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Graduate Student Perceptions of Multi-modal Tablet Use in Academic Environments

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Graduate Student Perceptions of Multi-modal Tablet Use in Academic Environments

by

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Dedication

To my mother and father who ensured that I enriched both my mind and my body, to my grandmother who provided educational leadership and wisdom in my life, and to my sister for being strong like iron and sharpening me.

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Table of Contents

List of Tables iv

List of Figures vii

Abstract viii

Chapter 1: Introduction 1
- Statement of the Problem 5
- Purpose of the Study 7
- Research Questions 7
- Theoretical Framework 8
  - Theory of Reasoned Action 9
  - Theory of Planned Behavior 9
  - Technology Acceptance Model 11
- Significance of the Study 12
- Definition of Terms 13
- Organization of Study 15

Chapter 2: Literature Review 16
- University Adoption of Technology 16
- Multi-modal Tablets in Higher Education 18
  - Ebooks 18
    - Advantages 22
    - Disadvantages 23
  - Multi-modal Tablets 24
    - Disadvantages 26
- Unified Theory of Acceptance and Use of Technology 26
  - Effort Expectancy 29
  - Social Influence 30
  - Facilitating Conditions 31
- UTAUT2 31
  - Age and Gender 34
- Tablet Adoption and Health Professional Students 36
- Self-directed Learning and Technology Adoption 39
- Technology Use and Students with Disabilities 41
- Summary 44

Chapter 3: Methods 45
Research Design 45
Population and Sample 46
Instrumentation 48
UTAUT2 49
Validity and Reliability of the UTAUT2 51
Questionnaire 53
Data Collection 54
Data Analysis 55
Research Questions 55
Summary 57

Chapter 4: Results 59
Demographic Characteristics of the Participants 59
Performance Expectancy 63
Effort Expectancy 64
Facilitating Conditions 66
Social Influence 67
Habit 68
Price Value 70
Hedonic Motivation 72
Behavioral Intention 73
Reliability of the UTUAT2 Instrument 74
Research Questions 76
Gender 94
Age 96
College enrollment 98
Previous experience 99
Observations 100

Chapter 5: Recommendations 105
Summary of the Study 105
Population and sample 106
Unified Theory of Acceptance and Use of Technology 107
Findings 107
Conclusions 108
Implications 110
Recommendations for Further Research 113

References 118

Appendix A: Demographic Form 131

Appendix B: Unified Theory of Acceptance and Use of Technology Study Survey 133

Appendix C: Unified Theory of Acceptance and Use of Technology 2 (Venkatesh et al., 2012) 142

Appendix D: UTAUT Model and Collaboration Technology Use as Presented in Brown et al., 2010 145

Appendix E: Survey Items Based on the UTAUT2 Survey Framework 149

Appendix F: Participant Informed Consent and IRB Approval Letter 151

Appendix G: Survey Participation Announcement 154

Appendix H: Individual Item Per Construct Means 156

Appendix I: UTAUT Graduate Student Responses 159

About the Author ..... End Page

List of Tables

Table 1 Advantages of Multi-Modal Tablets Identified in Specific Studies in the Literature 27

Table 2 Research Questions 58

Table 3 Demographic Data by Graduates by College Enrollment 61

Table 4 Tablet Ownership Frequency By Tablet Type 62

Table 5 Performance Expectancy Mean Scores Across Four Colleges 64

Table 6 ANOVA Summary Table for Performance Expectancy Across Four Colleges 64

Table 7 Effort Expectancy Mean Scores Across Four Colleges 65

Table 8 ANOVA Summary Table for Effort Expectancy Across Four Colleges 66

Table 9 Facilitating Conditions Mean Scores Across Four Colleges 67

Table 10 ANOVA Summary Table for Facilitating Conditions Across Four Colleges 67

Table 11 Social Influence Mean Scores Across Four Colleges 68

Table 12 ANOVA Summary Table for Social Influence Across Four Colleges 68

Table 13 Habit Mean Scores Across Four Colleges 70

Table 14 ANOVA Summary Table for Habit Across Four Colleges 70

Table 15 Price Value Mean Scores Across Four Colleges 71

Table 16 ANOVA Summary Table for Price Value Across Four Colleges 71

Table 17 Hedonic Motivation Mean Scores Across Four Colleges 72

Table 18 ANOVA Summary Table for Hedonic Motivation Across Four Colleges 73

Table 19 Behavioral Intention Mean Scores Across Four Colleges 74

Table 20 ANOVA Summary Table for Behavioral Intention Across Four Colleges 74

Table 21 Internal Reliability Coefficients for Scales Scale Using Cronbach's Alpha 75

Table 22 Pearson's Correlations and Probability Values for UTAUT Constructs 77

Table 23 ANOVA Summary Table With R^2 for Behavioral Intention 78

Table 24 Summary of Multiple Regression Analysis for Behavioral Intention 79

Table 25 Relationship of UTAUT Constructs to Reported Use 79

Table 26 ANOVA Summary Table With R^2 for Use 80

Table 27 Summary of Multiple Regression Analysis for Use.....81

Table 28 ANOVA Summary Table with R^2 for Behavioral Intention With the Performance Expectancy and Habit Interaction Predictor Variables.....82

Table 29 Summary of Multiple Regression Analysis for Behavioral Intention With the Performance Expectancy and Habit Interaction Predictor Variables.....82

Table 30 ANOVA Summary Table with R^2 for Behavioral Intention With the Effort Expectancy and Habit Interaction Predictor Variables 84

Table 31 Summary of Multiple Regression Analysis for Behavioral Intention With the Effort Expectancy and Habit Interaction Predictor Variables.....85

Table 32 ANOVA Summary Table with R^2 for Behavioral Intention With the Social Influence and Habit Interaction Predictor Variables 86

Table 33 Summary of Multiple Regression Analysis for Behavioral Intention With the Social Influence and Habit Interaction Predictor Variables.....86

Table 34 ANOVA Summary Table With R^2 for Behavioral Intention With the Performance Expectancy and Hedonic Motivation Interaction Predictor Variables.....88

Table 35 Summary of Multiple Regression Analysis for Behavioral Intention With the Performance Expectancy and Hedonic Motivation Interaction Predictor Variables.....88

Table 36 ANOVA Summary Table With R^2 for Behavioral Intention With the Effort Expectancy and Hedonic Motivation Interaction Predictor Variables 89

Table 37 Summary of Multiple Regression Analysis for Behavioral Intention With the Effort Expectancy and Hedonic Motivation Interaction Predictor Variables.....90

Table 38 ANOVA Summary Table With R^2 for Behavioral Intention With the Social Influence and Hedonic Motivation Interaction Predictor Variables 90

Table 39 Summary of Multiple Regression Analysis for Behavioral Intention With the Social Influence and Hedonic Motivation Interaction Predictor Variables 91

Table 40 ANOVA Summary Table With R^2 for Behavioral Intention With the Performance Expectancy and Price Value Interaction Predictor Variables 92

Table 41 Summary of Multiple Regression Analysis for Behavioral Intention With the Performance Expectancy and Price Value Interaction Predictor Variables 93

Table 42 ANOVA Summary Table With R^2 for Behavioral Intention With the Effort Expectancy and Price Value Interaction Predictor Variables 93

Table 43 Summary of Multiple Regression Analysis for Behavioral Intention With the Effort Expectancy and Hedonic Motivation Interaction Predictor Variables 94

Table 44 ANOVA Summary Table With R^2 for Behavioral Intention With the Social Influence and Price Value Interaction Predictor Variables 94

Table 45 Summary of Multiple Regression Analysis for Behavioral Intention With the Social Influence and Price Value Interaction Predictor Variables 95

Table 46 Behavioral Intention Mean Scores for Females and Males 96

Table 47 Tests of Normality for Behavioral Intention for All Respondents 96

Table 48 Comparison of Means Between Male and Female Participants 97

Table 49 ANOVA Summary Table of Behavioral Intention Among Age Groups 98

Table 50 Behavioral Intention Mean Scores Across Age Groups 98

Table 51 Comparison of Means of Behavioral Intention Among Groups by Previous Experience 100

Table 52 Means and Confidence Intervals for Behavioral Intention by Levels of Experience 101

Table 53 Pair-wise Tukey HSD Comparisons Across Levels of Experience 102

Table 54 Tukey HSD Grouping for Differences in Previous Experience Group Means 103

Table I1 Graduate Student Survey Response Frequencies 160

List of Figures

Figure 1. Theory of Reasoned Action (TRA) beginning with attitude and subjective norms impact on Behavioral Intention that directly affects behavior. Adapted from Ajzen & Fishbein, 1975; Fishbein & Ajzen, 1980. 9

Figure 2. Theory of Planned Behavior (TPB) extends the TRA by incorporating perceived behavioral control which directly behavior and indirectly affects behavior through intention. Adapted from Ajzen, 1991; Madden et al., 1992..... 10

Figure 3. Technology Acceptance Model (TAM) developed by Davis (1985) and based on the TRA, is designed to predict a person's computer usage behavior. 12

Figure 4. UTAUT Model (Venkatesh et al., 2003) showing on the left the four constructs that act as determinants of user acceptance and usage of a system. Printed with permission. 28

Figure 5. The UTAUT2 Model as presented by Venkatesh et al. (2012)..... 50

Figure 6. Graph of Behavior Intent as a function of Habit and Performance Expectancy with Moderation..... 83

Figure 7. Graph of multiple regression analysis for Behavioral Intention with the Social Influence and Habit interaction predictor variable..... 87

Abstract

The purpose of this study was to explore graduate student perceptions of use and the ease of use of multi-modal tablets to access electronic course materials, and the perceived differences based on students' gender, age, college of enrollment, and previous experience.

This study used the Unified Theory of Acceptance and Use of Technology to identify the constructs that may explain a graduate student's intention to use a multi-modal tablet in graduate course work. This study administered the UTAUT to 224 graduate students from four different colleges at a regional university. The models developed from the UTAUT explained 80% of the variability in Behavioral Intention values and 55% of the reported Use values. The results of the study showed that only Performance Expectancy, Social Influence, Hedonic Motivation, and Habit showed significance in explaining Behavioral Intention. Performance Expectancy, Hedonic Motivation, and Habit also showed moderately strong to strong correlations with Behavioral Intention. The regression analysis revealed a positive significant relationship with reported Use and Habit and reported Use and Behavioral Intention. Habit and Behavioral Intention both had strong correlations with reported Use. Habit affects the relationship of Performance Expectancy and Behavioral Intention. Habit, Price Value, or Hedonic Motivation did not have a significant affect on the relationship between Behavioral Intention and Effort Expectancy or Behavioral Intention and Social Influence.

When trying to explain a graduate student's intention to use a multi-modal tablet, only Performance Expectancy, Habit, Social Influence, Hedonic Motivation, and Previous Experience appeared to sufficiently explain whether a student intends to adopt the device.

Across age groups, intention to use the tablet device does not vary by age in this study. There were no differences in Behavioral Intention among groups by college enrollment. Individuals with more experience using a tablet, as measured in years, have a higher predicted intention to use the tablet in the future than individuals with no previous experience using a tablet. Individuals with 5 or more years using a multi-modal tablet have a higher intention to use the device than those with less than 3 years experience. The results of this study support the concept that Habit is the strongest predictor of Use in the framework.

Chapter 1

Introduction

According to several authors (Dickson & Segars, 1999; Ni, 2004), the new teaching environment afforded by the phenomenon known as ubiquitous computing has required a paradigm shift in teaching practice. The expansion of wireless networks and networking devices on higher education campuses has provided the foundation for ubiquitous computing on the physical institution campus.

Mobile learning is a term that has been used when discussing ubiquitous computing (Ni, 2004). The prolific use of mobile and tablet devices and wireless networking provided on the higher education institution campus has blurred the lines of e-learning from m-learning or mobile learning (Lee & Chan, 2005; Quinn, 2000; Wurst, Smarkola, & Gaffney, 2008). The Pearson Foundation (2012) found that ownership of these devices by college students and college-bound high school seniors had tripled over the past year. Due to ubiquitous computing on the campuses of higher education institutions, the educational experience has evolved higher education from an environment filled primarily of textbooks, lectures, and exams to the potential for immersive digital learning environments that provide flexible and ease of access to digital learning materials through personal computers (PC) or post-PC devices (multi-modal tablets).

Multi-modal tablets are becoming more and more advanced blurring the line between laptop and multi-modal tablet. Microsoft‘s Windows Surface Pro runs the

same operating system as new desktop and laptop computers that have Windows 10 installed on them. The Surface Pro appears to be a multi-modal tablet with touch screen features similar to the iPad or Kindle Fire, yet comes with an attachable keyboard to provide power users of their office products such as Microsoft Word the ease of using a tactile input keyboard instead of a glass keyboard.

Ubiquitous computing environments allow universities to adopt post-PC devices in favor of desktops and laptops (Murphy, 2011; Weiser, 1998). Murphy (2011) surveyed 36 universities and discovered that 27 of them had adopted the iPad as a mode of delivering course content to their students. Following the success of Apple's iPad, many other companies have created similar multi-modal tablets. Learner preference for a multi-modal tablet may be a factor in determining whether or not the learner will successfully adopt or intend to adopt a new technology in their learning. With other types of multi-modal tablets arriving on the market, such as the Nexus 7 from Google or Samsung Galaxy Tablet, students now have additional options to choose from when adopting a multi-modal tablet. Multi-modal tablets offer a combination of three innovative technologies: digital text, electronic readers, and multi-modal devices (Bush & Cameron, 2011).

Researchers have studied the use of multi-modal tablets on a device-by-device basis since some institutions have instituted pilot tests and/or mandated students use a specific device for a particular degree program or class (Bush & Cameron, 2011; Goodwin, Shurtz, Gonzalez, & Clark, 2012; Martinez-Estrada & Conaway, 2012; Pattuelli & Rabina, 2010). These devices may be required in the curriculum and thus either the institution has provided that specific device to the student as part of tuition or

students are required to purchase the devices on their own. Proponents of eReaders and eBooks argue that eBooks become more cost effective over time when compared to their print counterparts. In a study from University of Texas cited by Bunkell, the initial costs for per use of print books ranges from $3.24 to $28.57, while the up front cost for the usage of an eBook ranges from $0.25 to $4.80 with yearly maintenance costs for eBooks decreasing each year in comparison to their print counterparts (Bunkell & Dyas-Correia, 2009; O'Hare & Smith, 2012).

Previous research (Bush & Cameron, 2011; Pattuelli & Rabina, 2010) has reported that multi-modal tablets lacked the necessary tools to support many of the learning strategies students had developed in school. Studies which explored usability found the desire for eBooks to provide hyperlinks, within text search capabilities, dictionary, annotations, note-taking, portability, and increased content integration (Abdullah & Gibb, 2008; Agee, 2003; Bell, McCoy, & Peters, 2002; Bush & Cameron, 2011; Chu, 2003; Dominick, 2005; Mercieca, 2004; Nielsen, 2009; Noorhidawati & Gibb, 2008; Schcolnik, 2001; Simon, 2002; Vernon, 2006). Prior research in the field primarily focused on dedicated eReader devices, such as the Sony Reader or Kindle, and not multi-modal tablets and their multimodal properties. More recently, studies have been published that examine the use of the iPad, a multi-modal tablet, in the undergraduate classroom (Bush & Cameron, 2011; Francis, 2012; Marcial, 2012; Mathur, 2011; Murphy, 2011; Tualla, 2011). Other studies found that students wished for more multimodal features such as sound, animation, navigation, and annotation tools (Allison, 2003; Baker, 2010; Bush & Cameron, 2011; Chu, 2003; Landoni & Gibb, 2000; Mercieca, 2004; Nielsen, 1996; O'Hara & Sellen, 1997; Vernon, 2006). Multi-modal

tablets have been updated to incorporate many of the features that research has identified as necessary for students to be successful with these devices in an academic environment (Bush & Cameron, 2011).

Due to the flexibility and accessibility of digital formats and innovations in technology, educators, researchers, and students are able to enhance learning and creativity through exploration of interactive and immersive environments (Vogl, Lee, Russell, & Genesereth, 2012). Multi-modal tablets and digital texts may be of benefit for students with learning disabilities or visual impairments as the texts can be easily manipulated within the multi-modal tablet (Pattuelli & Rabina, 2010). Nelson (2008) reports 10% to 20% of enrolled university students are choosing to purchase the digital textbook over the print textbook for any given course. Digital textbooks or eBooks could be the easiest method for institutions to begin advocating the adoption of multi-modal tablets to access higher education course materials. Companies and institutions are investing money in the creation of materials for multi-modal tablets.

Textbook publishers are offering various titles of their textbooks in eBook format in the iBooks store, Amazon.com Kindle store, Barnes & Noble Nook store, and other platforms to distribute their eTextbooks. Other platforms allow students to buy only a section of the book they need for the specific class. This purchasing method cannot be accomplished with print books. Inkling is a service that allows students to decide to buy a whole book or just specific chapters. Students may have to decide if they want an eBook or a traditional physical textbook since most publishers are selling the different textbook delivery methods as separate items, unlike when some textbooks used to come packaged together with digital materials on CDs or DVDs. Reynolds and Ioffe

(2010) projected that in 2014 digital textbooks would “surpass 18% of combined new textbook sales for the Higher Education and Career Education markets” (p. 2). Cumaoğlu, Saçici, and Torun (2012) found that students’ pleasure reading consists mostly of print books while they use eBooks and other digital text sources as the primary sources for research books and course materials. The authors also recognize that this finding may be due to the fact that much of the eBooks are research or course textbooks. Jamali, Nicholas, and Rowlands (2009) found that males were significantly more likely to access research materials through their institution’s virtual collection rather than visit the physical library at their university (Jamali et al., 2009; Nicholas, Rowlands, Clark, Huntington, Jamali, Ollé, 2008).

Previous studies (Bush & Cameron, 2011; Marmarelli & Ringle, 2009; Mathur, 2011; Miller, Nutting, & Baker-Eveleth, 2012; Tualla, 2011) explored the use of multi-modal tablets or mobile technology in higher education, but most of these studies focus on undergraduate population. Even though many institutions are evaluating flexible learning or anytime-anywhere access to learning for the first generation of digital learners entering college, few studies have investigated how recent information technology (IT) changes has been adopted by graduate students. This study sought to determine which factors could explain graduate students’ Behavioral Intention to use multi-modal tablets to access higher education course materials.

Statement of the Problem

There have been a limited number of studies concerning graduate students’ perceived use and ease of use of multi-modal tablets in higher education; even fewer focus on the acceptance and use of multi-modal tablets in academic environments

among graduate-level students. More and more students in college have embraced new digital technologies from smartphones (iPhone, Android, Windows 7 Phones) and dedicated eReaders (Kindle and Nook series eBook readers) to interactive whiteboards and video conferencing software (Elias, Phillips, & Luechtefeld, 2012). The Pearson Foundation (2012) reports that the low-priced and flexible formats of electronic textbooks (e-textbooks) make them more popular among college students. According to Winkler (2012), the portability and ease of search e-textbooks has provided added conveniences that many budget conscious students find attractive.

While many of these devices are popular, there has been little research about the educational advantages of these tools over other systems that are already in place. Furthermore there are limited studies that explore the acceptance of multi-modal tablets in higher education based on gender, age, students' degree area of study, or previous experience. Previous studies have shown that students did not prefer or purchase e-textbooks over traditional print textbooks when given an option between the two textbook formats (Shepperd, Grace, & Koch, 2008; Woody, Daniel, & Baker, 2010).

In a more recent study, Bush and Cameron (2011) found that the majority of faculty and undergraduate students would recommend the use of the iPad in the academic environment to access digital course materials even though they suggested more features needed to be added to the iPad at the time of the study. Most of the pilot studies in the research have focused on one specific multi-modal tablet or eReader within the study. Many institutions have invested in the iPad in various ways including providing them as an incentive to attract new students to directly integrate this device into their curriculum (Bush & Cameron, 2011). Other studies have focused on students'

perceptions of mobile learning and accessing course material through an application on a multi-modal tablet (Mathur, 2011). Both of the studies by Bush and Cameron (2011) and Mathur (2011) focused on either one specific device or application. There has been limited research about graduate student perceptions of using multi-modal tablets in the higher education setting. In addition, there are few studies that explored the perceptions of students based on previous experience, students' degree enrollment, age, or gender.

Purpose of the Study

The purpose of this study was to explore graduate student perceptions of use and the ease of use of multi-modal tablets to access electronic course materials and the perceived differences based on student gender, age, college of enrollment, and previous experience. This study investigated which constructs might explain a graduate student's acceptance and use of a multi-modal tablet in the academic environment.

Research Questions

By identifying factors that explain the adoption of technology by graduate students in the academic environment, this study should inform program and IT decision makers in the implementation of multi-modal tablets in graduate programs of study. The Unified Theory of Acceptance and Use (UTAUT2) (Venkatesh, Thong, & Xu, 2012) was used to derive the research questions for this study.

1. Which of the following factors explain a student's Behavioral Intention to use a multi-modal tablet in the academic environment: Performance Expectancy, Effort Expectancy, Social Influence, Facilitating Conditions, Habit, Price Value, and Hedonic Motivation?

2. Which of the following factors explain a student's reported use of a multi-modal tablet in the academic environment: Performance Expectancy, Effort Expectancy, Facilitating Conditions, Social Influence, Habit, Price Value, and Hedonic Motivation?
3. To what extent does the relationship between the following factors and Behavioral Intention change depending on the value of Habit: Performance Expectancy, Effort Expectancy, and Social Influence?
4. To what extent does the relationship between the following factors and Behavioral Intention change depending on the value of Hedonic Motivation: Performance Expectancy, Effort Expectancy, and Social Influence?
5. To what extent does the relationship between the following factors and Behavioral Intention change depending on the value of Price Value: Performance Expectancy, Effort Expectancy, and Social Influence?
6. Is there a statistically significant difference between demographic factors such as gender, age previous experience, student status and degree program in Behavioral Intention to use multi-modal tablets?

Theoretical Framework

For decades researchers (Fishbein & Ajzen, 1975; Osgood & Tannenbaum, 1955) have explored the factors that determine the human behavior in order to be able to better predict behavior. In information sciences, researchers (Compeau & Higgins, 1995; Davis, 1989; Venkatesh, Morris, & Davis, 2003) have been trying to understand for years what factors determine an individual's behavior of adopting new information

technologies. Davis, Bagozzi, and Warshaw (1989) began exploring how to better predict and explain use of information technology by the individual.

Theory of reasoned action. One of the theories of human behavior is the Theory of Reasoned Action (TRA) (Ajzen & Fishbein, 1980; Fishbein & Ajzen, 1975). This theory has been well researched and has also been the foundation of several behavior prediction instruments developed since its creation (Davis, 1989; Venkatesh et al., 2003). TRA is general enough that it has been used to predict a wide array of behaviors (Ajzen & Fishbein, 1980; Fishbein & Ajzen, 1975). According to TRA, Behavioral Intention (BI) to perform a behavior is determined by the individual's beliefs that performance of the specified behavior leads to a specific outcome (Madden, Ellen, & Ajzen, 1992). Figure 1 presents the Theory of Reasoned Action framework developed by Ajzen and Fishbein (1980).

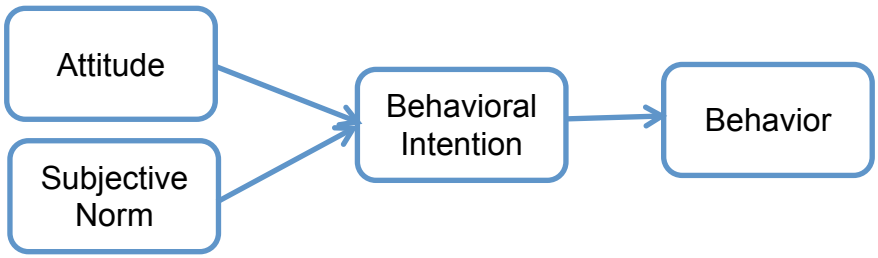

Figure 1. Theory of Reasoned Action (TRA) beginning with attitude and subjective norms impact on Behavioral Intention that directly affects behavior. Adapted from Ajzen & Fishbein, 1975; Fishbein & Ajzen, 1980.

Theory of planned behavior. The Theory of Planned Behavior (TPB) addresses its limitations in dealing with the individuals' behaviors over which they have

little volitional control (Ajzen, 1991; Ajzen & Fishbein, 1980; Fishbein & Ajzen, 1975). Presented in Figure 2, the TPB incorporates the perceived behavioral control construct as an additional determinant of Behavioral Intention and behavior. Perceived behavioral control is the perceived ease of use or difficulty of performing the behavior and is believed to reveal past experiences and anticipate future barriers and obstacles to behavior. The addition of perceived behavioral control to attitudes towards a behavior and subjective norms with respect to the behavior can directly predict behavioral achievement with a high degree of accuracy (Ajzen, 1991). The TPB has been used to predict intention and behavior in many studies in various settings including the understanding of the individual's acceptance and use of different technologies (Venkatesh et al., 2003).

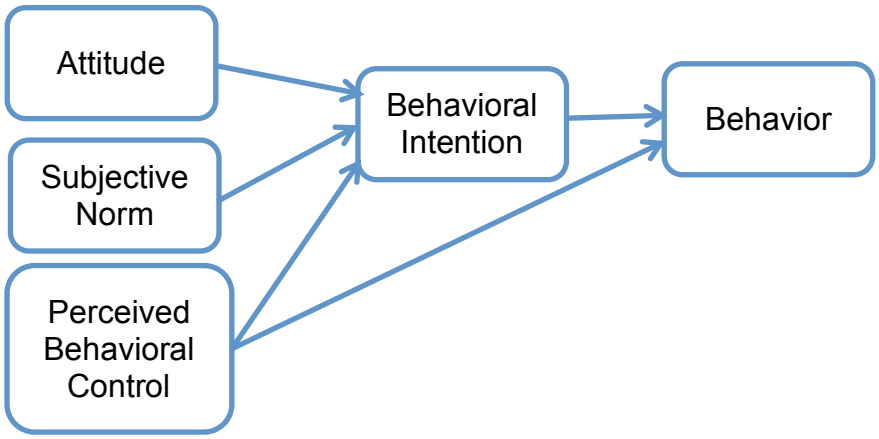

Figure 2. Theory of Planned Behavior (TPB) extends the TRA by incorporating perceived behavioral control which directly behavior and indirectly affects behavior through intention. Adapted from Ajzen, 1991; Madden et al., 1992.

Technology acceptance model. Davis (1985) introduced the Technology Acceptance Model (TAM), which was adapted from the TRA, to specifically "explain computer usage behavior" (Davis et al., 1989, p. 983). While the TRA is a general model that can be used in various environments to explain any human behavior, the TAM is specifically designed to predict and explain user acceptance or rejection of computer information systems (Davis, 1985; Davis et al., 1989). "A key purpose of TAM, therefore, is to provide a basis for tracing the impact of external factors on internal beliefs, attitudes, and intentions" (Davis et al., 1989, p. 985).

The TAM states that perceived ease of use and perceived usefulness are linked to the user's attitude toward using a particular technology. "Perceived ease of use has a causal effect on perceived usefulness" (Davis, 1985, p. 24). Perceived ease of use is the belief that using a technology will be free of effort. Perceived usefulness is the extent to which an individual believes that a specific technology will enhance his or her job performance. According to Venkatesh (2008), the TAM, represented in Figure 3, has garnered empirical support over the past two decades. Google Scholar provided over 17,000 citations and Microsoft academic listed over 4,800 citations to the Davis's (1989) "Perceived usefulness, perceived ease of use, and User Acceptance of Information Technology" which introduces the TAM to this stream of research. "TAM posits that two particular beliefs, perceived usefulness and perceived ease of use, are of primary relevance for computer acceptance behaviors" (Davis et al., 1989, p. 985).

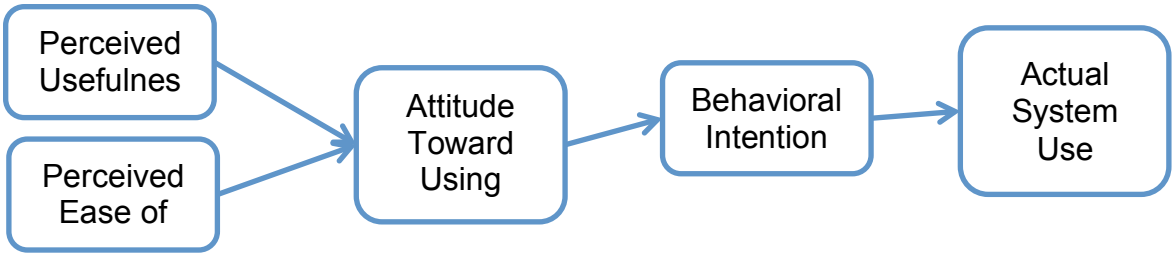

Figure 3. Technology Acceptance Model (TAM) developed by Davis (1985) and based on the TRA is designed to predict a person's computer usage behavior.

Significance of the Study

This study contributed to existing research of individual user acceptance of technology by exploring the factors that affect adoption of computer technology among higher education students. This study examined factors to explain graduate student adoption of multi-modal tablet devices similar to the iPad, Samsung Note, or Google Nexus 10. Previous studies have identified features necessary to make the dedicated eReader and tablet devices more useful for students in an educational environment (Agee, 2003; Bell et al., 2002; Chu, 2003; Landoni & Gibb, 2000; Simon, 2002).

The new multi-modal tablets on the market today have adopted many of these features. This research should also explain to multi-modal tablet developers, institutions of higher education, and textbook developers the factors that determine one's acceptance of mobile tablets and eBooks in a higher education learning environment. The entrance of mobile devices into academia has provided researchers with an ever-changing body of work to be explored to gain an understanding of the impact of these devices on students' learning. The devices are continually being updated as more and more is learned about what users need in a mobile multi-modal tablet (Moran, Hawkes, & El Gayar, 2010). As additional features are being added in

the multi-modal tablet and eBook industries, an increasing number of students indicate their preference to read a book on an eReader or tablet than to carry around physical print book for reading in one capacity or another in the academic arena (Goodwin et al., 2012; Ugaz & Resnick, 2008). Research findings vary as different studies have employed different types of devices; some studies deployed dedicated eReaders such as the Sony PRS 505 Reader or the Kindle 2 (Gibson & Gibb, 2011; Goodwin et al., 2012; Richardson & Mahmood, 2012; Kissenger, 2011; Marmarelli & Ringle, 2009; Martinez-Estrada & Conaway, 2012), while others have used multi-modal tablets such as the iPad or Kindle Fire (Bush & Cameron, 2011; Goodwin et al., 2012; Richardson & Mahmood, 2012; Martinez-Estrada & Conaway, 2012; Melhuish & Falloon, 2010; Tualla, 2011).

Definition of Terms

The following terms were used within this study according to the definitions presented:

Academic Environment—the setting in which an individual attempts to learn while accessing resources and materials provided at or through a formal institution of learning.

Behavioral Intention—the individual's reported intention to use the multi-modal tablet

Effort Expectancy—the individual's perception of the extent to which the use of a particular technology or system is effortless, also referred to as ease of use (Venkatesh et al., 2003).

Facilitating Conditions— the individual's perception of the available organizational and technical infrastructure to support for use of the multi-modal tablet (Venkatesh et al., 2003,)

Habit— the individual's perception of automatic and repeated use of the multi-modal tablet (Venkatesh et al., 2012).

Hedonic Motivation— the individual's perception of the fun or pleasure derived from using the multi-modal tablet (Venkatesh et al., 2012).

Graduate Student—individual enrolled at an institution of higher education participating in graduate-level course work at that institution.

Multi-modal Tablet—tablet form computing device that allows input and output to be conveyed over multiple channels such as voice, graphics, and motion/gesture.

Performance Expectancy—the extent to which a user believes that the use of a particular technology or system will increase their productivity. Increases performance or productivity (Brown et al., 2010).

Price Value— the individual's perception of the tradeoff between the perceived benefits of the using a multi-modal tablet and its monetary cost (Venkatesh et al., 2012).

Social Influence— the individual's perception of the other important people's opinion of using the multi-modal tablet. Social Influence includes the participant's family, friends, professors, and other important people to the participant opinions of using the multi-modal tablet (Venkatesh et al., 2012).

Use— the individual's reported use of the multi-modal tablet in a variety of tasks.

Organization of Study

Chapter 1 introduces the study, presenting the problem, purpose, research questions, theoretical framework, significance of the study, definition of terms, and organization of the study. Chapter 2 includes a review of related literature concerning university adoption of technology, multi-modal tablets in higher education, the unified theory of acceptance and use of technology, the UTAUT2, tablet adoption and health profession students, self-directed learning and technology adoption, technology use and students with disabilities, and a summary. Chapter 3 reports the procedures utilized in this study, including the population and sample, instrumentation, the two-stage data collection, data analysis and a summary. The findings of the study are presented in Chapter 4. The sections include the demographic characteristics of the participants, reliability of the UTAUT2 instrument, research questions, and observations. Chapter 5 includes a summary of the study, conclusions, implications, and recommendations for further research.

Chapter 2

Literature Review

The purpose of this study was to explore graduate student perceptions of use and the ease of use of multi-modal tablets to access electronic course materials and the perceived differences based on students' gender, age, college of enrollment, and, previous experience. The parts of the chapter are university adoption of technology, multi-modal tablets in higher education, the unified theory of acceptance and use of technology, the UTAUT2, tablet adoption and health profession students, self-directed learning and technology adoption, technology use and students with disabilities, and a summary.

University Adoption of Technology

Akour (2009) notes that the technology investments acquired by universities to improve teaching and learning have affected the learning paradigms and promoted the inclusion of a greater number of students both residential and commuter. "Universities are investing in technologies that facilitate distance learning, e-learning, and most recently m-learning. All learning paradigms have advantages, disadvantages, and challenges" (Akour, 2009, p. 41).

Weiser (1998) identified three waves of the computing revolution. During each computing revolution, he claims that university campuses have been at the forefront. The first wave consisted of mainframes, where universities established computing rooms for students, faculty, researchers, and administrators. After the mainframe

phase, the second wave of computing revolution that gained traction was the personal computing era. During this era, many students and faculty had access to either their own personal computer at their home or office or they had access to computers in multiple locations, such as public libraries, school libraries, as well as having multiple computers of their own in a few locations. Weiser (1998) identified the current wave of the computing revolution identified as the era of ubiquitous computing. "Computers can already be found in watches, toasters, ovens, cars, wallets, even in some campus ID. Inevitably these computers will become more pervasive, will talk to one another, and will form the invisible computational infrastructure of our lives" (Weiser, 1998, p. 41).

Since 1998, there has been a rise in the ability of devices to communicate with each other. Cell phones and mp3 players now communicate with other devices through wireless internet or Wi-Fi, Bluetooth, or near field communication (NFC) technologies making the transmission of data between individuals more accessible. Students can now send multimedia files and documents to each other and their professors from their smartphones or multi-modal tablet devices via an array of communication protocols, including email, short message service/multimedia message service (SMS/MMS), direct to device Bluetooth or NFC transmission, or cloud services such as Apple's iCloud.com, Dropbox.com, or Google Drive services just to name a few. Surry and Land (2000) have pointed out the importance for universities to strategically plan for the expansion and utilization of technology on their campuses in order to maximize the potential that technology creates.

Multi-modal Tablets in Higher Education

Technology has been suggested to have the potential to improve teaching and learning at the higher education level when integrated properly (Surry & Land, 2000). Multi-modal tablets provide the ability to act as very efficient repositories and delivery devices for course materials (Murphy, 2011). Multi-modal tablets entered the market as media-consumption devices. These tablets, such as the iPad, Google Nexus, and Windows Surface, provide access to diverse and dynamic digital content that is available in many course curricula. They can store and deliver interactive eBooks, PDF files, slideshows, videos, audio files (e.g., lectures), word-processing documents, and more. Murphy (2011) identified six typologies of the utilization of multi-modal tablets in higher education:

- Ubiquitous access to course and subject materials
- Enrollment and administration
- Peer-to-peer and Peer-to-educator collaboration
- Content generation
- Research/material yielding
- Productivity enhancement.

Murphy (2011) surveyed 37 universities that implemented iPads between 2010 and 2011. The universities in the study overwhelmingly focused only on one typology, delivery of course materials, or ubiquitous access to course and subject materials.

Ebooks. EBooks can be read on an individual's desktop, laptop, or mobile device; however, the computer does not offer the avid reader the portability of a physical book. In the literature, the term eBook has had different definitions and

spellings. According to Abdullah and Gibb (2008), the term eBook may encompass the hardware device, eReader, software, document, and content.

Hart ("Project Gutenberg Website", n.d.) began Project Gutenberg, which digitizes and archives books, in 1971. Through partners and affiliates, Project Gutenberg is able to offer thousands of digitized books, or eBooks as they are known today. As computing devices have advanced throughout the following decades, they have become increasingly more portable. Dedicated devices called eReaders were created to read the eBooks. EReaders are high-capacity, lightweight, electronic computing devices that store and display numerous books to the reader. Electronics companies, such as Sony, began pushing different types of eReaders to the consumer market. Even though there were eReader devices, there was little digital book material available for consumers. This lack of content may have slowed the acceptance of the eReader device. Today many companies that distribute published digital materials such as Amazon.com, Barnes and Noble, and Kobo, also produce their own eReader devices.

Multi-modal tablets began gaining in popularity after the launch of the Apple iPad. Since then, other companies have developed and released eReaders and multi-modal tablets similar to the Kindle or iPad. Barnes and Noble released its Nook and Nook Color to compete with Amazon Kindle and book sales. Amazon also updated its Kindle line of devices to include multi-modal capabilities with its introduction of the Kindle Fire. Google joined the multi-modal tablet market by releasing its Google Nexus device in three different sizes. Microsoft came to the market, releasing its Surface and Surface Pro tablets in 2012 and 2013.

The introduction of the Kindle by Amazon.com, in 2007, spurred a number of studies that have examined the effectiveness of eReaders and eBooks in academic and library settings (Chou, Stu, & Lin, 2010; Clark, Goodwin, Samuelson, & Coker, 2008; Gibson & Gibb, 2011; Goodwin et al., 2012; Hoseth & McLure, 2012; Marmarelli & Ringle, 2009). Some of the advantages of eBooks identified in the literature include portability, searchability, online access, easy-to-locate content, adaptability of content such as increasing or decreasing font size, zoom in or out content materials (Bush & Cameron, 2011; Gibson & Gibb, 2011; Jamali et al., 2009; Levine-Clark, 2007; Shelburne, 2009). The literature has also noted some disadvantages of eBooks and eReaders, which include battery life, price point, eyestrain, and the inability to make notes or highlight text (Bush & Cameron, 2011; Gibson & Gibb, 2010; Shelburne, 2009).

The Pearson Foundation (2012) found that 58% of college students between the ages of 18 and 30 have used a digital textbook and 57% have read a digital format book for fun. "The United Kingdom's Joint Information Systems Committee (JISC) National eBooks Observatory project (MyiLibrary) is certainly one of the largest studies of eBooks usage to date" (Shelburne, 2009, p. 60). The study was a national study conducted in the United Kingdom, which included full or partial responses from 22,437 academic staff and students across more than 120 universities (Nicholas et al., 2008). Most students using eBooks for learning only read a few pages to a chapter or two, while very few use eBooks to read the entire academic book (Jamali et al., 2009; Levine-Clark, 2007; Nicholas et al., 2008). Nicholas et al. (2009) revealed that about 72% of students reported occasionally or frequently using eBooks. Although most reported reading a few pages to a couple of chapters, only 7% indicated that they read

the entire eBook. This could be due to the nature of research and study in higher education. Many students use eBooks to access reference materials (Levine-Clark, 2007; Shelburne, 2009).

An issue with eBook adoption by students on campus could be due to the fact that students have been unaware of their campus library's eBook catalogue (Levine-Clark, 2007; Shelburne, 2009). Shelburne (2009) found that almost 45% of faculty and students were unaware that their institution's library offered eBooks for their use; 47% of graduate students did not know that eBooks were available via the library. Research has also identified that students may not use eBooks in the academic environment, because the titles available to the student may not be applicable to their current studies. Other reported factors for not adopting eBooks include: not wanting to read from a screen; lack of knowledge about how to find eBooks; a preference for print books; and the need to use eJournals only, instead of eBooks (Levine-Clark, 2006; Shelburne, 2009).

The preference for eBooks over print materials among students is on the rise. The purpose for the use of the book has to be respected when interpreting the preference of print or eBooks. Shelburne et al. (2009) reported that readers report preference for print books when an assignment requires reading a book from cover to cover, but eBooks also did not cause people to report wanting to read fewer print books. The majority of users will use both eBooks and print books, but the purpose of the materials and availability of titles may dictate usage in the academic setting more so than user preference for print books or eBooks.

***Advantages*.** EBooks and eReaders offer the student a few advantages over print materials, which include portability, searchability, online access, easy-to-locate content, and adaptability of content such as increasing or decreasing font size or the ability to manipulate the size of content materials. A clear advantage of eBooks is their ease of access (Jamali et al., 2009). Jamali et al. (2009) found that respondents mentioned instantaneous access about 1,380 times as one of the advantages of online access, and over 1,000 of the comments regarding online access stated the convenience of not having to travel to a physical destination such as the library or school to access a book.

In Jamali et al.'s (2009) study, 22,437 academic staff and students were surveyed, and 16,000 open-ended question text responses were collected. After online access, searchability and cost were mentioned the most as advantages of eBooks. Table 1 outlines the responses from the Jamali et al. (2009) study, the largest study to date on eBooks. Additional advantages were identified by Martinez-Estrada and Conway (2012); Marmarelli and Ringle (2009); Bush and Cameron (2011); Elias, Phillips, and Luechetfeld (2012); and Gibson and Gibb (2011). Elias et al. (2012) listed features that would affect a user's decision to use an eBook or eReader, and Gibson and Gibb (2011) identified eBook advantages over print books as well as features of eBooks that are liked. The Marmarelli and Ringle (2009) study explored the use of the Kindle DX in an undergraduate course setting.

Bush and Cameron (2011) researched the perceptions of undergraduates using the iPad and the iAnnotate app to access digital course materials during the course of the semester. These six studies each identified portability or form factor as a feature or

advantage of the eReader or multi-modal tablet. Other factors mentioned in most of the studies were reduced costs, Internet or connectivity, and display. Marmarelli and Ringle (2009) did point out that while eBooks may be less expensive than print books, some students did worry about how expensive an eReader or multi-modal tablet would be to replace if the device were damaged.

***Disadvantages*.** The eBook reading experience could be a reason for hesitation of the adoption of eBooks (Clark et al., 2008). Students still prefer to read longer passages of text in print instead of in an eBook format, which is suggested by the fact that very few students read the entire eBook (Clark et al., 2008; Shelburne, 2009). Students with reading disabilities have mentioned that reading black text on the bright white screen of an eBook can make reading difficult. Jamili et al. (2009) reported that students wished to be able to change the text color or background colors of the text. In many multi-modal tablets this is a feature; however, some applications or types of eBooks do not allow the reader this flexibility. Another disadvantage identified by Jamili et al. (2009) is that some students may not know how to access or manipulate an eBook or eReader. Macfadyen (2011) notes that eReaders and multi-modal tablets did not provide adequate features for "creating and recording interconnections among the discontinuity that characterizes digital reading practices" (p. 9). "EBook devices can support both the immersive reading of a single text and the expansive skimming of multiple texts, but have not yet crossed the critical hurdle of supporting the intertwined reading, note taking, and composition practices that are the foundation of creating new and meaningful texts" (Macfadyen, 2011, p. 10). Other researchers have identified that

the creation of annotations and notes during reading improves retention and comprehension.

Miller, Nutting, and Baker-Eveleth (2012) found that younger students were more likely to have purchased or used an electronic textbook. Students from larger high schools, students financing their educations through loans and/or scholarships, and students who own either a laptop or a desktop computer were significantly more likely to have purchased or used an electronic textbook (Miller et al., 2012).

Multi-modal tablets. Bush and Cameron (2011) found that students use their multi-modal tablets at least a couple of times a week or more for purposes other than just reading, but utilized the features of the multi-modal device, which was the iPad for this study. Students stated they felt they read more often on their iPads than they would if they had printed course materials (Bush & Cameron, 2011). According to Bush and Cameron (2011), the multi-modal tablets have features that motivate the students to keep the tablet with them, unlike the single-modal eReaders. Students reported carrying the iPad more often and 25% reported carrying the device more often than print course materials. Of that 25%, Bush and Cameron found that 50% used the iPad more often for academic purposes and 32% used the multi-modal tablet much more often. Multi-modal tablets provide features that are relevant to the student's personal life and needs, which in turn means the student is much more likely to have the device on their person allowing them additional opportunity to read the course material than with print resources (Bush & Cameron, 2011).

Bush and Cameron (2011) found that reading frequency of course materials is increased with multi-modal tablets. Portability of eReaders and multi-modal devices

lends itself to an increased frequency in reading course materials. While frequency of reading course materials increased, the reading duration or reading speed was not reported to differ when compared to reading print course materials. According to the research, even though students may access their digital course materials more often than they would print materials, digital course materials or multi-modal devices do not lend themselves to having students read for longer periods of time or read faster or slower.

Previous studies of digital course materials or eBooks have reported that students need the ability to integrate print reading strategies such annotating over the content (Bush & Cameron, 2011; Hernon, Hopper, Leach, Saunders, & Zhang, 2007; Richardson & Mahmood, 2012; Mercieca, 2004; Moore, 2012; O'Hara & Sellen, 1997). In some studies where annotation capabilities were present, the students did not utilize the feature, preferring to annotate on print resources rather than digitally (Carlock & Perry, 2008; Hernon et al., 2007; Mercieca, 2004; Vernon, 2006). Annotating course materials may include: highlighting, underlining, writing notes, drawing, adding stamps or stickers, and bookmarking (Bush & Cameron, 2011; Shelburne, 2009, Tualla, 2011). Tualla (2009) found that students identified that multi-modal tablets impacted their education by the speed the device provides, ease of access, the convenience the device provides, and its efficiency. Early in the development of multi-modal tablets certain tasks were not valued on the tablet. Students reported that the iPad was not valued for the following tasks in the educational environment: formal or long-form writing, electronic database queries, file storage and management (Tualla, 2011). Multi-modal tablets allow students to open applications for their device that contain all of

these features. As the capabilities of multi-modal devices are advancing, more features to help students study are being added to the applications on the devices.

Disadvantages. A percentage of students have reported using a multi-modal tablet for studying course materials is more distracting than using print materials. Bush and Cameron (2011) found that approximately 31% of the students in their study reported being distracted because of the multi-modal capabilities of the iPad. This includes the availability of switching tasks and using other applications that may be available on the multi-modal device.

Even though the multi-modal capabilities of the devices augmented classroom participation and personal study, the device was used primarily as a consumption device. Students still use their personal computers to write their papers. This could be due to the fact that they may have multiple monitors or personal computers, which could be used in conjunction with the iPad screen to have course content on one screen, which allows them to type their papers on the computer (Bush & Cameron, 2011).

Unified Theory of Acceptance and Use of Technology

The Unified Theory of Acceptance and Use of Technology (UTAUT) was based in the rich history of the TAM. It combines elements from eight models of technology use and adoption: Model of PC Utilization (MPCU), Theory of Planned Behavior (TPB), Motivational Model (MM), Technology Acceptance Model (TAM), Theory of Reasoned Action (TRA), Combined Theory of TAM and TPB (C-TAM-TPB), Social Cognitive Theory (SCT), and Innovation Diffusion Theory (IDT) (Venkatesh et al., 2003). From these models, Venkatesh et al. (2003) identified eight constructs for the UTAUT that appear to be significant.

Table 1

Advantages of Multi-Modal Tablets Identified in Specific Studies in the Literature

Jamali et al., 2009	Martinez-Estrada & Conway, 2012	Gibson & Gibb, 2011	Marmarelli & Ringle, 2009	Bush & Cameron, 2011	Elias et al., (2012)
Portability	Portability	Portability	Portability (Form Factor)	Portability	Readability
Online access	Internet	Environment	Online Access	Display	Display
Reduced Costs	Reduced Costs	Display	Paper Savings (Environment)	Storage	Cost
Searchability	eBooks	Storage	Paper	Bookmarking	Searchability
Storage	e-ink Technology	e-ink Technology	Battery Life	Dictionary	
Eco-friendly	Availability	Usability	Legibility		
Convenience	Connectivity	Zoom			
Easy to navigate	Battery Performance				
Multiple users	Storage				
Relevance	Paper Savings (Environment)				
Easy to locate					
Copy paste					
Easy to read					
More choices					
Display flexibility					
Access to books not available in print					
Easy to annotate/ highlight					
Easy to share					
Micro-access					
Up to Dateness					
Bookmarking					
Quality					
Graphs/Colour					
Multitasking					
Interactive					
Other advantages					

These direct determinants of a user's intention to use or actual usage behavior include: Performance Expectancy, Effort Expectancy, Social Influence, Facilitating Conditions, gender, age, experience, and voluntariness of use. In the UTAUT, Venkatesh et al. (2003) theorized that only four of the seven constructs act as direct determinants of user acceptance and usage of a system: Performance Expectancy, Effort Expectancy, Social Influence, and Facilitating Conditions (Venkatesh et al., 2003). Figure 4 shows Venkatesh et al. (2003) UTAUT research model. In this model, age, experience, voluntariness of use, and gender are key moderating variables that are significant in the model. The rest of this section presents a brief summary of the key constructs of the UTAUT proposed by Venkatesh et al. (2003).

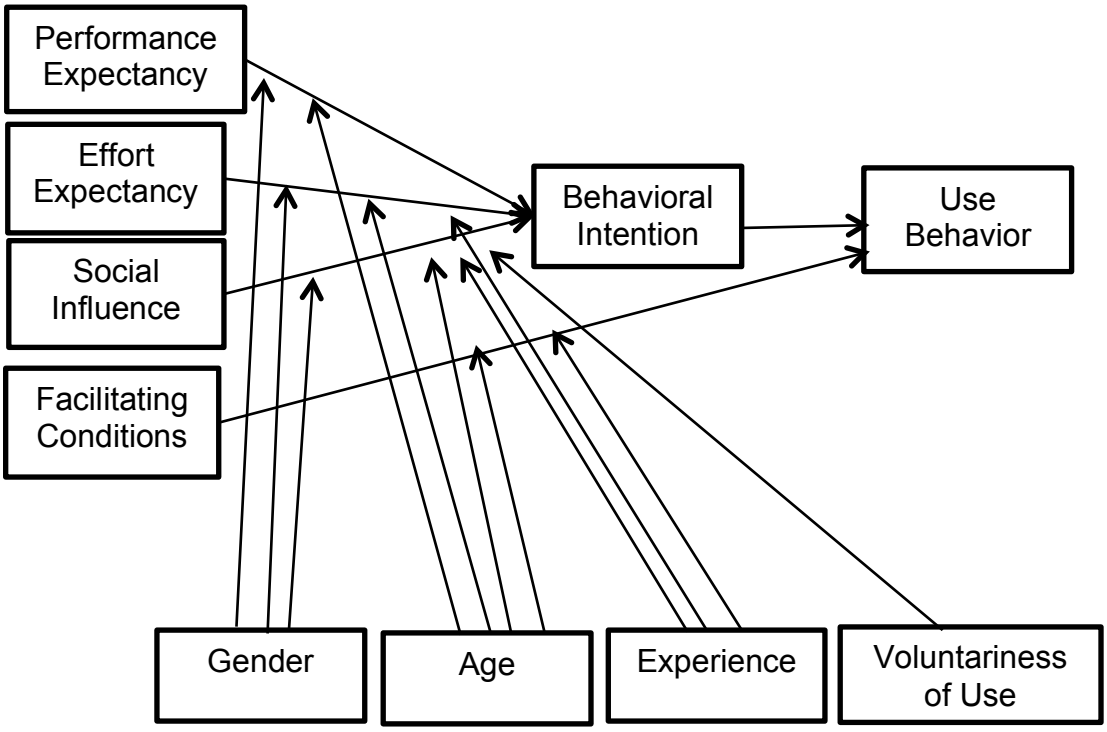

Figure 4. UTAUT Model *(Venkatesh et al., 2003)* showing on the left the four constructs that act as determinants of user acceptance and usage of a system. Printed with permission.

Performance expectancy. This was believed to be the strongest predictor of Behavioral Intention in both voluntary use and mandatory use settings of a system (Venkatesh et al., 2003). Performance Expectancy is the level at which the individual believes that using a particular system or device will improve his or her job performance (Davis et al., 1989; Venkatesh et al., 2003). This effect was found to be stronger with the male gender and younger users (Venkatesh et al., 2003). Venkatesh et al. (2012) found that Habit was the strongest predictor of Behavioral Intention when the UTAUT model was updated to investigate consumer use of technology.

Effort expectancy. In previous models such as the TAM, MPCU, and IDT, Effort Expectancy was identified as ease of use. It was defined as the level of ease that an individual associates with a system or device. Effort expectancy lost significance over time, meaning that Effort Expectancy was only significant following the initial use after training of a system or device (Venkatesh et al., 2003). Previous research has found that Effort Expectancy may be more "salient for women than men" (Venkatesh et al., 2003, p. 450). Venkatesh et al. (2003) also noted that this finding might be due to "cognitions related to gender social roles" (p. 450). Moran, Hawkes, and Gayar (2010) did not find a significant difference between males and females for Effort Expectancy. Cameron (2006) suggests that women's perceived ease of use may be increasing while men's perceived ease of use are decreasing. This could be because the ages of the participants were younger than in the Venkatesh et al.'s (2003) study, or because younger generations of women have had more experience with computers than prior generations due to changing beliefs about gender social roles. Brown, Dennis, and Venkatesh (2010) found that younger users and male users were more likely to report

perceiving technology systems require less effort. Effects of Effort Expectancy are expected to fade over time as an individual gains more experience with a system or device (Davis, 1989). Previous experience and general beliefs of computer devices and systems may shape one's perceived ease of use even after experience with the target system or with the device that was introduced (Venkatesh, 2000).

Social influence. Social influence is identified as social norms in previous adoption models (TRA, TPB, C-TAM-TPB), social factors (MPCU), and image (IDT) (Venkatesh et al., 2003). It is defined as the "degree to which an individual perceives important others believe he or she should use the new system" (Venkatesh et al., 2003, p. 453). In voluntary use instances, Social Influence is not significant, but in mandatory circumstances, Social Influence has a significant direct effect on Behavioral Intention. Venkatesh et al. (2003) pointed out that the Social Influence construct is complex and many variables can affect its relationship with Behavioral Intention.

For example, Awuah (2012) reported "the effect of Social Influence was different in China from what was observed in the more individualistically oriented culture of the United States" (p. 81). Social influence is more likely to affect Behavioral Intention in women than in men (Wang & Shih, 2009). Venkatesh et al. (2003) acknowledge that this may be because women have shown in the past to be more sensitive to the opinions of others, yet this effect declines as experience increases. As technology is advancing, more current research is challenging the effect gender has on the Social Influence to Behavioral Intention interaction (Awuah, 2012; Cameron, 2006; Williams, 2009). Awuah (2012) found that Social Influence was not significantly moderated by gender or age.

Facilitating conditions. “Facilitating conditions are defined as the degree to which an individual believes that an organizational and technical infrastructure exists to support use of the system” (Venkatesh et al., 2003, p. 453). The TPB and C-TAM-TPB identify Facilitating Conditions as perceived behavioral control (Venkatesh et al., 2003). The factor of Facilitating Conditions is significant in both voluntary and mandatory environments, but this is only true immediately following training of a device or system. As the individual gains more experience, the relationship between Facilitating Conditions and Behavioral Intention diminishes (Venkatesh et al., 2003). Age moderates the interaction between Facilitating Conditions and Behavioral Intention; older users are more affected by Facilitating Conditions than younger users (Venkatesh et al., 2003). Venkatesh, Thong, and Xu (2012) found that this effect is more salient for older women. Facilitating conditions is also moderated by users experience with the target device (Venkatesh et al., 2012). Brown et al. (2006) discovered that compatibility with previous technologies currently in place produced a greater effect than resource-Facilitating Conditions such as money or time.

UTAUT2

The original UTAUT was developed based on eight previous models of technology use and adoption. UTAUT was developed to explore adoption in organizational and non-organizational settings. The model has been replicated, adapted, or applied in whole or in part in a manner that establishes its generalizability (Venkatesh et al., 2012). The UTAUT has been used to study the adoption of either new technologies (e.g., collaborative technologies, Brown et al., 2010) health technologies, (Chiu, 2008; Hennington & Janz, 2007), government technologies, (Wang & Shih, 2009;

Awuah, 2012), adoption by new user populations or adoption in new cultural settings (Awuah, 2012) from its original inception (Venkatesh et al., 2012). In each study, the information system tool is substituted with the appropriate system tool for that particular study (Brown et al., 2010).

> The extensions, particularly the addition of new constructs, have been helpful to expand the theoretical horizons of UTAUT. However, the addition of constructs has been on an ad hoc basis without careful theoretical consideration to the context being studied and the works have not necessarily attempted to systematically choose theoretically complementary mechanisms to what is already captured in UTAUT. Such complementary constructs can help expand the scope and generalizability of UTAUT. (Venkatesh et al., 2012, p. 160)

The UTAUT has been tested with additional constructs added which extend the model (Awuah, 2012). UTAUT2 integrates key constructs and relationships that have been identified in the consumer use context (Venkatesh et al., 2012). The UTAUT2 integrates Hedonic Motivation, Habit, and Price Value into the UTAUT model of use and adoption (Venkatesh et al., 2012). The addition of these new constructs to the UTAUT increases the comprehensiveness of the model. "The integration of Hedonic Motivation, Price Value, and Habit brings such new mechanisms (i.e., affect, monetary constraints, and automaticity) tied to the new constructs into the largely cognition and intention-based UTAUT" (Venkatesh et al., 2012, p.159). Awuah (2012) found that the UTAUT2 has improved on the UTAUT in explained variance in user's Behavioral Intention by 18% and technology use by 12%.

Various constructs related to Hedonic Motivation in previous consumer and information systems research have been theorized as important in consumer product and/or technology use (Brown & Venkatesh, 2005; Van der Heijden, 2004; Venkatesh et al., 2012). In an educational setting, Raman and Don (2013) found that Hedonic Motivation positively influences the Behavioral Intention of use of the information

systems. The same could not be said of Habit as it showed an insignificant influence on Behavioral Intention of use of the information systems. Raman and Don (2013) state that students may use educationally related information systems for just academic purposes only, even though there may be popular tools embedded in the educational information systems. The information system studied in Raman and Don (2013) does not provide a system that is outside the academic setting. Raman and Don (2013) point out that the learning management system (LMS) "Moodle", which provides popular features such as chatting or messaging, is not a tool the students are willing to use for those features.

The Habit construct integrated into UTAUT helps provide a clearer picture of the users intention to adopt, which is the key driver of behavior (Venkatesh et al., 2012). Venkatesh et al. (2012) found that Habit was the strongest predictor of intention to adopt. Prior to this extended version of the UTAUT framework, Performance Expectancy was believed to be the strongest predictor of Behavioral Intention. Further research regarding Habit and Hedonic Motivation constructs in the academic setting was needed. This study considered both of those constructs in the learning environment in higher education.

Much of the research regarding information systems adoption focuses on the workforce population and does include the responsibilities of the user when adopting an information systems device, such as cost. In the consumer context, costs can be very important and dominate a consumer's decision to adopt a technology (Brown & Venkatesh, 2005; Venkatesh et al., 2012). Similarly students may be required to cover the costs of these devices if their institutions of higher learning do not provide the

devices upon enrollment. The construct of price adds an additional decision point to the UTAUT's focus on time and effort. While in the workforce, perceived Effort Expectancy (ease of use) and perceived Performance Expectancy account for much of the variance in adoption of an IS technology; in the consumer context, other considerations such as price, Habit, and Hedonic Motivation must also be explored.

Another adaptation from the original UTAUT that is present in the UTAUT2 as presented by Venkatesh et al. (2012) is the removal of Voluntariness from the moderators replaced with the addition of the link between Facilitating Conditions and Behavioral Intention, which is moderated by age, gender, and experience. Age, gender, and experience also moderate the relationships pertaining to price, Habit, and Hedonic Motivation as well (Venkatesh et al., 2012).

> According to UTAUT, Performance Expectancy, Effort Expectancy, and Social Influence are theorized to influence Behavioral Intention to use a technology, while Behavioral Intention and Facilitating Conditions determine technology use. Also, individual difference variables, namely age, gender, and experience are theorized to moderate various UTAUT relationships (Venkatesh et al., 2012, p. 159)

Age and gender. In previous studies, age and gender seem to play a role in the adoption of new technology. Plude and Hoyer (1986) found that older adults may experience a slower speed of learning when it comes to complex information and processes. For new technology, this difficulty in processing new or complex information may affect an older person's learning and ultimately adoption of a new technology (Morris, Venkatesh, & Ackerman, 2005; Plude & Hoyer, 1986; Venkatesh et al., 2012). Morris et al. (2005) reported that the difference in perceptions for adoption of technology is more pronounced between genders of older users; however, with younger users in the study, there is little difference between the genders, an almost unisex pattern. This

led Morris et al. (2005) to conclude that as the younger generations grow older, researchers will continue to see more similarities between the genders of the older generation with respect to perceptions and decisions about technology.

This study explored the effects of gender on Behavioral Intention in the adoption of technology as suggested by Gefen and Straub (1997). Previous research has found some differences in the affect of gender on Behavioral Intention or the adoption of technology. Venkatesh et al. (2012) stated that men, in general, tend to "rely less on Facilitating Conditions" when deciding to adopt a new technology, but women place a "greater emphasis on external supporting factors" (p. 162). Women also respond to Social Influences more than men (Morris et al., 2005). Nicholas et al. (2008), in a study from the UK on scholarly eBook usage, found that men were more likely to use an eResource, buying their eBook or searching for a digital book online. Women were more likely to use the library to obtain the eBook. This finding would seem to parallel Venkatesh et al.'s (2012) statements that men are more likely to spend more effort to accomplish a task or meet a goal and women are more likely to employ external supports. Other studies have noted that gender differences have to be interpreted around the context of age. One opinion, expressed by Morris et al. (2005), is that differences may be due to older generations not having been exposed to technology the same way the younger generations.

Secondly, another way of interpreting the findings in previous studies is that as men and women mature, the differences in the factors that affect their Behavioral Intention to adopt a new technology become more apparent (Morris et al., 2005). Venkatesh et al. (2003) found that older women placed a greater importance on the

magnitude of effort output necessary (ease of use) and Social Influence than other groups.

> One possible reason for the more unisex pattern among younger workers is that the socialization of women and men in the post-feminist era is more similar compared with socialization patterns of women and men in the past (e.g., less gender typing and increased career focus among women). (Morris et al., 2005, p. 80)

There is also a difference based on age with older users placing more importance on Facilitating Conditions or external support than younger users, regardless of gender (Venkatesh et al., 2003).

Tablet Adoption and Health Professional Students

Research related to the use of tablets and factors that explain adoption among graduate students and health profession students has been scarce. Although many institutions have begun implementing the devices with health profession students, research studies were not conducted using the UTAUT or UTAUT2 in regards to intention to adopt the multi-modal tablet in the academic environment.

Reynolds (2008) believed that the UTAUT was not a good model to measure the intentions of first-year students to use electronic medical records. There were statistically significant relationships between some of the variables, including direct affects on attitude. Reynolds (2008) notes that Behavioral Intention items could be rewritten to address future intention to use an information system. Depending on the time frame of the administration of the UTAUT survey, the participants of a study may not consider future use, as was the case of first-year medical students who appeared not to consider that they might be using the system in question in another three years.

Lapczynski (2004) utilized the Integrated Technology Acceptance Model for Mobile Computing (ITAMM) to identify the factors that influence mobile technology

acceptance. The ITAMM combines the Technology Acceptance Model (TAM), the Extended Technology Acceptance Model (TAM2), the Theory of Planned Behavior (TPB), and the Task-Technology Fit (TTF) models. Lapczynski (2004) found that nursing students' average attitudes towards adopting PDAs score was lower than that of other participants in the study. The nursing students in the study had not previously used the PDA. The study included other doctoral students, previous PDA users from a small private college, and chief information officers at educational institutions.

Wu, Wang, and Lin (2007) incorporated a revised version of the Technology Acceptance Model in their study of factors to determine mobile computing acceptance in the healthcare industry. The study showed that a healthcare professional's intention to use a mobile healthcare system (MHS) could be explained by perceived usefulness (Performance Expectancy) and perceived ease of use (Effort Expectancy). Compatibility was a factor added to the model, which was found to directly affect perceived usefulness (Performance Expectancy), perceived ease of use (Effort Expectancy), MHS self-efficacy, and Behavioral Intention. Compatibility was found to be the most significant explanatory factor to be considered when promoting and implementing MHS (Wu et al., 2007). Wu et al. (2007) did state "Insufficient understanding of MHS and limited applications will lead to a lower user intention to use it" (p. 74). A study of public health nurses' intention to use web-based learning found that perceived usefulness was the only significant factor to explain adoption (Chen, Yang, Tang, Huang, & Yu, 2008). Chen et al. (2008) found that an external factor that was an antecedent to adoption among the public health nurses in Taiwan was Internet access. Kijsanayotin, Pannarunothai, and Speedie (2009) also found perceived

usefulness (Performance Expectancy) along with perceived ease of use (Effort Expectancy), social influence, and voluntariness predict technology acceptance.

Ugaz and Resnick (2008) compared the use of specific resource titles of eTextbooks within a collection for medical students. The study reported an increase in the use of the eTextbooks over the print versions of the same titles. From 2005-2006, print materials were found to be used only 278 times, while the eTextbook counterparts were accessed 12,132 times. The statistics on the use of the eTextbooks were provided from the vendors and the usage of print materials were collected from the library system. For the print materials, librarians walked the library several times a day scanning books before they were placed back on the shelf. Electronic resources can be tracked more efficiently than print resources; it is much harder to track if a print resource was perused in the library and placed back on the shelf whereas the same type of access is easily monitored in electronic format. Another reason for increased usage of electronic resources over the print resource books, in the Ugaz and Resnick (2008) study, was due to how dispersed geographically the group of participants were in the study. According to Ugaz and Resnick (2008), students in clinical studies may be accessing electronic resource materials because they are not physically on campus to access the print versions (Ugaz & Resnick, 2008).

In a study by Smørdal and Gregory (2003) on a precursor to the multi-modal tablet, the personal digital assistant (PDA), medical students used the device more to read from the digital medical handbook already available on the PDA over using it to gather information from the internet. The authors found several reasons why PDAs, while causing excitement in students, did not catch on as a study tool:

- PDAs do not challenge the usability of materials already in place, such as reference books,
- Digital materials, such as websites, were not optimized for the screen size of the PDA, and
- The applications on the PDA do not match the needs of the learner.

The eBook that was available on all of the PDAs was not used by the medical students. The reasons enumerated by the authors included, the eBook as a format did not fit the means for students to use the information available in the eBook as opposed to the print counterpart; the eBook did not sufficiently support just-in-time access to information, and the eBook does not contain the same study properties as the print version (Smørdal & Gregory, 2003).

Self-directed Learning and Technology Adoption

Technology is a force that presents andragogical adult learning model with great opportunities as well as challenges (Knowles, Holton, & Swanson, 2005). The andragogical model is a process model in which the facilitator provides resources and procedures that will help the learners obtain the necessary knowledge and skills. (Knowles et al., 2005). Knowles (1975) identified six assumptions of andragogy. In Knowles et al. (2005), the language was changed from assumptions to six identified core-learning principles. These six core-learning principles are learner's need to know, self-concept of the learner (self-directed learning), prior experience of the learner, readiness to learn, and motivation to learn (Knowles et al., 2005).

> In its broadest meaning, "self-directed learning" describes a process in which individuals take the initiative, with or without the help of others, in diagnosing their learning needs, formulating learning goals, identifying human and material

> resources for learning, choosing and implementing appropriate learning strategies, and evaluating learning outcomes. (Knowles, 1975, p.18)

Knowles (1975) pointed out that in the literature, self-directed learning may also be labeled as “self-planned learning,” “inquiry method,” “independent learning,” “self-education,” “self-instruction,” “self-teaching,” “self-study,” and “autonomous learning.” Åkerlind and Trevitt (1999) noted that self-directed, computer-based learning does not just require students to acquire additional skills in taking more responsibility for their learning, but it is a more “extensive paradigm shift” (p. 97). Knowles (1975) is considered by many as one of the earliest and most vocal advocated of self-directed learning and andragogy (Adya & Mascha, 2011; Boyne, 2013; Bullock, 2013; Knowles et al., 2005; Williams, 2009).

New technologies being introduced into the classroom is facilitating a shift from traditional thought of education and learning in the formal setting of the classroom to a more informal settings outside of the classroom (Sorensen, 2011; Wu, Hiltz, & Bieber, 2010). Technology is pushing teaching from information transmission to more of a constructivist paradigm, potentially changing the role of the educator (Mishra, Fahnoe, Henriksen, & Deep-Play Research Group, 2013; Sorensen, 2011). Students build knowledge through the understanding of new information expanding their current understanding and expertise. In the constructivist paradigm, the student moves from a passive learner absorbing content delivered by the teacher, to an active learner creating new knowledge (Brown, 2005). Also, learning does not stop just because the instructor or students have left the classroom. Technology allows students to have access to learning materials in an informal space (Brown, 2005), moving the idea of formal instruction into the realm of self-teaching/self-directed learning (Chou & Chen, 2008).

Technology Use and Students with Disabilities

The awareness of the needs of students with disabilities has increased as a result of the Rehabilitation Act of 1973 and the passage of the Americans with Disabilities Act (ADA) in 1990 (Day & Edwards, 1996). The ADA extends the civil rights protection to students with disabilities pursing postsecondary education, which were not originally protected by the Rehabilitation Act of 1973 (Day & Edwards, 1996). Since the 1990s, other authors have noted that more students with learning disabilities are entering higher education than before and have cited Section 504 of the Rehabilitation Act of 1973 and the American with Disabilities Act of 1990 (Pérez, 2013; Stodden, 2005; Tanners, 2010). Stodden (2005) stated the percentage of students with disabilities enrolled in higher education increased from 2.6% to 9.2% from 1978-1994. Colleges and universities, as entities that provide services to the public and receive federal or state funds, must adhere to many of the provisions presented in the ADA and Section 504 of the Rehabilitation Act of 1973 (Pérez, 2013). These U.S. federal laws were written to protect the rights of individuals with disabilities in all programs and services offered by entities that receive federal financial assistance (Pérez, 2013; Sharpe, 2010; U.S. Department of Education Website, n.d., U.S. Department of Health and Human Services, n.d.).

> Section 504 forbids organizations and employers from excluding or denying individuals with disabilities an equal opportunity to receive program benefits and services. It defines the rights of individuals with disabilities to participate in, and have access to, program benefits and services. (U.S. Department of Health and Human Services-Office for Civil Rights, n.d., para. 2)

Any technology provided by a college or university will be rendered ineffective if it is not used or is inaccessible to students. In adopting technology that may assist a

student who has a disability or assistive technology, one must realize there are barriers to an individual's use of that technology (Day & Edwards, 1996; Pérez, 2013; Sharpe, 2010; Tanners 2010). Sharpe (2010) states that an institution's culture regarding assistive technology may influence the adoption of assistive technology in the classroom. In 2010, the United States Department of Justice and the Department of Education published a letter for college and university presidents, which outlines the responsibilities of public educational institutions as required by the ADA and Section 504 (Perez & Ali, 2010).

The letter also reiterated the results of a lawsuit with colleges and universities "that used the Kindle DX, an inaccessible, electronic book reader, in the classroom as part of a pilot study with Amazon.com" (Perez & Ali, 2010, para. 4). As a result, this incident reminds colleges and universities that it is against ADA and Section 504 and unacceptable to require the use of an emerging technology that is not accessible to all students.

There is still a demand for research documenting factors that affect assistive technology adoption or abandonment from the consumer's perspective (O'Neill et al., 2013; Riemer-Reiss & Wacker, 1994). Tanners (2010) suggests that any specialized assistive technology tool that may cause a student to feel self-conscious about his or her disability could be a contributing factor to technology abandonment. Not much is documented about the technology use patterns and preferences of students with mild disabilities (Parette, Wojcik, Peterson-Karlan, & Hourcade, 2005).

Besides just staying connected to the world, students from the millennial generation and later have technology deeply embedded in their lives since they were

young children. The results of this kind of access and having technology always around and usable on a daily basis is not fully understood by the education professionals guiding these students (Parette et al., 2005). This lack of understanding of technology use patterns and preferences of students with and without disabilities is even more complicated in education by the lack of a wide-scale application of universal design for learning (UDL) principles (Meyer & Rose, 2000).

> Universal design for learning provides a blueprint for creating instructional goals, methods, materials, and assessments that work for everyone—not a single, one-size-fits-all solution but rather flexible approaches that can be customized and adjusted for individual needs (udlcenter.org, para. 2).

Parette et al. (2005) also note that research has yet to examine and document student-perceived success in the classroom as it relates to specific use of a particular device. Students with mild or hidden disabilities such as a learning disability may not disclose their disability to educational professionals for fear of stigma or persecution against themselves. Students who choose not to self-identify have to accommodate themselves in the classroom (Tanners, 2010). Even more work is needed to understand students' perceptions of these devices and usefulness in the classroom (Parette et al., 2005; Tanners, 2010). Tanners (2010) also suggests that research needs to adopt a qualitative investigation into students with disabilities' perceptions of the technology they have available to them in the classroom.

This study investigated the perceptions of students who self-identify as having a disability and their use of the iPad to access course materials in a higher education setting. This study did not identify students' with disabilities perceptions of technology by specific disability category.

Summary

This chapter presented information on the use of multi-modal tablets in higher education, used by nursing students and healthcare professionals, the use of eBooks by students, and the UTAUT instruments. The instruments discussed in this chapter included UTAUT and the UTAUT2, which extended the information gathered from the original UTAUT by including factors that are pertinent for the consumer. While the UTAUT was developed for use in the workplace, the UTAUT2 is intended for use with consumers. Self-directed learning principles align with some of the perceptions as measured by the UTAUT2, including Facilitating Conditions. There are few studies that examine the perceptions of technology of students with disabilities in the higher education environment.

Chapter 3

Methods

The purpose of this study was to explore graduate student perceptions of use and the ease of use of multi-modal tablets to access electronic course materials and the perceived differences based on student gender, age, college of enrollment, and previous experience. The sections of this chapter include the following: research design, population and sample, instrumentation, data collection, data analysis, and summary.

Research Design

This study was a quantitative design that was descriptive and correlational. Quantitative research uses operational definitions to collect numerical data of observable behaviors of a sample that and performs statistical analysis upon the data (Ary, Jacobs, Razavieh, & Sorrensen, 2006; Gall, Gall, & Borg, 2007). Descriptive research, or survey research, was a type of quantitative method that uses instruments (e.g., questionnaires and interviews) to gather information to measure the characteristics of a sample or population (Ary et al., 2006; Gall, et al., 2007). This study used a self-report survey instrument to collect the data to measure students' perceptions of multi-modal tablets. The study utilized the Unified Theory Use and Adoption of Technology adapted from Venkatesh et al. (2012).

A survey was administered to graduate students enrolled in courses in the Colleges of Pharmacy, Public Health, Nursing, and Education at a large institution in the

south. One survey instrument for collecting quantitative data was used. After receiving permission from all colleges, the measurement forms were administered to the voluntary participants via the online survey tool, Qualtrics. This study investigated students' perceptions of using multi-modal tablets based in higher education course work. The Pharmacy program had already implemented the iPad in course work for one semester prior to the onset of this study. The students in the Colleges of Education, Public Health, and Nursing may use a multi-modal tablet of their choice, but a device is not provided to the students by the colleges.

Population and Sample

The target population for this study was graduate students who were at least 18 years of age enrolled in the Colleges of Education, Nursing, Pharmacy, and Public Health at a large regional university. The inclusion criteria for this study was defined as any adult graduate student of at least 18 years of age studying at a regional university that utilized or intended to utilize multi-modal tablets (i.e., iPad, Nook Tablets, Kindle Fire, Google Nexus, Windows Surface) for academic work or research related to their university degree program.

According to American Association of Colleges of Pharmacy (AAACP) website (www.aacp.org), there are 132-accreditation holding institutions based in the United States that grant professional degrees. Of these institutions, 73 institutions offer graduate programs in the pharmaceutical sciences at the Masters or Doctoral levels. As of fall 2015, 4,421 students were enrolled in those graduate level programs. Of graduate students enrolled full-time, 49.8% of the students were women, and of the Ph.D. degrees award for 2014-2015, 55.6% of graduates were male.

At the College of Pharmacy in this study, 226 students were enrolled, 56% of which were women. The university is comprised of three campuses and has a graduate student enrollment of 10,392 in the Spring of 2015. The total graduate degree seeking male population is 41% of the total graduate degree seeking population in the Spring of 2015.

The National Center for Educational Statistics (NCES) (2016) (https://nces.ed.gov/programs/digest/d14/tables/dt14_318.30.asp, 02-20-2016) reports that 104,547 Bachelor's degrees and 164,624 Master's degrees and 10,572 Doctoral degrees in the field of education were awarded from 2012-2013. The College of Education graduate level enrollment in the Spring of 2015 at the university where this study was conducted numbered 1,279. Females outnumbered males nearly 3 to 1, with 935 females and 344 males enrolled in graduate level programs in the college.

The National Center for Education Statistics reports 5,237 Bachelor's degrees; 9,541 Master's degrees; and 511 Doctoral degrees were awarded in the field of public health from 2012-2013. In the Spring of 2015, at this study's participating university, the College of Public Health enrolled 746 graduate students. Females comprised almost 75% of the total graduate student enrollment for the College of Public Health, numbering 553 students. Males numbered 193 of the enrolled College of Public Health graduate students.

The number of degrees awarded in a nursing profession as measured by the National Center for Education Statistics were the following: Bachelor's – 110,412; Master's – 32,941; Doctoral – 3,1500. The College of Nursing in this study enrolled 935

graduate students. Females outnumbered males in enrollment with 821 to 114 graduate students in the Spring of 2015.

A convenience sample comprised of voluntary students in the College of Pharmacy, College of Nursing, College of Public Health, and the College of Education was obtained in this study. Participants from the College of Pharmacy are provided iPads as part of a scholarship program at the university. Each Pharmacy student is provided iPads once admitted to the program. The participants completed the surveys voluntarily, and neither the researchers nor the instructors in any college program knew who had or had not completed the survey.

College of Education, College of Public Health, and College of Nursing students can choose the computing device they deem necessary to access digital academia content. The students, who are either Masters or Ph.D. level, may use laptops, multi-modal tablets, or smartphones to access their course materials. Learning materials are posted into the university's learning management system, named Canvas created by Instructure. Canvas provides mobile apps for both android and iOS devices (http://www.instructure.com/features-higher-education/save-time-and-effort#app-center).

Sample size was computed using the free software, G*Power. The type of power analysis used was a priori to compute the sample size given an alpha of .05, an effect size of .15, a power of .9 and a total of eight predictors. The total number of participants needed for this study as computed by the software was 160.

Instrumentation

Two instruments were used to collect the data: a demographics form and an adoption of technology and use form (UTAUT2). See Appendix A for a copy of the

demographic form and Appendix B for a copy the UTAUT2 used in this study. The adoption of technology and use form used in this study is based on the UTAUT2 instrument in Venkatesh, Thong, and Xu (2012). See Appendix C for a copy of the UTAUT2 as presented by Venkatesh et al. (2012).

The survey (Appendix B) contains items to address nine factors related to technology acceptance: Performance Expectancy, Effort Expectancy, Social Influence, Facilitating Conditions, Hedonic Motivation, Price Value, Habit, Behavioral Intention, and use of device features. The wording of the survey items was modified to address the category of devices known as multi-modal tablets specifically.

UTAUT2. A number of instruments have been developed and validated that operationalize the constructs examined in this study. This research study adopted the constructs and definitions provided in these previous studies for the data collection survey and follow-up questions. The UTUAT was originally developed for the business sector to predict the acceptance and use of new technology by employees (Venkatesh et al., 2012). The UTUAT2, as presented by Venkatesh et al. (2012), extends the previous version of the UTUAT constructs by including three additional constructs (Hedonic Motivation, price point, and Habit) and dropping the voluntariness moderator. This addition was an attempt to systematically investigate and theorize about the "salient factors that would apply to a consumer technology use context" (Venkatesh et al., 2012, p. 158). Figure 5 displays the updated UTAUT2 model as presented by Venkatesh et al. (2012), which measures perceptions based on eight constructs: Performance Expectancy, Effort Expectancy, Social Influence, Facilitating Conditions, Hedonic Motivation, Price Value, Habit, and Behavioral Intention.

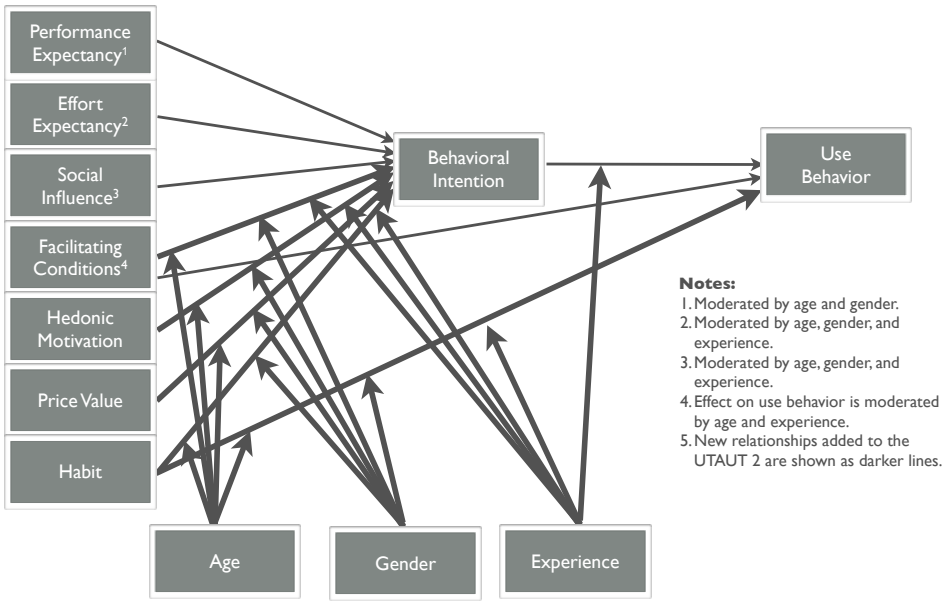

Figure 5. The UTAUT2 Model as presented by Venkatesh et al. (2012)

The UTAUT is an instrument based on the Technology Acceptance Model (TAM); the TAM, an adaptation of Theory of Reasoned Action (TRA) was developed specifically to "explain computer usage behavior" (Davis et al., 1989, p. 983). The other objective of the TAM is to provide systems designers a "practical 'user acceptance testing' method to evaluate proposed new systems prior to their implementation" (Davis, 1985). The TAM has been used to predict individual adoption of a wide range of technologies; the UTAUT is a combination of the TAM as well as seven other models of technology adoption (Alenezi, 2011; Brown et al., 2010; Brown & Venkatesh, 2005; Lin & Anol, 2008; Loiacono, Djamasbi, & Kiryazov, 2013; Mathur, 2011; Venkatesh et al., 2003, 2012; Williams, 2009). A comparison of Appendix C and Appendix D can

highlight the changes in the UTAUT as it was presented in Venkatesh et al. (2012) and Brown et al. (2010).

Validity and reliability of the UTAUT2. The instrument adapted for this study has acceptable reliability and validity as shown in previous studies (Bonney, 2012; Brown et al., 2010; Oshlyansky, Cairns, Thimbleby, & Park, 2007; Sykes, Venkatesh, & Johnson, 2014; Venkatesh et al., 2012). Venkatesh et al. used partial least squares (PLS) to measure the validity and reliability of the UTAUT2 Model. "PLS is a wide class of methods for modeling relations between sets of observed variables by means of latent variables" (Rosipal & Krämer, 2006, p. 31). In a PLS approach, "the predictor, moderator, and dependent variables are now viewed as latent variables which cannot be measured directly" (Chin, Marcolin, & Newsted, 1996, p. 25). PLS also allows for the use of small or medium sample sizes to model latent constructs (Chin et al., 1996; Hair, Ringle, & Sarstedt, 2011). The PLS model does not assume equal weights for all of the indicators of the scale; instead the algorithm allows each indicator to "vary in how much it contributes to the composite score of the latent variable" (Chin et al., 1996, p25). Indicators with weaker relationships to the related indicators and latent construct are then given lower weightings (Chin et al., 1996). The PLS approach is argued to provide a more accurate measure of interaction affect in information science research than traditionally used measures such as ANOVA or moderated multiple regression (MMR), as in conditions of measurement error ANOVA and MMR may not detect an interaction effect. Under repeated calculation, the measurement error may bias the estimate of the true effect downwards (Chin et al., 1996).

"The internal consistency reliabilities (ICRs) of multi-item scales modeled with reflective indicators was .75 or greater, suggesting that the scales were reliable. The average variance extracted (AVE) was greater than .70 in all cases and greater than the square of the correlations, thus suggesting discriminant validity" (Venkatesh et al., 2012, p. 167). Items that did not support internal consistency and discriminant validity were dropped from the UTAUT2 instrument. Using Partial Least Squares method, Venkantesh et al. (2012) reported an average variance explained (AVE) of approximately .70 with a method factor less than .02, suggesting "common method bias is not a concern" (Venkatesh et al., 2012, p. 167). The scales in the UTAUT each reported an internal consistency of .75 or greater. Venkatesh et al. (2012) reported the following internal consistency reliability (ICR) for each of the constructs of the UTAUT: Performance Expectancy, 0.88; Effort Expectancy, 0.91; Social Influence, 0.82; Facilitating Conditions, .75; Hedonic Motivation, 0.86; Price Value, 0.85; Habit, 0.82; and Behavioral Intention, 0.93. Venkatesh et al. (2012) state that the ICR numbers reported suggest that the UTAUT is reliable. The reliability of the instrument for this study was high in comparison to Venkatesh et al. (2012). The Social Influence and Facilitating Conditions scales did not have as high of a reliability score in comparison to the other factors of the UTAUT2. This may explain why there was not as strong of a relationship between each of these factors and Behavioral Intention to use a multi-modal tablet. The scale was a good instrument for data collection, although the instrument may have been viewed as repetitive. The instrument in its entirety was rather quick to complete, with most finishing the instrument in less than five minutes during pilot testing.

Questionnaire. The questions were written as close-ended, Likert-scale questions allowing the researcher the ability to quantify the respondents' perceptions of the adoption of multi-modal tablets as an academic tool for graduate students. Appendix E identifies the factors in the UTAUT2 and the corresponding survey items. The survey instrument required little modification as it was administered in a university in the United States and was presented in English. There were no substantive changes made to the instrument and it did not need revalidation. All items were measured in a 5-point Likert-scale scored from "strongly disagree" (1) to "strongly agree" (5).

The questionnaire consisted of questions that will address the following factors as defined by Venkatesh et al. (2012): Performance Expectancy is defined as the degree to which using a technology will provide benefits to consumers in performing certain activities; Effort Expectancy is the perceived degree of ease associated with consumers' use of technology; Facilitating Conditions refer to consumers' perceptions of the resources and support available to perform a behavior; Social Influence is the extent to which consumers perceive that important others (e.g., family and friends) believe they should use a particular technology; Hedonic Motivation is defined as the fun or pleasure derived from using a technology, and it has been shown to play an important role in determining technology acceptance and use; Price Value is the consumers' cognitive tradeoff between the perceived benefits of the applications and the monetary cost for using them (Dodds, Monroe, & Grewal, 1991); and Habit is a perceptual construct that reflects the results of prior experiences.

Data Collection

The deans of the colleges of Education, Nursing, Pharmacy, and Public Health were contacted via email for approval to interact with professors and students in their college for voluntary participation in this research study. None of the colleges allowed the researcher to utilize class time to recruit participants for the study. College email and on campus notification boards were used to announce the study. An IRB approved flyer was emailed to students in the colleges of education, nursing, pharmacy, and public health. The researcher composed an email that included the Demographic Form (Appendix A), the UTAUT instrument (Appendix B), the participant informed consent form (Appendix F) (the IRB approval form is also included in this appendix; however, it was not sent to the participants), and the participation announcement (Appendix G), and participants received communication from the researcher vie email. Participation in the study was anonymous and the researcher could not track who specifically completed the survey.

The demographic form and the UTAUT survey was administered using the Qualtrics survey system, which was distributed via campus email and posted on college notification boards. Data was collected over a two-month period, with a reminder email sent to students two weeks after data collection had begun. All surveys were accompanied by a welcome message, purpose of the study, the participant's consent to participate in the research, and instructions for completing the survey.

After the online surveys were administered and the data were collected in Qualtrics, the researcher had access to the survey data in the Qualtrics Admin area. The data were identified as completed, partially completed, or screened out by the

survey tool. The demographic information collected included each person's gender, year of birth, ownership of a multi-modal tablet, and prior use of a multi-modal tablet. The data will be stored behind passphrase protection on 128-bit encrypted servers for five years after the study is completed before being deleted.

Data Analysis

The purpose of this study was to investigate graduate student perceptions of use and the ease of use of multi-modal tablets to access electronic course materials, and the perceived differences based on gender, age, and college of enrollment.

Research questions. The following research questions that were addressed in this study were derived from the UTAUT2 framework:

1. Which of the following factors explain a student's Behavioral Intention to use a multi-modal tablet in the academic environment: Performance Expectancy, Effort Expectancy, Social Influence, Facilitating Conditions, Habit, Price Value, and Hedonic Motivation?
2. Which of the following factors explain a student's reported use of a multi-modal tablet in the academic environment: Performance Expectancy, Effort Expectancy, Facilitating Conditions, Social Influence, Habit, Price Value, and Hedonic Motivation?
3. To what extent does the relationship between the following factors and Behavioral Intention change depending on the value of Habit: Performance Expectancy, Effort Expectancy, and Social Influence?
4. To what extent does the relationship between the following factors and Behavioral Intention change depending on the value of Hedonic Motivation: Performance Expectancy, Effort Expectancy, and Social Influence?
5. To what extent does the relationship between the following factors and Behavioral Intention change depending on the value of Price Value: Performance Expectancy, Effort Expectancy, and Social Influence?
6. Is there a statistically significant difference between demographic factors such as gender, age previous experience, student status and degree program in Behavioral Intention to use multi-modal tablets?

Table 2 outlines the research questions and the statistical analysis procedures to be used for each question. Moderated Multiple Regression (MMR) was utilized to

measure interaction effects of the independent variables on the dependent variables. Previous studies had used the Partial Least Squares, because the researchers believed it was a more accurate measure of interaction affect (Chin et al., 1996; Hair, Ringle, Sarstedt, 2011; Rosipal & Krämer, 2006). Previous studies have shown that MMR is an appropriate technique for assessing the effects of categorical moderator and continuous moderator variables (Aguinis, 1995; Saunders, 1956). "When researchers conduct a moderated multiple regression, their goal is to see if the findings of the multiple regression are the same (or perhaps different) for different settings" (Huck, 2012, p.388).

Mean-centering is recommended by some researchers as a method for decreasing multicollinearity between interaction terms (Chin et al., 1996). Huck (2012) states that multicollinearity exists "if two or more independent variables are too highly correlated with each other" (p.400). This study does not utilize mean-centering techniques as it is not been proven to make a difference (Echambadi & Hess, 2007; Kromrey & Foster-Johnson, 1998; Shieh, 2010). Echambadi and Hess (2007) reported that mean-centering does not improve or change the "computational precision of parameters, the sampling accuracy of the main effects, simple effects, interaction effects, or the overall model R^2" (p. 443). Age is a continuous variable that was measured in years. Participants were asked the year they were born and age was calculated from that information. Gender was coded using a 0 or 1 dummy variable where 1 represented women. Experience is a continuous variable that was measured in years.

Summary

This chapter outlined the researcher's conduct of the study. The purpose of this study was to explore graduate student perceptions of use and the ease of use of multi-modal tablets to access electronic course materials and the perceived differences based on student gender, age, college of enrollment, previous experience, and tablet ownership. The research questions were investigated using a survey that was based on the UTAUT2 (Venkatesh et al., 2012). Moderated multiple regression is an appropriate method to measure the interaction effects of variables in the study.

Table 2

Research Questions

Question	Data Collection	Data Analysis
Which of the following factors explain a student's Behavioral Intention to use a multi-modal tablet in the academic environment: Performance Expectancy, Effort Expectancy, Social Influence, Facilitating Conditions, Habit, Price Value, and Hedonic Motivation?	UTAUT2 Instrument	Multiple Regression
Which of the following factors explain a student's reported use of a multi-modal tablet in the academic environment: Performance Expectancy, Effort Expectancy, Facilitating Conditions, Social Influence, Habit, Price Value, and Hedonic Motivation?	UTAUT2 Instrument	Multiple Regression
To what extent does the relationship between the following factors and Behavioral Intention change depending on the value of Habit: Performance Expectancy, Effort Expectancy, and Social Influence?	UTAUT2 Instrument	Moderated Multiple Regression
To what extent does the relationship between the following factors and Behavioral Intention change depending on the value of Hedonic Motivation: Performance Expectancy, Effort Expectancy, and Social Influence?	UTAUT2 Instrument	Moderated Multiple Regression
To what extent does the relationship between the following factors and Behavioral Intention change depending on the value of Price Value: Performance Expectancy, Effort Expectancy, and Social Influence?	UTAUT2 Instrument	Moderated Multiple Regression
Is there a statistically significant difference between demographic factors such as gender, age, previous experience, student status, and degree program in Behavioral Intention to use multi-modal tablets?	UTAUT2 Instrument Demographic Survey	*t* test ANOVA Post Hoc Tukey test

Chapter 4

Results

The purpose of this study was to explore graduate student perceptions of use and the ease of use of multi-modal tablets to access electronic course materials, and the perceived differences based on students' gender, age, college of enrollment, and previous experience. The UTAUT2 instrument (Venkatesh et al., 2012), which measures a user's perceptions of technology, was implemented to collect students' perceptions of multi-modal tablets. The UTAUT2 instrument consists of seven constructs: Performance Expectancy, Effort Expectancy, Social Influence, Facilitating Conditions, Habit, Hedonic Motivation, and Price Value. In order to analyze the relationship of the constructs and dependent variables present in the data collected, moderated multiple regression and correlation analysis were utilized. This chapter provides the demographic characteristics of the respondents, the results for each of the research questions, and observations.

Demographic Characteristics of the Participants

This study surveyed graduate students from four colleges at a regional university located in the southeast. The participants came from the College of Education, College of Nursing, College of Pharmacy, and College of Public Health. The participants were contacted via email by the researcher to participate in the study. The demographic information was collected using the online demographic form (see Appendix A). A total of 434 participants completed the online survey. Surveys that were not completed were removed from the study results. However, in those instances where an individual

survey item was not completed by a participant, there were differences in the *n* responses for certain factors.

Table 3 presents the demographic data of the participants in this study, including tablet experience, age, gender, college of enrollment, and diagnosis of disability. More females (*n* = 172, 75.11%) completed the survey than males (*n* = 57, 24.89%). Participation from the colleges was as follows: College of Education–*n* = 67, College of Nursing–*n* = 47, College of Pharmacy–*n* = 30, and College of Public Health–*n* = 85. Respondents varied in age ranging from 18-63 years while most fell into the 25-31 age range (*n* = 113, 49.34%). The researcher divided age into groups 18-25 (*n* = 13, 5.68%), 25-31 (*n* = 113, 49.34%), 32-41 (*n* = 54, 23.58%), 42-51 (*n* = 26, 11.35%), and 52-63 (*n* = 13, 5.38%).

Most of the respondents owned a multi-modal tablet (*n* = 197, 86.40%), however 31 (13.60%) students did not own a tablet, and one respondent did not answer the survey item. Table 4 displays the types of tablets participants identified they owned. The Apple iPad (any generation/model) was the most owned device among respondents (*n* = 169), followed by the Kindle Fire (*n* = 31), Samsung Galaxy Tab (*n* = 28), Windows Surface Pro (*n* = 19), Nook Color Tablet (*n* = 12), Google Nexus 10 (*n* = 3). Other tablets (*n* = 17) were identified by respondents with less than two responses per type, including the following brands: Acer, Asus, Dell, and LG).

Table 3

Demographic Data by Graduates by College Enrollment

Characteristic	EDU		Nursing		Phar		PH		Other		Total	
	n	*%*	*n*	*%*	*n*	*%*	*n*	*%*	*n*	*%*	*n*	*%*
Gender												
Female	53	79.10	42	89.36	20	66.67	57	67.06	8	78.57	180	75.11
Male	14	20.90	5	10.64	9	30.00	28	32.94	3	21.43	60	24.59
No Response					1						1	
Age Group												
18-24	0	0.00	0	0.00	8	26.67	5	5.88			13	5.68
25-31	25	37.31	23	48.94	19	63.33	46	54.12	6	55.00	119	49.34
32-41	13	19.40	14	29.79	1	3.33	26	30.59	3	27.00	57	23.58
42-51	14	20.90	7	14.89	1	3.33	4	4.71	2	18.00	28	11.35
52-63	11	16.42	1	2.13	0	0.00	1	1.18			13	5.68
No Response	4	5.97	2	4.26	1	3.33	3	3.53			10	4.37
Tablet Ownership												
Yes	56	83.58	42	91.30	29	100.00	69	81.18	10	71.43	206	86.12
No	11	16.42	4	8.70			16	18.82	4	28.57	35	13.60
No Response			1							7.14	1	
Tablet Experience												
Never	5	7.46	3	6.38	0	0.00	10	11.76	1		19	7.86
< 1 Year	6	8.96	9	19.15	5	16.67	10	11.76	1		31	13.10
1-2 Years	20	29.85	16	34.04	11	36.67	28	34.12	3		79	33.19
3-4 Years	25	37.31	12	25.53	11	36.67	30	35.29	5		77	34.06
5 Years or More	11	16.42	7	14.89	3	10.00	6	7.06	1		28	11.79
Diagnosed w/ Disability												
Yes	6	8.96	1	2.13	2	6.67	7	8.33	0	0.00	16	6.61
No/Not Answered	61	91.04	46	97.87	28	93.33	78	91.67	11	100.00	226	93.39

The demographic data show most of the respondents have had moderate experience with the tablet as measured in years. The tablet experience section has more variability than gender and tablet ownership characteristics with those who have never used a tablet were 7.86% (*n* = 18), 13.10% (*n* = 30) have had less than 1 year experience using a tablet device, 33.19% (*n* = 76) used a tablet for 1 to 2 years, 34.06% (*n* = 78) have used a tablet between 3 and 4 years, and 11.79% (*n* = 27) have used a tablet for 5 years or more.

Table 4

Tablet Ownership Frequency By Tablet Type

Tablet	*n*	*%*
Google Nexus 10	3	1.10
Nook Color Tablet	12	8.06
Windows Surface Pro	19	5.13
Samsung Galaxy Tab	28	10.62
Kindle Fire	31	11.72
Apple iPad (Any Generation/Model)	169	60.07
Other	17	5.86

N = 229. Other Tablets listed include - Acer Switch 10, Acer Android Tablet, ASUS Tablet, ASUS Infinity, Dell Latitude Tablet, Kindle WhitePaper, Lenovo A10, LG 10.1, Pandigital, Samsung Galaxy 4, Samsung Galaxy Note 10.1, and Windows Surface RT.

Females comprised the majority (65% or more) of graduate respondents from each of the four colleges reviewed in this study. Table 5 displays the graduate frequency data by college for gender, age group, tablet ownership, tablet experience, and disability. The College of Pharmacy tablet ownership equaled 100% while other colleges ranged from 85% to 92% (Education – 85.19%, Nursing – 91.3%,

Public Health – 86.85%). Students in the 25-31 and 32-41 age groups composed most of the respondents from each college except College of Pharmacy, where the highest number of respondents came from the 18-24 and 25-31 age groups. For tablet experience, a response of 1-4 years garnered 54% or more of the responses from each college. The response "Never" was selected less than 10% of the time within each college, except for in the College of Public Health (*n* = 10, 11.76%).

Only 16 (*7%*) of the respondents self-identified as having a disability (Education – *n* = 6, 8.96%; Nursing – *n* = 1, 2.13 % Pharmacy – *n* = 2, 6.67%; Public Health – *n* = 7, 8.33%). The following were identified as disabilities by the participants: Hearing, visual, emotional, and physical impairments as well as a variety of learning disabilities.

Performance expectancy. Performance Expectancy is the extent to which a user believes that the use of a particular technology or system will increase their productivity, ultimately increasing their performance (Brown et al., 2010). For this sample of graduate students, the Performance Expectancy score (*n* = 224, *SD* = 2.69, Mode = 11) ranged from 3-15 with a mean score of 10.34. Table 5 displays the means, standard deviation, and range for Performance Expectancy by college. The mean Performance Expectancy score for participants from the college of Education was slightly higher than the overall mean, with an average of 10.44 (*n* = 66,*SD* = 2.57, and the Mode = 11), while scores ranged from 6-15. Public Health students' average Performance Expectancy score was lower than the overall Performance Expectancy mean with a score of 10.20, and scores ranged from 3-15(*n* = 81, *SD* = 2.71, Mode = 10). Nursing students reported the highest PE average score of the four colleges with a Mean of 10.81, and a range of 4-15 (*n* = 47, *SD* = 2.52, Mode = 11). Pharmacy graduate students' mean Performance Expectancy score was the lowest across the four

colleges at 9.80 with a range of 4-15 (*n* = 30, *SD* = 3.16, Mode = 10). Table 6 displays the results of a one-way ANOVA (*F*(3, 220) = 0.98, *p* = 0.406), which show there was not a significance difference in the mean scores for Performance Expectancy across colleges.

Effort expectancy. Effort Expectancy is the extent to which the use of a particular technology or system is effortless. A high Effort Expectancy score means the technology or system perceived to be easier to use as opposed to a low Effort Expectancy score that means a technology is perceived as hard to use.

Table 5
Performance Expectancy Mean Scores Across Four Colleges

College	*n*	$\bar{x}$	*SD*	*Min*	*Max*	Mo
Overall	224	10.34	2.69	3	15	11
Education	66	10.44	2.57	6	15	11
Nursing	47	10.81	2.52	4	15	11
Pharmacy	30	9.80	3.16	4	15	10
Public Health	80	10.20	2.70	3	15	10

Note. Mo = Mode. = Sample Mean. *SD* = sample standard deviation.

Table 6

ANOVA Summary Table for Performance Expectancy Across Four Colleges

Source	*df*	*MS*	*F*	*p*
Between Groups	3	7.12	0.98	0.4016
Within Groups	220	7.24		
Total	223			

Table 7 displays the means, standard deviation, and range for Effort Expectancy by college. For the overall graduate sample, the mean Effort Expectancy score was 15.57 and scores ranged from 6-19 (*n* = 221, *SD* = 2.73, Mode = 15). College of Education graduate students reported a mean Effort Expectancy of 14.70, range of 7-19 (*n* = 64, *SD* = 2.82, Mode = 15). Public Health graduate students provided a slightly higher summative mean than the overall graduate student sample average, with a 15.87 mean and scores ranging from 6-19 (*n* = 82, *SD* = 2.49, Mode = 15.00). Nursing graduate students' summative mean was 16.11 with scores ranging 10-19 (*n* = 46, *SD* = 2.60, Mode = 15). College of Pharmacy graduate students mean was 15.79 and scores in the range of 5-19 (*n* = 29, *SD* = 3.05, Mode = 15). Table 8 displays the results of a one-way ANOVA ($F(3, 217) = 3.23$, $p = 0.0233$), which shows there is a significant difference in mean scores for Effort Expectancy among colleges.

Table 7

Effort Expectancy Mean Scores Across Four Colleges

College	*n*	$\bar{x}$	*SD*	*Min*	*Max*	Mo
Overall	221	15.57	2.73	5	19	15
Education	64	14.70	2.82	7	19	15
Nursing	46	16.11	2.60	10	19	15
Pharmacy	29	15.79	3.05	5	19	15
Public Health	82	15.87	2.49	6	19	15

Mo = Mode. = Sample Mean. *SD* = sample standard deviation.

Table 8

ANOVA Summary Table for Effort Expectancy Across Four Colleges

Source	*df*	*MS*	*F*	*p*
Between Groups	3	23.35	3.23	0.0233
Within Groups	217	7.23		
Total	220			

Facilitating conditions. "Facilitating conditions are defined as the degree to which an individual believes that an organizational and technical infrastructure exists to support use of the system" (Venkatesh et al., 2003, p. 453). Table 9 displays the means, standard deviation, and range for Facilitating Conditions by college. The overall graduate student summative mean for Facilitating Conditions was 16.28 with a 10-20 range (*n* = 224, *SD* = 2.19, Mode = 16). College of Education students reported a summative mean of 15.90 with a range of 11-20 (*n* = 63, *SD* = 2.02, Mode = 16). Public Health graduate students' summative mean was 16.35, with a range of 10-20 (*n* = 82, *SD* = 2.21, Mode = 16). With a mean higher than the overall graduate student mean, Nursing students reported a summative mean of 16.69 and a range of 10-20 (*n* = 45, *SD* = 2.31, Mode = 16). The summative mean for pharmacy graduate students was 16.31 and scores ranged from 11-20 (*n* = 29, *SD* = 2.27, Mode = 17). The results of a one-way ANOVA ($F(3, 220) = 1.25$, $p = 0.2941$) are shown in Table 10; this table shows that there is no significant difference in the mean Facilitating Conditions score across colleges.

Table 9

Facilitating Conditions Mean Scores Across Four Colleges

College	*n*	$\bar{x}$	*SD*	*Min*	*Max*	Mo
Overall	224	16.28	2.19	10	20	16
Education	67	15.90	2.02	11	20	16
Nursing	45	16.69	2.31	10	20	16
Pharmacy	29	16.31	2.27	11	20	17
Public Health	83	16.35	2.21	10	20	16

Note. Mo = Mode. = Sample Mean. *SD* = sample standard deviation.

Table 10

ANOVA Summary Table for Facilitating Conditions Across Four Colleges

Source	*df*	*MS*	*F*	*p*
Between Groups	3	5.95	1.25	0.2941
Within Groups	220	4.78		
Total	223			

Social influence. Social Influence (SI) is an individual's perception that important other people (family or friends) believe the individual should use the system or technology (Venkatesh et al., 2012). Table 11 displays the means, standard deviation, and range for Social Influence by college. Overall, the graduate students who participated in this study had a mean Social Influence score of 9.24 and responses ranged from 2-14 (*n* = 223, *SD* = 2.21, Mode = 9). College of Education graduate students returned a mean score of 9.38 and a range of scores from 4-13 (*n* = 65, *SD* = 2.30, Mode = 9). Public Health graduate students' summative mean score was 9.11, and scores ranged from 4-14 (*n* = 82, *SD* = 1.99, Mode = 9). The Nursing students'

summative mean was higher than the overall mean, 9.57 and scores ranged 6-14 (*n* = 46, *SD* = 2.06, Mode = 11). The Pharmacy students reported an 8.77 mean score, with scores ranging from 2-14 (*n* = 30, *SD* = 2.06, Mode = 9). Table 12 presents the results of a one-way ANOVA ($F(3, 219) = 0.98$, $p = 0.4039$), which show there was no significant difference across colleges in the mean scores for Social Influence.

Table 11

Social Influence Mean Scores Across Four Colleges

College	*n*	$\bar{x}$	*SD*	*Min*	*Max*	Mo
Overall	223	9.24	2.21	2	14	9
Education	65	9.38	2.30	4	13	9
Nursing	46	9.57	2.06	6	14	11
Pharmacy	30	8.77	2.74	2	14	9
Public Health	82	9.11	1.99	4	14	9

Note. Mo = Mode. = Sample Mean. *SD* = sample standard deviation.

Table 12

ANOVA Summary Table for Social Influence Across Four Colleges

Source	*df*	*MS*	*F*	*p*
Between Groups	3	4.78	0.98	0.4039
Within Groups	219	4.89		
Total	222			

Habit. Habit is one's perception of performing a task or behavior automatically based on previous learning or prior experience and repeated use (Kim et al., 2005;

Limayem et al., 2007; Venkatesh et al., 2012). In previous research, Habit has been reported to have a direct effect on the use of a technology or system that is stronger than the effect Behavioral Intention has on technology use (Lymayem et al., 2007; Venkatesh et al., 2012). There was more disparity in the Habit score than the other factors previously mentioned.

Table 13 displays the means, standard deviation, and range for Habit by college. The overall graduate students' perception of Habit mean score was 7.79, with scores ranging from 3-15 (n = 222, SD = 3.02, Mode = 8). Education graduate students' Habit mean score was 7.69, and scores ranged from 4-15 (n = 64, SD = 2.51, Mode = 6). Public Health graduate Habit mean 7.51 (n = 81, SD = 3.44, Mode = 3) was also below the overall average, with scores ranging from 3-15. The Nursing students' Habit perception mean of 8.11 (n = 47, SD = 2.84, Mode = 8) was higher than the overall average, and scores ranged from 3-15. Pharmacy students' perception of Habit score mean was 8.30 (n = 30, SD = 3.12, Mode = 8, Range = 3-15). Table 14, the results of a one-way ANOVA (F(3, 220) = 0.72, p = 0.5428), show that there was no significant difference across colleges for Habit.

Price value. Venkatesh et al. (2012) define Price Value (PV) as the "consumers' cognitive tradeoff between the perceived benefits of the applications and the monetary cost for using them" (p. 161). Table 15 displays the means, standard deviation, and range for Price Value by college.

Table 13

Habit Mean Scores Across Four Colleges

College	*n*	$\bar{x}$	*SD*	*Min*	*Max*	Mo
Overall	222	7.79	3.02	3	15	10
Education	64	7.69	2.51	4	15	6
Nursing	47	8.11	2.84	3	15	8
Pharmacy	30	8.30	3.12	3	15	8
Public Health	81	7.51	3.44	3	15	3

Note. Mo = Mode. = Sample Mean. *SD* = sample standard deviation.

Table 14

ANOVA Summary Table for Habit Across Four Colleges

Source	*df*	*MS*	*F*	*p*
Between Groups	3	6.57	0.72	0.5428
Within Groups	220	9.16		
Total	223			

The overall Price Value mean for the graduate student participants was 10.33 (*n* = 224, *SD* = 2.53, Mode = 12), with a range of 3-15. The participants from the College of Education reported a Price Value mean 10.47 (*n* = 66, *SD* = 2.01, Mode = 12), with a range of 6-15. The College of Public Health mean Price Value score was 10.05 (*n* = 81, *SD* = 2.76, Mode = 12) and scores ranged from 3-15. The Nursing students' summative mean was higher than the overall mean, 11.30, and scores ranged 6-15 (*n* = 47, *SD* = 2.27, Mode = 12). The Pharmacy students reported the lowest mean PV score, 9.23, with scores ranging from 3-14 (*n* = 30, *SD* = 2.81, Mode = 12). Table 16 ANOVA results ($F(3, 220) = 4.81$, $p = 0.0029$), shows that there is a significant difference across colleges for Price Value. A post hoc Tukey HSD (honest

significant difference) test revealed that participants from the College of Nursing showed significantly more positive perception of the value the multi-modal tablet at the current price point than the participants from the College of Pharmacy. There was no significant difference for the other pairwise comparisons. The minimum significant difference calculated by the Tukey HSD test was 1.29. The minimum significant difference was the smallest mean difference between pairs that was deemed to be a significant difference.

Table 15

Price Value Mean Scores Across Four Colleges

College	*n*	$\bar{x}$	*SD*	*Min*	*Max*	Mo
Overall	224	10.33	2.53	3	15	12
Education	64	10.47	2.01	6	15	12
Nursing	47	11.30	2.27	6	15	12
Pharmacy	30	9.23	2.81	3	14	12
Public Health	81	10.05	2.76	3	15	12

Note. Mo = Mode. = Sample Mean. *SD* = sample standard deviation.

Table 16

ANOVA Summary Table for Price Value Across Four Colleges

Source	*df*	*MS*	*F*	*p*
Between Groups	3	29.26	4.81	0.0029
Within Groups	220	6.09		
Total	223			

Hedonic motivation. The fun or pleasure derived from using a technology or system is defined as Hedonic Motivation (HM) (Brown & Venkatesh, 2005). Table 17 displays the means, standard deviation, and range for Hedonic Motivation by college. The overall Hedonic Motivation mean for the graduate student participants was 12.01 (*n* = 218 *SD* = 2.13, Mode = 12), with a range of 3-15. The graduate students' from the College of Education HM mean score was 11.84 (*n* = 63, *SD* = 1.83, Mode = 12), while scores ranged from 6-15.

The College of Public Health mean HM score was 11.93 (*n* = 80, *SD* = 2.24, Mode = 12) and scores ranged from 3-15. With a mean higher than the overall graduate student mean, Nursing students reported a summative mean of 12.33 and a range of 7-15 (*n* = 45, *SD* = 2.13, Mode = 12). The summative mean for pharmacy graduate students was 12.10 and scores ranged from 7-15 (*n* = 30, *SD* = 2.45, Mode = 12). Table 18 displays the ANOVA results ($F(3, 220) = 0.53$, $p = 0.6598$), for Hedonic Motivation. There was no significant difference for Hedonic Motivation across colleges.

Table 17

Hedonic Motivation Mean Scores Across Four Colleges

College	*n*	$\bar{x}$	*SD*	*Min*	*Max*	Mo
Overall	218	12.01	2.13	3	15	12
Education	67	11.84	1.83	6	15	12
Nursing	47	12.33	2.13	7	15	12
Pharmacy	30	12.10	2.45	7	15	12
Public Health	85	11.93	2.24	3	15	12

Note. Mo = Mode. = Sample Mean. *SD* = sample standard deviation.

Table 18

ANOVA Summary Table for Hedonic Motivation Across Four Colleges

Source	*df*	*MS*	*F*	*p*
Between Groups	3	2.44	0.53	0.6598
Within Groups	214	4.57		
Total	217			

Behavioral intention. Behavioral Intention (BI) is the individual's reported intention to use the multi-modal tablet. Table 19 displays the means, standard deviation, and range for Behavioral Intention by college. The overall BI mean for the graduate student participants was 10.43 (*n* = 224, *SD* = 2.65, Mode = 10), with a range of 3-15. Education graduate students' BI mean score was 10.52, and scores ranged from 7-15 (*n* = 66, *SD* = 2.04, Mode = 11). The College of Public Health mean BI score was 10.20 (*n* = 81, *SD* = 2.90, Mode = 10), slightly lower than the overall mean, and scores ranged from 3-15. Nursing students reported the highest BI average score of the four colleges with a Mean of 10.85, and a range of 5-15 (*n* = 47, *SD* = 2.76, Mode = 12). Pharmacy graduate students' mean BI score was the lowest across the four colleges at 10.20 with a range of 4-15 (*n* = 30, *SD* = 2.99, Mode = 11). Table 20 reveals ANOVA ($F(3, 220) = 0.70$, $p = 0.5547$) results for Behavioral Intention across colleges. There was no significant difference for Behavioral Intention across colleges.

The means for the individual instrument items are presented in Appendix H. The missing values for each item were dropped from the data before inputted into the means calculation using SAS Studio.

Table 19

Behavioral Intention Mean Scores Across Four Colleges

College	*n*	$\bar{x}$	*SD*	*Min*	*Max*	Mo
Overall	224	10.43	2.65	3	15	10
Education	66	10.52	2.04	7	15	11
Nursing	47	10.85	2.76	5	15	12
Pharmacy	30	10.20	2.99	4	15	11
Public Health	81	10.20	2.90	3	15	10

Note. Mo = Mode. = Sample Mean. *SD* = sample standard deviation.

Table 20

ANOVA Summary Table for Behavioral Intention Across Four Colleges

Source	*df*	*MS*	*F*	*p*
Between Groups	3	4.93	0.70	0.5547
Within Groups	220	4.57		
Total	223			

Reliability of the UTUAT2 Instrument

The UTAUT instrument consists of 28 self-report items that measure across nine constructs: Performance Expectancy, Effort Expectancy, Facilitating Conditions, Social Influence, Hedonic Motivation, Habit, Price Value, Behavioral Intention, and Use Behavior. The Use Behavior is the participant's reported use as marked in the survey in Appendix B. Venkatesh et al. (2012) reported that the scales were reliable, with an internal consistency reliability of .75 or greater for multi-scale items with reflective indicators. For this study, Cronbach's alpha was calculated for individual items and for the summative scale, adding results of the individual construct items, as a whole to

calculate internal reliability. Cronbach's alpha is measured from 0 to 1. The analysis measures the degree to which items in a scale are inter-correlated.

Table 21 shows the internal consistency scores for each of the frameworks. Performance Expectancy (α = .78), Effort Expectancy (α = .86), Habit (α = .81), Hedonic Motivation (α = .88), Price Value (α = .87), and Behavioral Intention (α = .81), each had high reliability levels as a construct with a reliability coefficient above .70. Both Social Influence (α = .64) and Facilitating Conditions (α = .56) did not show high reliability scores when the individual construct items were measured. A Pearson's correlation analysis was conducted to view any significant relationships between the individual constructs. The results are presented in Table 22.

Table 21

Internal Reliability Coefficients for Scales Scale Using Cronbach's Alpha

Scale	# of Items	Raw Alpha
Performance Expectancy	3	.783
Effort Expectancy	4	.863
Social Influence	3	.640
Facilitating Conditions	4	.565
Habit	3	.807
Hedonic Motivation	3	.880
Price Value	3	.867
Behavioral Intention	3	.807
All Items	26	.924
Use Behavior	15	.926

Research Questions

The research questions for this study form the basis for data analysis. The research questions for the study are:

1. *Which of the following factors explain a student's Behavioral Intention to use a multi-modal tablet in the academic environment: Performance Expectancy, Effort Expectancy, Social Influence, Facilitating Conditions, Habit, Price Value, and Hedonic Motivation?*

The relationship between each of the factors and Behavioral Intention were investigated using the Pearson correlation analysis and multiple regression modeling. All of the factors, Performance Expectancy, Effort Expectancy, Social Influence, Facilitating Conditions, Habit, Price Value, and Hedonic Motivation, had a medium to strong positive relationship with Behavioral Intention. With a $p < .0001$, a statistically significant positive relationship existed between Behavioral Intention and the seven constructs of the UTAUT scale.

The regression analysis of the dataset used 203 of 229 observations. Table 23 displays the ANOVA for the regression analysis. The results were significant ($F(7, 195) = 119.49$, $p < .0001$; $R^{2} = .811$) with the factors explaining 81% of the variance in Behavioral Intention. There was a statistically significant positive relationship between Performance Expectancy ($\beta = .301$, $t = 6.49$, $p < .0001$), Social Influence ($\beta = .092$, $t = 1.98$, $p = .0496$), Hedonic Motivation ($\beta = .292$, $t = 5.39$, $p < .0001$), and Habit ($\beta = .368$, $t = 9.52$, $p < .0001$) and Behavioral Intention to use a tablet device prior to the addition of any moderating variables to the model. Table 24 provides a summary of the multiple regression analysis to answer research question 1.

Table 22

Pearson's Correlations and Probability Values for UTAUT Constructs

UTAUT Constructs	PE *r / p*	EE *r / p*	SI *r / p*	FC *r / p*	HM *r / p*	PV *r / p*	H *r / p*	BI *r / p*
PE	1.00000							
EE	0.51906 <.0001	1.000						
SI	0.40241 <.0001	0.40960 <.0001	1.000					
FC	0.46000 <.0001	0.69285 <.0001	0.52439 <.0001	1.000				
HM	0.58780 <.0001	0.56174 <.0001	0.44882 <.0001	0.53180 <.0001	1.000			
PV	0.49281 <.0001	0.29676 <.0001	0.29748 <.0001	0.34554 <.0001	0.38841 <.0001	1.000		
H	0.64836 <.0001	0.42658 <.0001	0.39620 <.0001	0.41765 <.0001	0.56528 <.0001	0.39474 <.0001	1.000	
BI	0.78419 <.0001	0.53497 <.0001	0.49897 <.0001	0.50122 <.0001	0.71224 <.0001	0.48584 <.0001	0.80764 <.0001	1.000

N = 203. PE = Performance Expectancy. EE = Effort Expectancy. SI = Social Influence. FC = Facilitating Conditions. PV = Price Value. H = Habit. BI = Behavioral Intention.

The results of the analysis show that only Performance Expectancy, Social Influence, Habit, and Hedonic Motivation have a statistically significant effect on Behavioral Intention. The correlations between Behavioral Intention and Performance Expectancy ($\rho_{X,Y} = 0.7842$, $p < .0001$), Hedonic Motivation ($\rho_{X,Y} = 0.7122$, $p < .0001$), and Habit ($\rho_{X,Y} = 0.8076$, $p < .0001$) were strong, as previously shown in Table 22.

Table 23

ANOVA Summary Table With R^2 for Behavioral Intention

Source	*df*	*SS*	*MS*	*F*	*p*	R^2	Adj R^2
Regression	7	1168.323	166.903	119.49	<.0001	0.8109	0.8042
Residual Error	195	272.366	1.397				
Total	202	1440.69					

Note. Predictors for Behavioral Intention included Performance Expectancy, Effort Expectancy, Social Influence, Facilitating Conditions, Hedonic Motivation, Habit, and Price Value

2. *Which of the following factors explain a student's reported use of a multi-modal tablet in the academic environment: Performance Expectancy, Effort Expectancy, Facilitating Conditions, Social Influence, Habit, Price Value, and Hedonic Motivation?*

There is a positive relationship between each of the UTAUT constructs and the reported use of tablet devices. Table 25 displays each of the constructs, Performance Expectancy (n = 192, $\rho_{X,Y}$ = 0.618, p < .0001), Effort Expectancy (n = 192, $\rho_{X,Y}$ = 0.429, p < .0001), Facilitating Conditions (n = 192, $\rho_{X,Y}$ = 0.376, p < .0001), Social Influence (n = 192, $\rho_{X,Y}$ = 0.372, p < .0001), Habit (n = 192, $\rho_{X,Y}$ = 0.657, p < .0001), Price Value (n = 192, $\rho_{X,Y}$ = 0.316, p < .0001), Hedonic Motivation (n = 192, $\rho_{X,Y}$ = 0.507, p < .0001), and Behavioral Intention (n = 192, $\rho_{X,Y}$ = 0.715, p < .0001).

Each has a significant positive correlation with the reported use. Regression analysis reveals that the ANOVA results were significant (F(8, 183) = 27.54, p < .0001; R^2 = .547) with the factors explaining 55% of the variance in reported Use of multi-modal tablets. The regression analysis revealed a positive statistically significant relationship with reported Use and Habit (β = 1.374, t = 2.94, p = .0037) and reported Use and Behavioral Intention (β = 2.535, t = 3.51, p = .0006) prior to the addition of any

moderators to the model. Table 26 and Table 27 display the summary of the ANOVA and Regression statistics for Use.

Table 24

Summary of Multiple Regression Analysis for Behavioral Intention

Variable	*β*	SE(*β*)	*t*	*p*
Intercept	-0.427	0.667	-0.64	0.5229
Performance Expectancy	0.301	0.046	6.49	<.0001
Effort Expectancy	0.042	0.044	0.97	0.3356
Social Influence	0.092	0.043	1.98	0.0496
Facilitating Conditions	-0.046	0.056	-0.82	0.4114
Habit	0.368	0.039	9.52	<.0001
Hedonic Motivation	0.292	0.054	5.39	<.0001
Price Value	0.062	0.037	1.66	0.0981

α = .05. *n* = 203.

Table 25

Relationship of UTAUT Constructs to Reported Use

Construct	Pearson Correlation Coefficients
Performance Expectancy	.618
Effort Expectancy	.429
Social Influence	.372
Facilitating Conditions	.376
Habit	.665
Price Value	.316
Hedonic Motivation	.507
Behavioral Intention	.715

p < .0001. *n* = 192

Table 26

ANOVA Summary Table With R^2 for Use

Source	*df*	*SS*	*MS*	*F*	*p*	R^2	Adj R^2
Regression	8	29281	3660.09	27.54	<.0001	0.5462	0.5264
Residual Error	183	24324	132.92				
Total	191	53605					

Note. Predictors for Behavioral Intention included Performance Expectancy, Effort Expectancy, Social Influence, Facilitating Conditions, Hedonic Motivation, Habit, Price Value, and Behavioral Intention

3. *To what extent does the relationship between the following factors and Behavioral Intention change depending on the value of Habit: Performance Expectancy, Effort Expectancy, and Social Influence?*

The following model was estimated to test if Habit affects the relationship between Performance Expectancy and Behavioral Intention:

$$Y = a + b_H(H) + b_{EE}(PE) + b_{EE\times H}(PE \times H)$$

with PE x H equaling the product of Habit and Social Influence. The result of the regression model of Performance Expectancy and Habit with Behavioral Intention is statistically significant. When the regression model only includes Performance Expectancy (β = 0.663, t = 8.10, p < .0001), Habit (β = 0.836, t = 6.79, p < .0001), and the interaction term (β = -0.033, t = -3.22, p = 0.015), regressed on the dependent variable Behavioral Intention, the model (R^2 = 0.783, p < .0001) was found to be statistically significant.

Table 27

Summary of Multiple Regression Analysis for Use

Variable	*β*	SE(*β*)	*t*	*p*
Intercept	-2.174	6.704	-0.32	0.7461
Performance Expectancy	0.914	0.519	1.76	0.0798
Effort Expectancy	0.399	0.441	0.90	0.3673
Social Influence	0.188	0.471	0.40	0.6905
Facilitating Conditions	-0.213	0.575	-0.37	0.7119
Habit	1.374	0.575	2.94	0.0037
Hedonic Motivation	-0.167	0.580	-0.29	0.7733
Price Value	-0.408	0.380	-1.07	0.2849
Behavioral Intention	2.535	0.723	3.51	0.0006

α = .05. *n* = 192

The regression model was:

$$\hat{Y} = -0.083 + 0.836*(H) + 0.836\ (PE) - 0.033*(H \times PE)$$

Table 28, Table 29, and Figure 6 contain the results of the regression analysis. The relationship between Behavioral Intention and Performance Expectancy was assessed at each value of Habit. Estimated values of Behavioral Intention were generated from the regression equation using the sample mean, one standard deviation above the mean, one standard deviation below the mean of Social Influence and each value in the range for Habit (3-15). As shown in Figure 6, with every unit increase in Habit, there is an increase in the predicted Behavioral Intention. The gap in the predicted value of Behavioral Intention for individuals with above average and below

average value of Performance Expectancy decreases. The mean for Performance Expectancy was 15.57 with a 2.73 *SD.*

Table 28

ANOVA Summary Table with R^2 for Behavioral Intention With the Performance Expectancy and Habit Interaction Predictor Variables

Source	*df*	*SS*	*MS*	*F*	*p*	R^2	Adj R^2
Regression	3	1221.817	407.272	258.02	<.0001	0.7826	0.7796
Residual Error	215	339.370	1.578				
Total	218	1561.187					

Note. Predictors for Behavioral Intention included Performance Expectancy (PE), Habit, and PE*Habit interaction

Table 29

Summary of Multiple Regression Analysis for Behavioral Intention With the Performance Expectancy and Habit Interaction Predictor Variables

Variable	*β*	SE(*β*)	*t*	*p*
Intercept	-0.083	0.821	-0.10	0.9192
Performance Expectancy	0.663	0.082	8.10	<.0001
Habit	0.836	0.123	6.79	<.0001
Performance Expectancy Habit	-0.033	0.010	-3.22	0.0015

α = .05. *n* = 219

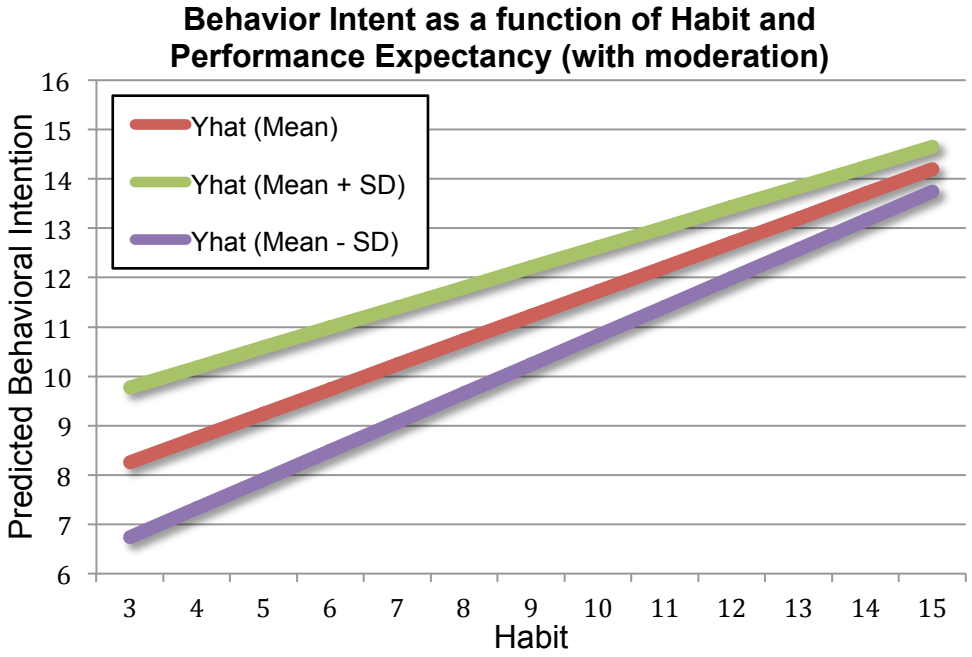

Figure 6. Graph of Behavior Intent as a function of Habit and Performance Expectancy with Moderation.

The following model was estimated to test if Habit affects the relationship between Effort Expectancy and Behavioral Intention:

$$Y = a + b_H(H) + b_{EE}(EE) + b_{EE\times H}(EE \times H)$$

with EE x H equaling the product of Habit and Social Influence. The ANOVA results for Effort Expectancy (β = .336, t = 3.68, p = .0003) and Habit (β = 0.969, t = 4.45, p < .0001) only in the regression model was significant ($F(3, 212) = 165.03$, $p<.0001$; R^2 = .700), explaining 70% of the variance in Behavioral Intention. The interaction effect for Habit and Effort Expectancy was not significant at the .05 level (β = -0.020, t = -1.54, p = .126), meaning that Habit does not affect the relationship between Effort Expectancy and Behavioral Intention. The regression model was:

$$\hat{Y} = 0.456 + 0.969*(H) + 0.336(EE) - 0.020*(H \times EE)$$

Table 30 and Table 31 contain the results of the regression analysis. The relationship between Behavioral Intention and Effort Expectancy was assessed at each value of Habit. Estimated values of Behavioral Intention were generated from the regression equation using the sample mean, one standard deviation above the mean, one standard deviation below the mean of Effort Expectancy and each value in the range for Habit (range: 3-15). The mean for Effort Expectance was 15.57 with a 2.73 *SD.*

The following model was estimated to test if Habit affects the relationship between Social Influence and Behavioral Intention:

$$Y = a + b_H(H) + b_{SI}(SI) + b_{SI\times H}(SI \times H)$$

with SI x H equaling the product of Habit and Social Influence.

Table 30

ANOVA Summary Table with R^2 for Behavioral Intention With the Effort Expectancy and Habit Interaction Predictor Variables

Source	*df*	*SS*	*MS*	*F*	*p*	R^2	Adj R^2
Regression	3	1073.354	357.785	165.03	<.0001	0.7002	0.6959
Residual Error	212	459.604	2.168				
Total	215	1532.958					

Note. Predictors for Behavioral Intention included Effort Expectancy (EE), Habit, and EE*Habit interaction

Table 31

Summary of Multiple Regression Analysis for Behavioral Intention With the Effort Expectancy and Habit Interaction Predictor Variables

Variable	*β*	SE(*β*)	*t*	*p*
Intercept	0.09195	1.46715	0.06	0.9501
Effort Expectancy	0.33582	0.09135	3.68	0.0003
Habit	0.96869	0.21744	4.45	<.0001
Effort Expectancy Habit	-0.01970	0.01283	-1.54	0.1260

α = .05. *n* = 219

A regression analysis was run in SAS with only Social Influence (*β* = 0.537, *t* = 4.59, *p* < .0001), Habit (*β* = 1.033, *t* = 6.92, *p* < .0001), and the Habit*Social Influence interaction (*β* = -0.040, *t* = -2.74, *p* = 0.007) variables in the model to predict Behavioral Intention. The model was shown to be significant ($F(3, 214) = 170.10$, $p < .0001$; $R^2 = .705$).

The regression model was:

$$\hat{Y} = 0.456 + 1.033*(H) + 0.537(SI) - 0.040*(H \times SI)$$

Table 32, Table 33, and Figure 7 contain the results of the regression analysis. The relationship between Behavioral Intention and Social Influence was assessed at each value of Habit. Estimated values of Behavioral Intention were generated from the regression equation using the sample mean, one standard deviation above the mean, one standard deviation below the mean of Social Influence and each value in the range for Habit (range: 3-15). As shown in Figure 7, with every unit increase in Habit, there was an increase in the predicted Behavioral Intention. The gap in predicted value of

Behavioral Intention for individuals with above average and below average means of Social Influence decreases as Habit increases. The mean for Social Influence was 9.24 with a 2.21 *SD.*

Table 32

ANOVA Summary Table with R^2 for Behavioral Intention With the Social Influence and Habit Interaction Predictor Variables

Source	*df*	*SS*	*MS*	*F*	*p*	R^2	Adj R^2
Regression	3	1079.458	359.819	170.10	<.0001	0.705	0.700
Residual Error	214	452.671	2.115				
Total	217	1532.128					

Note. Predictors for Behavioral Intention included Social Influence (SI), Habit, and SI*Habit interaction

Table 33

Summary of Multiple Regression Analysis for Behavioral Intention With the Social Influence and Habit Interaction Predictor Variables

Variable	*β*	SE(*β*)	*t*	*p*
Intercept	0.456	1.095	0.42	0.6775
Social Influence	0.537	0.117	4.59	<.0001
Habit	1.033	0.149	6.92	<.0001
Social Influence Habit	-0.040	0.015	-2.74	0.0067

α = .05. *n* = 218

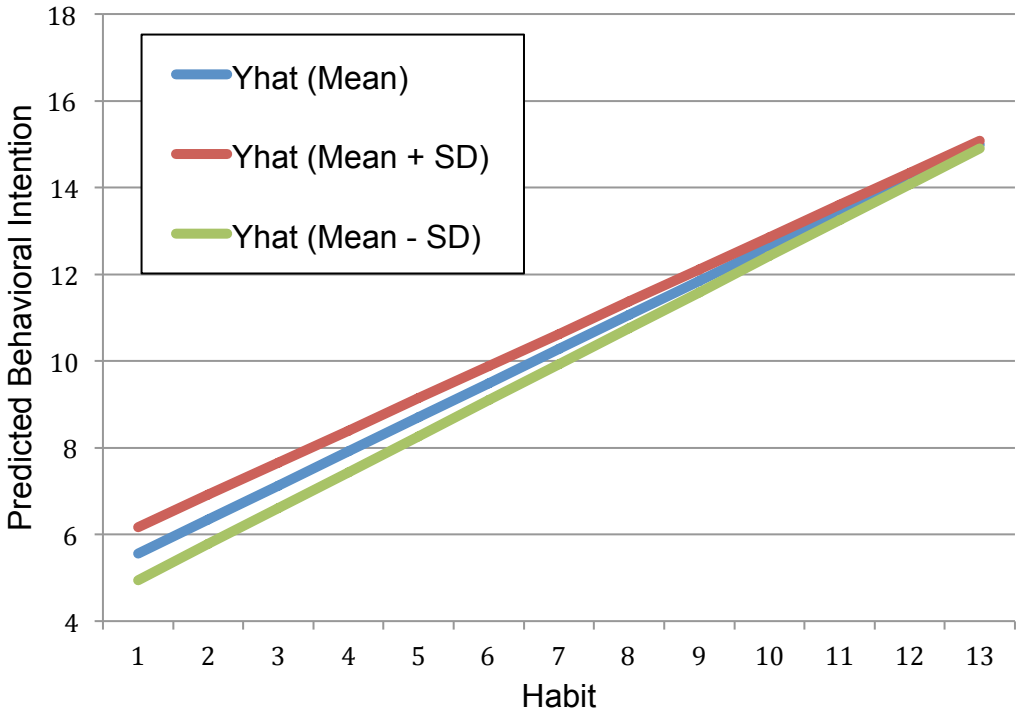

Figure 7. Graph of multiple regression analysis for Behavioral Intention with the Social Influence and Habit interaction predictor variable.

4. *To what extent does the relationship between the following factors and Behavioral Intention change depending on the value of Hedonic Motivation: Performance Expectancy, Effort Expectancy, and Social Influence?*

Hedonic Motivation was entered into the UTAUT2 model as an interaction with Performance Expectancy, Effort Expectancy, and Social Influence. A regression model was created that contained Performance Expectancy, Hedonic Motivation, and the Performance Expectancy x Hedonic Motivation interaction variable. Behavioral Intention was the dependent variable. The ANOVA results ($F(3, 210) = 168.94$, $p < .0001$; $R^2 = .707$) from this model showed significance.

The Hedonic Motivation x Performance Expectancy interaction variable was not significant when regressed against Behavioral Intention. Table 34 and Table 35 contain the results of the regression analysis.

Table 34

ANOVA Summary Table With R^2 for Behavioral Intention With the Performance Expectancy and Hedonic Motivation Interaction Predictor Variables

Source	*df*	*SS*	*MS*	*F*	*p*	R^2	Adj R^2
Regression	3	1068.040	356.013	168.94	<.0001	0.7070	0.7029
Residual Error	210	442.544	2.107				
Total	213	1510.584					

Note. Predictors for Behavioral Intention included Performance Expectancy (PE), Hedonic Motivation, and PE*Hedonic Motivation interaction

Table 35

Summary of Multiple Regression Analysis for Behavioral Intention With the Performance Expectancy and Hedonic Motivation Interaction Predictor Variables

Variable	*β*	SE(*β*)	*t*	*p*
Intercept	-1.415	1.553	-0.91	0.3632
Performance Expectancy	0.602	0.172	3.50	0.0006
Hedonic Motivation	-0.506	0.136	3.72	0.0003
Performance Expectancy Hedonic Motivation	-0.004	0.0138	-0.27	0.7912

α = .05. n = 214

The ANOVA results for the Hedonic Motivation, Effort Expectancy and Hedonic Motivation x Effort Expectancy to explain Behavioral Intention was significant ($F(3, 207)72.99$, $p < .0001$; $R^2 = .514$). Only including Effort Expectancy ($\beta = 0.056$, $t = 0.30$, $p = 0.7658$), Hedonic Motivation ($\beta = 0.0364$, $t = 2.11$, $p = 0.0364$), and Hedonic Motivation x Effort Expectancy ($\beta = 0.011$, $t = 0.68$, $p = 0.4959$) did not reveal the Hedonic Motivation x Effort Expectancy interaction variable to be a significant variable to explain Behavioral Intention. Table 36 and Table 37 contain the results of the regression analysis.

A model, which included Hedonic Motivation x Social Influence interaction variable, Social Influence, and Hedonic Motivation was regressed against Behavioral Intention. The ANOVA results showed significance ($F(3, 209) = 86.17$, $p < .0001$; $R^2 = .552$), but the interaction (HM x SI) was not significant ($\beta = 0.029$, $t = 1.37$, $p = 0.172$) in explaining Behavioral Intention. Table 38 and Table 39 contain the results of the regression analysis.

Table 36

ANOVA Summary Table With R^2 for Behavioral Intention With the Effort Expectancy and Hedonic Motivation Interaction Predictor Variables

Source	*df*	*SS*	*MS*	*F*	*P*	R^2	Adj R^2
Regression	3	761.919	253.974	72.99	<.0001	0.5140	0.5070
Residual Error	207	720.308	3.480				
Total	210	1482.227					

Note. Predictors for Behavioral Intention included Effort Expectancy (EE), Hedonic Motivation, and EE*Hedonic Motivation interaction

Table 37

Summary of Multiple Regression Analysis for Behavioral Intention With the Effort Expectancy and Hedonic Motivation Interaction Predictor Variables

Variable	*β*	SE(*β*)	*t*	*p*
Intercept	0.621	2.880	0.22	0.8296
Effort Expectancy	0.056	0.189	0.30	0.7658
Hedonic Motivation	0.566	0.269	2.11	0.0364
Effort Expectancy Hedonic Motivation	0.011	0.017	0.68	0.4959

α = .05. *n* = 211

Table 38

ANOVA Summary Table With R^2 for Behavioral Intention With the Social Influence and Hedonic Motivation Interaction Predictor Variables

Source	*df*	*SS*	*MS*	*F*	*P*	R^2	Adj R^2
Regression	3	818.992	272.997	86.17	<.0001	0.5529	0.5465
Residual Error	209	662.163	3.168				
Total	212	1481.155					

Note. Predictors for Behavioral Intention included Social Influence (SI), Hedonic Motivation, and SI*Hedonic Motivation interaction

Table 39

Summary of Multiple Regression Analysis for Behavioral Intention With the Social Influence and Hedonic Motivation Interaction Predictor Variables

Variable	*β*	SE(*β)*	*t*	*p*
Intercept	1.861	2.241	0.83	0.4072
Social Influence	-0.078	0.257	-0.30	0.7612
Hedonic Motivation	0.506	0.193	2.62	0.0095
Social Influence Hedonic Motivation	0.029	0.021	1.37	0.1721

α = .05. *n* = 213

5. *To what extent does the relationship between the following factors and Behavioral Intention change depending on the value of Price Value: Performance Expectancy, Effort Expectancy, and Social Influence?*

A regression analysis was performed to test the effects Price Value may have on the relationship between each Performance Expectancy, Effort Expectancy, Social Influence and Behavioral Intention. The first regression model included Performance Expectancy, Price Value and the Performance Expectancy x Price Value interaction variable. The model ($F(3, 216) = 124.15$, $p < .0001$; $R^2 = .633$) showed significance, but the interaction variable, Performance Expectancy x Price Value, did not display any significance ($\beta = -0.005$, $t = -0.35$, $p = 0.7284$). Price Value did not have an affect on the relationship between Performance Expectancy and Behavioral Intention. Table 40 and Table 41 display the results of the regression analysis.

Table 40

ANOVA Summary Table With R^2 for Behavioral Intention With the Performance Expectancy and Price Value Interaction Predictor Variables

Source	*df*	*SS*	*MS*	*F*	*p*	R^2	Adj R^2
Regression	3	981.115	327.038	124.15	<.0001	0.6329	0.6278
Residual Error	216	568.994	2.634				
Total	219	1550.109					

Note. Predictors for Behavioral Intention included Performance Expectancy (PE), Price Value, and PE x Price Value interaction

To test the effect Price Value has on the relationship between Effort Expectancy and Behavioral Intention, a regression model was built which included Effort Expectancy, Price Value, and the interaction variable, Price Value x Effort Expectancy, regressed against the dependent variable, Behavioral Intention. The model displayed significance ($F(3, 213) = 41.52$, $p < .0001$; $R^2 = .369$), but the interaction variable did not show significance ($\beta = 0.010$, $t = 0.56$, $p = 0.574$). Price Value did not have a significant affect on the relationship between Effort Expectancy and Behavioral Intention. Table 42 and Table 43 show the results of the regression analysis.

To test the effect of Price Value on the relationship between Social Influence and Behavioral Intention, the first regression model was built and included the

Price Value x Social Influence interaction variable, Social Influence, and Price Value regressed against the dependent variable, Behavioral Intention.

Table 41

Summary of Multiple Regression Analysis for Behavioral Intention With the Performance Expectancy and Price Value Interaction Predictor Variables

Variable	*β*	SE(*β)*	*t*	*p*
Intercept	1.053	1.528	0.69	0.4917
Performance Expectancy	0.771	0.157	4.92	<.0001
Price Value	0.190	0.153	1.24	0.2153
Performance Expectancy Price Value	-0.005	0.015	-0.35	0.7284

α = .05. *n* = 220

Table 42

ANOVA Summary Table With R^2 for Behavioral Intention With the Effort Expectancy and Price Value Interaction Predictor Variables

Source	*df*	*SS*	*MS*	*F*	*p*	R^2	Adj R^2
Regression	3	561.531	187.177	41.52	<.0001	0.3690	0.3601
Residual Error	213	960.211	4.508				
Total	216	1521.742					

Note. Predictors for Behavioral Intention included Effort Expectancy (EE), Price Value, and EE*Price Value interaction

The model displayed significance ($F(3, 216) = 43.37$, $p < .0001$; $R^2 = .376$), but the interaction variable, Price Value*Social Influence did not prove to be a significant variable ($\beta = -0.014$, $t = -0.53$, $p = 0.599$). Price Value did not significantly affect the relationship between Social Influence and Behavioral Intention. The result of this moderated multiple regression is shown in Table 44 and Table 45.

Table 43

Summary of Multiple Regression Analysis for Behavioral Intention With the Effort Expectancy and Hedonic Motivation Interaction Predictor Variables

Variable	*β*	SE(*β*)	*t*	*p*
Intercept	1.999	2.915	0.69	0.4937
Effort Expectancy	0.306	0.184	1.67	0.0967
Price Value	0.193	0.296	0.65	0.5137
Effort Expectancy Price Value	0.010	0.018	0.56	0.5739

α = .05. *n* = 217

Table 44

ANOVA Summary Table With R^2 for Behavioral Intention With the Social Influence and Price Value Interaction Predictor Variables

Source	*df*	*SS*	*MS*	*F*	*p*	R^2	Adj R^2
Regression	3	576.164	192.055	43.37	<.0001	0.3759	0.3672
Residual Error	216	956.546	4.428				
Total	219	1532.709					

Note. Predictors for Behavioral Intention included Social Influence (SI), Price Value, and SI*Price Value interaction

6. *Is there a statistically significant difference between demographic factors such as gender, age, previous experience, and degree program in Behavioral Intention to use multi-modal tablets?*

Gender. The groups for this analysis were independent groups. Gender was recoded as dummy variables. Female was coded as 1 and Male was coded 0.

Table 45

Summary of Multiple Regression Analysis for Behavioral Intention With the Social Influence and Price Value Interaction Predictor Variables

Variable	*β*	SE(*β)*	*t*	*p*
Intercept	0.858	2.476	0.35	0.7292
Social Influence	0.640	0.271	2.36	0.0192
Price Value	0.484	0.242	2.00	0.0463
Social Influence Price Value	-0.013	0.025	-0.53	0.5986

α = .05. *n* = 220

Women ($\bar{x}$ = 10.60, *SD* = 2.58) showed a higher Behavioral Intention to use the device with a lower variance score than males ($\bar{x}$ = 9.91, *SD* = *2.84*). Table 47 displays the Behavioral Intention mean scores for both males and females. Table 48 displays the results of the Shapiro–Wilk test (W = 0.965, *p* < 0.0001), which explains that the data were not from a normally distributed sample. The sample groups were not equal in size with 55 males and 169 females. The data did not meet the assumptions necessary for analysis with a *t* Test to determine if there is a statistically significant difference between males and females. The *t* Test is robust to violations of assumptions of equal sample size and normality. Table 49 shows that the *t* statistic failed to reveal any evidence that there was a statistically significant difference between female and male Behavioral Intention scores.

Table 46

Behavioral Intention Mean Scores for Females and Males

Gender	*n*	$\bar{x}$	*SD*	*Min*	*Max*	Mo
Overall	224	10.43	2.65	3.00	15.00	10.00
Female	169	10.60	2.57	3.00	15.00	10.21
Male	55	9.91	2.84	3.00	15.00	9.14

Mo = Mode. = Sample Mean. *SD* = sample standard deviation.

Age. Age was divided into five levels. Each group was independent of each other, which was assured by the study's design. Age was reported as a categorical variable: age Group1 = 18-24 years, age Group2 = 25-31 years, age Group3 = 32-41 years, age Group4 = 42-51 years, age Group5 = 52-63 years.

Table 47

Tests of Normality for Behavioral Intention for All Respondents

Statistic	Female	Male	Total Sample
Shapiro-Wilk	0.9634	0.9631	0.965
p	0.002	0.0903	< 0.0001
Skewness	-0.4403	-0.3460	-0.432
Kurtosis	0.0568	-0.589	-0.137

n = 224 Male *n* = 55. Female *n* = 169.

Table 48

Comparison of Means Between Male and Female Participants

Groups	*df*	Mean Difference	*t*	*p*
Male and Female	222	1.50	1.68	0.0946

n = 224.

Table 49 shows the mean scores for Behavioral Intention across age groups. Behavioral intention mean score was higher for individuals in the 32-41 age group ($\bar{x}$ = 11.06, *SD* = 2.49), but the oldest age group had the lowest variance with a standard deviation of 2.11. Table 47 displays the results of the Shapiro–Wilk test (W = 0.965, $p < 0.0001$), which shows that the sample data did not meet the assumption of normality. The sample groups were not equal in size. The assumption of homogeneity was met as indicated by Levene's statistic ($F = 0.87$, $p = 0.3531$). An ANOVA is robust to the violations of assumptions of equal sample size and normality. An ANOVA was conducted to compare the respondents' mean Behavioral Intention score. The *F* value was 1.00 ($df = 4, 209$, $\alpha = .05$, $p = 0.4089$). Table 49 presents the results of the analysis; the results show that no statistically significant differences exist among the age groups in this study.

Table 49

ANOVA Summary Table of Behavioral Intention Among Age Groups

Source	*df*	*MS*	*F*	*p*
Between Groups	4	7.154807	1.00	0.4089
Within Groups	209	7.158889		
Total	213			

Note. n = 224.

Table 50

Behavioral Intention Mean Scores Across Age Groups

Age Groups	*n*	$\bar{x}$	*SD*	*Min*	*Max*	Mo
Overall	224	10.43	2.65	3.00	15.00	10.00
18-23	12	10.00	2.00	6.00	14.00	8.73
24-31	112	10.23	2.91	3.00	15.00	9.69
32-41	52	11.06	2.49	5.00	15.00	10.36
42-51	26	26.00	10.50	2.44	6.00	15.00
52-63	13	12.00	10.08	2.11	7.00	14.00
Other	10	10.10	2.18	5.00	13.00	8.54

Note. Mo = Mode. = Sample Mean. *SD* = sample standard deviation.

College enrollment. Degree program was a categorical variable including the following colleges: College of Education, College of Nursing, College of Pharmacy, and the College of Public Health. Students enrolled in the College of Nursing had the highest mean score for Behavioral Intention ($\bar{x}$ = 10.85, *SD* = 2.76), and the College of Education students showed the lowest variance ($\bar{x}$ = 10.52, *SD* = 2.04). ANOVA results reveal that a statistically significant difference in Behavioral Intention means among respondents from different colleges in this study does not exist. The *F* value

was 0.70 (*df* = 3, 220, *α* = .05, *p* = 0.5547). Table 20 (previously presented) provides a summary of the ANOVA results.

Previous experience. Previous experience was broken into five categories: No experience, less than 1 year, 1-2 years, 3-4 years, and 5 years or more. Individuals with 5 or more years experience showed the greatest Behavioral Intention average, and the lowest variance was the group without any prior experience with multi-modal tablets ($\bar{x}$ = 11.96, *SD* = 2.33). Individuals with no experience ($\bar{x}$ = 6.79, *SD* = 2.08) showed the lowest intention to use the device and smallest level of variance. Table 51 displays the ANOVA results for Previous Experience. ANOVA results showed that a statistically significant difference existed in Behavioral Intention means among previous experience groups. The *F* value was 12.20 (*df* = 4, 219, *α* = .05, *p* < .0001). Table 51 shows the mean and confidence intervals of Behavioral Intention for each level of Previous Experience.

A post hoc pair-wise Tukey *HSD* (honest significant difference) test revealed several significant pairwise comparisons. The Tukey minimum significant difference or *HSD* result was 1.75. The Tukey HSD significant difference value reveals the minimum difference between two paired means values that must exist for the paired means to be considered statistically significantly different by the HSD. Tables 52, 53, and 54 reveal that individuals with no previous experience with multi-modal tablets have a significantly lower Behavioral Intention score than every other level of previous experience measured. Individuals with 5 or more years experience with multi-modal tablets reported a significantly higher Behavioral Intention score than individuals in the 1-2 years experience, less than 1-year experience, and no previous experience groups. Individuals in less than 1-year experience and 1-2 years experience with multi-modal

tablets reported a significantly lower level of Behavioral Intention than individuals with 5 or more years of experience. Table 53 reveals the mean differences for each possible pair of groups based on Previous Experience and the 95% confidence level limits for each pair. Table 54 shows the grouping of the Tukey HSD test across Previous Experience groups.

Table 51

Comparison of Means of Behavioral Intention Among Groups by Previous Experience

Source	*df*	*MS*	*F*	*P*
Between Groups	4	71.453	12.20	<0.0001
Within Groups	219	5.859		
Total	223			

Note. *n* = 224.

Observations

The researcher observed several variables, which may have influenced the study. The observations are related to data loss, college support, survey response behavior, and survey construction.

Table 52

Means and Confidence Intervals for Behavioral Intention by Levels of Experience

Sample	*n*	Mean	*SD*	95% Confidence Intervals	
				Lower	Upper
No Tablet Experience	14	6.79	2.08	5.58	7.99
Less than 1 Year Tablet Experience	30	9.90	2.70	8.89	10.91
1-2 Years Tablet Experience	76	10.20	2.42	9.64	10.75
3-4 Years Tablet Experience	77	10.99	2.39	10.44	11.53
5 Years or More Tablet Experience	27	11.96	2.33	11.04	12.88

Some data points were not useable, because it was advised that online surveys should be designed to be as freeform as possible, similar to a paper survey in which participants can choose to not answer questions. Data points were also lost because data validation was not used to defend against participants misreading the question and responding with incorrect data (e.g., place of birth instead of date of birth).

Table 53

Pair-wise Tukey HSD Comparisons Across Levels of Experience

Experience Comparison	Difference Between Means	Simultaneous 95% Confidence Limits		
5 Years - 3-4 Years	0.9759	-0.5131	2.4650	
5 Years - 1-2 Years	1.7656	0.2740	3.2572	***
5 Years - <1 Year	2.0630	0.2968	3.8291	***
5 Years - No Experience	5.1772	2.9845	7.3699	***
3-4 Years - 5 Years	-0.9759	-2.4650	0.5131	
3-4 Years - 1-2 Years	0.7896	-0.2869	1.8662	
3-4 Years - <1 Year	1.0870	-0.3459	2.5199	
3-4 Years - No Experience	4.2013	2.2669	6.1357	***
1-2 Years - 5 Years	-1.7656	-3.2572	-0.2740	***
1-2 Years - 3-4 Years	-0.7896	-1.8662	0.2869	
1-2 Years - <1 Year	0.2974	-1.1382	1.7329	
1-2 Years - No Experience	3.4117	1.4753	5.3480	***
<1 Year - 4-5 Years	-2.0630	-3.8291	-0.2968	***
<1 Year - 3-4 Years	-1.0870	-2.5199	0.3459	
<1 Year - 1-2 Years	-0.2974	-1.7329	1.1382	
<1 Year - No Experience	3.1143	0.9593	5.2692	***
No Experience - 4-5 Years	-5.1772	-7.3699	-2.9845	***
No Experience - 3-4 Years	-4.2013	-6.1357	-2.2669	***
No Experience - 1-2 Years	-3.4117	-5.3480	-1.4753	***
No Experience - <1 Year	-3.1143	-5.2692	-0.9593	***
5 Years - 1-2 Years	1.7656	0.2740	3.2572	***
5 Years - <1 Year	2.0630	0.2968	3.8291	***
5 Years - No Experience	5.1772	2.9845	7.3699	***

Note.***Significant at the $p = .05$

Initial data collection was slow, as direct access to the students was not provided by any of the participating colleges, even though each college provided permission for the study. The researcher administered the survey and collected the responses using the Qualtrics Online Survey Software. The electronic data collection of 434 total respondents was downloaded and uploaded to the SAS Online Studio Software for data analysis. The data can be easily viewed without disturbing the data collection process. Several features that an online survey provides, which are not available with a paper-

based survey were not utilized. Some questions were not marked as required and data validation was not used to prevent input errors.

Table 54

Tukey HSD Grouping for Differences in Previous Experience Group Means

Tukey Grouping		Mean	*N*	Experience
	A	11.9630	27	5 Years
	A			
B	A	10.9870	77	3-4 Years
B				
B		10.1974	76	1-2 Years
B				
B		9.9000	30	<1 Year
	C	6.7857	14	No Experience

Note. Means with the same letter are not significantly different.

The researcher did not incorporate data validation to check that a 4-digit year was entered by the participant for the “What year were you born?” question. Four percent of the respondents entered a location such as a city or country for the year they were born. Data validation would have allowed the participant know that the response needed to be a 4-digit year. One response was a 5-digit year. Others entered the year in different formats (e.g., 01/10/1980, or Jan. 10, 1980, which required the researcher to change the date formats before data analysis. The researcher received a couple of

emails stating that the online survey tool would not accept the respondent's answers, and showed an error message to the participant.

The College of Nursing participants rated Price Value significantly differently than College of Pharmacy participants. College of Nursing perceived multi-modal tablets would provide benefit for their academic work for the monetary value of using the devices. College of Pharmacy participants showed a neutral perception towards the Price Value of multi-modal tablets. This difference in views between Nursing and Pharmacy may be due to the increase of computing devices in the daily work of individuals in the Nursing field in comparison to the other fields, such as education and public health. It is also worth noting that College of Pharmacy participants are provided the tablets upon enrolling into the program negating the need to evaluate the benefits provided by multi-modal tablets considering the cost for using them.

Additional research may be needed to establish whether this difference in Price Value perceptions was an artifact of this research only or if this would be true of most Colleges of Nursing and colleges that provide multi-modal devices "free-of-charge" such as the College of Pharmacy in this study. College of Pharmacy graduate students (90% < 32 years old) were also younger than College of Nursing graduate students (49% < 32 years old).

Chapter 5

Recommendations

The purpose of this study was to explore graduate student perceptions of use and the ease of use of multi-modal tablets to access electronic course materials, and the perceived differences based on students' gender, age, college of enrollment, and previous experience. The parts of this chapter are the summary of the study, conclusions, implications, and recommendations for further research.

Summary of the Study

This study used the Unified Theory of Acceptance and Use of Technology 2 as defined in Venkatesh et al. (2012) to identify the constructs that may explain a graduate student's intention to use a multi-modal tablet in graduate course work. First, the study looked at which constructs of the UTAUT2 explained a graduate student's Behavioral Intention. Second, the study examined which factors explained a graduate student's reported use of the multi-modal tablet. Third, this study explored the effects Habit, Price Value, and Hedonic Motivation had on the relationship between Performance Expectancy, Effort Expectancy, Social Influence, and Behavioral Intention. Lastly the study examined the difference in Behavioral Intention between groups based on age, gender, experience, and college of enrollment.

This study administered the UTAUT2 to graduate students from four different colleges at a regional university. Of the 434 students who participated, only 224 responses met the criteria for inclusion in this study. The research employed a

quantitative design with a combination of descriptive statistics, correlation, and moderated multiple regression. Six research questions guided the study.

1. Which of the following factors explain a student's Behavioral Intention to use a multi-modal tablet in the academic environment: Performance Expectancy, Effort Expectancy, Social Influence, Facilitating Conditions, Habit, Price Value, and Hedonic Motivation?

2. Which of the following factors explain a student's reported use of a multi-modal tablet in the academic environment: Performance Expectancy, Effort Expectancy, Facilitating Conditions, Social Influence, Habit, Price Value, and Hedonic Motivation?

3. To what extent does the relationship between the following factors and Behavioral Intention change depending on the value of Habit: Performance Expectancy, Effort Expectancy, and Social Influence?

4. To what extent does the relationship between the following factors and Behavioral Intention change depending on the value of Hedonic Motivation: Performance Expectancy, Effort Expectancy, and Social Influence?

5. To what extent does the relationship between the following factors and Behavioral Intention change depending on the value of Price Value: Performance Expectancy, Effort Expectancy, and Social Influence?

6. Is there a statistically significant difference between demographic factors such as gender, age, previous experience, and degree program in Behavioral Intention to use multi-modal tablets?

Population and sample. This study was conducted among college students taking graduate courses in the following colleges at a regional university: Education, Nursing, Pharmacy, and Public Health. The sample was a convenience sample with participants contacted via email. The final responses included 67 Education graduate students, 47 Nursing graduate students, 30 Pharmacy, and 85 Public of Health graduate students. The participants varied in age from 18-63 years and were divided into five groups: 18-24 years, 25-31 years, 32-41 years, 42-51 years, and 52-63 years.

Unified Theory of Acceptance and Use of Technology. The survey was modified from Venkatesh et al. (2012), replacing the form of technology being questioned. It contained 30 questions to measure the participants' perceptions of their use of multi-modal tablets, as well as items to capture demographic information. The survey was administered online and was field-tested to ensure the system was user friendly and that the collected data from the system could be downloaded in a format necessary for use by SAS statistical software. During pilot testing, it was recommended to alter the choice options on some questions to include an "I don't know" option.

Findings. Question 1 examined which factors explained a student's intention to use a multi-modal tablet device in graduate course work. Multiple regression was used to determine if there were significant relationships between the seven independent variables and Behavioral Intention to use a multimodal tablet. Only Performance Expectancy (β = .301, t = 6.49, p < .0001), Social Influence (β = .092, t = 1.98, p = 0.0496), Hedonic Motivation (β = .292, t = 5.39, p < .0001), and Habit (β = .368, t = 9.52, p < .0001) showed significance. Performance Expectancy, Hedonic Motivation, and Habit also showed moderately strong to strong correlations with Behavioral Intention. Question 2 examined if there were any significant relationships between the seven constructs, Behavioral Intention, and reported Use. The regression analysis revealed a positive significant relationship with reported Use and Habit (β = 1.374, t = 2.94, p = .0037) and reported Use and Behavioral Intention (β = 2.535, t = 3.51, p = .0006). Habit and Behavioral Intention both had strong correlations with reported Use.

The UTAUT2, as presented by Venkatesh et al. (2012), added three new factors to the model when compared to the original UTAUT model presented in Venkatesh et

al. (2003). Questions three through five examined if any of the new factors, Habit, Hedonic Motivation, and Price Value affect the relationship between Behavioral Intention and a few of the original factors of the UTAUT: Performance Expectancy, Effort Expectancy, and Social Influence. Moderated multiple regression was used to examine the interaction variables. Habit (habitual / repeated use) affects the relationship of Performance Expectancy (increased performance / productivity) and Behavioral Intention. Habit, Price Value, or Hedonic Motivation (enjoyable/fun) did not have a significant affect on the relationship between Behavioral Intention and Effort Expectancy (ease of use) or Social Influence (others' opinions of use).

Appropriate statistical procedures were used to determine if there were differences in perceived Behavioral Intention among demographic characteristics. There was a difference in Behavioral Intention to use a multi-modal tablet among groups based on years of previous experience. Individuals with no previous experience using multi-modal tablets reported lower levels of Behavioral Intention than individuals with any previous experience with multi-modal tablets. Individuals with five or more years of previous experience with multi-modal tablets reported a higher level of Behavioral Intention than individuals with less than three years of previous experience. Behavioral Intention did not significantly differ between genders. There also was no difference in Behavioral Intention by college enrollment. The results did not show any significant differences in Behavioral Intention based on the respondents' age.

Conclusions

The conclusions that were drawn from this study include the following.

When trying to explain a graduate student's intention to use a multi-modal tablet, only Performance Expectancy (increase in performance/productivity), Habit (habitual / repeated use), Social Influence (others' opinions of use), Hedonic Motivation (enjoyable / fun), and Previous Experience appeared to sufficiently explain whether a student intends to adopt the device. If a device is perceived as a habit forming, increases productivity, is recommended by peers or those in power, or is fun to use there is an increase in intention of using the device in the academic environment. Increase in performance or productivity (Performance Expectancy) and enjoyable-to-use (Hedonic Motivation) are the only two factors that explained a student's reported Use of multi-modal tablets.

Habit affects the relationship between Performance Expectancy (the perception that a device will improve one's performance) and Behavioral Intention to use the device. Habit does not affect the Effort Expectancy (also known as ease of use) and Behavioral Intention relationship, but it does affect the Social Influence and Behavioral Intention relationship. Social Influence is the individual's perception of the opinions of the use of multi-modal tablets from other people important to the individual.

The relationship between Performance Expectancy (increased productivity / performance) and Behavioral Intention stays the same regardless of the value of Hedonic Motivation. Hedonic Motivation (fun/enjoyable to use) does not affect the relationship between Effort Expectancy (ease of use) and Behavioral Intention to use a multi-modal tablet. Pleasure derived from using the tablet (Hedonic Motivation) does not affect the relationship between Social Influence (opinions of friends, family, faculty) and Behavioral Intention.

Price value does not impact the Performance Expectancy and Behavioral Intention relationship. In other words, money does not affect one's cognitive decision to intend to use the device even if there is a perceived performance increase from using the device. Cost to obtain the multi-modal tablet also does not affect the relationship between Effort Expectancy (ease of use) and Behavioral Intention or the relationship between Social Influence (friends, family, and faculty perceived opinions of using the tablet) and Behavioral Intention. There was a difference in how College of Nursing graduate students and College of Pharmacy students perceived the Price Value of multi-modal tablets. The difference could be because College of Pharmacy students are provided their multi-modal tablets from the college.

Across age groups, intention to use the tablet device did not vary by age in this study.

There were no differences in Behavioral Intention among groups by college enrollment.

Individuals with more experience using a tablet, as measured in years, have a higher predicted intention to use the tablet in the future than individuals with no previous experience using a tablet. Individuals with 5 or more years using a multi-modal tablet have a higher intention to use the device than those with less than 3 years experience.

Implications

Stakeholders, marketers, faculty, and administration could first ensure that the new technology will increase the student's perceived performance at completing required tasks. Performance Expectancy, the level that the individual believes that using a particular system or device will improve his or her job performance, is believed

to be the strongest predictor of one's Behavioral Intention to use the technology (Venkatesh et al., 2003) in organizational settings. Venkatesh et al. (2012) found that Hedonic Motivation (fun/enjoyable to use) was the strongest predictor of Behavioral Intention over Performance Expectancy in the consumer setting. In this study, in the higher education setting, Habit had the strongest relationship with Behavioral Intention over Performance Expectancy and Hedonic Motivation. Habit affects graduate students' perceptions of whether the multi-modal tablet will increase their performance in an academic environment. Results of this study reveal that individuals with more experience with the multi-modal tablet device have an increased perception of their habitual or repeated use of the device.

As habit affects the relationship of Performance Expectancy on an individual's intention to use, stakeholders need to ensure that the opportunities they provided for use appear to increase the student's productivity or performance in completing tasks associated with the academic environment. Stakeholders can build these Habits by incorporating multi-modal tablets, in place of laptops and desktop computers, for everyday functions such as course registration, course look-up, cashiers, on-campus restaurants, library catalogues, library loaned device, etc. Removing access to laptops and desktop computers for smaller quick tasks around campus, such a class registration or reserving material at the campus library, might help stimulate Habit and provide increased experiences. Administrators, marketers, and faculty need to provide varying opportunities for repeated use of the new device in the academic environment, when trying to implement a new technology. These examples provide different

scenarios to repeatedly use the multi-modal tablet and increase intention to use the device.

Previous Experience affects individuals' perceptions of their intention to use the multi-modal tablet. The more experience individuals have with a tablet device affects their intention to use the device. Besides creating differing experiences for student's to use new technology throughout the academic environment, another approach to implementing a technology into the academic technology infrastructure is to adopt a device that is already being adopted by student's in higher education, but may not already be officially supported by the institution.

Facilitating conditions, the perception that there was an organizational and technological support system for the technology in place, did not appear to affect students' intention to use or the reported use in this study. This may be because the academic environment already provides sufficient access to resources needed for the multi-modal tablet to be in the academic environment, such as campus-wide Wi-Fi to access the electronic library catalogue of books, multimedia, and online lectures on demand. These resources are not only useful for the multi-modal tablet user, but also the student who uses a laptop, desktop computer, Wi-Fi enabled hand-held multimedia player, or smartphone.

The desktop and laptop can be used to accomplish many of the same tasks for the graduate student in the academic environment, but in a larger size and different configuration or physical arrangement than a multi-modal tablet. The multi-media player and smartphone may be able to accomplish the same tasks for the graduate student in

the academic environment, but is a smaller size and configuration than that of a multi-modal tablet.

Hedonic Motivation is the fun or pleasure derived from using a technology or system (Brown & Venkatesh, 2005). The fun derived from using the multi-modal tablet affects the graduate students' perception of how useful the tablet is for increasing their productivity or performance in the academic environment. For stakeholders, it may be beneficial to identify multi-modal tablets that provide a perceived pleasurable experience for graduate students in the academic environment when integrating a new multi-modal tablet into a curriculum, college bookstore, or campus. For device designers and application developers, it is important to make sure the products created. provide an enjoyable experience for the end user in the higher education environment

Price Value did not affect the graduate student's perception of the usefulness (Performance Expectancy), ease of use (Effort Expectancy) or the influence of others (Social Influence) to adopt a device. It may be that price point is not a barrier to adoption, if the device is perceived to increase the student's performance in the academic environment, is easy to use, and is championed by the students' faculty, family, and friends whose opinions they value. The other reason for Price Value to not affect one's intention to adopt may be because the devices are already optimally priced, as this is already the business of the manufacturers and retailers.

Recommendations for Further Research

Several recommendations for future research are derived from the results.

Research in colleges and universities with students of varying geographical and cultural backgrounds could be conducted. The validity and reliability of the UTAUT2

could be measured for different consumer environments. The UTAUT2 scale provided by Venkatesh et al. (2012) provided good reliability and validity. Three new constructs were added to the UTAUT (Venkatesh et al., 2003, Venkatesh et al., 2012). Further research could further examine the reliability, validity, and usefulness of the extended UTAUT2.

Examination of the UTAUT2 instrument across varied graduate school populations including size, geography, program selectivity, and cultural differences may help to establish the reliability and validity of the instrument. Other areas to investigate are differences between institutions that are early adopters of technology and institutions that wait longer before to adopting new technology.

Differences in perception of use across age groups in campuses with a predominantly traditional college age population (18-26 years) and institutions geared to address the needs of individuals returning to college later in life and students who work full time in a career position returning to college for career advancement could deepen the research around the UTAUT.

Differences in use based on residential students and commuter-student status may provide more information about how students who live on campus differ in technology adoption from students who commute. Non-residential students may not have repeated exposure to new technology that stakeholders at a university or college may try implementing in the same way that on-campus students may.

The purpose of the extended UTAUT2, as presented in this study and in Venkatesh et al. (2012), is to predict or explain the consumer's intention to use or adopt

a new technology or system. Further research could explore the effect campus size has on the adoption of new technology or systems.

Research should investigate the differences between private and public institutions. The UTAUT originally included voluntariness as a moderator. Future research could explore the effect of providing the multi-modal tablet per enrollment, acceptance, or scholarship has on intention to use and use among students.

Perceptions of Price Value may differ in institutions that provide technology as part of tuition, scholarship, parental or guardian financial assistance, or use of student loans in comparison to students who may not receive any financial assistance in purchasing new technology. Additional research may be needed to establish whether a difference in Price Value perceptions was an artifact of this research only or if this would be true of colleges that do not provide multi-modal tablet devices and colleges that provide multi-modal devices “free-of-charge” such as the College of Nursing and the College of Pharmacy in this study.

Other studies could be developed to research the contrast among universities with graduate programs from different hemispheres of the globe.

Different populations in university graduate programs could be examined to find similarities and contrasts in differing populations including students from traditionally underserved backgrounds, individuals with disabilities, first-time in college students, student-athletes, or other colleges or degree programs not included in this study.

In looking at other colleges or degree programs, research could see if there is a difference in perceptions for individuals pursuing degrees or training in fields or industries that require computers to complete a variety of day-to-day tasks in

comparison to degrees in industries or fields that do not use computing devices to complete a diversity of day-to-day tasks for the general worker of that field or industry. For example in some institutions, nurses may use multi-modal tablets to complete a diversity of tasks whereas pharmacists may not use smaller computing devices to complete tasks in their day-to-day activities.

There is little research about the factors that explain the perceptions students with disabilities and their use of new technology. The promise of popular technology for students with disabilities is to remove the stigma usually associated with use of technology that has been traditionally provided to students with disabilities.

This study used a 5-point Likert scale that allows the participant to choose neutral. The scale has been used in numerous studies as a 5-point or 7-point Likert scale that includes neutral, but further research may identify a better scale that may or may not include neutral as an option. The option of “I do not know” may also provide more insight. Currently the scale assumes that the user already maintains the perception necessary to answer all of the answers accurately. If implementing the study, prior to the use, adoption or ownership of a new technology, “I do not know” may more accurately describe the participants’ perceptions of their environment in regards to use.

Including other colleges or schools within a university to examine differences among liberal arts degrees and technical or hard sciences degree programs and the effect various types of learning content has on students’ adoption rate of new technology.

Using a mixed-methods design might yield a deeper understanding of one's intention to use and use of a new technology. Mixed-methods design combines quantitative and qualitative measures to study a phenomenon. This study could integrate an interview protocol or focus group study to better understand students' perceptions that affect their intention to use and ultimately their use of a new technology or system. A mixed-method or qualitative study might provide deeper understanding of students' intention to adopt a new technology.

This would allow further investigation into one's interpretation of the verbiage chosen in the survey. For example, two of the survey questions for Habit use the words "addicted" and "must". These words may be interpreted differently for participants from the definition of the construct as presented by Venkatesh et al. (2012). Habit is defined as the "result of prior experience" and the "extent to which one believes the behavior to be automatic" (Venkatesh et al., 2012). The words "habit", "addicted", and "must", may cause some age groups to be psychologically opposed to the addiction-type behavior since that could infer a lack of control to use or not use any technology.

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Appendix A: Demographic Form

1. How long have you used an iPad or similar tablet device?
(Similar tablet devices include: Google Nexus 10, Kindle Fire, Nook Color Tablet, Samsung Galaxy Tab, Windows Surface) *[NOTE: This does not include iPhones, Samsung Galaxy Note, or other smartphones, laptops, or desktop computers].*

- Never
- < 1 year
- 1-2 years
- 2-4 years
- 4-5 years
- 5+ years

2. What year were you born? _____

3. Gender: Female Male

4. What is your student classification?

Undergraduate, Graduate, Other_____

5. What college are you enrolled in?

Education, Nursing, Pharmacy, Public Health

6. Have you been diagnosed as having a disability?

Yes

6b. Are you willing to share your disability diagnosis?_____

ADD/ADHD, dysgraphia, dyslexia,….Other, Please specify_____

Appendix B: Unified Theory of Acceptance and Use of Technology Study Survey

Undergraduate and Graduate Student Perceptions of Using Tablet Devices to Access Course Materials

Q1 Student Perceptions of Using Multi-modal Tablets in an Academic Environment
The overall purpose of this research is to explore your perceptions and experiences using a multi-modal tablet (Apple iPad, Kindle Fire, Nook Color, Samsung Galaxy Tab, Windows Surface Pro, etc.) in your academic program. The results of this study are of great interest to the university and will be considered when deciding to improve the operations and opportunities provided to students in the college.

Participation in this study is strictly voluntary. If you should decide to participate in the study, you will be asked to participate in an online survey. The survey is short and easy to complete. It should take only 10 minutes to complete the survey. Please complete the survey during one session. All survey data will be collected anonymously through the Qualtrics software.

Neither the faculty of your program, the college, or the University of South Florida will know who has participated or who has not participated in the online survey because no personally identifiable information will be collected by the researcher.

If you should decide to participate, you have the right to discontinue at any point without being questioned about your decision. You also do not have to answer any of the questions on the survey that you prefer not to answer, just leave those items blank.

Thank you for taking the time to read this information, and I hope you decide to complete the survey. The results of the survey will be used to improve university operations and opportunities made available to students.

By completing the survey, you are acknowledging that you have read and understand what your study participation entails, and are consenting to participate in the study.

Thank you for your time,
Ezzard Bryant, Jr.
e##########@mail.usf.edu
###.###.###

Q2 Please note, some participants have thought that some questions are the same; the questions are similar, but each question is slightly different.

Instructions: Please respond to each question with the your best possible answer. To submit your responses please scroll to the bottom of the page and click the Submit button.

Q3 Do you own a tablet device? Note: Tablet Device includes the following kinds of devices: Apple iPad, Google Nexus 10, Kindle Fire, Samsung Galaxy Tab, Windows Surface Pro. Tablet device does NOT include laptop computers, desktop computers, or smartphones (e.g., iPhones, Google Nexus 7, Windows Phones, etc.)
- ❍ Yes
- ❍ No

Q4 I find tablet devices useful in my daily life.
- ❍ Strongly Disagree
- ❍ Disagree
- ❍ Neither Agree nor Disagree
- ❍ Agree
- ❍ Strongly Agree

Q5 Learning how to use a tablet device is easy for me.
- ❍ I Don't Know
- ❍ Strongly Disagree
- ❍ Disagree
- ❍ Neither Agree nor Disagree
- ❍ Agree
- ❍ Strongly Agree

Q6 People who are important to me think that I should use a tablet device.
- ❍ Strongly Disagree
- ❍ Disagree
- ❍ Neither Agree nor Disagree
- ❍ Agree
- ❍ Strongly Agree

Q7 I have the resources necessary to use a tablet device.
- ❍ Strongly Disagree
- ❍ Disagree
- ❍ Neither Agree nor Disagree
- ❍ Agree
- ❍ Strongly Agree

Q8 Using a tablet device is fun.
- ❍ Strongly Disagree
- ❍ Disagree
- ❍ Neither Agree nor Disagree
- ❍ Agree
- ❍ Strongly Agree

Q10 Tablet devices are reasonably priced.
- ❍ Strongly Disagree
- ❍ Disagree
- ❍ Neither Agree nor Disagree
- ❍ Agree
- ❍ Strongly Agree

Q11 The use of a tablet device has become a habit for me.
- ❍ Strongly Disagree
- ❍ Disagree
- ❍ Neither Agree nor Disagree
- ❍ Agree
- ❍ Strongly Agree

Q12 I intend to continue using a tablet device in the future.
- ❍ Strongly Disagree
- ❍ Disagree
- ❍ Neither Agree nor Disagree
- ❍ Agree
- ❍ Strongly Agree

Q13 Using tablet devices helps me accomplish things more quickly.
- ❍ Strongly Disagree
- ❍ Disagree
- ❍ Neither Agree nor Disagree
- ❍ Agree
- ❍ Strongly Agree

Q14 How I interact with a tablet device is clear and understandable.
- ❍ Strongly Disagree
- ❍ Disagree
- ❍ Neither Agree nor Disagree
- ❍ Agree
- ❍ Strongly Agree

Q15 People who influence my behavior think that I should use a tablet device.
- ❍ I Don't Know
- ❍ Strongly Disagree
- ❍ Disagree
- ❍ Neither Agree nor Disagree
- ❍ Agree
- ❍ Strongly Agree

Q16 I have the knowledge necessary to use tablet devices.
- ❍ Strongly Disagree
- ❍ Disagree
- ❍ Neither Agree nor Disagree
- ❍ Agree
- ❍ Strongly Agree

Q17 Using tablet devices is enjoyable.
- ❍ Strongly Disagree
- ❍ Disagree
- ❍ Neither Agree nor Disagree
- ❍ Agree
- ❍ Strongly Agree

Q18 Tablet devices are a good value for the money.
- ❍ Strongly Disagree
- ❍ Disagree
- ❍ Neither Agree nor Disagree
- ❍ Agree
- ❍ Strongly Agree

Q19 I am addicted to tablet devices.
- ❍ Strongly Disagree
- ❍ Disagree
- ❍ Neither Agree nor Disagree
- ❍ Agree
- ❍ Strongly Agree

Q20 I will always try to use a tablet device in my daily life.
- ❍ Strongly Disagree
- ❍ Disagree
- ❍ Neither Agree nor Disagree
- ❍ Agree
- ❍ Strongly Agree

Q21 Using a tablet device increases my productivity.
- ❍ Strongly Disagree
- ❍ Disagree
- ❍ Neither Agree nor Disagree
- ❍ Agree
- ❍ Strongly Agree

Q22 I find tablet devices easy to use.
❍ Strongly Disagree
❍ Disagree
❍ Neither Agree nor Disagree
❍ Agree
❍ Strongly Agree

Q24 People whose opinions that I value prefer that I use a tablet device.
❍ Strongly Disagree
❍ Disagree
❍ Neither Agree nor Disagree
❍ Agree
❍ Strongly Agree

Q25 Tablet devices are compatible with other technologies I use.
❍ Strongly Disagree
❍ Disagree
❍ Neither Agree nor Disagree
❍ Agree
❍ Strongly Agree

Q26 Using tablet devices are very entertaining.
❍ Strongly Disagree
❍ Disagree
❍ Neither Agree nor Disagree
❍ Agree
❍ Strongly Agree

Q27 At the current price, tablet devices provide a good value.
❍ Strongly Disagree
❍ Disagree
❍ Neither Agree nor Disagree
❍ Agree
❍ Strongly Agree

Q28 I must use a tablet device.
❍ Strongly Disagree
❍ Disagree
❍ Neither Agree nor Disagree
❍ Agree
❍ Strongly Agree

Q29 I plan to continue to use a tablet device frequently.
❍ Strongly Disagree
❍ Disagree
❍ Neither Agree nor Disagree
❍ Agree
❍ Strongly Agree

Q30 It is easy for me to become skillful at using tablet devices.
❍ Strongly Disagree
❍ Disagree
❍ Neither Agree nor Disagree
❍ Agree
❍ Strongly Agree

Q31 I can get help from others when I have difficulties using a tablet device.
❍ Strongly Disagree
❍ Disagree
❍ Neither Agree nor Disagree
❍ Agree
❍ Strongly Agree

Q32 Please indicate which tablet devices you have access to.
❑ Apple iPad (Any model)
❑ Google Nexus 10
❑ Kindle Fire
❑ Nook Color Tablet
❑ Samsung Galaxy Tab
❑ Windows Surface Pro
❑ Other

Q33 Please specify other tablets you have access to. Provide brand name and tablet name if possible (e.g., Toshiba Excite, Lenovo A10, etc.)

Q34 How frequently do you use your tablet device?
❍ Never
❍ Monthly or less
❍ Once a week
❍ Multiple times a week
❍ Once a day
❍ Multiple times a day

Q36 How frequently do you use your tablet device for the following tasks?

	Never	Monthly or less	Once a week	Multiple times a week	Once a day	Multiple times a day
Browse Websites	❍	❍	❍	❍	❍	❍
Read for pleasure	❍	❍	❍	❍	❍	❍
Write for pleasure	❍	❍	❍	❍	❍	❍
Read for school	❍	❍	❍	❍	❍	❍
Write for school	❍	❍	❍	❍	❍	❍
Read e-mail	❍	❍	❍	❍	❍	❍
Compose e-mail	❍	❍	❍	❍	❍	❍
Watch videos	❍	❍	❍	❍	❍	❍
Create videos	❍	❍	❍	❍	❍	❍
Listen to audio	❍	❍	❍	❍	❍	❍
Create audio	❍	❍	❍	❍	❍	❍
Play games	❍	❍	❍	❍	❍	❍
Video Message (Skype, Facetime, Google Hangout, etc.)	❍	❍	❍	❍	❍	❍
Social Networks (Facebook, Twitter, Google+, WhatsApp, Yahoo, kik)	❍	❍	❍	❍	❍	❍

Q37 How long have you used a tablet device? (e.g., Apple iPad Google Nexus 7/10, Kindle Fire, Nook Color Tablet, Samsung Galaxy Tab, Windows Surface)

- ❍ Never
- ❍ < 1 Year
- ❍ 1-2 Years
- ❍ 3-4 Years
- ❍ 5 Years or More

Q38 Gender
- ❍ Male
- ❍ Female

Q39 What year were you born?

Q40 What college are you enrolled in?(e.g., College of Education, College of Public Health, College of Nursing, Non-Degree Seeking, etc.)

Q41 What is your class level?
- ❑ Undergraduate
- ❑ Graduate
- ❑ Non-Degree Seeking taking Undergraduate level courses
- ❑ Non-Degree Seeking taking Master's, Specialist, Doctoral, or Graduate Certificate level courses
- ❑ Other

Q42 Please explain why you checked other.

Q43 Have you ever been diagnosed with a disability?
- ❍ Yes
- ❍ No

Q44 What were you diagnosed with? (Please identify any you feel comfortable listing.)

Appendix C: Unified Theory of Acceptance and Use of Technology 2

(Venkatesh et al., 2012)

Performance Expectancy

- PE1. I find mobile Internet useful in my daily life.
- PE2. Using mobile Internet increases my chances of achieving things that are important to me. (dropped)
- PE3. Using mobile Internet helps me accomplish things more quickly.
- PE4. Using mobile Internet increases my productivity.

Effort Expectancy

- EE1. Learning how to use mobile Internet is easy for me.
- EE2. My interaction with mobile Internet is clear and understandable.
- EE3. I find mobile Internet easy to use.
- EE4. It is easy for me to become skillful at using mobile Internet.

Social Influence

- SI1. People who are important to me think that I should use mobile Internet.
- SI2. People who influence my behavior think that I should use mobile Internet.
- SI3. People whose opinions that I value prefer that I use mobile Internet.

Facilitating Conditions

- FC1. I have the resources necessary to use mobile Internet.
- FC2. I have the knowledge necessary to use mobile Internet.
- FC3. Mobile Internet is compatible with other technologies I use.
- FC4. I can get help from others when I have difficulties using mobile Internet.

Hedonic Motivation

- HM1. Using mobile Internet is fun.
- HM2. Using mobile Internet is enjoyable.
- HM3. Using mobile Internet is very entertaining.

Price Value

- PV1. Mobile Internet is reasonably priced.
- PV2. Mobile Internet is a good value for the money.
- PV3. At the current price, mobile Internet provides a good value.

Habit

- HT1. The use of mobile Internet has become a Habit for me.
- HT2. I am addicted to using mobile Internet.
- HT3. I must use mobile Internet.
- HT4. Using mobile Internet has become natural to me. (dropped)

Behavioral Intention

- BI1. I intend to continue using mobile Internet in the future.
- BI2. I will always try to use mobile Internet in my daily life.
- BI3. I plan to continue to use mobile Internet frequently.

Use

Please choose your usage frequency for each of the following:

a) SMS
b) MMS
c) Ringtone and logo download
d) Java games
e) Browse websites
f) Mobile e-mail

Note: Frequency ranged from “never” to “many times per day.”

Appendix D: UTAUT Model and Collaboration Technology Use as Presented in Brown et al., 2010

<Collaboration tool> is replaced with the actual system name in the company.

Use

- I rate my intensity of use of <collaboration tool> to be: Very light . . . Very heavy (seven-point scale)
- How frequently do you use <collaboration tool>: Never . . . Very frequently (seven- point scale)
- On an average week, how much time (in hours) do you use <collaboration tool>?
- Of the opportunities you have to use collaboration tools, including a telephone,
- What percentage of time do you choose <collaboration tool>?

Intention to use (seven-point Likert agreement scale)

- I intend to use the <collaboration tool> in the next 6 months.
- I predict I would use the system in the next 6 months.
- I plan to use the system in the next 6 months.

Performance Expectancy (seven-point Likert agreement scale)

- I believe <collaboration tool> will be useful for communication.
- Using <collaboration tool> will enable me to accomplish work tasks more quickly.
- Using the collaboration tool will increase my productivity.

Effort Expectancy (seven-point Likert agreement scale)

- Using <collaboration tool> will *not* require a lot of mental effort.
- I believe <collaboration tool> will be easy to use.
- Using <collaboration tool> will be easy for me.

Social Influence (seven-point Likert agreement scale)

- People who influence my behavior think that I should use <collaboration tool>.
- People who are important to me think that I should use <collaboration tool>.
- The senior management of this business thinks I should use <collaboration tool>.

Facilitating Conditions (seven-point Likert agreement scale)

- I have the resources necessary to use <collaboration tool>.
- I have the knowledge necessary to use <collaboration tool>.
- A specific person (or group) is available for assistance with difficulties with <collaboration tool>.

Social Presence (seven-point Likert agreement scale)

- Using <collaboration tool> to interact with others creates a warm environment for communication.
- Using <collaboration tool> to interact with others creates a sociable environment for communication.
- Using <collaboration tool> to interact with others creates a personal environment for communication.

Immediacy (seven-point Likert agreement scale)

- <Collaboration tool> enables me to quickly reach communication partners.
- When I communicate with someone using <collaboration tool>, they usually respond quickly.
- When someone communicates with me using <collaboration tool>, I try to respond immediately.

Concurrency (seven-point Likert agreement scale)

- I can easily use <collaboration tool> while participating in other activities.
- I can easily communicate using <collaboration tool> while I am doing other things.
- I can use <collaboration tool> while performing another task.

Technology Experience (seven-point scale)

- My experience with audio conferencing is: None at all . . . Very extensive
- My experience with video conferencing is: None at all . . . Very extensive
- My experience with messaging tools (e.g., MSN messenger) is: None at all . . . Very extensive
- My experience with technologies similar to <collaboration tool> is: None at all . . .Very extensive

Computer Self-efficacy (seven-point Likert agreement scale)

- I could complete a task using a computer if there was no one around to tell me what to do.
- I could complete a task using a computer even if there was not a lot of time to complete it.
- I could complete a task using a computer if I had just the built-in help facility for assistance.

Familiarity with Communication Partners (seven-point Likert agreement scale)

- I feel comfortable discussing personal or private issues with co-workers with whom I collaborate.
- I feel comfortable using informal communication (such as slang or abbreviations) with co-workers with whom I collaborate.
- Overall, I feel that I know my collaborators well.

Peer Influence (seven-point Likert agreement scale)

- My friends think I should use <collaboration tool>.
- My peers think I should use <collaboration tool>.
- My co-workers believe I should use <collaboration tool>.

Superior Influence (seven-point Likert agreement scale)

- I believe the top management would like me to use <collaboration tool>.
- My supervisor suggests that I use <collaboration tool>.
- There is pressure from the organization to use <collaboration tool>.

Resource-Facilitating Conditions (seven-point Likert agreement scale)

- There isn't sufficient access to use <collaboration technology>.
- Using <collaboration tool> is very resource intensive for me.
- I am not able to use <collaboration tool> when I need it.

Technology-Facilitating Conditions (seven-point Likert agreement scale)

<Collaboration tool> is not compatible with other tools and technologies that I use. <Collaboration tool> is not compatible with other software that I use. I have trouble using <collaboration tool> seamlessly with other applications.

Appendix E: Survey Items Based on the UTAUT2 Survey Framework

Factor	*Survey Item*
Performance Expectancy	• I find iPad or similar tablet devices useful in my daily life • Using the iPad or similar tablet devices helps me accomplish things more quickly. • Using the iPad or similar tablet devices increases my productivity.
Effort Expectancy	• Learning how to use iPad or similar tablet devices is easy for me. • My interaction with iPad or similar tablet devices is clear and understandable. • I find the iPad or similar tablet devices easy to use. • It is easy for me to become skillful at using the iPad or similar tablet devices.
Social Influence	• People who are important to me think that I should use an iPad or similar tablet device. • People who influence my behavior think that I should use an iPad or similar tablet devices. • People whose opinions that I value prefer that I use an iPad or similar tablet device.
Facilitating Conditions	• I have the resources necessary to use an iPad or similar tablet device. • I have the knowledge necessary to use an iPad or similar tablet device. • iPads or similar tablet devices are compatible with other technologies I use. • I can get help from others when I have difficulties using an iPad or similar tablet device.
Hedonic Motivation	• Using an iPad or similar tablet device is fun. • Using an iPad or similar tablet devices are enjoyable. • Using the iPad or similar tablet devices are very entertaining.
Price Value	• The iPad devices are reasonably priced. • The iPad or similar tablet devices are a good value for the money. • At the current price, the iPad or similar tablet devices provide a good value.
Habit	• The use of an iPad or similar tablet devices has become a Habit for me. • I am addicted to the iPad or similar tablet devices. • I must use an iPad or similar tablet device.
Behavioral Intention	• I intend to continue using an iPad or similar tablet device in the future. • I will always try to use an iPad or similar tablet device in my daily life. • I plan to continue to use the iPad or similar tablet device frequently.

Appendix F: Participant Informed Consent and IRB Approval Letter

Participant Informed Consent

The overall purpose of this research is to explore your perceptions and experiences using a multi-modal tablet (iPad) in your health studies. The results of this study are of great interest to your program to help improve the operations and opportunities provided to students in the program. Participation in this study is strictly **voluntary**.

If you should decide to participate in the study, you will be asked to participate in an online survey. It should take approximately 10 minutes to complete the survey. Please complete the survey alone in a single setting. All survey data is collected **anonymously** through the Qualtrics software.

Neither the faculty nor Administration of your college will know who has participated or who has not participated in the online survey because the researcher will collect no personally identifiable information.

If you should decide to participate, you are not obligated to submit the survey; you have the right to discontinue at any point without being questioned about your decision. You also do not have to answer any of the questions on the survey that you prefer not to answer, just leave those items blank.

Thank you for taking the time to read this information. The results of the survey you provide are greatly appreciated as the college continues to improve its operations and opportunities made available to students.

By completing the survey, you are acknowledging that you have read and understand what your study participation entails, and are consenting to participate in the study.

You may contact the researcher, with the information provided below, should you decide to participate in the short interview or have questions about this study.

Thank you for your time,

Ezzard Bryant, Jr.
ebryantj@usf.edu
###.###.####
SKYPE: ######.######

Undergraduate and Graduate Student Perceptions of using Multi-modal Tablets in Academic Environments

RE: PI: Ezzard Bryant

Link: Pro00021252

You are receiving this notification because processing has been completed on the above-listed study. For more information, please navigate to the project workspace by clicking the Link above.

Please note, as per USF IRB Policy 303, “Once the Exempt determination is made, the application is closed in eIRB. Any proposed or anticipated changes to the study design that was previously declared exempt from IRB review must be submitted to the IRB as a new study prior to initiation of the change.”

If alterations are made to the study design that change the review category from Exempt (i.e., adding a focus group, access to identifying information, adding a vulnerable population, or an intervention), these changes require a new application. However, administrative changes, including changes in research personnel, do not warrant an amendment or new application.

Given the determination of exemption, this application is being closed in ARC. This does not limit your ability to conduct your research project. Again, your research may continue as planned; only a change in the study design that would affect the exempt determination requires a new submission to the IRB.

DO NOT REPLY: *To ensure a timely response, please direct correspondence to* ***Research Integrity & Compliance*** *either through your project's workspace or the contact information below.*

Research Integrity & Compliance

University of South Florida - Research and Innovation ARC Help Desk (eIRB, eIACUC, eCOI): (813) 974-2880 Email: rsch-arc@usf.edu

Mail: 12901 Bruce B. Downs Blvd, MDC 35, Tampa, FL 33612-4799
Template:_000 - IRB Study: Certified Exempt

Appendix G: Survey Participation Announcement

WHAT DO YOU THINK?

IRB Number: Pro00021252

Tablets at College? Good, bad, or useless?

USF Students! Researchers would like to know about your perceptions of using tablet devices such as the Windows Surface, Samsung Tab, Google Nexus10, iPad, etc., for classes at the university.

Complete the survey and submit your email address to enter for a chance at 1 of 4 - $50 prepaid gift cards.

The survey will take only 5-7 minutes of your time and is completely voluntary.

If you are interested in participating in this research study please go to

http://bit.ly/usftabletstudy

E. Bryant
Doctoral Candidate
University of South Florida
ebryantj@usf.edu

http://bit.ly/usftabletstudy

IRB Number: Pro00021252

Tablet study http://bit.ly/usftabletstudy

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Appendix H: Individual Item Per Construct Means

	Item	*n*	Mean	*SD*	Mode	Min	Max
PERFORMANCE EXPECTANCY							
PE1	I find tablet devices useful in my daily life.	226	3.66	1.10	4.00	1.00	5.00
PE2	Using tablet devices helps me accomplish things more quickly.	226	3.49	1.09	4.00	1.00	5.00
PE3	Using a tablet device increases my productivity.	225	3.19	1.02	4.00	1.00	5.00
EFFORT EXPECTANCY							
EE1	Learning how to use a tablet device is easy for me	226	3.27	0.84	3.00	0.00	5.00
EE2	How I interact with a tablet device is clear and understandable.	224	4.05	0.81	4.00	2.00	5.00
EE3	I find tablet devices easy to use.	225	4.16	0.78	4.00	1.00	5.00
EE4	It is easy for me to become skillful at using tablet devices.	226	4.11	0.78	4.00	1.00	5.00
SOCIAL INFLUENCE							
SI1	People who are important to me think that I should use a tablet / device.	224	3.14	0.92	3.00	1.00	5.00
SI2	People who influence my behavior think that I should use a tablet / device.	226	2.26	1.26	2.00	0.00	5.00
SI3	People whose opinions that I value prefer that I use a tablet / device.	224	2.92	0.90	3.00	1.00	5.00
FACILITATING CONDITIONS							
FC1	I have the resources necessary to use a tablet device.	227	4.22	0.84	4.00	1.00	5.00
FC2	I have the knowledge necessary to use tablet devices.	227	4.37	0.70	5.00	1.00	5.00
FC3	Tablet devices are compatible with other technologies I use.	226	3.80	0.96	4.00	1.00	5.00
FC4	I can get help from others when I have difficulties using a tablet / device.	225	3.89	0.81	4.00	1.00	5.00
HABIT							
H1	The use of a tablet device has become a Habit for me.	225	3.28	1.26	4.00	1.00	5.00
H2	I am addicted to tablet devices.	225	2.13	1.13	2.00	1.00	5.00
H3	I must use a tablet device.	226	2.39	1.17	2.00	1.00	5.00

	Item	*n*	Mean	*SD*	Mode	Min	Max
PRICE VALUE							
PV1	Tablet devices are reasonably priced.	226	3.31	0.99	4.00	1.00	5.00
PV2	Tablet devices are a good value for the money.	227	3.60	0.92	4.00	1.00	5.00
PV3	At the current price, tablet devices provide a good value.	225	3.42	0.94	4.00	1.00	5.00
HEDONIC MOTIVATION							
HM1	Using a tablet device is fun.	223	4.05	0.80	4.00	1.00	5.00
HM2	Using tablet devices is enjoyable.	223	4.07	0.74	4.00	1.00	5.00
HM3	Using tablet devices are very entertaining.	225	3.89	0.82	4.00	1.00	5.00
BEHAVIORAL INTENTION							
BI1	I intend to continue using a tablet device in the future.	224	4.04	0.89	4.00	1.00	5.00
BI2	I will always try to use a tablet device in my daily life.	227	2.84	1.16	2.00	1.00	5.00
BI3	I plan to continue to use a tablet device frequently.	227	3.55	1.06	4.00	1.00	5.00

N = 229

Appendix I: UTAUT Graduate Student Responses

Table I1 Graduate Student Survey Response Frequencies

I find tablet devices useful in my daily life.				
Q4	**Frequency**	**Percent**	**Cumulative Frequency**	**Cumulative Percent**
1	12	5.31	12	5.31
2	23	10.18	35	15.49
3	46	20.35	81	35.84
4	93	41.15	174	76.99
5	52	23.01	226	100.00
Frequency Missing = 3				

Learning how to use a tablet device is easy for me				
Q5_1	**Frequency**	**Percent**	**Cumulative Frequency**	**Cumulative Percent**
0	2	0.88	2	0.88
1	10	4.42	12	5.31
2	15	6.64	27	11.95
3	99	43.81	126	55.75
4	99	43.81	225	99.56
5	1	0.44	226	100.00
Frequency Missing = 3				

People who are important to me think that I should use a tablet / device.				
Q6	**Frequency**	**Percent**	**Cumulative Frequency**	**Cumulative Percent**
1	10	4.46	10	4.46
2	30	13.39	40	17.86
3	123	54.91	163	72.77
4	41	18.30	204	91.07
5	20	8.93	224	100.00
Frequency Missing = 5				

I have the resources necessary to use a tablet device.				
Q7	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	1	0.44	1	0.44
2	16	7.05	17	7.49
3	6	2.64	23	10.13
4	113	49.78	136	59.91
5	91	40.09	227	100.00
Frequency Missing = 2				

Using a tablet device is fun.				
Q8	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	2	0.90	2	0.90
2	6	2.69	8	3.59
3	35	15.70	43	19.28
4	115	51.57	158	70.85
5	65	29.15	223	100.00
Frequency Missing = 6				

Tablet devices are reasonably priced.				
Q10	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	7	3.10	7	3.10
2	50	22.12	57	25.22
3	51	22.57	108	47.79
4	102	45.13	210	92.92
5	16	7.08	226	100.00
Frequency Missing = 3				

The use of a tablet device has become a habit for me.				
Q11	**Frequency**	**Percent**	**Cumulative Frequency**	**Cumulative Percent**
1	17	7.56	17	7.56
2	58	25.78	75	33.33
3	41	18.22	116	51.56
4	64	28.44	180	80.00
5	45	20.00	225	100.00
Frequency Missing = 4				

I intend to continue using a tablet device in the future.				
Q12	**Frequency**	**Percent**	**Cumulative Frequency**	**Cumulative Percent**
1	2	0.89	2	0.89
2	14	6.25	16	7.14
3	31	13.84	47	20.98
4	104	46.43	151	67.41
5	73	32.59	224	100.00
Frequency Missing = 5				

Using tablet devices helps me accomplish things more quickly.				
Q13	**Frequency**	**Percent**	**Cumulative Frequency**	**Cumulative Percent**
1	8	3.54	8	3.54
2	36	15.93	44	19.47
3	65	28.76	109	48.23
4	71	31.42	180	79.65
5	46	20.35	226	100.00
Frequency Missing = 3				

How I interact with a tablet device is clear and understandable.				
Q14	**Frequency**	**Percent**	**Cumulative Frequency**	**Cumulative Percent**
2	13	5.80	13	5.80
3	29	12.95	42	18.75
4	116	51.79	158	70.54
5	66	29.46	224	100.00
Frequency Missing = 5				

People who influence my behavior think that I should use a tablet / device.				
Q15_1	**Frequency**	**Percent**	**Cumulative Frequency**	**Cumulative Percent**
0	15	6.64	15	6.64
1	36	15.93	51	22.57
2	107	47.35	158	69.91
3	33	14.60	191	84.51
4	14	6.19	205	90.71
5	21	9.29	226	100.00
Frequency Missing = 3				

I have the knowledge necessary to use tablet devices.				
Q16	**Frequency**	**Percent**	**Cumulative Frequency**	**Cumulative Percent**
1	1	0.44	1	0.44
2	4	1.76	5	2.20
3	11	4.85	16	7.05
4	104	45.81	120	52.86
5	107	47.14	227	100.00
Frequency Missing = 2				

Using tablet devices is enjoyable.				
Q17	**Frequency**	**Percent**	**Cumulative Frequency**	**Cumulative Percent**
1	1	0.45	1	0.45
2	7	3.14	8	3.59
3	27	12.11	35	15.70
4	129	57.85	164	73.54
5	59	26.46	223	100.00
Frequency Missing = 6				

Tablet devices are a good value for the money.				
Q18	**Frequency**	**Percent**	**Cumulative Frequency**	**Cumulative Percent**
1	6	2.64	6	2.64
2	18	7.93	24	10.57
3	69	30.40	93	40.97
4	102	44.93	195	85.90
5	32	14.10	227	100.00
Frequency Missing = 2				

I am addicted to tablet devices.				
Q19	**Frequency**	**Percent**	**Cumulative Frequency**	**Cumulative Percent**
1	74	32.89	74	32.89
2	90	40.00	164	72.89
3	30	13.33	194	86.22
4	19	8.44	213	94.67
5	12	5.33	225	100.00
Frequency Missing = 4				

I will always try to use a tablet device in my daily life.				
Q20	**Frequency**	**Percent**	**Cumulative Frequency**	**Cumulative Percent**
1	28	12.33	28	12.33
2	68	29.96	96	42.29
3	63	27.75	159	70.04
4	48	21.15	207	91.19
5	20	8.81	227	100.00
Frequency Missing = 2				

Using a tablet device increases my productivity.				
Q21	**Frequency**	**Percent**	**Cumulative Frequency**	**Cumulative Percent**
1	9	4.00	9	4.00
2	53	23.56	62	27.56
3	69	30.67	131	58.22
4	74	32.89	205	91.11
5	20	8.89	225	100.00
Frequency Missing = 4				

I find tablet devices easy to use.				
Q22	**Frequency**	**Percent**	**Cumulative Frequency**	**Cumulative Percent**
1	2	0.89	2	0.89
2	9	4.00	11	4.89
3	14	6.22	25	11.11
4	127	56.44	152	67.56
5	73	32.44	225	100.00
Frequency Missing = 4				

People whose opinions that I value prefer that I use a tablet / device.				
Q24	**Frequency**	**Percent**	**Cumulative Frequency**	**Cumulative Percent**
1	12	5.36	12	5.36
2	53	23.66	65	29.02
3	110	49.11	175	78.13
4	38	16.96	213	95.09
5	11	4.91	224	100.00
Frequency Missing = 5				

Tablet devices are compatible with other technologies I use.				
Q25	**Frequency**	**Percent**	**Cumulative Frequency**	**Cumulative Percent**
1	5	2.21	5	2.21
2	24	10.62	29	12.83
3	30	13.27	59	26.11
4	120	53.10	179	79.20
5	47	20.80	226	100.00
Frequency Missing = 3				

Using tablet devices are very entertaining.				
Q26	**Frequency**	**Percent**	**Cumulative Frequency**	**Cumulative Percent**
1	2	0.89	2	0.89
2	12	5.33	14	6.22
3	41	18.22	55	24.44
4	124	55.11	179	79.56
5	46	20.44	225	100.00
Frequency Missing = 4				

At the current price, tablet devices provide a good value.				
Q27	**Frequency**	**Percent**	**Cumulative Frequency**	**Cumulative Percent**
1	7	3.11	7	3.11
2	35	15.56	42	18.67
3	56	24.89	98	43.56
4	111	49.33	209	92.89
5	16	7.11	225	100.00
Frequency Missing = 4				

I must use a tablet device.				
Q28	**Frequency**	**Percent**	**Cumulative Frequency**	**Cumulative Percent**
1	59	26.11	59	26.11
2	75	33.19	134	59.29
3	49	21.68	183	80.97
4	30	13.27	213	94.25
5	13	5.75	226	100.00
Frequency Missing = 3				

I plan to continue to use a tablet device frequently.				
Q29	**Frequency**	**Percent**	**Cumulative Frequency**	**Cumulative Percent**
1	11	4.85	11	4.85
2	31	13.66	42	18.50
3	43	18.94	85	37.44
4	107	47.14	192	84.58
5	35	15.42	227	100.00
Frequency Missing = 2				

It is easy for me to become skillful at using tablet devices.				
Q30	**Frequency**	**Percent**	**Cumulative Frequency**	**Cumulative Percent**
1	2	0.88	2	0.88
2	7	3.10	9	3.98
3	25	11.06	34	15.04
4	123	54.42	157	69.47
5	69	30.53	226	100.00
Frequency Missing = 3				

I can get help from others when I have difficulties using a tablet / device.				
Q31	**Frequency**	**Percent**	**Cumulative Frequency**	**Cumulative Percent**
1	2	0.89	2	0.89
2	13	5.78	15	6.67
3	37	16.44	52	23.11
4	129	57.33	181	80.44
5	44	19.56	225	100.00
Frequency Missing = 4				

Please indicate which tablet devices you have access to.-Apple iPad (Any model)				
Q32_1	**Frequency**	**Percent**	**Cumulative Frequency**	**Cumulative Percent**
1	159	100.00	159	100.00
Frequency Missing = 70				

Please indicate which tablet devices you have access to.-Google Nexus 10				
Q32_2	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	3	100.00	3	100.00
Frequency Missing = 226				

Please indicate which tablet devices you have access to.-Kindle Fire				
Q32_3	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	30	100.00	30	100.00
Frequency Missing = 199				

Please indicate which tablet devices you have access to.-Nook Color Tablet				
Q32_4	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	12	100.00	12	100.00
Frequency Missing = 217				

Please indicate which tablet devices you have access to.-Samsung Galaxy Tab				
Q32_5	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	28	100.00	28	100.00
Frequency Missing = 201				

Please indicate which tablet devices you have access to.-Windows Surface Pro				
Q32_6	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	17	100.00	17	100.00
Frequency Missing = 212				

Please indicate which tablet devices you have access to.-Other				
Q32_7	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	17	100.00	17	100.00
Frequency Missing = 212				

Please specify other tablets you have access to. Provide brand name / and tablet name if possible (...				
Q33	Frequency	Percent	Cumulative Frequency	Cumulative Percent
ACER SW	1	5.88	1	5.88
ACER AND	1	5.88	2	11.76
ASUS	3	17.65	5	29.41
ASUS INF	1	5.88	6	35.29
ASUS TAB	1	5.88	7	41.18
DELL LAT	1	5.88	8	47.06
HELLO! E	1	5.88	9	52.94
KINDLE W	1	5.88	10	58.82
LENOVO A	1	5.88	11	64.71
LG 10.1	1	5.88	12	70.59
NONE. SE	1	5.88	13	76.47
PANDIGIT	1	5.88	14	82.35
SAMSUNG	2	11.76	16	94.12
WINDOWS	1	5.88	17	100.00
Frequency Missing = 212				

How frequently do you use your tablet device?				
Q34	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	20	8.93	20	8.93
2	26	11.61	46	20.54
3	22	9.82	68	30.36
4	54	24.11	122	54.46
5	20	8.93	142	63.39
6	82	36.61	224	100.00
Frequency Missing = 5				

How frequently do you use your tablet device for the following / tasks? / Â -Browse Websites				
Q36_1	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	23	10.31	23	10.31
2	34	15.25	57	25.56
3	30	13.45	87	39.01
4	44	19.73	131	58.74
5	23	10.31	154	69.06
6	69	30.94	223	100.00
Frequency Missing = 6				

How frequently do you use your tablet device for the following / tasks? / Â -Read for pleasure				
Q36_2	**Frequency**	**Percent**	**Cumulative Frequency**	**Cumulative Percent**
1	67	30.04	67	30.04
2	49	21.97	116	52.02
3	28	12.56	144	64.57
4	27	12.11	171	76.68
5	25	11.21	196	87.89
6	27	12.11	223	100.00
Frequency Missing = 6				

How frequently do you use your tablet device for the following / tasks? / Â -Write for pleasure				
Q36_3	**Frequency**	**Percent**	**Cumulative Frequency**	**Cumulative Percent**
1	135	60.81	135	60.81
2	51	22.97	186	83.78
3	13	5.86	199	89.64
4	11	4.95	210	94.59
5	4	1.80	214	96.40
6	8	3.60	222	100.00
Frequency Missing = 7				

How frequently do you use your tablet device for the following / tasks? / Â -Read for school				
Q36_4	**Frequency**	**Percent**	**Cumulative Frequency**	**Cumulative Percent**
1	55	24.55	55	24.55
2	43	19.20	98	43.75
3	28	12.50	126	56.25
4	52	23.21	178	79.46
5	15	6.70	193	86.16
6	31	13.84	224	100.00
Frequency Missing = 5				

How frequently do you use your tablet device for the following / tasks? / Â -Write for school				
Q36_5	**Frequency**	**Percent**	**Cumulative Frequency**	**Cumulative Percent**
1	119	53.60	119	53.60
2	42	18.92	161	72.52
3	21	9.46	182	81.98
4	22	9.91	204	91.89
5	2	0.90	206	92.79
6	16	7.21	222	100.00
Frequency Missing = 7				

How frequently do you use your tablet device for the following / tasks? / Â -Read e-mail				
Q36_6	**Frequency**	**Percent**	**Cumulative Frequency**	**Cumulative Percent**
1	34	15.32	34	15.32
2	30	13.51	64	28.83
3	27	12.16	91	40.99
4	47	21.17	138	62.16
5	13	5.86	151	68.02
6	71	31.98	222	100.00
Frequency Missing = 7				

How frequently do you use your tablet device for the following / tasks? / Â -Compose e-mail				
Q36_7	**Frequency**	**Percent**	**Cumulative Frequency**	**Cumulative Percent**
1	49	22.07	49	22.07
2	38	17.12	87	39.19
3	27	12.16	114	51.35
4	45	20.27	159	71.62
5	14	6.31	173	77.93
6	49	22.07	222	100.00
Frequency Missing = 7				

How frequently do you use your tablet device for the following / tasks? / Â -Watch videos				
Q36_8	**Frequency**	**Percent**	**Cumulative Frequency**	**Cumulative Percent**
1	33	14.73	33	14.73
2	35	15.63	68	30.36
3	30	13.39	98	43.75
4	54	24.11	152	67.86
5	23	10.27	175	78.13
6	49	21.88	224	100.00
Frequency Missing = 5				

How frequently do you use your tablet device for the following / tasks? / Â -Create videos				
Q36_9	**Frequency**	**Percent**	**Cumulative Frequency**	**Cumulative Percent**
1	166	74.77	166	74.77
2	30	13.51	196	88.29
3	10	4.50	206	92.79
4	9	4.05	215	96.85
5	1	0.45	216	97.30
6	6	2.70	222	100.00
Frequency Missing = 7				

How frequently do you use your tablet device for the following / tasks? / Â -Listen to audio				
Q36_10	**Frequency**	**Percent**	**Cumulative Frequency**	**Cumulative Percent**
1	67	30.88	67	30.88
2	49	22.58	116	53.46
3	18	8.29	134	61.75
4	39	17.97	173	79.72
5	18	8.29	191	88.02
6	26	11.98	217	100.00
Frequency Missing = 12				

How frequently do you use your tablet device for the following / tasks? / Â -Create audio				
Q36_11	**Frequency**	**Percent**	**Cumulative Frequency**	**Cumulative Percent**
1	176	79.64	176	79.64
2	30	13.57	206	93.21
3	5	2.26	211	95.48
4	7	3.17	218	98.64
5	1	0.45	219	99.10
6	2	0.90	221	100.00
Frequency Missing = 8				

How frequently do you use your tablet device for the following / tasks? / Â -Play games				
Q36_12	**Frequency**	**Percent**	**Cumulative Frequency**	**Cumulative Percent**
1	77	34.53	77	34.53
2	54	24.22	131	58.74
3	20	8.97	151	67.71
4	31	13.90	182	81.61
5	19	8.52	201	90.13
6	22	9.87	223	100.00
Frequency Missing = 6				

How frequently do you use your tablet device for the following / tasks? / Â -Video Message (Skype, Facetime, Google Hangout, etc.)				
Q36_13	**Frequency**	**Percent**	**Cumulative Frequency**	**Cumulative Percent**
1	74	33.04	74	33.04
2	78	34.82	152	67.86
3	28	12.50	180	80.36
4	24	10.71	204	91.07
5	9	4.02	213	95.09
6	11	4.91	224	100.00
Frequency Missing = 5				

How frequently do you use your tablet device for the following / tasks? / Â -Social Networks (Facebook, Twitter, Google+, WhatsApp, Yahoo, kik)				
Q36_14	**Frequency**	**Percent**	**Cumulative Frequency**	**Cumulative Percent**
1	48	21.43	48	21.43
2	38	16.96	86	38.39
3	23	10.27	109	48.66
4	43	19.20	152	67.86
5	17	7.59	169	75.45
6	55	24.55	224	100.00
Frequency Missing = 5				

How long have you used a tablet device? / (e.g.,Â Apple iPad Google Nexus 7/10, Kindle Fire, Nook Co...				
Q37	**Frequency**	**Percent**	**Cumulative Frequency**	**Cumulative Percent**
1	18	7.86	18	7.86
2	30	13.10	48	20.96
3	76	33.19	124	54.15
4	78	34.06	202	88.21
5	27	11.79	229	100.00

Gender				
Q38	**Frequency**	**Percent**	**Cumulative Frequency**	**Cumulative Percent**
1	56	24.56	56	24.56
2	172	75.44	228	100.00
Frequency Missing = 1				

What year were you born?				
Q39	**Frequency**	**Percent**	**Cumulative Frequency**	**Cumulative Percent**
1952	1	0.45	1	0.45
1954	1	0.45	2	0.91
1955	1	0.45	3	1.36
1957	2	0.91	5	2.27
1958	1	0.45	6	2.73
1959	2	0.91	8	3.64
1960	1	0.45	9	4.09
1961	2	0.91	11	5.00
1962	1	0.45	12	5.45
1963	1	0.45	13	5.91
1964	3	1.36	16	7.27
1965	2	0.91	18	8.18
1966	3	1.36	21	9.55
1967	2	0.91	23	10.45
1968	4	1.82	27	12.27
1969	4	1.82	31	14.09
1970	2	0.91	33	15.00
1971	1	0.45	34	15.45
1972	1	0.45	35	15.91
1973	4	1.82	39	17.73
1974	3	1.36	42	19.09
1975	3	1.36	45	20.45
1976	3	1.36	48	21.82
1977	4	1.82	52	23.64
1978	6	2.73	58	26.36
1979	6	2.73	64	29.09
1980	7	3.18	71	32.27
1981	6	2.73	77	35.00
1982	9	4.09	86	39.09

What year were you born?				
Q39	**Frequency**	**Percent**	**Cumulative Frequency**	**Cumulative Percent**
1983	7	3.18	93	42.27
1984	9	4.09	102	46.36
1985	14	6.36	116	52.73
1986	12	5.45	128	58.18
1987	18	8.18	146	66.36
1988	16	7.27	162	73.64
1989	19	8.64	181	82.27
1990	14	6.36	195	88.64
1991	11	5.00	206	93.64
1992	8	3.64	214	97.27
1993	3	1.36	217	98.64
1994	2	0.91	219	99.55
1998	1	0.45	220	100.00
Frequency Missing = 9				

Program of Study				
Q40	Frequency	Percent	Cumulative Frequency	Cumulative Percent
("COLLEGE OF NURSING)	1	0.44	1	0.44
ADULT EDUCATION	3	1.31	4	1.75
COLLEE OF NURSING	1	0.44	5	2.18
COLLEGE OF EDUCATION	50	21.83	55	24.02
COLLEGE OF EDUCATION, MA IN ADULT EDUCATION	1	0.44	56	24.45
COLLEGE OF NURSING	36	15.72	92	40.17
COLLEGE OF PHARMACY	19	8.30	111	48.47
COLLEGE OF PUBLIC HEALTH	57	24.89	168	73.36
COLLEGE OF PUBLIC HEALTH, PREVIOUSLY COLLEGE OF AR	1	0.44	169	73.80
COLLEGE OR PHARMACY	1	0.44	170	74.24
COPH	13	5.68	183	79.91
COPH AND CAS	1	0.44	184	80.35
CPH	1	0.44	185	80.79
EDUCATION	11	4.80	196	85.59
GRADUATE SCHOOL OF EDUCATION AND HR	1	0.44	197	86.03
MPH PUBLIC HEALTH	1	0.44	198	86.46
NURSING	8	3.49	206	89.96
PHARMACY	8	3.49	214	93.45
PUBLIC HEALTH	10	4.37	224	97.82
PUBLIC HEALTH + ARTS AND SCIENCES	1	0.44	225	98.25
PUBLIC HEALTH AND BEHAVIORAL AND COMMUNITY SCIENCE	1	0.44	226	98.69
USF COLLEGE OF EDUCATION	1	0.44	227	99.13
USF COP	1	0.44	228	99.56
USF NURSING	1	0.44	229	100.00

Undergrad				
Q41_1	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Frequency Missing = 229				

Graduate				
Q41_2	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	224	100.00	224	100.00
Frequency Missing = 5				

UG_ND				
Q41_3	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Frequency Missing = 229				

GRAD_ND				
Q41_4	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	5	100.00	5	100.00
Frequency Missing = 224				

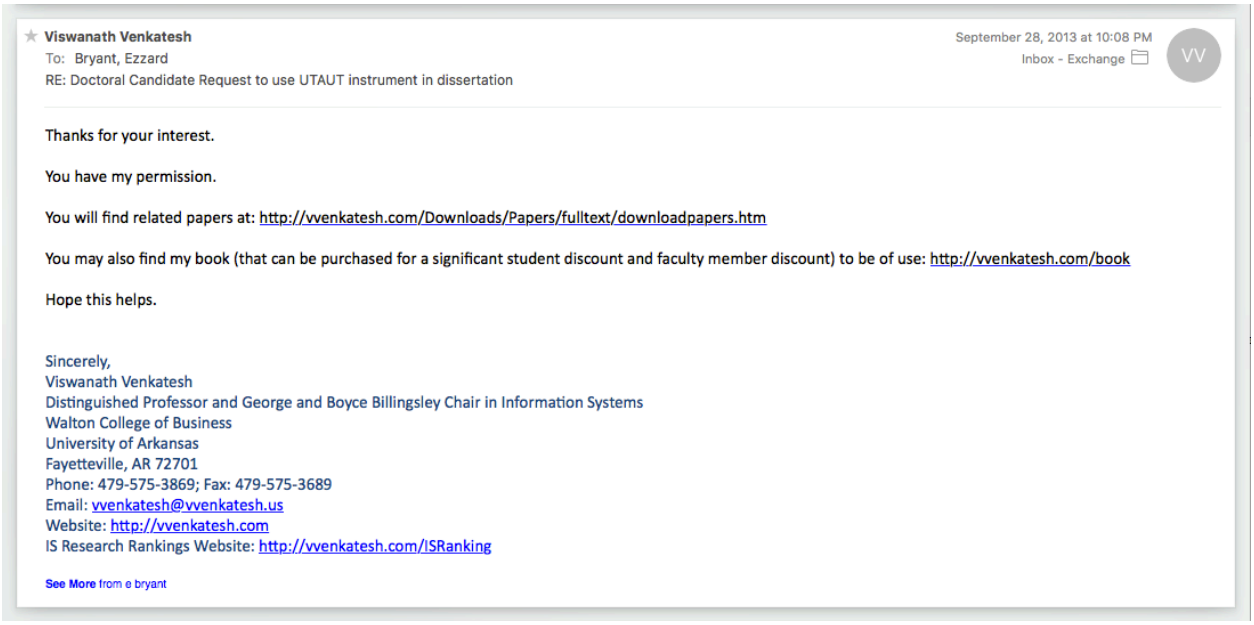
OTHER LEVEL				
Q41_5	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Frequency Missing = 229				

Please explain why you checked other.				
Q42	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Frequency Missing = 229				

Have you ever been diagnosed with a disability?				
Q43	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	16	6.99	16	6.99
2	213	93.01	229	100.00

What were you diagnosed with? (Please identify any you feel / comfortable listing.)				
Q44	Frequency	Percent	Cumulative Frequency	Cumulative Percent
ADD	2	13.33	2	13.33
ADHD	3	20.00	5	33.33
ADHD, VASCULAR DISEASE, NEUROLOGICAL DYSFUNCTIONS	1	6.67	6	40.00
ATTENTION DEFICIT DISORDER	1	6.67	7	46.67
DEAFNESS	1	6.67	8	53.33
DEGENERATIVE DISC DISEASE, CHRONIC PAIN, BUT I WORK FULL-TIME WITH ACCOMMODATIONS AND ATTEND SCHOOL PART-TIME ONLINE	1	6.67	9	60.00
GENERALIZED ANXIETY DISORDER / ATTENTION DEFICET DISORDER	1	6.67	10	66.67
LEARNING DISABILITIES, FIBROMYALGIA	1	6.67	11	73.33
LOSS OF RIGHT PERIPHERAL VISION	1	6.67	12	80.00
MATH PROCESSING DISORDER	1	6.67	13	86.67
SERVICE CONNECTED DISABILITY. DOES NOT IMPACT YOUR QUESTIONING.	1	6.67	14	93.33
TINITUS / PTSD	1	6.67	15	100.00
Frequency Missing = 214				

Appendix I Permission to Use UTAUT



Viswanath Venkatesh
To: Bryant, Ezzard
RE: Doctoral Candidate Request to use UTAUT instrument in dissertation

September 28, 2013 at 10:08 PM
Inbox - Exchange

VV

Thanks for your interest.

You have my permission.

You will find related papers at: http://vvenkatesh.com/Downloads/Papers/fulltext/downloadpapers.htm

You may also find my book (that can be purchased for a significant student discount and faculty member discount) to be of use: http://vvenkatesh.com/book

Hope this helps.

Sincerely,
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Ezzard C. Bryant, Jr. received a Bachelor's degree in Electronic Media Art Technology in 2006 from the University of Tampa, while playing on the National championship baseball team and running on the track team. He received a Masters of Education degree in Curriculum and Instruction with an emphasis in Instructional Technology in 2007 from the University of South Florida.

Ezzard has worked at the university teaching introduction educational technology and creating teacher technology workshops for pre-service teachers. He has also worked as an instructional designer, designing and developing corporate training for multiple companies over the past several years.