058	1	.151
	[YRS_CURRENT=4.00] * EESCORE	0[a]	.	.	0	.

Note. R^2=.071

Table I.13

Social Influence and Intentions to Use Augmented Reality

		Estimate	Std. Error	Wald	df	Sig.
	[ARINTENTION = 1.00]	2.446	.548	19.946	1	.000
Threshold	[ARINTENTION = 2.00]	3.899	.572	46.420	1	.000
	[ARINTENTION = 3.00]	5.514	.612	81.098	1	.000
	SISCORE	.218	.046	22.937	1	.000
	[GENDER=1.00] * SISCORE	.010	.017	.342	1	.558
	[GENDER=2.00] * SISCORE	0[a]	.	.	0	.
	[AGE=1.00] * SISCORE	.004	.030	.016	1	.898
	[AGE=2.00] * SISCORE	.034	.021	2.671	1	.102
	[AGE=3.00] * SISCORE	.039	.024	2.797	1	.094
	[AGE=4.00] * SISCORE	0[a]	.	.	0	.
Location	[YRS_CURRENT=1.00] * SISCORE	.044	.029	2.272	1	.132
	[YRS_CURRENT=2.00] * SISCORE	.019	.022	.749	1	.387
	[YRS_CURRENT=3.00] * SISCORE	.019	.021	.758	1	.384
	[YRS_CURRENT=4.00] * SISCORE	0[a]	.	.	0	.

Note. R^2=.149

Table I.14

Social Influence and Intentions to Use File/Resource Sharing

		Estimate	Std. Error	Wald	df	Sig.
Threshold	[FILEINTENTION = 1.00]	.049	.560	.008	1	.930
	[FILEINTENTION = 2.00]	1.116	.548	4.158	1	.041
	[FILEINTENTION = 3.00]	2.760	.565	23.824	1	.000
Location	SISCORE	.201	.047	18.296	1	.000
	[GENDER=1.00] * SISCORE	.017	.018	.811	1	.368
	[GENDER=2.00] * SISCORE	0[a]	.	.	0	.
	[AGE=1.00] * SISCORE	.029	.032	.778	1	.378
	[AGE=2.00] * SISCORE	.018	.022	.622	1	.430
	[AGE=3.00] * SISCORE	.030	.026	1.338	1	.247
	[AGE=4.00] * SISCORE	0[a]	.	.	0	.
	[YRS_CURRENT=1.00] * SISCORE	.001	.033	.002	1	.967
	[YRS_CURRENT=2.00] * SISCORE	-.019	.024	.609	1	.435
	[YRS_CURRENT=3.00] * SISCORE	-.004	.023	.037	1	.847
	[YRS_CURRENT=4.00] * SISCORE	0[a]	.	.	0	.

Note. R^2=.093

Table I.15

Social Influence and Intentions to Use Gaming/Simulation

		Estimate	Std. Error	Wald	df	Sig.
Threshold	[GAMINGINTETNION = 1.00]	2.192	.538	16.577	1	.000
	[GAMINGINTETNION = 2.00]	3.479	.557	38.947	1	.000
	[GAMINGINTETNION = 3.00]	4.825	.586	67.681	1	.000
Location	SISCORE	.219	.045	23.571	1	.000
	[GENDER=1.00] * SISCORE	.010	.017	.327	1	.568
	[GENDER=2.00] * SISCORE	0[a]	.	.	0	.
	[AGE=1.00] * SISCORE	.006	.030	.047	1	.828
	[AGE=2.00] * SISCORE	-.004	.021	.042	1	.838
	[AGE=3.00] * SISCORE	.013	.023	.331	1	.565
	[AGE=4.00] * SISCORE	0[a]	.	.	0	.

		Estimate	Std. Error	Wald	df	Sig.
	[YRS_CURRENT=1.00] * SISCORE	.057	.029	3.773	1	.052
	[YRS_CURRENT=2.00] * SISCORE	.048	.022	4.810	1	.028
	[YRS_CURRENT=3.00] * SISCORE	.058	.021	7.365	1	.007
	[YRS_CURRENT=4.00] * SISCORE	0[a]	.	.	0	.

Note. R^2=.154

Table I.16

Social Influence and Intentions to Use Research/Reference Applications

		Estimate	Std. Error	Wald	df	Sig.
Threshold	[RESEARCHINTENTIONS = 1.00]	.855	.545	2.463	1	.117
	[RESEARCHINTENTIONS = 2.00]	1.625	.544	8.920	1	.003
	[RESEARCHINTENTIONS = 3.00]	3.303	.569	33.739	1	.000
Location	SISCORE	.243	.047	26.403	1	.000
	[GENDER=1.00] * SISCORE	-.016	.018	.826	1	.363
	[GENDER=2.00] * SISCORE	0[a]	.	.	0	.
	[AGE=1.00] * SISCORE	-.043	.031	1.971	1	.160
	[AGE=2.00] * SISCORE	-.026	.022	1.379	1	.240
	[AGE=3.00] * SISCORE	-.008	.025	.092	1	.762
	[AGE=4.00] * SISCORE	0[a]	.	.	0	.
	[YRS_CURRENT=1.00] * SISCORE	.043	.032	1.860	1	.173
	[YRS_CURRENT=2.00] * SISCORE	.011	.023	.219	1	.640
	[YRS_CURRENT=3.00] * SISCORE	-.001	.022	.004	1	.949
	[YRS_CURRENT=4.00] * SISCORE	0[a]	.	.	0	.

Note. R^2=.107

Table I.17

Social Influence and Intentions to Use Social Media

		Estimate	Std. Error	Wald	df	Sig.
Threshold	[SMINTENTIONS = 1.00]	-.052	.511	.010	1	.918
	[SMINTENTIONS = 2.00]	.884	.511	2.998	1	.083
	[SMINTENTIONS = 3.00]	2.477	.528	22.024	1	.000
Location	SISCORE	.098	.043	5.172	1	.023
	[GENDER=1.00] * SISCORE	-.019	.017	1.266	1	.261
	[GENDER=2.00] * SISCORE	0[a]	.	.	0	.
	[AGE=1.00] * SISCORE	.001	.030	.002	1	.964
	[AGE=2.00] * SISCORE	.010	.021	.212	1	.645
	[AGE=3.00] * SISCORE	.014	.023	.377	1	.539
	[AGE=4.00] * SISCORE	0[a]	.	.	0	.
	[YRS_CURRENT=1.00] * SISCORE	.049	.029	2.816	1	.093
	[YRS_CURRENT=2.00] * SISCORE	.022	.022	.976	1	.323
	[YRS_CURRENT=3.00] * SISCORE	.023	.021	1.173	1	.279
	[YRS_CURRENT=4.00] * SISCORE	0[a]	.	.	0	.

Note. R^2=.047

Table I.18

Social Influence and Intentions to Use Text Messaging

		Estimate	Std. Error	Wald	df	Sig.
Threshold	[SMSINTENTIONS = 1.00]	.284	.514	.304	1	.581
	[SMSINTENTIONS = 2.00]	1.194	.515	5.375	1	.020
	[SMSINTENTIONS = 3.00]	2.600	.531	23.935	1	.000
Location	SISCORE	.150	.044	11.875	1	.001
	[GENDER=1.00] * SISCORE	.008	.017	.218	1	.640
	[GENDER=2.00] * SISCORE	0[a]	.	.	0	.
	[AGE=1.00] * SISCORE	-.091	.030	9.436	1	.002
	[AGE=2.00] * SISCORE	-.038	.021	3.339	1	.068
	[AGE=3.00] * SISCORE	-.017	.024	.497	1	.481
	[AGE=4.00] * SISCORE	0[a]	.	.	0	.

		Estimate	Std. Error	Wald	df	Sig.
	[YRS_CURRENT=1.00] * SISCORE	.050	.029	2.981	1	.084
	[YRS_CURRENT=2.00] * SISCORE	.017	.022	.590	1	.443
	[YRS_CURRENT=3.00] * SISCORE	.027	.021	1.545	1	.214
	[YRS_CURRENT=4.00] * SISCORE	0[a]	.	.	0	.

Note. R^2=.080

Table I.19

Facilitating Conditions and Intentions to Use Augmented Reality

		Estimate	Std. Error	Wald	df	Sig.
	[ARINTENTION = 1.00]	1.767	.514	11.806	1	.001
Threshold	[ARINTENTION = 2.00]	3.159	.534	35.003	1	.000
	[ARINTENTION = 3.00]	4.751	.571	69.336	1	.000
	FCSCORE	.200	.051	15.314	1	.000
	[GENDER=1.00] * FCSCORE	.010	.019	.256	1	.613
	[GENDER=2.00] * FCSCORE	0[a]	.	.	0	.
	[AGE=1.00] * FCSCORE	-.009	.035	.066	1	.797
	[AGE=2.00] * FCSCORE	.017	.024	.495	1	.482
	[AGE=3.00] * FCSCORE	.034	.027	1.551	1	.213
	[AGE=4.00] * FCSCORE	0[a]	.	.	0	.
Location	[YRS_CURRENT=1.00] * FCSCORE	.058	.034	2.815	1	.093
	[YRS_CURRENT=2.00] * FCSCORE	.027	.026	1.135	1	.287
	[YRS_CURRENT=3.00] * FCSCORE	.031	.025	1.612	1	.204
	[YRS_CURRENT=4.00] * FCSCORE	0[a]	.	.	0	.

Note. R^2=.108

Table I.20

Facilitating Conditions and Intentions to Use File/Resource Sharing

		Estimate	Std. Error	Wald	df	Sig.
Threshold	[FILEINTENTION = 1.00]	.383	.546	.492	1	.483
	[FILEINTENTION = 2.00]	1.500	.534	7.877	1	.005
	[FILEINTENTION = 3.00]	3.186	.558	32.644	1	.000
Location	FCSCORE	.278	.055	25.580	1	.000
	[GENDER=1.00] * FCSCORE	.027	.022	1.482	1	.223
	[GENDER=2.00] * FCSCORE	0[a]	.	.	0	.
	[AGE=1.00] * FCSCORE	.008	.039	.044	1	.834
	[AGE=2.00] * FCSCORE	-.010	.027	.138	1	.711
	[AGE=3.00] * FCSCORE	.013	.031	.173	1	.678
	[AGE=4.00] * FCSCORE	0[a]	.	.	0	.
	[YRS_CURRENT=1.00] * FCSCORE	.014	.039	.135	1	.713
	[YRS_CURRENT=2.00] * FCSCORE	-.007	.028	.060	1	.807
	[YRS_CURRENT=3.00] * FCSCORE	.012	.027	.182	1	.669
	[YRS_CURRENT=4.00] * FCSCORE	0[a]	.	.	0	.

Note. R^2=.127

Table I.21

Facilitating Conditions and Intentions to Use Gaming/Simulation

		Estimate	Std. Error	Wald	df	Sig.
Threshold	[GAMINGINTETNION = 1.00]	1.151	.501	5.291	1	.021
	[GAMINGINTETNION = 2.00]	2.408	.513	22.018	1	.000
	[GAMINGINTETNION = 3.00]	3.717	.537	47.936	1	.000
Location	FCSCORE	.162	.050	10.498	1	.001
	[GENDER=1.00] * FCSCORE	.014	.019	.502	1	.479
	[GENDER=2.00] * FCSCORE	0[a]	.	.	0	.
	[AGE=1.00] * FCSCORE	.008	.035	.055	1	.815
	[AGE=2.00] * FCSCORE	-.020	.024	.683	1	.409
	[AGE=3.00] * FCSCORE	.012	.027	.186	1	.666
	[AGE=4.00] * FCSCORE	0[a]	.	.	0	.

	[YRS_CURRENT=1.00] * FCSCORE	.069	.034	4.037	1	.045
	[YRS_CURRENT=2.00] * FCSCORE	.057	.026	5.061	1	.024
	[YRS_CURRENT=3.00] * FCSCORE	.071	.025	8.159	1	.004
	[YRS_CURRENT=4.00] * FCSCORE	0[a]	.	.	0	.

Note. R^2=.103

Table I.22

Facilitating Conditions and Intentions to Use Research/Reference Applications

		Estimate	Std. Error	Wald	df	Sig.
	[RESEARCHINTENTIONS = 1.00]	1.516	.540	7.882	1	.005
Threshold	[RESEARCHINTENTIONS = 2.00]	2.293	.542	17.903	1	.000
	[RESEARCHINTENTIONS = 3.00]	4.099	.575	50.754	1	.000
	FCSCORE	.368	.057	42.346	1	.000
	[GENDER=1.00] * FCSCORE	-.020	.021	.949	1	.330
	[GENDER=2.00] * FCSCORE	0[a]	.	.	0	.
	[AGE=1.00] * FCSCORE	-.079	.038	4.444	1	.035
	[AGE=2.00] * FCSCORE	-.068	.027	6.499	1	.011
	[AGE=3.00] * FCSCORE	-.034	.030	1.271	1	.260
	[AGE=4.00] * FCSCORE	0[a]	.	.	0	.
Location	[YRS_CURRENT=1.00] * FCSCORE	.063	.038	2.701	1	.100
	[YRS_CURRENT=2.00] * FCSCORE	.022	.028	.660	1	.417
	[YRS_CURRENT=3.00] * FCSCORE	.018	.026	.475	1	.491
	[YRS_CURRENT=4.00] * FCSCORE	0[a]	.	.	0	.

Note. R^2=.171

Table I.23

Facilitating Conditions and Intentions to Use Social Media

		Estimate	Std. Error	Wald	df	Sig.
Threshold	[SMINTENTIONS = 1.00]	.185	.499	.138	1	.710
	[SMINTENTIONS = 2.00]	1.117	.499	5.006	1	.025
	[SMINTENTIONS = 3.00]	2.742	.519	27.871	1	.000
Location	FCSCORE	.141	.050	7.982	1	.005
	[GENDER=1.00] * FCSCORE	-.035	.020	3.137	1	.077
	[GENDER=2.00] * FCSCORE	0[a]	.	.	0	.
	[AGE=1.00] * FCSCORE	-.013	.035	.134	1	.715
	[AGE=2.00] * FCSCORE	-.001	.024	.001	1	.982
	[AGE=3.00] * FCSCORE	.012	.027	.187	1	.666
	[AGE=4.00] * FCSCORE	0[a]	.	.	0	.
	[YRS_CURRENT=1.00] * FCSCORE	.065	.035	3.452	1	.063
	[YRS_CURRENT=2.00] * FCSCORE	.038	.026	2.177	1	.140
	[YRS_CURRENT=3.00] * FCSCORE	.042	.025	2.900	1	.089
	[YRS_CURRENT=4.00] * FCSCORE	0[a]	.	.	0	.

Note. R^2=.066

Table I.24

Facilitating Conditions and Intentions to Use Text Messaging

		Estimate	Std. Error	Wald	df	Sig.
Threshold	[SMSINTENTIONS = 1.00]	.568	.503	1.273	1	.259
	[SMSINTENTIONS = 2.00]	1.463	.505	8.395	1	.004
	[SMSINTENTIONS = 3.00]	2.923	.525	30.959	1	.000
Location	FCSCORE	.213	.051	17.344	1	.000
	[GENDER=1.00] * FCSCORE	-.005	.020	.054	1	.815
	[GENDER=2.00] * FCSCORE	0[a]	.	.	0	.
	[AGE=1.00] * FCSCORE	-.134	.036	13.997	1	.000
	[AGE=2.00] * FCSCORE	-.058	.025	5.314	1	.021
	[AGE=3.00] * FCSCORE	-.029	.028	1.092	1	.296

[AGE=4.00] * FCSCORE	0[a]	.	.	0	.
[YRS_CURRENT=1.00] * FCSCORE	.064	.035	3.395	1	.065
[YRS_CURRENT=2.00] * FCSCORE	.034	.026	1.694	1	.193
[YRS_CURRENT=3.00] * FCSCORE	.042	.025	2.755	1	.097
[YRS_CURRENT=4.00] * FCSCORE	0[a]	.	.	0	.

Note. R^2=.104