Investigating the Faculty Behavioral Intentions to Adopt Learning Management Systems (LMSs) in a Higher Education Institution in Saudi Arabia

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ABSTRACT

Learning Management Systems (LMSs) have been an essential part of the e-Learning ecosystem since the 1990s. LMSs have been developed and widely adopted by higher education institutions around the world. Despite the instructional and financial benefits of using LMSs, the adoption and diffusion of LMSs by faculty members continues to be challenging in higher education institutions, and particularly in developing countries.

The purpose of this study is to determine the factors influencing the adoption of learning management systems (LMSs) by faculty members in Saudi Arabian higher education. The study employed a mixed method approach and applied the Unified Theory of Acceptance and Use of Technology (UTAUT) to explore these factors. Specifically, the study aims to determine the extent at which Performance Expectancy (PE), Effort Expectancy (EE), Facilitating Conditions (FC), and Social Norms (SN) influence faculty members' Behavioral Intention (BI) to adopt the Blackboard LMS. It also examines the moderating roles of age, gender, experience, perceived voluntariness, and computer self-efficacy on Performance Expectancy (PE), Effort Expectancy (EE), Social Norms (SN), and Facilitating Conditions (FC). The results of the study revealed a strong and positive correlation between performance expectancy and behavioral intention for Blackboard usage. The study also found Effort Expectancy, Facilitating Conditions, and Social Norms to be significant predictors of Behavioral Intention for Blackboard usage. Additionally, the findings show no moderation effects of age, gender, perceived voluntariness, and computer self-efficacy on Performance

Expectancy, Effort Expectancy, Social Norms, and Facilitating Conditions. Experience was found to have a moderation effect on the relationship between Social Norms and Behavioral Intention.

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GENERAL AUDIENCE ABSTRACT

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The purpose of this study is to determine the factors influencing the usage of learning management systems (LMSs) by faculty members in Saudi Arabian higher education. The study employed a mixed method approach and applied the Unified Theory of Acceptance and Use of Technology (UTAUT) to explore these factors. Specifically, the study aims to determine the extent at which Performance Expectancy (PE), Effort Expectancy (EE), Facilitating Conditions (FC), and Social Norms (SN) influence faculty members' Behavioral Intention (BI) to adopt the Blackboard LMS. It also examines the moderating roles of age, gender, experience, perceived voluntariness, and computer self-efficacy on Performance Expectancy (PE), Effort Expectancy (EE), Social Norms (SN), and Facilitating Conditions (FC). The results of the study revealed a strong and positive correlation between performance expectancy and behavioral intention for Blackboard usage. The study also found Effort Expectancy, Facilitating Conditions, and Social Norms to be strong predictors of Behavioral Intention for Blackboard usage.

DEDICATION

This dissertation is dedicated to my family. My exceptional parents, my beloved wife, and my amazing brothers and sisters. Your prayers have been answered and your sacrifices, patience, and support have paid off.

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I am grateful to Allah for the spiritual, physical, and intellectual support that He has given me in this long journey. The successful completion of this dissertation away from home would not have been possible without His support and providing.

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Introduction

Driven by the World Wide Web revolution, the era of web-based learning started in the late 1990s (Davis, Carmean, & Wagner, 2009). Since then, many higher education institutions have become interested in integrating the internet to provide web-based systems for their students and faculty members. According to Davis, Carmean, and Wagner (2009), Learning Management Systems (LMSs) have been an essential part of the e-Learning ecosystem since the 1990s. In the first decade of e-Learning adoption, LMSs, "were the hub of all online learning activities" (Davis et al., 2009, p. 6). Now, they are considered one of the most widespread e-learning systems used by both instructors and students in academic institutions (Chang, 2013). Berking and Gallagher (2013) define an LMS as, "a key enabling technology for 'anytime, anywhere' access to learning content and administration" (p. 6). According to these researchers, LMSs can be defined as a set of software platforms that allow instructors and students to communicate and manage content through the internet and the use of various hardware (Berking & Gallagher, 2013). Ellis and Ryan (2009) provided a technical definition for a learning management system, describing it as a software system that helps instructors with the administration, reporting, tracking, documentation, and delivery in online courses. Lonn and Teasley (2009) have provided a similar definition for LMSs, stating that, "web-based systems allow instructors and students to share instructional materials, make class announcements, submit and return course assignments, and communicate with each other online" (p. 688).

Over the past two decades, LMSs have been developed and widely adopted by higher education institutions around the world. Research shows that integrating learning management

systems may assist faculty members with managing and organizing the content of their courses, engaging their students, and decreasing their planning time. This promotes the learning process (Chapman, 2009; Ramirez, 2014). The key feature of an LMS is the fact that it provides a learning environment for both instructors and students without time or distance restrictions (Epping, 2010). LMSs also offer useful tools for assignments and multimedia content. They provide support for interactions such as discussion boards, chat sessions, and quizzing tools (Bonk & Graham, 2006). According to Bouhnik and Marcus (2006), LMSs have four main advantages including the freedom to decide when to learn each lesson, student freedom to express thoughts and ask questions that they are not able to ask in traditional classrooms, lack of dependence on time limits, and the accessibility of course materials at any time. Allen and Seaman (2005) and Morris (2004), stress that if a higher institution is considering operating traditional courses online, adopting an LMS is important for the proper organization of content, grades, instructors, students, and courses. In addition to the evident instructional needs, cost savings are an important motive that drives many institutions to invest in LMSs (Chapman, 2009).

Perhaps because of the aforementioned advantages of LMSs, the adoption of such systems is a noteworthy phenomenon in higher education. Brown, Dehoney, and Millichap (2015) report that, in the US, "Estimates of institutions running an LMS are almost always near 99%. According to the first ECAR survey of faculty and IT, 85% of faculty use an LMS (with 56% using it on a daily basis), and 74% say it is a useful tool to enhance teaching. Among students, 83% use an LMS, and 56% say they use it in most or all courses" (p. 2).

According to Davis, Bagozzi, and Warshaw (1989), the effective use and successful adoption of LMSs in education can be determined by a number of factors related to the

behavioral attitudes of teachers and students, applied information technologies, and university support. One important perspective regarding the use of LMSs in higher education focuses on the use of the LMS as a whole. From this perspective a number of variables have been identified explaining faculty adoption and usage of LMSs. These factors include internal variables such as perceived usefulness of the LMS and faculty efficacy (Torrisi-Steele & Drew, 2013). They also include external variables, such as institutional infrastructure, technical support, perceived ease of use, funding, and preparation time (Davis & Fill, 2007).

Statement of the Problem

The adoption and diffusion of LMSs by faculty members continues to be challenging in higher education institutions, particularly in the developing countries. According to The National Center for e-Learning and Distance Learning in Saudi Arabia (NCeL), the Ministry of Education has spent significant financial and human resources supporting and deploying instructional technologies, including LMSs (NCeL, n.d.). For example, the Ministry of Education has selected Blackboard as a strategic partner to support the e-learning requirements of most of the universities in Saudi Arabia (Zaki & Hassan, 2014). Despite the instructional and financial benefits of using LMSs, "providing the required technological infrastructure does not guarantee the optimal implementation of LMS by all faculty members of the institution" (Asiri, 2012, p. 132). The proper implementation and adoption of LMSs is essential to improve the quality of teaching and learning, provide cost-effectiveness, and reduce the cost of learning and access to education (Bates, 2000). In consequence, Asiri (2012) noted that, "every higher educational institution seeks to increase the utilization level of LMS of its faculty members to ensure the successful integration of technology in teaching and learning processes" (p. 132). Moreover, a number of studies have indicated that the higher

institutions in Saudi Arabia have been using LMSs for a long time. The overall adoption of LMSs, however, is modest (Hussein, 2011; Al-Judi, 2011; Bousbahi & Alrazgan, 2015).

Theoretical Framework

Researchers have studied and explored a number of factors that impact the decision to adopt new technologies and innovations. The Technology Acceptance Model (TAM), which was developed by Davis in 1989, deals with an individual's behavior, and more specifically, their technology-related behavior. Davis developed his model to, "provide an explanation of the determinants of computer acceptance that is general, capable of explaining user behavior across a broad range of end-user computing technologies and user populations, while at the same time being both parsimonious and theoretically justified" (Davis, 1989, p. 985). The main objective of the TAM was to study the relationship between external factors and an individual's internal beliefs and attitudes. This was meant to predict their acceptance of a particular system. The TAM model considered two acceptance measures as the main factors influencing a user's intention to adopt and use technology. These factors were perceived usefulness (PU) and perceived ease of use (PEU). According to Davis (1989), perceived usefulness is, "the degree to which a person believes that using a particular system would enhance his or her job performance," and perceived ease of use is, "the degree to which a person believes that using a particular system would be free from effort" (p. 985).

The Unified Theory of Acceptance and Use of Technology (UTAUT) model by Venkatesh et al. (2003) has integrated eight well-known models that are related to technology adoption, namely: Theory of Reasoned Action (TRA), the Diffusion Innovation Theory (DIT), the Motivational Model (MM), the Technology Acceptance Model (TAM), the Theory of Planned Behavior (TPB), a model combining the Theory of Planned Behavior and

the Technology Acceptance Model, the model of PC utilization (MPCU), and Social Cognitive Theory (SCT). The UTAUT model consists of four independent variables: Performance Expectancy (PE), Effort Expectancy (EE), Social Norm (SN), and Facilitating Conditions (FC). The model suggests that these variables are moderated by gender, age, experience, and perceived voluntariness of use. The dependent variables are the Behavioral Intention (BI) and the actual behavior (Venkatesh et al., 2003).

The Technology Acceptance Model developed by Davis (1989), the UTAUT model presented by Venkatesh et al. (2003), and the findings of other studies such as that of Ajzen and Fishbein (1980) agree that the Behavioral Intention to use a technology has a direct influence on the actual usage. Both the TAM and the UTAUT models also agree that the Behavioral Intention is influenced by the perceived ease of use and the perceived usefulness. Macharia (2011), pointed out that the TAM and the UTAUT models both support the role of external variables but, "there is no clear pattern on the choice of variables selected, allowing the researcher to tailor this to his unique context" (p. 12). Thus, the external variables selected for this study were identified as computer self-efficacy (Igbaria, Zinatelli, Cragg, & Cavaye, 1997), gender (Venkatesh & Morris, 2000), subjective norms, perceived voluntariness, and age (Venkatesh & Davis, 1996).

Saudi Arabia is unique as a developing country, which means that the adoption factors could be different from what is typically found in western countries. It is therefore important to consider the cultural differences when conducting this study. Many researchers have indicated that cultural factors need to be integrated into technology adoption models (Al-Gahtani, Hubona, & Wang, 2007; Lu & Lin, 2012). Hofstede (1997) pointed out that cultural variables have a great impact on adoption behavior, and cultural dimensions provide a

theoretical foundation for examining the use of technology. Therefore, the cultural variables selected for this study will be based on cultural dimensions developed by Hofstede (1980). These dimensions will be used to explore the impact that culture may have on the adoption of LMSs in Saudi Arabia.

Purpose of the Study

The purpose of this study was to determine the factors influencing the adoption of learning management systems (LMSs) by faculty members in Saudi Arabian higher education using the Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh, 2003). The study analyzed the relationship between these factors. Specifically, the study aimed to determine to what extent Performance Expectancy (PE), Effort Expectancy (EE), Facilitating Conditions (FC), and Social Norms (SN) influence Behavioral Intention (BI). It also examined the moderating roles of age, gender, experience, perceived voluntariness, and computer self-efficacy on Performance Expectancy (PE), Effort Expectancy (EE), and Social Norms (SN). The study considered the unique culture of Saudi Arabia, which may mean that the adoption factors for LMSs will be different from what is commonly found in western countries.

Findings from this study can be used by university leaders, instructors, instructional designers, and policy and decision-makers in Saudi higher education by giving them insight into the factors that may influence faculty adoption of LMSs. This may provide them with solutions to promote the utilization of LMSs in Saudi higher educational institutions.

Significance of the Study

The movement toward e-learning in developing countries is slow when compared to the rapid developments that are occurring in developed countries. Alsunbul (2002) believes

that this slow movement is because, "change does not come about easily in traditional higher education systems that are deeply rooted in certain beliefs, cultures, and ways of teaching on campus" (p. 68). Moreover, "a greater understanding of the role of social and cultural factors such as gender, age and level of education in developing countries is now more important than ever" (Macharia, 2011, p. 7).

This study will attempt to provide a clear understanding of faculty perceptions and Behavioral Intentions regarding LMS adoption, considering variables such as age, gender, and Social Norms. This information will be valuable to the management of higher institutions in Saudi Arabia, as well as to the management of LMS projects.

Research Questions

This study aims to explore the factors that may influence the faculty usage of LMSs within the context of higher education in Saudi Arabia. Thus, the proposed research questions are:

1) What are the factors that influence faculty members' decisions to adopt LMSs as part of their teaching in Saudi Higher Education?
2) What are the relationships between these factors?

Research Hypotheses

The hypotheses for this study are:

H1: Performance Expectancy will have a positive effect on the Behavioral Intention of LMS usage.

H1a: Gender will moderate the effect of Performance Expectancy on Behavioral Intention of LMS usage.

H1b: Age will moderate the effect of Performance Expectancy on Behavioral Intention of LMS usage.

H2: Effort Expectancy will have a positive effect on the Behavioral Intention of LMS usage.

H2a: Gender will moderate the effect of Effort Expectancy on Behavioral Intention of LMS usage.

H2b: Age will moderate the effect of Effort Expectancy on Behavioral Intention of LMS usage.

H2c: Experience will moderate the effect of Effort Expectancy on Behavioral Intention of LMS usage.

H2d: Computer self-efficacy will moderate the effect of Effort Expectancy on Behavioral Intention of LMS usage.

H3: Social Norm will have a positive effect on the Behavioral Intention of LMS usage.

H3a: Gender will moderate the effect of Social Norm on Behavioral Intention of LMS usage.

H3b: Age will moderate the effect of Social Norm on Behavioral Intention of LMS usage.

H3c: Experience will moderate the effect of Social Norm on Behavioral Intention of LMS usage

H3d: Voluntariness of use will moderate the effect of Social Norm on Behavioral Intention of LMS usage

H4: Facilitating Conditions will have a positive effect on the Use Behavior of LMSs.

H4a: Age will moderate the effect of Facilitating Conditions on Use Behavior of LMSs.

H4b: Experience will moderate the effect of Facilitating Conditions on Use Behavior of LMSs.

H5: Behavioral Intention of LMS usage will have a positive effect on the Use Behavior of LMSs.

Definition of Terms

For the purposes of this study, the following list of definitions is provided:

UTAUT: The Unified Theory of Acceptance and Use of Technology (UTAUT) model was developed by Venkatesh et al. (2003) to explain and predict the adoption of information technology by end users.

TAM: The Technology Acceptance Model (TAM) was developed by Davis (1989) to provide an explanation of the determinants of technology acceptance.

LMS: "A software system designed to assist in the management of educational courses for students, especially by helping teachers and learners with course administration" (Simonson, 2007, p. vii).

Behavioral Intention: The intention of an individual to adopt a new technology. This is a strong predictor of the actual use of that technology.

Performance Expectancy: "The degree to which an individual believes that using the system will help him or her to attain gains in job performance" (Venkatesh et al., 2003, p. 447).

Effort Expectancy: "The degree of ease associated with the use of the system" (Venkatesh et al., 2003, p. 450).

Social Norm: "The degree to which an individual perceives that important others believe he or she should use the new system" (Venkatesh et al., 2003, p. 451).

Perceived Voluntariness: "The extent to which potential adopters perceive the adoption decision to be non-mandatory" (Venkatesh & Davis, 2000, p. 188).

Computer self-efficacy: "The judgment of one's capability to use computer technology" (Yuen & Ma, 2008, p. 7).

Chapter 2: Literature Review

Introduction

This chapter provides an overview of Learning Management Systems (LMSs) and their use in education, with a focus on their adoption in higher education. It also discusses a number of well-known technology adoption theories and models, as well as the factors related to educational technology adoption.

This chapter is divided into six sections. The first section provides an overview of LMSs, and presents a historical review of its evolution, definition, and features. The second section provides an overview of the field of electronic learning in the kingdom of Saudi Arabia with more focus on the adoption of LMSs in higher education institutions. The third section provides a discussion on four well-known technology adoption models, namely, the theory of reasoned action (TRA), the Technology Acceptance Model (TAM), the Diffusion of Innovation Theory (DOI), and the Unified Theory of Acceptance and Use of Technology (UTAUT). The fourth section discusses the four main variables included in this study: Performance Expectancy (PE), Effort Expectancy (EE), Social Norm (SN), and Facilitating Conditions (FC), as well as the moderating variables of experience, age and gender, perceived voluntariness, and computer self-efficacy. The fifth section discusses the influence of culture on technology adoption and provides insights on Hofstede's cultural dimensions. The sixth section outlines various studies related to Hofstede's cultural dimensions and UTAUT.

Learning Management Systems (LMSs)

Learning Management Systems (LMSs) have become some of the most popular educational technologies used in higher education (Piña, 2010; Hamuy & Galaz, 2010). There are a number of other terms used interchangeably with LMSs including Course Management

Systems (CMS), Virtual Learning Environments (VLE), Managed Learning Environments, and Learning Platforms (Simonson, 2007; Shiau & Chau, 2015). All these terms refer to the same idea of managing the teaching-learning process using certain tools or software via the internet. While the original purpose of LMSs was to enhance distance education, many universities around the world currently use LMSs as course management systems for their face-to-face courses as well.

According to Kennedy (2009), the market offers many types of open source and closed resource or commercial LMSs. The open source LMSs are the ones available for use and modification without requiring a licensing fee. These include LMSs such as Moodle, ATutor, and ClassWeb. The commercial LMSs require licensing fees per user, and include LMSs such as Blackboard, Desire2Learn, and Canvas.

Defining LMSs

The definition of LMSs varies largely in the literature. Martin (2008) has defined an LMS as, “A software environment that enables the management and delivery of learning content and resources to students. It provides an opportunity to maintain interaction between the instructor and students, and to assess the students by providing immediate feedback on the online quizzes” (p. 138). Simonson (2007) provided a simpler definition, stating that an LMS is, "a software system designed to assist in the management of educational courses for students, especially by helping teachers and learners with course administration" (p. vii). Nichols (2004) indicated that an LMS can be seen as a platform that assembles online course components as, "a collection of eLearning tools available through a shared administrative interface" (p. 2). White and Larusson (2010) defined an LMS as, “an online digital environment that allows information to be shared between students and faculty and provides

access to content and administrative procedures for specific courses" (p. 2). Walker (2014) defines it as, "A platform consisting of a software application and a hardware infrastructure designed to enhance learning and teaching through the use of integrated tools and features that provide flexible functionality and services to the users of the system" (p. 21).

Features of LMSs

The majority of LMSs are made up of web-based software that allow users to access learning materials and administration both synchronously and asynchronously (Black, Beck, Dawson, Jinks, & DiPietro, 2007). Kennedy (2009) indicates that LMSs have five core characteristics including communication and collaboration between users, assessment and student evaluation, online content and organization, management and tracking of students, and student tools and autonomy.

Similarly, Malikowski, Thompson, and Theis (2007) developed a research model for LMSs, which includes five core LMS characteristics. These characteristics allow for transmitting course content, evaluating students, evaluating courses and instructors, creating class discussions, and creating computer-based instruction.

Transmitting course content. According to Malikowski et al. (2007), transmitting course content is the most important component of an LMS. For instance, LMSs allow instructors to upload course materials such as a syllabus, articles for reading, and instructional videos. These learning materials are often given to students in the form of text, images, videos, and sometimes links to external resources. LMSs are also used to announce events, such as assignments and exams (Malikowski et al., 2007).

Student evaluation. LMSs usually contain a number of online assessment tools. Malikowski et al. (2007) stressed that a quiz generator is the most common LMS tool for

evaluating students. These quizzing tools usually offer a number of question types such as fill in the blank, multiple choice, true or false, matching, long answer, short answer, etc. (Malikowski et al., 2007). They can also contain essay and offline task assessment tools (Long, 2004).

Course evaluation. Learning Management Systems (LMSs) allow students to take part in the course evaluation process. LMSs may include course evaluation features such as quizzing and survey tools, where students can anonymously evaluate the course and give their reflections (Malikowski et al., 2007).

Communication and collaboration. Effective communication and collaboration between the instructors and students is crucial in an LMS (Kennedy, 2009). LMSs include communication tools that allow both instructors and students to interact synchronously (users communicate in real time) or asynchronously (users do not take part at the same time). For example, students and instructors can communicate asynchronously using email discussion boards. Conversely, the communication can be synchronous, such as through instant messaging and virtual classrooms (Malikowski et al., 2007).

Creating computer-based instruction. Malikowski et al. (2007) added, “creating computer-based instruction” into their model as a separate category from “transmitting course content” because, "it offers techniques to use a CMS for more than transmitting content" (p. 165). They emphasized the fact that LMSs can offer adaptive learning experiences where students are given customized learning activities and resources to address unique needs.

LMS Adoption in Higher Education in Saudi Arabia

The growing development of information and instructional technologies (ICTs) and their significant impact on education have led the government of Saudi Arabia towards the

adoption of these advanced technologies in academic institutions. In 2002, the government authority responsible for technical education and vocational training (the General Organization for Technical Education and Vocational Training, or GOTEVOT) in Saudi Arabia introduced the E-Learning Training and Resources Centre, which led to the opening of an e-library that contained 50,000 e-books and 3,000 training programs (Al-Khalifa, 2010). The Ministry of Education has also established numerous e-learning training programs for students and teachers by signing memorandums of understanding with Intel and Microsoft. This has resulted in industry growth of over 55%, making it the largest ICT market in the Middle East (Al-Asmari & Khan, 2014). In 2006, the Ministry of Education in Saudi Arabia established the National Centre for e-learning and Distance Education (NCeDL). The main objective of this center is to promote, "quality e-Learning and distance learning applications in higher educational institutions and contributing in expanding the capacity of higher educational institutions through e-Learning and distance learning applications" (The Ministry of Education, 2017).

In line with Saudi Arabia's efforts to support the adoption of e-learning, King Abdullah issued a royal decree in 2011 to establish a state electronic university in Riyadh with three other branches in three different cities (AlNajdi, 2014). The Saudi Electronic University (SEU) has become the first and only official distance-learning university in Saudi Arabia. SEU offers a number of graduate and undergraduate degrees from three colleges, and uses the Blackboard LMS as the main software environment for learning management and content delivery (AlNajdi, 2014).

According to Al-Nuaim (2012), King Abdulaziz University (KAU) (one the largest campuses in Saudi Arabia) has established the deanship of distance learning (DDL) as a step

to embrace the new culture of e-learning. Due to the limited seating available for KAU's traditional full-time students, the university offers a number of fully online programs. The DDL at KAU has developed an LMS called Learning Management Electronic System (LMES) which, "supports the educational process by facilitating asynchronous interactions between students and faculty. Courses uploaded to the system go through a rigorous process of instructional design, quality control, and peer evaluation for departmental approval of the content" (Al-Nuaim, 2012 p. 216).

According to the Ministry of Education website, as of September 1, 2018, there were 69 public and private higher education institutes in Saudi Arabia (The Ministry of Education, 2018). Aljuhney and Murray (2016) have investigated the adoption of LMSs in 46 higher educational institutions in Saudi Arabia. They found that about 87% of the higher educational institutions have been using LMSs. Bousbahi and Alrazgan (2015) pointed out that many universities in Saudi Arabia have established the deanship of e-learning as a step to support blended learning, and to promote LMS use in their courses. Furthermore, *Jusur* (an Arabic word for bridges) is an LMS that was introduced by the National Centre for e-learning and Distance Education (NCeDL) in 2009 (AlNajdi, 2014). *Jusur* enables faculty members to schedule their courses, deliver instruction and materials, track student progress, enable class discussions, and undertake student assessments (Hussein, 2011).

Despite all the efforts to enhance the use of LMSs in Saudi higher education institutions, a number of studies showed that the overall usage of LMS platforms is modest (Hussein, 2011; Al-Judi, 2011; Bousbahi & Alrazgan, 2015). Al-Judi (2011) indicated that the majority of faculty members were not using the *Jusur* LMS to create their courses, and the overall utilization of this system did not reach the required level. Furthermore, Asiri,

Mahmud, Bakar, and Ayub (2012) conducted a study to determine the utilization of *Jusur* by faculty members in Saudi Arabian universities. The results revealed that the adoption of Jusur was insufficient and, "faculty members use it on average twice a month for less than one hour" (p. 532).

Models of Adoption Technology

Over the last few decades, a considerable number of models have been developed to try to explain why individuals adopt a particular technology or innovation. Some of these models were built on intention-based theories such as Ajzen's (1991) Theory of Planned Behavior (TPB) and Davis's (1989) Technology Acceptance Model (TAM). This approach uses Behavioral Intention to explain individual behaviors such as technology usage. Another approach tried to explain technology usage from the diffusion of innovation perspective. Examples include Rogers's (2003) Diffusion of Innovation (DOI) theory and the work of Tornatzky and Klein (1982). This approach focuses on employing different types of variables (e.g. innovations characteristics and information sources) to explain technology adoption and diffusion. The following discussion considers four of the most popular theoretical models: The Theory of Reasoned Action (TRA) (Ajzen & Fishbein,1980), Davis's (1989) Technology Acceptance Model (TAM), Rogers's (2003) Diffusion of Innovation (DOI), and The Unified Theory of Acceptance and Use of Technology (UTAUT) model by Venkatesh et al. (2003).

The Theory of Reasoned Action (TRA)

The Theory of Reasoned Action was developed by Ajzen and Fishbein (1980), and seeks to explain human behavior. The TRA suggests that people's behavior is the result of their intentions, and intentions are the result of attitudes toward the behavior and subjective norms about the behavior. According to this theory, one's attitudes are formed by one's beliefs

about the outcomes and the consequences of the behavior. Subjective norms, sometimes referred to as Social Norm, are formed by beliefs about the opinions of others towards the performance of a given behavior. A subjective norm does not refer to one's attitude toward his or her actions. It refers to individual's beliefs about what important others, such as family members or friends, may feel about these actions (Ajzen & Fishbein, 1980).

The TRA has been used by researchers to explain human behavior in a number of social psychology disciplines (Conner, Kirk, Cade, & Barrett, 2001). It has also been found to support the predictions of multiple social behaviors in the literature (Mishra, Akman, & Mishra, 2014). Even though the TRA has been widely used in the literature, it has also been criticized in many ways. Possibly the most extensive critique is that it is difficult to identify the distinction between the two main constructs, attitude and subjective norms (Miniard & Cohen, 1981). Miniard and Cohen have argued that the problem with the TRA is a conceptual one. Since evaluating consequences determines attitudes, and normative beliefs determine subjective norms, it may be possible that behavioral beliefs and normative beliefs are the same constructs with different names (Miniard & Cohen, 1981).

The Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM), developed by Davis in 1989, deals with an individual's behavior, and more specifically, their technology-related behavior. Davis developed his model to, "provide an explanation of the determinants of computer acceptance that is general, capable of explaining user behavior across a broad range of end-user computing technologies and user populations, while at the same time being both parsimonious and theoretically justified" (Davis, 1989, p. 985). The main objective of the TAM was to study the relationship between external factors and an individual's internal beliefs and

attitudes to predict their acceptance of a particular system. The TAM considers two acceptance measures as the main factors influencing a user's intention to adopt and use technology. These factors are perceived usefulness (PU) and perceived ease of use (PEU). According to Davis (1989), perceived usefulness is, "the degree to which a person believes that using a particular system would enhance his or her job performance," and perceived ease of use is, "the degree to which a person believes that using a particular system would be free from effort" (p. 985).

The TAM assumes that perceived ease of use of a system influences perceived usefulness, and that both perceived ease of use and perceived usefulness of a system influence attitudes towards the usage of that system (Davis, 1989). According to Davis (1989), attitude (AT) is defined as a user's positive or negative assessment of a behavior. Additionally, the model proposes that attitude influences the individual's Behavioral Intention (BI) of adopting a system, and will therefore influence the actual use of the system (AU). Although the TAM is one of the more popular models explaining an individual's adoption and usage of systems, it has received several critiques. Lu, Yu, Liu, and Yao (2003) stressed that, because of its generality, the TAM is not capable of capturing detailed information on an individual's perceptions of a system. In addition, Legris, Ingham, and Collerette (2003) stressed that the TAM failed to include important factors for predicting user acceptance of a system (e.g., social and organizational factors).

The Diffusion of Innovation Theory (DOI)

Rogers's (2003) Diffusion of Innovation (DOI) theory analyzed the adoption of new ideas, products, or behaviors in a social system. Rogers (2003) considered diffusion to be social change and defined it as, "the process in which an innovation is communicated through

certain channels over time among the members of social system" (p. 5). The DOI framework includes four important elements: an innovation, communication channels, time, and a social system. According to Rogers (2003), "an innovation is an idea, practice, or object that is perceived as new by an individual or other unit of acceptance" (p. 12). Communication channels are, "the means by which a message is delivered from one individual to another" (p. 12), such as interpersonal channels and mass media (Rogers, 2003). Rogers identified time as an important element of his framework, as it plays an essential role in the diffusion process. Social system was defined as, "a set of interrelated units that are engaged in joint problem-solving to accomplish a common goal" (Rogers, 2003, p. 23).

The DOI theory has a number of sub-theories that aim to explain how an innovation or an idea is accepted or rejected by an individual (Rogers, 2003). These models include the individual innovativeness model, the theory of rate of adoption, the innovation-decision model, and the perceived attributes of innovations model (Rogers, 2003). The perceived attributes of innovations model has been widely used to explain the adoption of technologies within the educational context. In this model, Rogers identifies a user's technology-related concerns as characteristics which influence the rate of adoption. The model presents five innovation-related attributes including relative advantage, compatibility, complexity, trialability, and observability.

Rogers (2003) defined relative advantage as, "the degree to which an innovation is perceived as being better than the idea it supersedes" (p. 229). According to Rogers, the relative advantage of an innovation has a positive relationship with the adoption rate. Complexity is, "the degree to which an innovation is perceived as relatively difficult to understand and use" (p. 257). The model presents the complexity attribute of an innovation as

having a negative relationship with the adoption rate (Rogers, 2003). Compatibility is, "the degree to which an innovation is perceived as consistent with the existing values, past experiences, and needs of potential adopters" (p. 240). Compatibility was also found to have a positive relationship with the adoption rate. Rogers defined trialability as, "the degree to which an innovation may be experimented with on a limited basis" (p. 258). Similar to the compatibility attribute, trialability has a positive relationship with the adoption rate. Finally, observability is, "the degree to which the results of an innovation are visible to others" (p. 258). Observability also has a positive relationship with the adoption rate (Rogers, 2003).

While many studies supported Rogers's (2003) DOI theory, some researchers have indicated that it has limitations. Chen, Gillenson, and Sherrell (2002) have criticized Rogers's theory for providing insufficient proof for how and when attitudes evolve into acceptance or rejection decisions. Additionally, Lyytinen and Damsgaard (2001) criticized the theory for not recognizing the differences between individual and organizational adoption of innovations.

Unified Theory of Acceptance and Use of Technology (UTAUT)

The Unified Theory of Acceptance and Use of Technology (UTAUT) model by Venkatesh et al. (2003) was developed through integrating multiple research efforts represented in major technology adoption models into a single model. Eight models relating to the adoption of information technology were synthesized into the UTAUT. These models and theories are the Theory of Reasoned Action (TRA), the Diffusion of Innovation Theory (DOI), the Motivational Model (MM), the Technology Acceptance Model (TAM), the Theory of Planned Behavior (TPB), a model combining the Theory of Planned Behavior and the TAM, the model of PC utilization (MPCU), and Social Cognitive Theory (SCT) (Venkatesh et al., 2003).

The UTAUT model consists of four independent variables: 1) Performance Expectancy (PE), which pertains to Performance Expectancy in TAM and relative advantage in DOI, 2) Effort Expectancy (EE), which is equivalent to ease of use in both TAM and DOI, 3) Social Norm (SN), which pertains to subjective norm in TAM and image in DOI, and 4) Facilitating Conditions (FC). The model suggests that these variables are moderated by gender, age, experience, and perceived voluntariness of the usage. The dependent variables are the Behavioral Intention (BI) and the actual behavior (Venkatesh et al., 2003).

Behavioral Intention (BI). According to the TRA (Ajzen & Fishbein, 1980), the TAM (Davis, 1989) and UTAUT (Venkatesh et al., 2003), people's Behavioral Intention to perform a certain behavior has a direct influence on their actual behavior. All three (TRA, TAM and UTAUT) use Behavioral Intention as the main dependent variable. Macharia (2011), pointed out that, "the current usage can be viewed as the other dependent variable, but most authors prefer to measure intent rather than actual usage which may be affected by many other factors such as availability of the technology itself" (p. 52). A number of studies have indicated that the Behavioral Intention to use a technology has a high positive correlation with the actual use of the technology (Venkatesh et al., 2003; Shiau & Chau, 2015).

Performance Expectancy (PE). According to Venkatesh et al. (2003), Performance Expectancy (PE) is, “the degree to which an individual believes that using the system will help him or her to attain gains in job performance” (p. 447). The five constructs from other technology acceptance models pertaining to Performance Expectancy (PE) are: perceived usefulness from the TAM, extrinsic motivation from Motivational Model (MM), job-fit from the Model of PC Utilization (MPCU), relative advantage from the DIT theory, and outcome

expectations from Social Cognitive Theory (SCT). The Performance Expectancy construct, in all presented models is, "the strongest predictor of intention" (Venkatesh et al., 2003, p. 447).

Bandyopadhyay and Fraccastoro (2007) concluded that the Behavioral Intention to use technology is strongly influenced by Performance Expectancy. AbuShanab, Pearson, and Setterstrom, (2010) also conducted a study to examine the adoption of internet banking software in Jordan, and concluded that a customer's Behavioral Intention to use the software was strongly influenced by Performance Expectancy. In an attempt to explore IT acceptance in Saudi Arabia, Al-Gahtani, Hubona, and Wang (2007) found that Performance Expectancy had a positive effect on the Behavioral Intention to use IT.

Effort Expectancy (EE). Venkatesh et al. (2003) define Effort Expectancy (EE) as, "the degree of ease associated with the use of the system" (p. 450). The three constructs from other technology acceptance models pertaining to Effort Expectancy (EE) are perceived ease of use from the TAM, complexity from the Model of PC Utilization (MPCU), and ease of use from the Diffusion of Innovation theory (DIT). According to Venkatesh and Morris (2000) Effort Expectancy (EE) is more salient for women than for men. This could stem from cognitions related to gender roles.

Social Norm (SN): Social Norm (SN) is, "the degree to which an individual perceives that important others believe he or she should use the new system" (p. 451). The three constructs from other technology acceptance models pertaining to Social Norm (SN) are subjective norms from the Theory of Reasoned Action (TRA), social factors from the Model of PC Utilization (MPCU), and image from the Diffusion of Innovation theory (DIT).

A number of empirical studies also support the strong correlation between social factors and the Behavioral Intention to use technology (Venkatesh, et al., 2003; Venkatesh & Davis, 2000).

Facilitating Conditions (FC). Facilitating Conditions are, “the degree to which an individual believes that an organizational and technical infrastructure exists to support use of the system" (p. 453). The three constructs from other technology acceptance models pertaining to Facilitating Conditions (FC) are facilitating conditions from the Model of PC Utilization (MPCU), perceived behavioral control from the Theory of Planned Behavior (TPB), and compatibility from the Diffusion of Innovation theory (DIT).

Moderating Variables. Moreover, Venkatesh et al. (2003) indicate that the UTAUT model may also explain the impact that individual differences have on technology acceptance and adoption. For instance, Effort Expectancy (EE), Performance Expectancy, and Behavioral Intention (BI) can be moderated by a number of variables including experience, age, gender, and voluntariness of use (Venkatesh et al., 2003).

Experience. Venkatesh, Thong, and Xu, (2012) have defined experience, saying that it, “reflects an opportunity to use a target technology and is typically operationalized as the passage of time from the initial use of a technology by an individual" (p. 161). For example, Venkatesh et al. (2003) measure three different time points. The first measure is at post-training, when the system becomes available for use. This is then followed by measures at one month later, and three months later. Ajzen and Fishbein (2005) pointed out that previous experiences influence an individual's various beliefs and their future behavioral performance. A number of studies have indicated that experience influences the Facilitating Conditions and Behavioral Intention. For example, Alba and Hutchinson (1987) indicated that experience can

moderate the relationship between Behavioral Intention and Facilitating Conditions. They noted that greater experience results in greater familiarity with the system, and that this reduces user dependence on external support.

Age and gender. Venkatesh et al. (2003) noted that both age and gender are moderators affecting all constructs of Behavioral Intention (BI) in the UTAUT model. Age and gender moderate the connections between Effort Expectancy (EE) and Behavioral Intention (BI), Performance Expectancy (PE) and Behavioral Intention (BI), and Social Norm (SN) and Behavioral Intention (BI) (Venkatesh et al., 2003). Bandyopadhyay and Fraccastoro (2007) pointed out that both age and gender were found to be strong moderators of Performance Expectancy (PE), Effort Expectancy (EE), and Social Norm (SN) with Behavioral Intention (BI). In their longitudinal field investigation of technology adoption and gender differences, Venkatesh and Morris (2000) found that, "the role of gender in technology adoption and usage behavior is crucial. Clearly, gender shapes the initial decision process that drives new technology adoption and usage behavior in the short-term, which in turn influences sustained usage, thus establishing that early intentions formed by women and men will have a lasting influence on their usage of the said new technology" (p. 50). Plude (1985) noted that aging has been linked with difficulty in processing complex stimuli. Morris and Venkatesh (2000) found that constructs related to Effort Expectancy (EE) are strong predictors of Behavioral Intention (BI) for women and older workers.

Perceived voluntariness. Venkatesh and Davis (2000) defined perceived voluntariness as, "the extent to which potential adopters perceive the adoption decision to be non-mandatory" (p. 188). Previous research has shown voluntariness to have a direct effect on IT adoption and use (Agarwal & Prasad 1997; Karahanna, Straub, & Chervany, 1999).

Brown, Massey, Montoya, and Burkman (2002) noted that examining voluntariness factors in the TAM can help researchers determine if the TAM relationships differ within involuntary versus voluntary environments. According to the UTAUT model, voluntariness moderates the influence of Social Norm (SN) on Behavioral Intention (BI) (Venkatesh et al., 2003). Moreover, a meta-analysis study conducted by Wu and Lederer (2009) found that voluntariness also moderates Effort Expectancy (EE) and Performance Expectancy (PE) on the Behavioral Intention (BI) to use a new information technology. In the DIT, Rogers (2003) stressed the importance of the voluntariness factor when studying the adoption of innovations. He classifies voluntariness into three types: optional innovation decisions that are made by members who are from different social systems, collective innovation decisions (which are the decisions made by people from the same social system), and authority innovation decisions that are made by people who are influenced by higher authority individuals. (Rogers, 2003).

Computer self-efficacy. Yuen and Ma (2008) define computer self-efficacy as, "the judgment of one's capability to use computer technology" (p. 7). Venkatesh et al. (2003) point out that computer self-efficacy involves an individual's demonstrated confidence, as well as whether they need help or longer time to successfully use the technology. In their study to examine the effect of faculty computer self-efficacy on web portal usage, Yuen and Ma (2008) found that computer self-efficacy has a significant relationship with both perceived ease of use and the intention to use e-learning technology. An empirical study was conducted by Fagan, Neill, and Wooldridge (2004) to examine the factors that may affect an individual's use of information technology. The results revealed that experience and support have a

positive impact on computer self-efficacy, while computer self-efficacy has a negative relationship with anxiety and positive relationship with usage.

Culture and Technology Adoption

Hofstede (1980) defines culture as, “the collective programming of the mind which distinguishes the members of one human group from another” (p. 260). Researchers argue that technology adoption models need to integrate cultural factors because the use of technology is significantly affected by an individual’s cultural values (Al-Gahtani, Hubona, & Wang, 2007; Lu & Lin, 2012). Moreover, Hofstede (1980) argues that cultural factors can deliver a theoretical foundation for explaining technology adoption. Harvey (1999) stressed that culture has been recognized as a national-level indicator, having an impact on technology usage internationally. Rogers (2005) has also indicated that technology adoption is usually influenced by the social system, which is inclusive of the context, culture, and environment where technology usage takes place. Given the importance of considering culture as an indicator of technology adoption, the current study will integrate Hofstede's cultural dimensions (1980).

Hofstede’s Cultural Dimensions

Hofstede (1980, 1984) has attempted to investigate international organizations by collecting and analyzing data from forty different countries around the world. For this, he has used data from IBM, a large international corporation. Hofstede’s empirical study concluded that, "organizations are cultural-bounded" (p. 252). Additionally, he identified five dimensions by which a culture can be measured in different countries including power distance, individualism/collectivism, uncertainty avoidance, masculinity/femininity, and short/long-term orientation.

Power Distance. Hofstede (1997) defined power-distance as, "the extent to which the less powerful members of institutions and organizations within a country expect and accept that power is distributed unequally" (p. 28). Within the work context, it refers to the power inequality between superiors and subordinates. Greater power distance indicates that power inequalities are evident in a culture (Al-Gahtani et al., 2007). Hofstede (1980) explains that a higher degree of power-distance means an unequal distribution of power among employees, and that the societal culture promotes organizational hierarchy and centralized decision making. In high power distance cultures, Performance Expectancy (PE) has less impact on an individual's Behavioral Intention (BI), while Social Norms (SN) have more influence on Behavioral Intention (BI) (Sun & Zhang, 2006).

Individualism vs. Collectivism. Hofstede (1997) explains that the dimension of individualism is the extent to which, "the ties between individuals are loose" (p. 51). In an individualist culture, the relations between individuals within an organization are not strong enough and the people are expected to look out for themselves. Collectivism on the other hand, refers to the extent to which a person sees him/herself as a part of a cohesive group. Hofstede (1980) indicates that people within a culture with high collectivism are seen as an important source of achievement, loyalty, and identity. Employees with highly individualistic cultures tend to look out for their own interests and career progress, while those with less individualistic cultures are inclined to look out for the interests of their organization more than their own interests (Hofstede, 1980). In high individualism cultures, Performance Expectancy (PE) has more impact on an individual's Behavioral Intention (BI), while Social Norms (SN) have less influence on Behavioral Intention (BI) (Sun & Zhang, 2006).

Uncertainty Avoidance. Uncertainty avoidance is defined as the degree to which workers feel uncomfortable in uncertain situations (Hofstede, 1997). It refers to individual tolerance for ambiguity. Organizations functioning within a culture that has high uncertainty avoidance tend to have written rules and regulations in order to reduce uncertainty. With greater uncertainty avoidance values, societies resist accepting any innovations (Hofstede, 1997). Usually, individuals within a culture having strong uncertainty avoidance are not able to take risks to adopt new ideas, and will likely accept innovations that have already been used by others (Im, Hong, & Kang, 2011). In high uncertainty avoidance cultures, Performance Expectancy (PE) has less impact on an individual's Behavioral Intention (BI), while Social Norms (SN) have been shown to have more influence on Behavioral Intention (BI) (Sun & Zhang, 2006).

Masculinity vs. Femininity. The cultural dimensions of masculinity and femininity refer to the distribution of gender roles in certain cultures (Hofstede, 1980). According to Hofstede (1997), men are expected to be, "assertive, tough, and focused on material success" (p. 82). On the other hand, women are expected to be, "modest, tender, and concerned with the quality of life" (p. 82). Masculinity stresses ambition, recognition for improvement, competition, acquisition of wealth, goal-oriented roles, and differentiated gender responsibilities. By contrast, femininity represents caring and nurturing behaviors as well as equal gender roles (Hofstede, 1997). In cultures that value high masculinity, Performance Expectancy (PE) has more impact on an individual's Behavioral Intention (BI), while Social Norms (SN) have been shown to have less influence on Behavioral Intention (BI) (Sun & Zhang, 2006).

Short/Long-term Orientation. Hofstede (2001) stressed that long-term orientation stands, "for the fostering of virtues oriented towards future rewards, in particular, perseverance and thrift" (p. 359). Short-term orientation, on the other hand, stands, “for the fostering of virtues related to the past and present, in particular, respect for tradition, preservation of ‘face’ and fulfilling social obligations” (p. 359). This dimension emphasizes the connection between the extent to which a country is connected with its past traditions and its present activities and challenges. A nation with a higher rating in this dimension is inclined to encourage new innovation and adaptation (Hofstede, 2001).

Hofstede’s Cultural Dimensions and Saudi Arabia

According to Hofstede’s website (www.hofstede-insights.com), Saudi Arabia has a high score of 95 in Power Distance, which means that workers in organizations accept that the power is distributed unequally. It also indicates Saudi Arabia has a low score of 25 for Individualism, and can be considered a collectivistic society. According to Hofstede’s cultural dimensions, Saudi Arabia scores 60 in Masculinity, which indicates that Saudi Arabia’s society is more driven by competition, achievement, and success. Saudi Arabia scores 80 on Uncertainty Avoidance, which indicates that the society is intolerant of unorthodox behavior and ideas. Additionally, Saudi Arabia scored a low of 36 on Long-Term Orientation, indicating that Saudi Arabia is a normative society. Figure 4 shows Saudi Arabia scores based on Hofstede’s Cultural Dimensions.

Studies Related to Hofstede’s Cultural Dimensions and UTAUT

Hofstede’s cultural dimensions (1980) and the UTAUT of Venkatesh et al. (2003) have been widely used to investigate the adoption and usage of information technology around the world (Al-Gahtani et al., 2007; Baptista & Oliveira, 2015; Silvius 2008). For

example, a study was conducted by Al-Gahtani et al. (2007) to compare the adoption of information technology between developing and developed economies. The study utilized UTAUT to investigate the influence of social and cognitive factors on IT usage intentions. It also used Hofstede's cultural dimensions (1980) to compare the acceptance and usage of IT between Saudi Arabia and North America. The study found that Performance Expectancy (PE) had a positive relationship with Behavioral Intention (BI). It was also found that Effort Expectancy (EE) did not significantly influence Behavioral Intention (BI) if there were interactions with the moderating variables. In light of Hofstede's cultural dimensions, the study also revealed that Saudi Arabia had a low individualism score, which suggests that there is a significant relationship between subjective norms (SN) and Behavioral Intentions (BI) within the Saudi culture (Al-Gahtani et al., 2007).

Baptista and Oliveira (2015) utilized UTAUT and Hofstede's cultural dimensions (1980) to test mobile banking adoption in African countries. They concluded that Performance Expectancy (PE), hedonic motivation, and habit had the most significant influences on Behavioral Intention (BI). The study also found that BI had a strong relationship with both individualism/collectivism, uncertainty avoidance, and power distance.

Erumban and Jong (2006) used Hofstede's cultural dimensions (1980) to conduct a cross-cultural study to investigate ICT adoption rates across 49 countries. The study concluded that national culture is strongly related to the ICT adoption rate of these countries. They also found that most of the cultural dimensions presented by Hofstede (1980), particularly power distance and uncertainty avoidance, seemed to be significantly related to the ICT adoption.

Im et al. (2011) used data from Korea and the U.S. to examine the relationships between the variables of the UTAUT model, and explore how they are affected by culture. They then compared the differences between the two countries in light of Hofstede's cultural dimensions (1980). The results did not show significant differences in the influence of culture on technology usage between Korea and the U.S. However, the study did reveal that Effort Expectancy (EE) had a larger influence on Behavioral Intention (BI) in the U.S. compared to Korea. The results also showed no significant difference between the two countries when considering the impact of Performance Expectancy (PE) on Behavioral Intention (BI).

Tarhini, El-Masri, Ali, and Serrano (2016) conducted a study to determine the factors that influenced the adoption and usage of internet banking in the country of Lebanon. A conceptual framework was developed using UTAUT. Hofstede's cultural dimensions (1980) were then used to explain the rationale for the study. As indicated in Hofstede's work, power distance, uncertainty avoidance, and femininity/collectivism are high in Lebanon. The study revealed that Performance Expectancy (PE) and Social Norm (SN) were significant predictors of customers' Behavioral Intention (BI) to use internet banking. The study also found that Effort Expectancy (EE) was an insignificant predictor of Behavioral Intention (BI). Both BI and Facilitating Conditions (FC) were found to have a significant influence on the actual use of internet banking.

Brdesee (2013) explored the factors influencing e-commerce adoption in Saudi Arabia's tourism industry. Brdesee argued that the TAM was an important model for explaining technology acceptance, but was too simplistic. Thus, the TAM was combined with the UTAUT. Because the study aimed to explore organizational attitudes toward e-commerce adoption, the researcher modified the model by integrating factors from two different theories

of organizational culture: the Perceived E-Readiness Model (PERM), and the Competing Value Framework (CVF). The perceived ease of use (PEU) factor derived from the TAM was used to measure the extent to which the complexity of using a technology can predict the adoption of e-commerce. Thus, the researcher hypothesized that, "perceived ease of use has a positive influence on intention to adopt e-commerce in tourism services" (p.83). The results indicated that the perceived relative advantage of e-commerce utilization has a significant influence in promoting e-commerce in Saudi Arabia. The study also found that customer culture influence (CCI) has an insignificant influence on e-commerce adoption in the Saudi tourism market.

Gogus, Nistor, Riley, and Lerche (2012) conducted a study to extend the applicability of UTAUT to Turkish culture. The study was based on a large survey of 1723 Turkish educational technology users of diverse professions, geographical locations, ages, and genders. The authors modified the original UTAUT by adding Anxiety and Computer Literacy constructs. Cross-cultural differences were explored using Hofstede's Cultural dimensions, which were compared between the Istanbul area and other regions in Turkey as well as between professions (STEM versus non-STEM professions). Conclusions from the study support the applicability of UTAUT in educational technology practice, and the relationships between educational technology acceptance and culture. This confirmed the wider applicability of Venkatesh et al.'s (2003) UTAUT model.

Another study to validate the applicability of UTAUT within the context of educational technology was conducted by Nistor, Lerche, Weinberger, Ceobanu and Heymann (2014). The study utilized three of Hofstede's culture dimensions (uncertainty avoidance, individualism, and masculinity) to extend the scope of the UTAUT and capture the

cultural factors within Germany and Romania. The results showed the presence of cultural differences between Germany and Romania, and between different professions. The results also revealed a weak influence of Behavioral Intention on actual technology usage.

Summary

This chapter has reviewed and discussed various technology adoption theories and models including the Theory of Reasoned Action (TRA), the Technology Acceptance Model (TAM), the Diffusion of Innovation Theory (DOI), and the Unified Theory of Acceptance and Use of Technology (UTAUT). It also provided a discussion of factors that will be used in this study including Behavioral Intention (BI), Performance Expectancy (PE), Effort Expectancy (EE), Social Norm (SN), and Facilitating Conditions (FC) as well as the moderating variables of experience, age and gender, perceived voluntariness, and computer self-efficacy. This chapter has also provided an overview of learning management systems (LMSs) and their use in higher education. The status of electronic learning in the kingdom of Saudi Arabia was discussed with a focus on the adoption of LMSs. The impact of culture on technology adoption was also discussed, and insights on Hofstede's cultural dimensions were provided.

Chapter 3: Methodology

Introduction

This chapter provides a restatement of the purpose of the study as well as the research questions. It then discusses the research design, study sample, and power analysis. Data collection methods, tools, instruments, and data analysis are also outlined. This chapter will also discuss the methods undertaken to ensure reliability, validity, and the consideration of ethical factors.

Research Design

The purpose of this study was to determine the factors influencing the adoption of learning management systems (LMSs) by faculty members in Saudi Arabian higher education using the Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh, 2003). The study also sought to analyze the relationship between these factors. Specifically, the study sought to determine the extent at which Performance Expectancy (PE), Effort Expectancy (EE), Facilitating Conditions (FC) and Social Norms (SN) influence Behavioral Intention (BI). It also examined the moderating roles of age, gender, experience, perceived voluntariness, and computer self-efficacy on PE, EE, and SN. The research questions were:

Q1: What are the factors that influence faculty members' decisions to adopt LMSs as part of their teaching in Saudi Higher Education?

Q2: What are the relationships between these factors?

Creswell (2017), indicated that in order to measure associations between dependent and independent variables, correlational research design can be used. The research design for this study was developed to be descriptive and correlational. In order to answer the research questions, this study adopted a mixed methods approach. First, quantitative methods

involving structured survey questioning were implemented for data collection. Specifically, the empirically tested UTAUT survey instrument from the original studies of Venkatesh et al. (2003) was used for data collection. A number of researchers have utilized this instrument previously, which has resulted in acceptable levels of reliability and validity (Lu, Yu, & Liu, 2009, Nistor, Göğüş & Lerche, 2013, Wang, Liu, Tseng, & Tsai, 2010). Questionnaires were also sent to faculty members at the University of Hai'l in Saudi Arabia to measure their perceptions regarding the adoption of the Blackboard LMS. Using questionnaires for data collection can help researchers to explore characteristics of a large population from a small sample of participants (Creswell, 2017; Nardi, 2018), and results from this type of data collection tend to have higher credibility (Chen & Hirschheim, 2004).

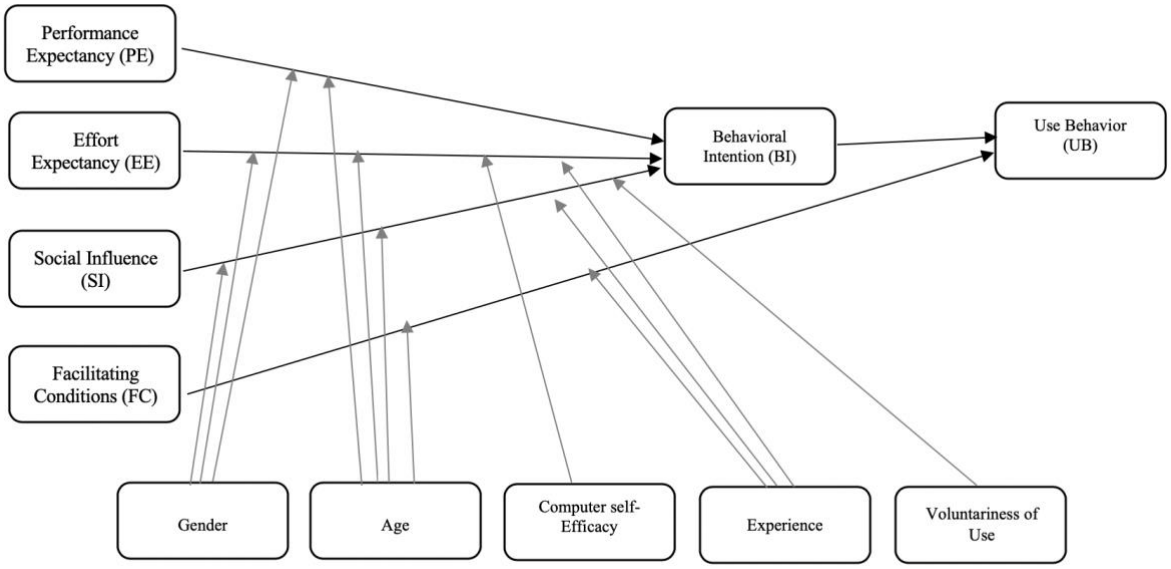
The UTAUT model is based on the contribution of multiple widely known technology adoption research models, such as the Technology Acceptance model (TAM), the Theory of Reasoned Action (TRA), and the Diffusion of Innovation Theory (DIT). As described in the research model in Figure 5, the dependent variables are faculty's Behavioral Intention (BI) to adopt LMSs as a teaching tool and the actual Use Behavior (UB). The independent variables are the four constructs presented by the Venkatesh et al. (2003) UTAUT model: Performance Expectancy (PE), Effort Expectancy (EE), Subjective Norms (SN) and Facilitated Conditions (FC). The UTAUT model was modified by including computer self-efficacy as a moderator variable. The rest of the moderating variables include age, gender, experience, and perceived voluntariness.

Statistical data and a correlational design were used to examine the connections between the dependent variable and the independent variables, as well as between the independent variables and the moderating variables. According to Meyers, Gamst, and

Guarino (2014), linear regression analyses can be used to examine the relationship between dependent and independent variables.

Figure 1

The modified research model



Research Hypotheses

H1: Performance Expectancy will have a positive effect on the Behavioral Intention of LMS usage.

H1a: Gender will moderate the effect of Performance Expectancy on Behavioral Intention of LMS usage.

H1b: Age will moderate the effect of Performance Expectancy on Behavioral Intention of LMS usage.

H2: Effort Expectancy will have a positive effect on the Behavioral Intention of LMS usage.

H2a: Gender will moderate the effect of Effort Expectancy on Behavioral Intention of LMS usage.

H2b: Age will moderate the effect of Effort Expectancy on Behavioral Intention of LMS usage.

H2c: Experience will moderate the effect of Effort Expectancy on Behavioral Intention of LMS usage.

H2d: Computer self-efficacy will moderate the effect of Effort Expectancy on Behavioral Intention of LMS usage.

H3: Social Norm will have a positive effect on the Behavioral Intention of LMS usage.

H3a: Gender will moderate the effect of Social Norm on Behavioral Intention of LMS usage.

H3b: Age will moderate the effect of Social Norm on Behavioral Intention of LMS usage.

H3c: Experience will moderate the effect of Social Norm on Behavioral Intention of LMS usage

H3d: Voluntariness of use will moderate the effect of Social Norm on Behavioral Intention of LMS usage

H4: Facilitating Conditions will have a positive effect on the Use Behavior of LMS.

H4a: Age will moderate the effect of Facilitating Conditions on Use Behavior of LMS.

H4b: Experience will moderate the effect of Facilitating Conditions on Use Behavior of LMS.

H5: Behavioral Intention of LMS usage will have a positive effect on the Use Behavior of LMS.

Quantitative Methodology

Sample

Education in Saudi Arabia is segregated by gender, which results in two segregated campuses - one for females and one for males. UOH, similar to many other institutions in Saudi Arabia, uses Blackboard as the primary LMS. Blackboard serves as a web-based platform to provide access to learning content and administration. The study sample consisted of 139 faculty members from University of Hai'l (76 females and 63 males), representing various professions. The sample included faculty members who have PhDs, lecturers with master's degrees, and teaching assistants with bachelor's degrees. There were no limitations on tenure, gender, or race.

Power analysis and sample size

Power analysis is "a statistical means to determine how many individuals or subjects to include in a study. In any study, investigators want to ensure they have enough sample to detect any difference if there is a true difference present" (Connelly, 2008, p.41). In this study, G*Power was used to determine the appropriate sample size. According to Faul, Erdfelder, and Buchner (2007), G*Power is a software which can assist researchers with conducting a power analysis at a high level of accuracy (Faul, Erdfelder, & Buchner, 2007). For the purpose of this study, G*Power was used with the following input parameters:

- Test family: f test
- Statistical test: linear multiple regression: fixed model, R^2 deviation from zero
- Effect size f^2: 0.1
- α err prob: 0.05
- Power (1-β err prob): 0.8
- Number of predictors: 4

The output parameters were:

- Noncentrality parameter λ: 12.5
- Critical F: 2.44
- Numerator df: 4
- Denominator df: 120
- Total sample size: 125
- Actual power: 0.80

The total number of study participants, after eliminating both missing data and outliers, was 132 which was above the minimum sample size of 125.

Instrumentation

Data for this research was collected using a self-administered survey instrument that was sent to participants electronically via email. The survey aims to explore the perceptions of faculty members towards the factors that may influence the adoption of LMSs as part of their teaching practice. This survey was based on instruments found in Bandyopadhyay and Fraccastoro (2007), Venkatesh et al. (2003), and Davis (1989). Table 1 shows the main references for the instrument.

Table 1

Instrument references

Construct	References
Performance Expectancy	Bandyopadhyay and Fraccastoro (2007), Venkatesh et al. (2003)
Effort Expectancy	Venkatesh et al. (2003), Davis (1989)
Social Norms	Bandyopadhyay and Fraccastoro (2007), Venkatesh et al. (2003)
Behavioral Intention	Venkatesh et al. (2003), Davis (1989)

Reliability

The scales for the constructs of the UTAUT model by Venkatesh et al. (2003) and the TAM model by Davis (1989) have already been tested and validated in previous technology acceptance studies. The Cronbach's alpha reliability coefficient was used by Davis (1989) to measure the reliability of the instrument. Alpha values should have a value of greater than 0.7 in order to be considered sufficient and reliable (George & Mallery, 2016). According to Davis (1989), all scores for the constructs were greater than 0.70. The UTAUT constructs scale was also tested by Venkatesh et al. (2003) using the internal consistency alpha scores. The resulting scores were all greater than 0.70 (Venkatesh et al., 2003).

Survey Questions

The survey questions were designed to target the perceptions of faculty members regarding the adoption and use of Blackboard in their teaching practice. The questions consisted of both ordinal and nominal scales to capture information regarding all ten study variables. The two variables of age and experience were ordinal, while the rest of the variables were nominal. The survey questions included a seven-point Likert scale using the following format: strongly disagree, moderately disagree, slightly disagree, neutral, slightly agree, moderately agree, strongly agree. Tables 2-10 show how each of the ten variables were presented in the survey questionnaire.

Table 2

Demographics

The variables	Items
Age	Under 35 years old 36-50 years old 51+ years old
Gender	Female Male
Experience	Less than 3 years 3-6 years 7-10years Over 10 years

Table 3

Perceived Voluntariness

Items	Resources
My dean expects me to use Blackboard	Venkatesh and Davis, (2000).
My use of Blackboard is voluntary	The questions were modified by changing the word system to Blackboard
My dean does not require me to use Blackboard	

Table 4

Social Norm

Items	Resources
People who influence my behavior think I should use Blackboard	Venkatesh and Davis (2000).
People who are important to me think I should use the Blackboard	The questions were modified by changing the word system to Blackboard
My dean has been helpful in the use of Blackboard	

In general, my university has supported the use of Blackboard	
I would use Blackboard only if all my peers were using it.	
I would not question why I must use Blackboard if my supervisor told me to use it.	
I would be willing to use Blackboard even if the benefits would come in the future	

Table 5

Performance Expectancy

Items	Resources
Using Blackboard would help me accomplish tasks more quickly	Davis (1989) and Venkatesh et al. (2003)
Using Blackboard would increase my productivity	
Using Blackboard would enhance my effectiveness on the job	The questions were modified by changing the word system to Blackboard.
Using Blackboard would make it easier to do my job	
I would find Blackboard useful in my job	
Using Blackboard would improve the quality of my teaching	
Using Blackboard would improve my students' attention	
Using Blackboard would improve my students' retention	

Using Blackboard would improve the quality of my testing and assessment	
Using Blackboard would improve my student's group discussions	

Table 6

Effort Expectancy

Items	Resources
Learning to use Blackboard would be easy for me	Davis (1989)
My interaction with Blackboard would be clear and understandable	The questions were modified by changing the word system to Blackboard.
I would find Blackboard to be flexible to work with	
It would be easy for me to become skillful at using Blackboard tools	
I would find Blackboard tools easy to use	

Table 7

Computer self-efficacy

Items	Resources
I could complete a job or task using Blackboard…	Venkatesh et al. (2003)
If there was no one around to tell me what to do as I go.	The questions were modified by changing the word system to Blackboard.
If I could call someone for help if I got stuck.	
If I had a lot of time to complete the job for which the software was provided.	
If I had just the built-in help facility for assistance.	

Table 8

Behavioral Intention

Items	Resources
Assuming I had access to Blackboard, I intend to use it	Venkatesh et al. (2003) The questions were modified by changing the word system to Blackboard.

Table 9

Facilitating Conditions

Items	Resources
I have the resources necessary to use Blackboard	Venkatesh et al. (2003)
I have the knowledge necessary to use Blackboard	The questions were modified by changing the word system to Blackboard.
Blackboard is not compatible with other systems I use	
A specific person (or group) is available for assistance with Blackboard difficulties.	

Table 10

Use Behavior

Items	Resources
I use Blackboard to communicate with my students	Wang and Wang (2009)
I use Blackboard to distribute course assignments to my students	The items were modified by changing the word system to Blackboard.
I allow my students to submit their assignments using Blackboard	

I use Blackboard to distribute course materials to my students
I use Blackboard to issue the grades of my students
I allow my students to discuss the course with one another through Blackboard

Data Analysis

After receiving the surveys, they were tested for completeness. The data were coded and entered into SPSS for statistical analysis. The analysis included descriptive statistics to describe demographic data for members of the sample such as age, computer literacy, and gender. The means, variances and standard deviations were calculated for the UTAUT factors used in this research, namely, Behavioral Intention, Use Behavior, Social Norms, Performance Expectancy, Effort Expectancy, Facilitating Conditions and Perceived Voluntariness.

The second part of the analysis used linear regression analysis to explore the relationships between the independent and dependent variables, as well as the distribution of these variables in the research model. Additionally, multiple regression analysis was used in order to test for potential moderation effects by the moderating variables on the relationships between the independent and dependent variables. Further, Pearson's Correlation coefficient was also used to test the relationships amongst the variables. Cronbach's alpha was used to test for reliability and internal consistency.

Qualitative Methodology

The goal of the qualitative part of the study was to gain more insight into the perceptions of University of Hai'l faculty members on the advantages and the disadvantages

of utilizing Blackboard in their teaching practice. According to Marshall (1996), one of the advantages of conducting qualitative research is that it uncovers why humans do what they do, which is normally a complicated matter. This portion of the study (phenomenological qualitative research) was developed to capture participant thoughts that the quantitative portion may not have captured. Moustakas (1994) indicated that qualitative research based on phenomenological design aims to investigate, "what an experience means for the persons who have had the experience and are able to provide a comprehensive description of it" (p. 13). The participants were asked about their experiences with Blackboard, and about what they actually saw as advantages and disadvantages. As previously stated in the theoretical framework section, gaining insight on faculty attitudes towards the adoption of Blackboard was the main goal of this study. The UTAUT theoretical framework was used to achieve this goal.

Sample

Thirteen faculty members from University of Hai'l in Saudi Arabia, who had previous experience with the Blackboard LMS, responded to the online survey. Two open-ended questions were added at the end of the quantitative survey as optional questions. Out of the 139 faculty participants who completed the quantitative survey, 13 faculty members chose to also complete the optional qualitative portion of the survey. The qualitative part of the study included five female and eight male faculty members from different age groups. The sample did not exclude any participants on the basis of profession, tenure, gender, or race.

Data coding

Data coding is essential in order to turn qualitative raw transcripts into a meaningful, communicative, and trustworthy story (Linneberg & Korsgaard, 2019). In his book, *The*

coding manual for qualitative researchers, Saldaña (2015) defined codes in qualitative research as, "a word or short phrase that symbolically assigns a summative, salient, essence-capturing, and/or evocative attribute for a portion of language-based or visual data" (p.3). After collecting the data, the initial coding was established in order to determine the key words within the transcript. During the initial coding, the answers were read carefully and the main ideas from these answers were identified after the key-words were determined. After the initial coding, a categorization cycle was used to identify similar key-words related to faculty experience with Blackboard in order to form sub-categories. Similar codes were organized under major themes based on the meaning of each code. The main two themes identified in the qualitative part of the study complemented the purpose of the survey questions, the *advantages* and the *disadvantages* of utilizing Blackboard by faculty members.

Summary

This chapter has reviewed and discussed the methodology that was used to examine the relationship between the UTAUT variables and faculty Behavioral Intention toward the use of Blackboard in their teaching practice. It has provided detailed insight about the research design that was utilized. This chapter has also restated the research questions as well as the research hypotheses. The research instrumentation and the survey questions were discussed. The sample size and the sample power analysis were also discussed in this chapter. The chapter has also outlined the main data analysis processes including multiple regression analysis and Pearson's Correlation coefficient. Additionally, the chapter, discussed the research design for the qualitative portion of the study.

Chapter 4: Findings

Introduction

The main purpose of this study was to determine the factors that may affect the Behavioral Intention of faculty members to incorporate Blackboard into their teaching practice. Specifically, the study has aimed to examine the relationship between the UTAUT constructs and faculty Behavioral Intention towards Blackboard usage. This chapter presents the results of the data analysis and answers the research questions. It includes a description of the sample and the survey, the scale items, the reliability estimates, and descriptive statistics. Additionally, this section presents the regression model results in order to answer the research questions. This chapter also discusses the results from the qualitative portion of the study.

Sample Description

The total sample for the quantitative portion of the study included 139 participants. Out of the 139 participants, four submitted incomplete data, and were therefore removed prior to the data analysis. Three cases were detected as multivariate outliers, and were also excluded from the data analysis. Thus, the final sample size for this project included 132 participants.

Out of the 132 participants, there were 56.1% (n=74) females and 43.9% (n=58) males. In regards to participant age, 43.2% (n=57) were under 35 years old, 44.7% (n=59) were from 36 to 50 years old, and 12.1% (n=16) were older than 50 (Table 11 below describes participant *gender* and *age*).

Table 11

Age and Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Under 35 years old	57	43.2	43.2	43.2
	36-50 years old	59	44.7	44.7	87.9j
	51+ years old	16	12.1	12.1	100.0
	Total	132	100.0	100.0	

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	58	43.9	43.9	43.9
	Female	74	56.1	56.1	100.0
	Total	132	100.0	100.0	

48% (n=36) of the female participants and 36.2% (n=21) of the male participants were under 35 years old, 39.2% (n=29) of the female participants and 51.7% (n=30) of the male participants were 36-50 years old, and 12.2% (n=9) of the female participants and 12.1% (n=7) of the male participants were under above 50 years old. Table 12 and figure 2 show gender and age crosstabulation.

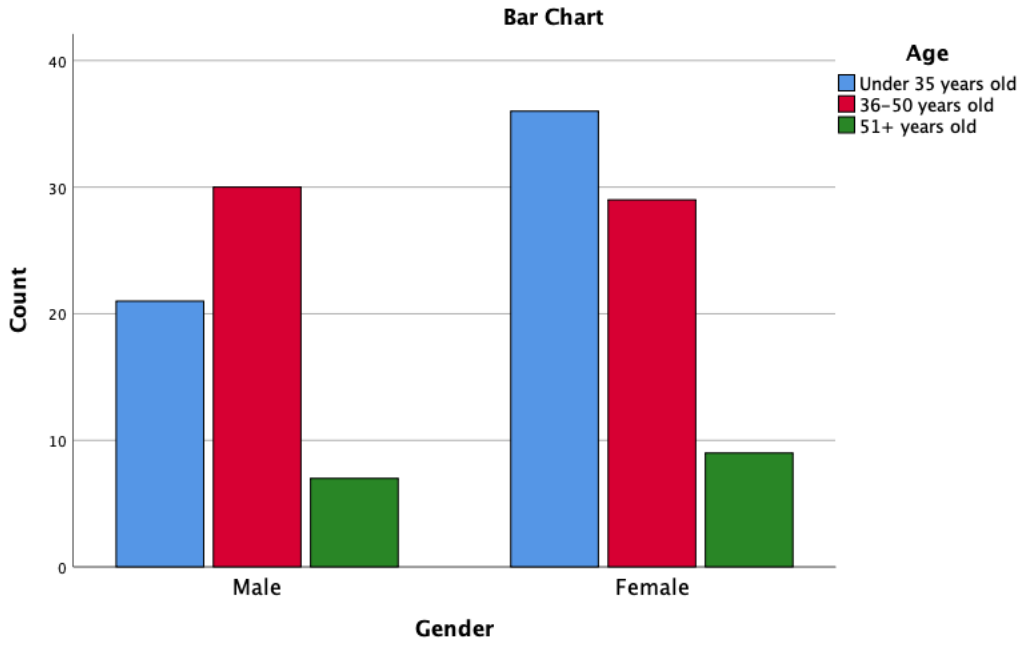
Table 12

*Gender * Age Crosstabulation*

		Age			
		Under 35 years old	36-50 years old	51+ years old	Total
Gender	Male	21	30	7	58
		36.2%	51.7%	12.1%	100.0%
	Female	36	29	9	74
		48.6%	39.2%	12.2%	100.0%

Figure 2

Count of participants based on their gender by their age.



When asked about how long participants had been using computers at work, 8.3% (n=11) indicated that they had been using computers at work for less than three years, 12.1% (n=16) indicated that they had been using computers at work for three to six years, 43.2% (n=57) indicated that they had been using computers at work for seven to ten years, and 36.4% (n=48) indicated that they had been using computers at work for more than ten years. Table 13 describes faculty computer experience.

Table 13

Experience

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less than 3 years	11	8.3	8.3	8.3
	3-6 years	16	12.1	12.1	20.5
	7-10 years	57	43.2	43.2	63.6
	Over 10 years	48	36.4	36.4	100.0
	Total	132	100.0	100.0	

As shown in table 14, 14% of the participants who were under 35 years old had been using computers at work for less than 3 years, 26.3% of this age group had been using computers for 3-6 years, 49.1% had been using computers for 7-10 years, and only 10.5% indicated that they had been using computers at work for over 10 years.

Table 14 also shows that 5.1% of the participants who were between 36-50 years old had been using computers at work for less than 3 years, only 1.7% of the same age group had been using computers for 3-6 years, 40.7% had been using computers for 7-10 years, and 52.5% had been using computers at work for over 10 years.

Among the last age group, 51+ years old, none of the participants indicated they have less than 7 years of experience in using computers at work, 31.3% of them indicated they had been using computers at work for 7-10 years and the majority, 68.8%, reported that they have over 10 years' experience.

Table 14

*Age * Experience Crosstabulation*

		Experience			
		Less than 3 years	3-6 years	7-10 years	Over 10 years
Age	Under 35 years old	8	15	28	6
		14%	26.3%	49.1%	10.5%
	36-50 years old	3	1	24	31
		5.1%	1.7%	40.7%	52.5%
	51+ years old	0	0	5	11
		0.0%	0.0%	31.3%	68.8%
Total		11	16	57	48
		8.3%	12.1%	43.2%	36.4%

Survey Description

The final survey included 41 items. Three of the total items were demographic (categorical) items, 36 were continuous items used to measure the constructs, and two items were qualitative questions. The demographics items included age, gender, and computer experience. The construct measurement items were as follows: three items to measure *perceived voluntariness*, seven items to measure *social norm*, 10 items to measure *Performance Expectancy*, five items to measure *Effort Expectancy*, four items to measure *computer self-efficacy,* four items to measure *Facilitating Conditions,* one item to measure *Behavioral Intention*, and six items to measure *use behavior*. All of the items utilized a seven-point Likert scale ranging as follows: 1 = strongly disagree, 2 = disagree, 3 = somewhat disagree, 4 = neither agree or disagree, 5 = somewhat agree, 6 = agree, and 7 = strongly agree. Before the data analysis, all negatively worded items were reverse-coded. The two qualitative items were as follows:

1. From your perspective, what three features of Blackboard do you think are the most useful?
2. From your perspective, what three features of Blackboard do you think are the least useful?

Reliability Estimates

As indicated in Chapter Three, this study adopted the scales for the constructs of the UTAUT model by Venkatesh et al. (2003) and the TAM model by Davis (1989), which have already been tested and validated in previous technology acceptance studies. However, to ensure the reliability of the instrument, the reliability estimate for each factor was computed using Cronbach's alpha reliability equation. The reliability estimate for Performance

Expectancy scale was 0.95, for the Effort Expectancy scale was 0.93, for the Social Norm scale was 0.68, for the Facilitating Conditions scale was 0.52, and for the use Behavior scale was 0.89, the perceived voluntariness scale was 0.48, for the computer self-efficacy scale was 0.68.

Descriptive Statistics

After calculating the reliability estimates, the means and standard deviations (SD) for all factors were calculated. The perceived voluntariness factor had a mean of 2.58 with a SD of 1.26, the social norm factor had a mean of 5.1 with a SD of 0.71, the Performance Expectancy factor had a mean of 6.1 with a SD of 0.69, the Effort Expectancy factor had a mean of 6 with a SD of 0.83, the computer self-efficacy factor had a mean of 5.6 with a SD of 0.84, the Facilitating Conditions factor had a mean of 5.4 with a SD of 0.82, the Behavioral Intention factor had a mean of 6.07 with a SD of 0.67, and the use behavior factor had a mean of 6.03 with a SD of 0.43 (Table 15 below presents these descriptive statistics).

Table 15

Means, variance and standard deviations of the factors

Factor	Mean	Std. Deviation	Variance
Performance Expectancy (PE)	6.1	0.69	0.48
Effort Expectancy (EE)	6	0.83	0.69
Social Norm (SN)	5.1	0.71	0.50
Facilitating Conditions (FC)	5.4	0.82	0.68
Behavioral Intention (BI)	6.07	0.67	0.45
Use Behavior UB	6.03	0.65	0.43
Computer self-efficacy	5.6	0.84	0.71
Voluntariness of use	2.58	1.26	1.59

Hypothesis Testing

H1: Performance Expectancy will have a positive effect on the Behavioral Intention of LMS usage.

A linear regression was conducted to examine whether *Performance Expectancy* could predict the level of *Behavioral Intention* to adopt an LMS by faculty members. Figure 3 presents a scatterplot which show that the relationship between *Performance Expectancy* and *Behavioral Intention* was positive and linear, and did not reveal any bivariate outliers. An analysis of standard residuals showed that the data contained no outliers. Independence of residual errors was confirmed with a Durbin-Watson test (d = 1.836), see table 16. The results of the regression showed that the that the model was significant. Tables 17 and 18 indicate a significant regression equation was found $F(1,119)=28.453$, $p<.000$, with an R^2 of .193.

Table 16

Model Summary[b] for H1

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.439[a]	.193	.186	.619	1.836

a. Predictors: (Constant), Performance Expectancy(PE)
b. Dependent Variable: Behavioral Intention (BI)

Table 17

ANOVA[a] for H1

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	10.892	1	10.892	28.453	.000[b]
	Residual	45.554	119	.383		
	Total	56.446	120			

a. Dependent Variable: Behavioral Intention (BI)

b. Predictors: (Constant), Performance Expectancy(PE)

Table 18

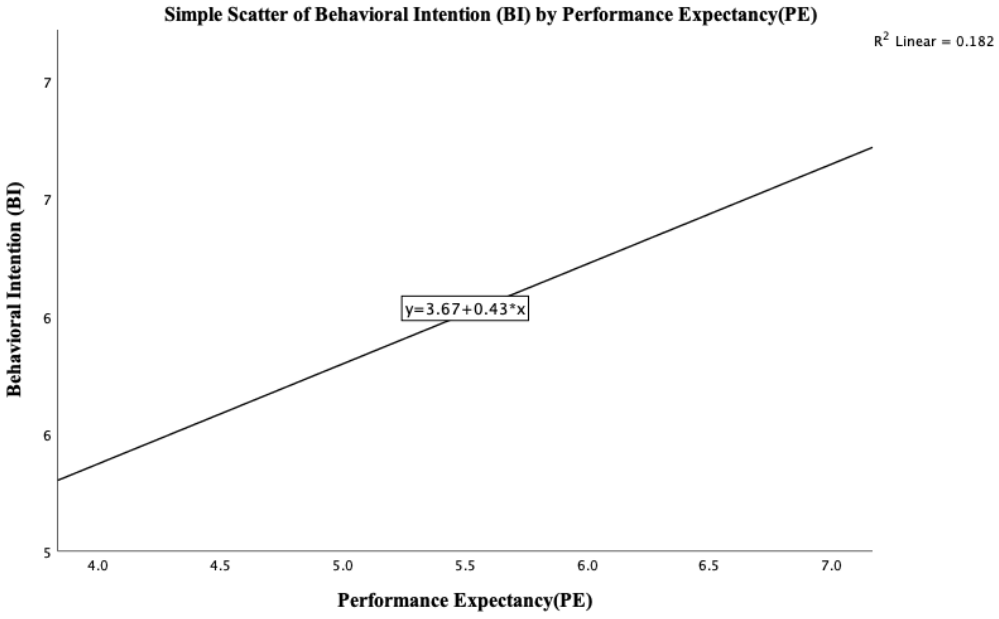
Coefficients[a] for H1

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	3.681	.491		7.503	.000
	Performance Expectancy(PE)	.430	.081	.439	5.334	.000

a. Dependent Variable: Behavioral Intention (BI)

Figure 3

Simple Scatter with Fit Line of Behavioral Intention (BI) by Performance Expectancy (PE)



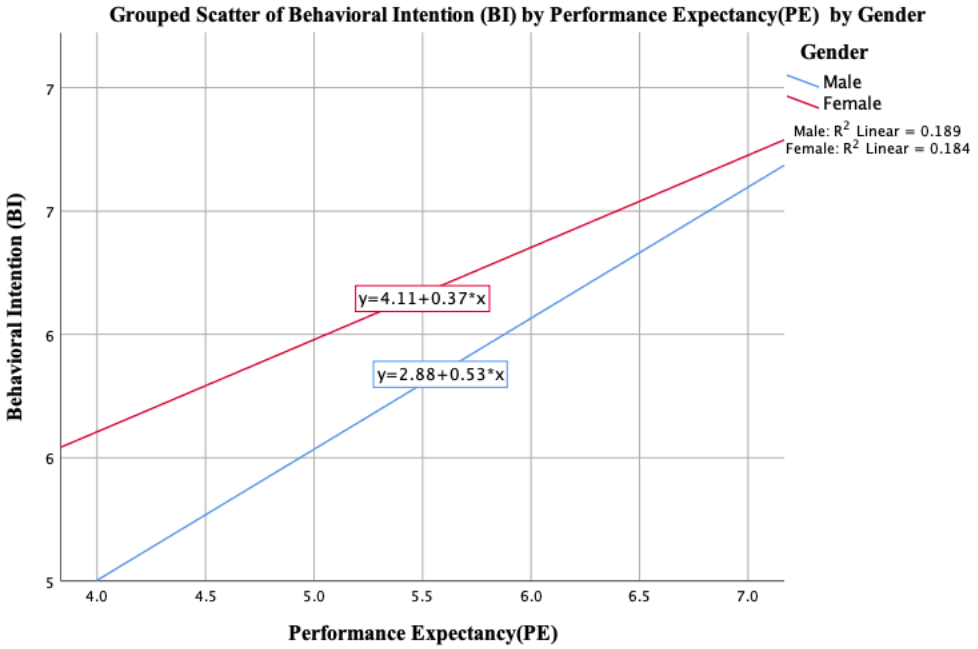
Moderators for H1

H1a: Gender will moderate the effect of Performance Expectancy on Behavioral Intention of LMS usage.

To test the hypothesis that *Gender* moderates the effect of *Performance Expectancy* on faculty members' *Behavioral Intention* towards LMS usage, a moderation analysis was conducted using the PROCESS macro (Hayes 2017, Model 1). The results show that the interaction between Gender and Performance Expectancy was not significant (P=0.37). Figure 4 shows that the relationship between Performance Expectancy and Behavioral Intention was positive, and that similar regression patterns appeared for both female and male faculty members. This indicates that Gender does not have a moderation effect on this relationship.

Figure 4

Grouped Scatter of Behavioral Intention (BI) by Performance Expectancy (PE) by Gender



H1b: Age will moderate the effect of Performance Expectancy on Behavioral Intention of LMS usage.

To test the hypothesis that Age moderates the effect of Performance Expectancy on faculty members' Behavioral Intention towards LMS usage, a moderation analysis was conducted using the PROCESS macro (Hayes 2017, Model 1). The results show that none of the interaction effects between any of the three age groups and Performance Expectancy were significant (*P*=0.40, and *P*=0.29) see Table 19 and Figure 5. These results indicate that the relationship between Performance Expectancy and Behavioral Intention was positive in both age groups, meaning that Age does not have a moderation effect on the relationship between Performance Expectancy and Behavioral Intention among faculty members.

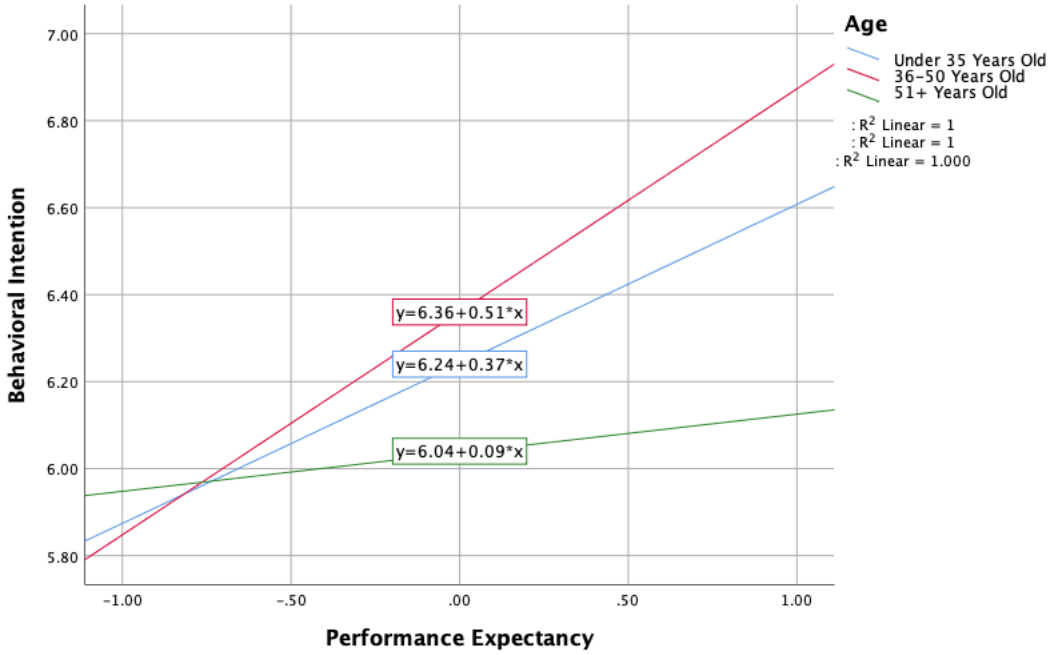
Table 19

Interaction Coefficients (Age Performance Expectancy)*

	Coefficient	t	Sig
Under 35 Years Old vs 36-50 Years Old * Performance Expectancy	0.1461	0.8338	0.40
Under 35 Years Old vs 51+ Years Old* Performance Expectancy	-0.2461	-1.0600	0.29

Figure 5

Grouped Scatter of Behavioral Intention (BI) by Performance Expectancy (PE) by Age



H2: Effort Expectancy will have a positive effect on the Behavioral Intention of LMS usage.

A linear regression was conducted to examine whether *Effort Expectancy* could predict the level of *Behavioral Intention* to adopt the Blackboard LMS by faculty members at University of Hai'l. Figure 6 presents a scatterplot which show that the relationship between *Performance Expectancy* and *Behavioral Intention* was positive and linear, and did not reveal any bivariate outliers. An analysis of standard residuals showed that the data contained no outliers. Table 20 shows that independence of residual errors was confirmed with a Durbin-Watson test (d = 1.797). The results of the regression showed that the model was significant. Tables 21 and 22 indicate a significant regression equation was found F(1,130)= 87.768, p<.000, with an R^2 of .397.

Table 20

Model Summary[b] for H2

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.630[a]	.397	.393	.539	1.797

a. Predictors: (Constant), Effort Expectancy(EE)
b. Dependent Variable: Behavioral Intention (BI)

Table 21

ANOVA[a] for H2

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	24.942	1	24.942	85.768	.000[b]
	Residual	37.806	130	.291		
	Total	62.748	131			

a. Dependent Variable: Behavioral Intention (BI)
b. Predictors: (Constant), Effort Expectancy(EE)

Table 22

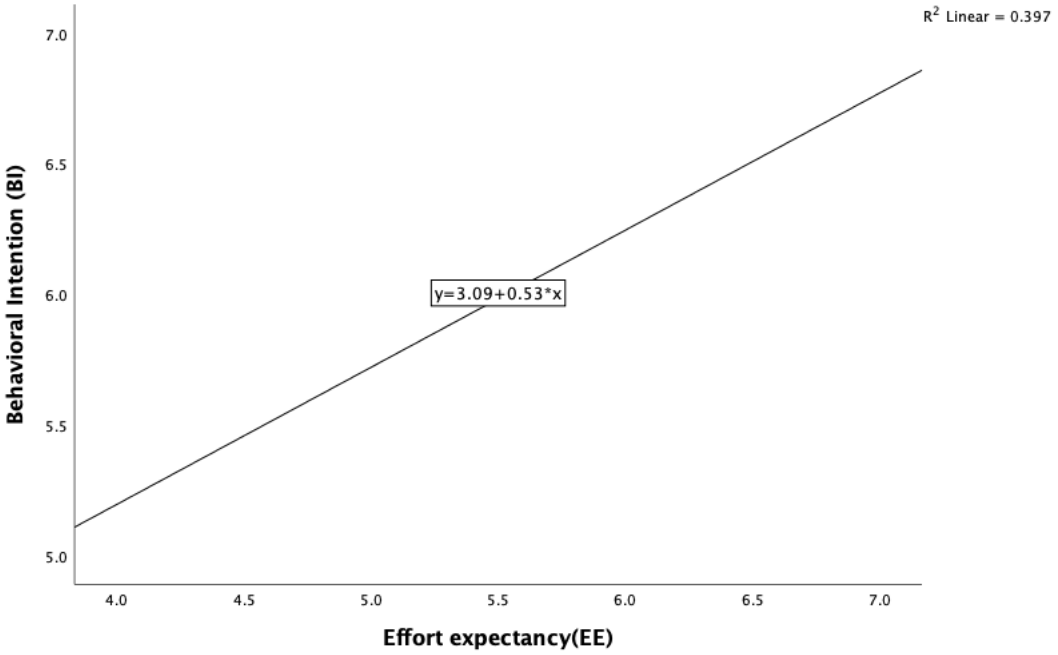
Coefficients[a] for H2

		Unstandardized Coefficients		Standardized Coefficients		
Model		B	Std. Error	Beta	t	Sig.
1	(Constant)	3.095	.344		8.988	.000
	Effort Expectancy(EE)	.525	.057	.630	9.261	.000

a. Dependent Variable: Behavioral Intention (BI)

Figure 6

Simple Scatter with Fit Line of Behavioral Intention (BI) by Effort Expectancy (EE)



Moderators for H2

H2a: Gender will moderate the effect of Effort Expectancy on Behavioral Intention of LMS usage.

To test the hypothesis that *Gender* moderates the effect of *Effort Expectancy* on faculty members *Behavioral Intention* of LMS usage, a moderation analysis was conducted using the PROCESS macro (Hayes 2017, Model 1). The results show that the interaction between Gender and Effort Expectancy was not significant (*P*= 0.1436), see table 23. Figure 7 indicates that the relationship between Effort Expectancy and Behavioral Intention was positive, and that the regression lines for female and male faculty members were similar.

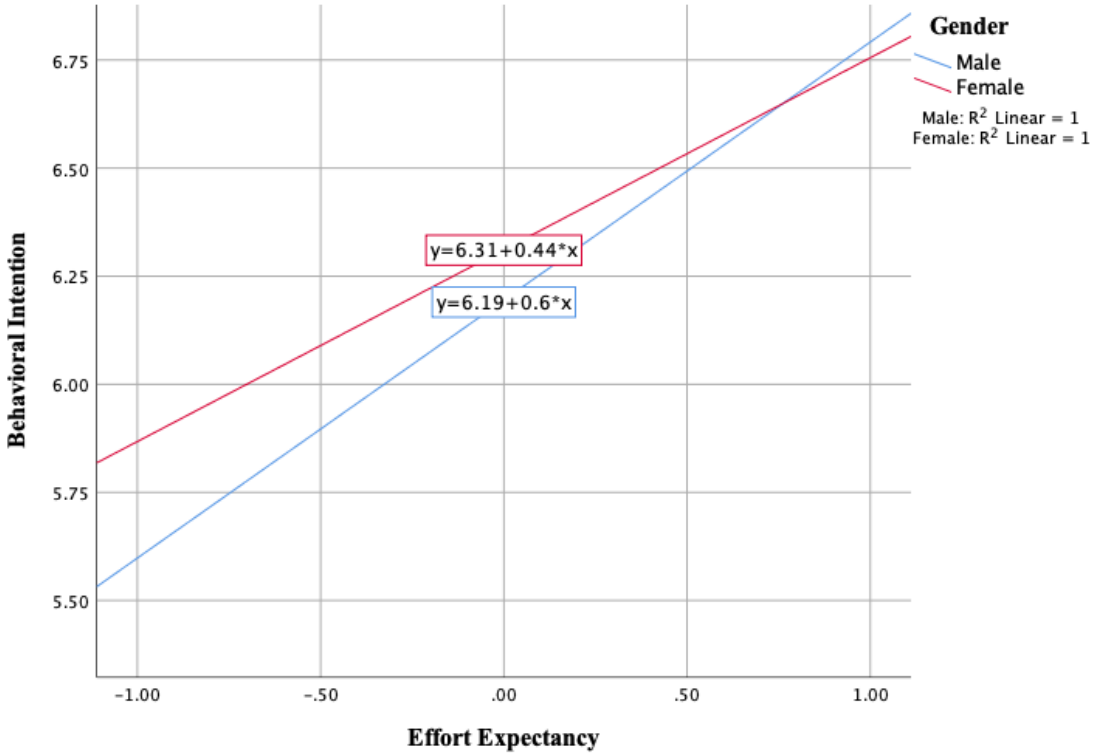
Table 23

Interaction Coefficients (Gender Effort Expectancy)*

	Coefficient	t	Sig
Gender* Effort Expectancy	-0.1649	-1.4715	0.1436

Figure 7

Grouped Scatter of Behavioral Intention (BI) by Effort Expectancy (PE) by Gender



H2b: Age will moderate the effect of Effort Expectancy on Behavioral Intention of LMS usage.

To test the hypothesis that *Age* moderates the effect of *Effort Expectancy* on faculty members' *Behavioral Intention* towards LMS usage, a moderation analysis was conducted using the PROCESS macro (Hayes 2017, Model 1). The results in Table 24 and Figure 8 show that none of the interaction effects between any of the three age groups and Effort

Expectancy were significant (*P*=.8324, and *P*= .0675). These results indicate that Age does not have a moderation effect on the relationship between Effort Expectancy and Behavioral Intention among faculty members.

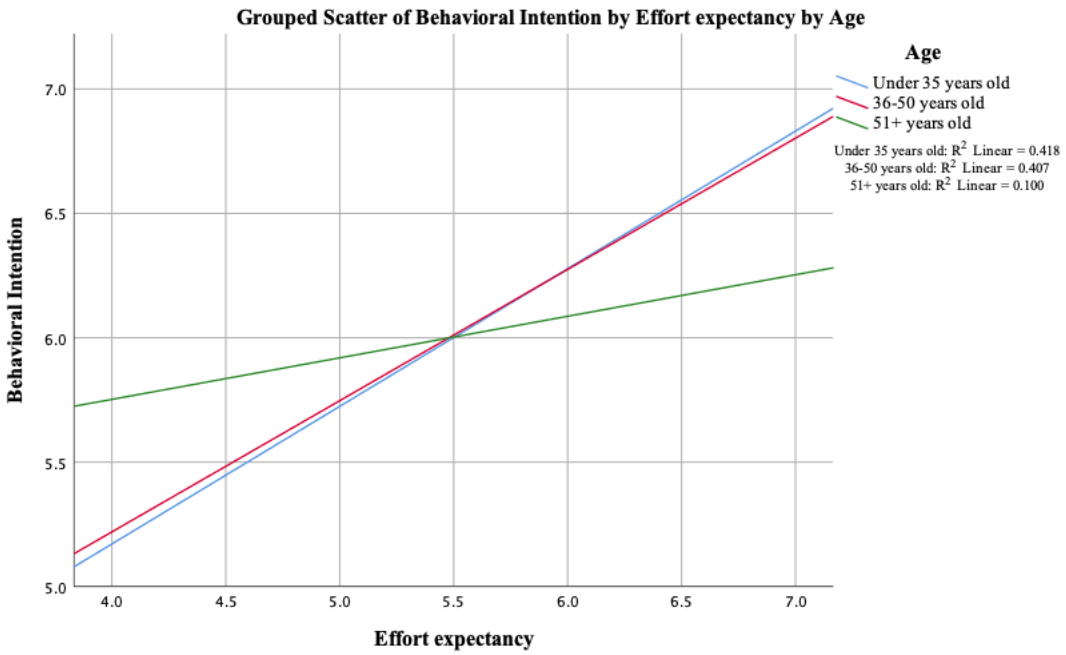
Table 24

Interaction Coefficients (Age Effort Expectancy)*

	Coefficient	t	Sig
Under 35 Years Old vs 36-50 Years Old * Effort Expectancy	-.0257	-.2120	.8324
Under 35 Years Old vs 51+ Years Old* Effort Expectancy	-.5080	-2.3845	.0675

Figure 8

Grouped Scatter of Behavioral Intention (BI) by Effort Expectancy (PE) by Age



H2c: Experience will moderate the effect of Effort Expectancy on Behavioral Intention of LMS usage.

To test the hypothesis that years of *Experience* in using computers moderates the effect of *Effort Expectancy* on faculty members' *Behavioral Intention* towards LMS usage, a moderation analysis was conducted using the PROCESS macro (Hayes 2017, Model 1). The results in Table 25 show that none of the interaction effects between the four Experience groups and Effort Expectancy were significant (*P*=.5418, *P*=.6688, and *P*=.524). As shown in Figure 9, the relationship between Performance Expectancy and Behavioral Intention was positive for all experience groups, which indicates that Experience does not have a moderation effect on the relationship between Effort Expectancy and Behavioral Intention among UOH faculty members.

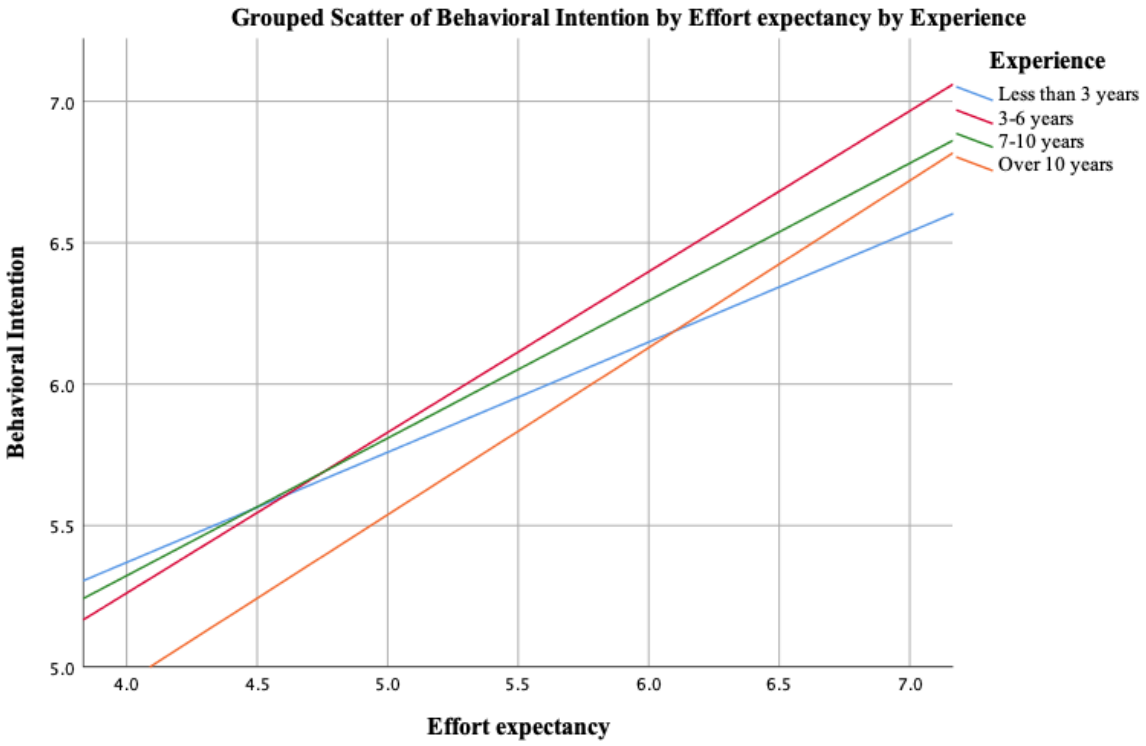
Table 25

*Interaction Coefficients (Experience * Effort Expectancy)*

	Coefficient	t	Sig
Less than 3 years vs 3-6 years * *Effort Expectancy*	.1787	.6118	.5418
Less than 3 years vs 7-10 years * *Effort Expectancy*	.0966	.4288	.6688
Less than 3 years vs Over 10 years * *Effort Expectancy*	.1439	.6385	.524

Figure 9

Grouped Scatter of Behavioral Intention (BI) by Effort Expectancy (PE) by Experience



H2d: Computer self-efficacy will moderate the effect of Effort Expectancy on Behavioral Intention of LMS usage.

To test the hypothesis that years of *Computer self-efficacy* would moderate the effect of *Effort Expectancy* on faculty members' *Behavioral Intention* towards LMS usage, a moderation analysis was conducted using the PROCESS macro (Hayes 2017, Model 1). The results in Table 26 and Figure 10 show that none of the interaction effects between all three levels of Computer self-efficacy and Effort Expectancy were significant (*P*=.2584). Thus, Computer self-efficacy does not have a moderation effect on the relationship between Effort Expectancy and Behavioral Intention among UOH faculty members.

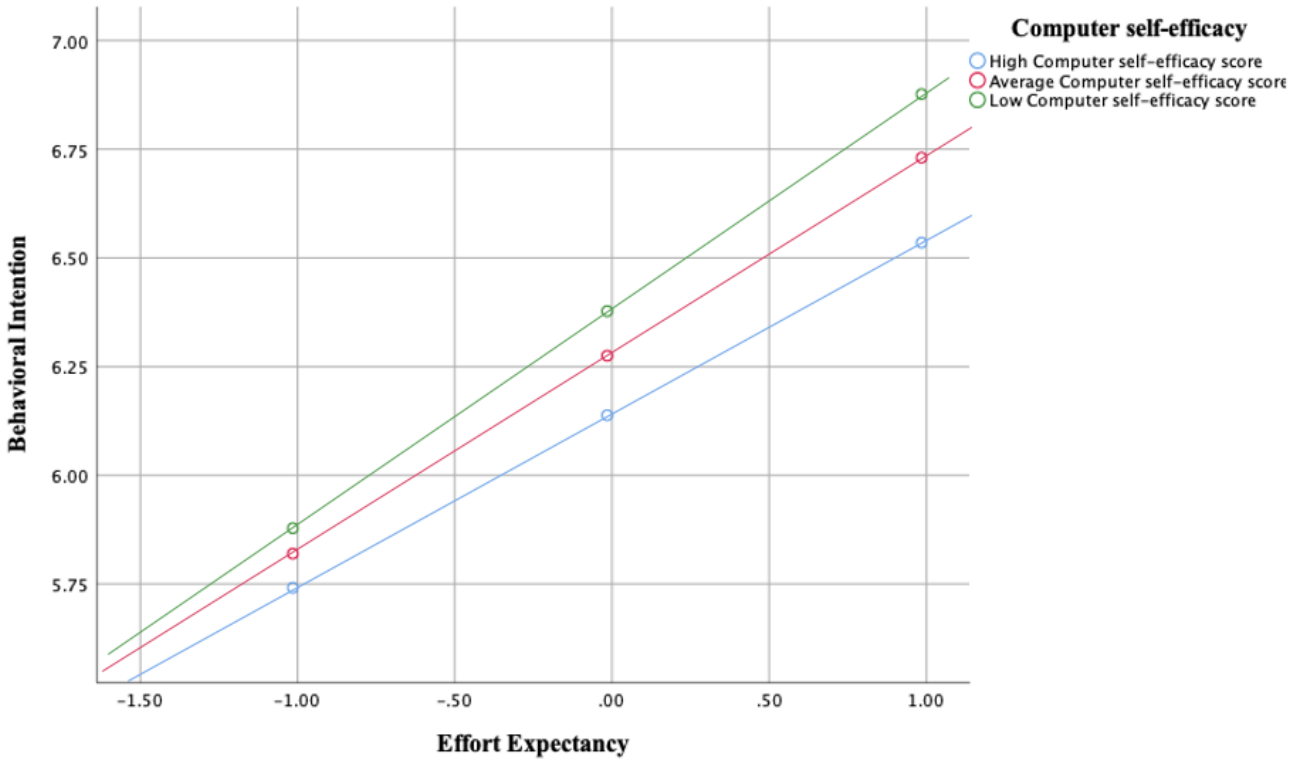
Table 26

*Interaction Coefficients (Computer self-efficacy * Effort Expectancy)*

	Coefficient	t	Sig
Computer self-efficacy * Effort Expectancy	.0817	1.1352	.2584

Figure 10

Grouped Scatter of Behavioral Intention (BI) by Effort Expectancy (PE) by Computer self-efficacy



H3: Social Norm will have a positive effect on the Behavioral Intention of LMS usage.

A linear regression was conducted to examine whether *Social Norm* could predict the level of *Behavioral Intention* to adopt LMSs by faculty members. Figure 11 presents a

scatterplot which show that the relationship between *Social Norm* and *Behavioral Intention* was positive and linear, and did not reveal any bivariate outliers. An analysis of standard residuals showed that the data contained no outliers. Independence of residual errors was confirmed with a Durbin-Watson test (d = 1.747), see table 27. The results of the regression showed that that the relationship between Social Norm and Behavioral Intention was significant. Tables 28 and 29 indicate a significant regression equation was found F(1,130)= 5.489, p<.021.

Table 27

Model Summary[b] for H3

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.201[a]	.041	.033	.6805	1.747

a. Predictors: (Constant), Social Norm
b. Dependent Variable: Behavioral Intention

Table 28

ANOVA[a] for H3

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2.542	1	2.542	5.489	.021[b]
	Residual	60.206	130	.463		
	Total	62.748	131			

a. Dependent Variable: Behavioral Intention
b. Predictors: (Constant), Social Norm

Table 29

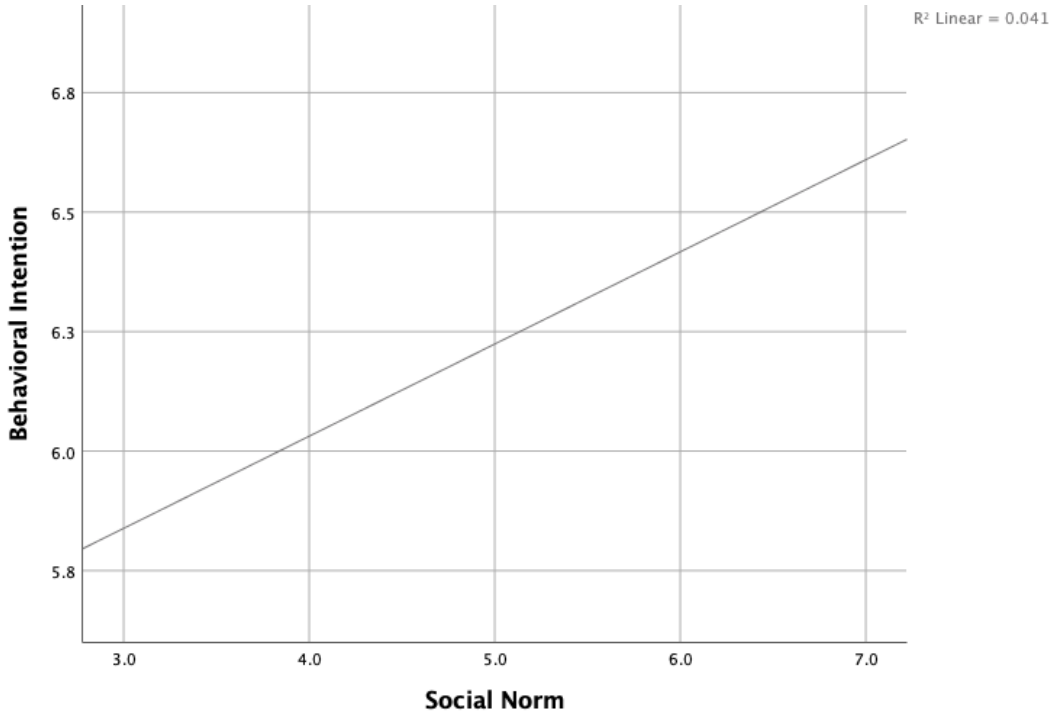
Coefficients[a] for H3

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	5.260	.428		12.284	.000
	Social Norm	.193	.082	.201	2.343	.021

a. Dependent Variable: Behavioral Intention

Figure 11

Simple Scatter with Fit Line of Behavioral Intention (BI) by Social Norm (SN)



Moderators for H3

H3a: Gender will moderate the effect of social norm on Behavioral Intention of LMS usage.

To test the hypothesis that *Gender* moderates the effect of *Social Norm* on faculty members' *Behavioral Intention* towards LMS usage, a moderation analysis was conducted using the PROCESS macro (Hayes 2017, Model 1). The results in Table 30 and Figure 12 show that the interaction between Gender and Social Norm was not significant (*P*=.2691). These results indicate that Gender does not have a moderation effect on the relationship between Social Norm and Behavioral Intention among UOH faculty members.

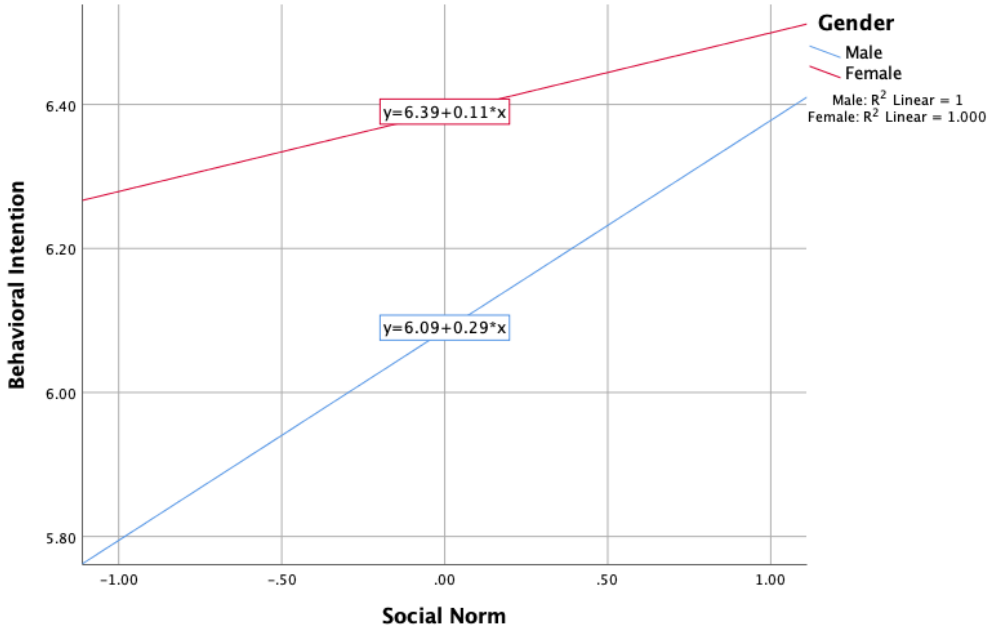
Table 30

Interaction Coefficients (Gender Social Norm)*

	Coefficient	t	Sig
Gender* Social Norm	-.1815	-1.1100	.2691

Figure 12

Grouped Scatter of Behavioral Intention (BI) by Social Norm (SN) by Gender



H3b: Age will moderate the effect of Social Norm on Behavioral Intention of LMS usage.

To test the hypothesis that *Age* moderates the effect of *Social Norm* on faculty members' *Behavioral Intention* towards LMS usage, a moderation analysis was conducted using the PROCESS macro (Hayes 2017, Model 1). The results in Table 31 show that none of the interaction effects between the three age groups and Social Norm were significant (*P*=.2585 and P= .2462). As shown in Figure 13 The relationship between Social Norm and Behavioral Intention was linear and positive for all age groups, which indicates that Age does not have a moderation effect on the relationship between Social Norm and Behavioral Intention among UOH faculty members.

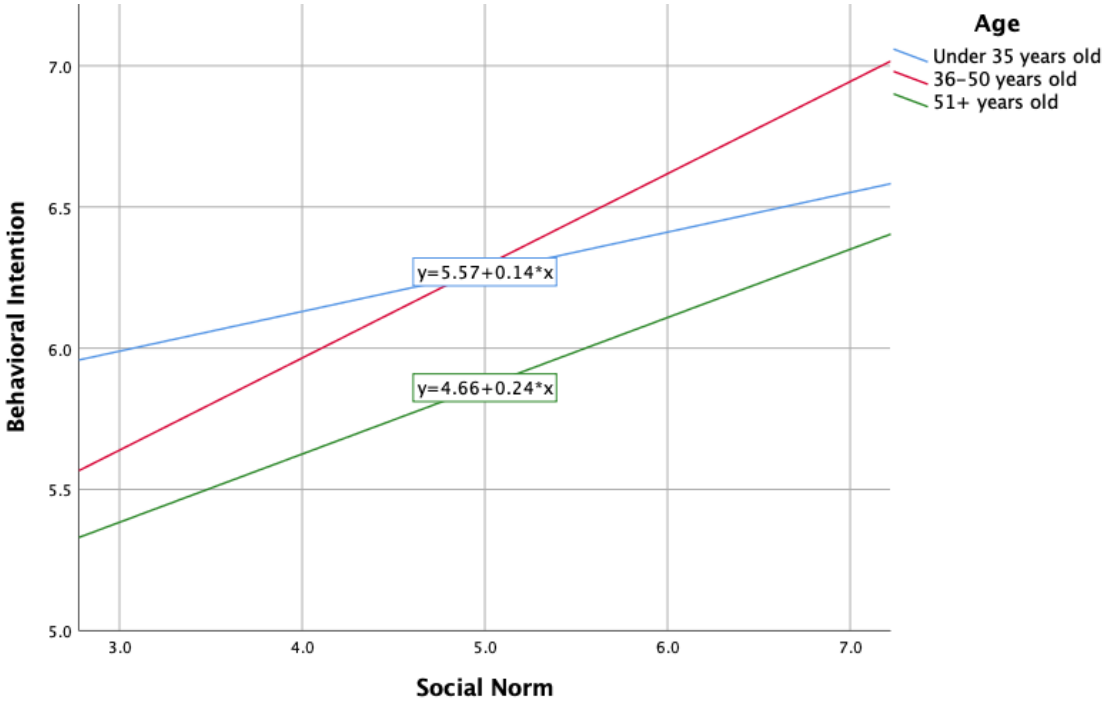
Table 31

Interaction Coefficients (Age Social Norm)*

	Coefficient	t	Sig
Under 35 Years Old vs 36-50 Years Old * Social Norm	.1858	1.1351	.2585
Under 35 Years Old vs 51+ Years Old* Social Norm	.4184	1.1651	.2462

Figure 13

Grouped Scatter of Behavioral Intention (BI) by Social Norm (SN) by Age



H3c: Experience will moderate the effect of Social Norm on Behavioral Intention of LMS usage.

To test the hypothesis that years of *Experience* in using computers moderates the effect of *Social Norm* on faculty members' *Behavioral Intention* towards LMS usage, a moderation analysis was conducted using the PROCESS macro (Hayes 2017, Model 1). The results in Table 32 show that the interaction effects between Social Norm and both the 7-10 year and over 10 years levels of computer experience were significant (*P*=.0237 and *P*= .0435), but that interaction effects were not significant among the other experience levels (*P*=.3240). This was also shown in Figure 14 which indicate that the relationship between Social Norm and Behavioral Intention varies among faculty members with different levels of experience with using computers. Thus, Experience appears to have a moderation effect on the relationship between Social Norm and Behavioral Intention.

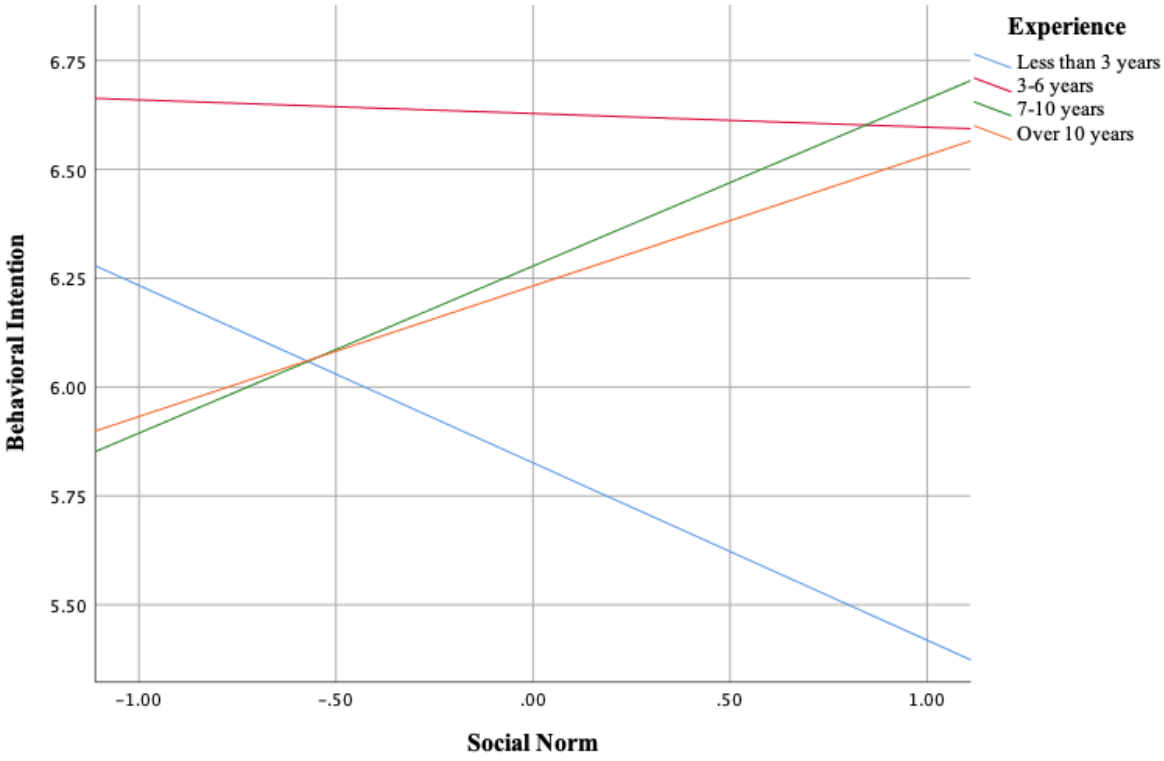
Table 32

*Interaction Coefficients (Experience * Social Norm)*

	Coefficient	t	Sig
Less than 3 years vs 3-6 years * *Social Norm*	.3763	.9872	.3255
Less than 3 years vs 7-10 years * *Social Norm*	.7912	2.2907	.0241
Less than 3 years vs Over 10 years * *Social Norm*	.7076	2.0401	.0435

Figure 14

Grouped Scatter of Behavioral Intention (BI) by Social Norm (SN) by Experience



H3d: Voluntariness of use will moderate the effect of Social Norm on Behavioral Intention of LMS usage.

To test the hypothesis that *Voluntariness of use* will moderate the effect of *Social Norm* on faculty members' *Behavioral Intention* towards LMS usage, a moderation analysis was conducted using the PROCESS macro (Hayes 2017, Model 1). The results in Table 33and Figure 15 show that the interaction between Voluntariness of use and Social Norm was not significant (*P*=.8408). Thus, Voluntariness of use does not have a moderation effect on the relationship between Effort Expectancy and Behavioral Intention among UOH faculty members.

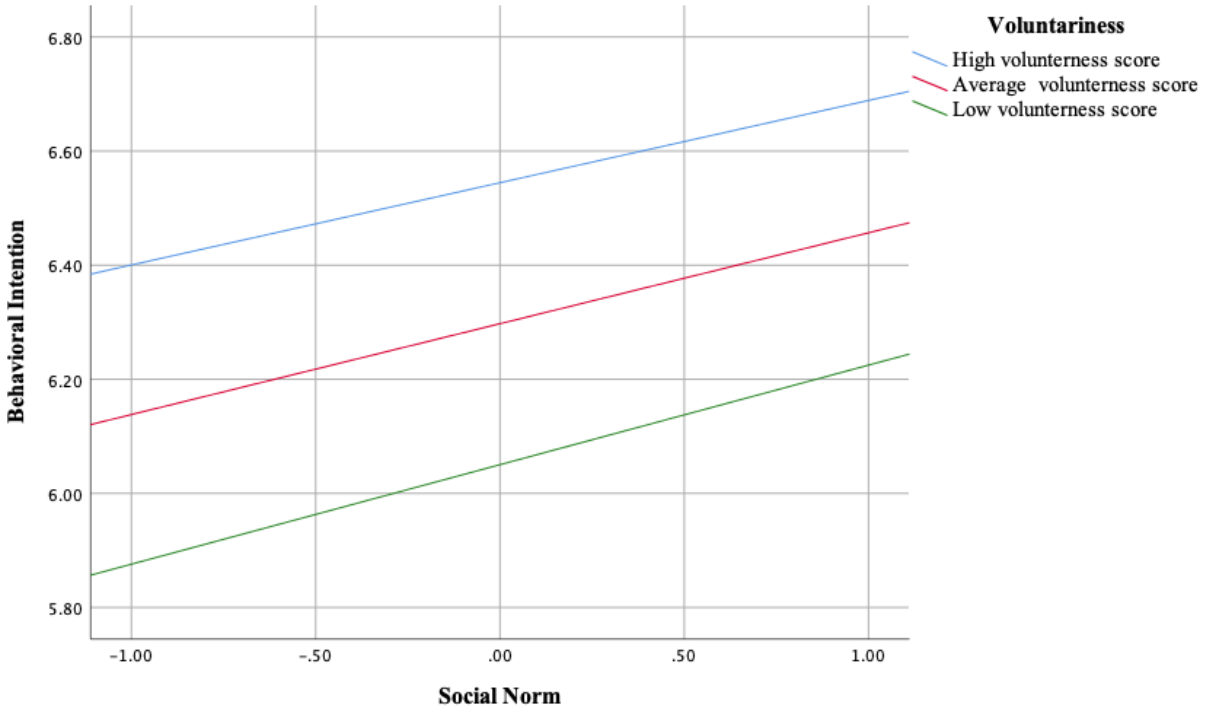
Table 33

*Interaction Coefficients (Voluntariness * Social Norm)*

	Coefficient	t	Sig
Voluntariness * Social Norm	.0101	.2013	.8408

Figure 15

Grouped Scatter of Behavioral Intention (BI) by Social Norm (SN) by Voluntariness



H4: Facilitating Conditions will have a positive effect on the Use Behavior of LMS.

A linear regression was conducted to examine whether *Facilitating Conditions* could predict the level of the actual *Use Behavior* of LMS by faculty members. Figure 16 presents a scatterplot which show that the relationship between Facilitating Conditions and Use Behavior was positive and linear, and did not reveal any bivariate outliers. An analysis of standard residuals showed that the data contained no outliers. Independence of residual errors was confirmed with a Durbin-Watson test (d = 2.153), see table 34. The results of the regression showed that the relationship between Facilitating Conditions and Use Behavior

was significant. Tables 35 and 36 indicate a significant regression equation was found $F(1,130)= 15.280$, $p<.000$, with an R^2 of .041.

Table 34

Model Summary[b] for H4

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.324[a]	.105	.098	.6220	2.153

a. Predictors: (Constant), Facilitating Conditions
b. Dependent Variable: Use Behavior

Table 35

ANOVA[a] for H4

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	5.911	1	5.911	15.280	.000[b]
	Residual	50.289	130	.387		
	Total	56.199	131			

a. Dependent Variable: Use Behavior
b. Predictors: (Constant), Facilitating Conditions

Table 36

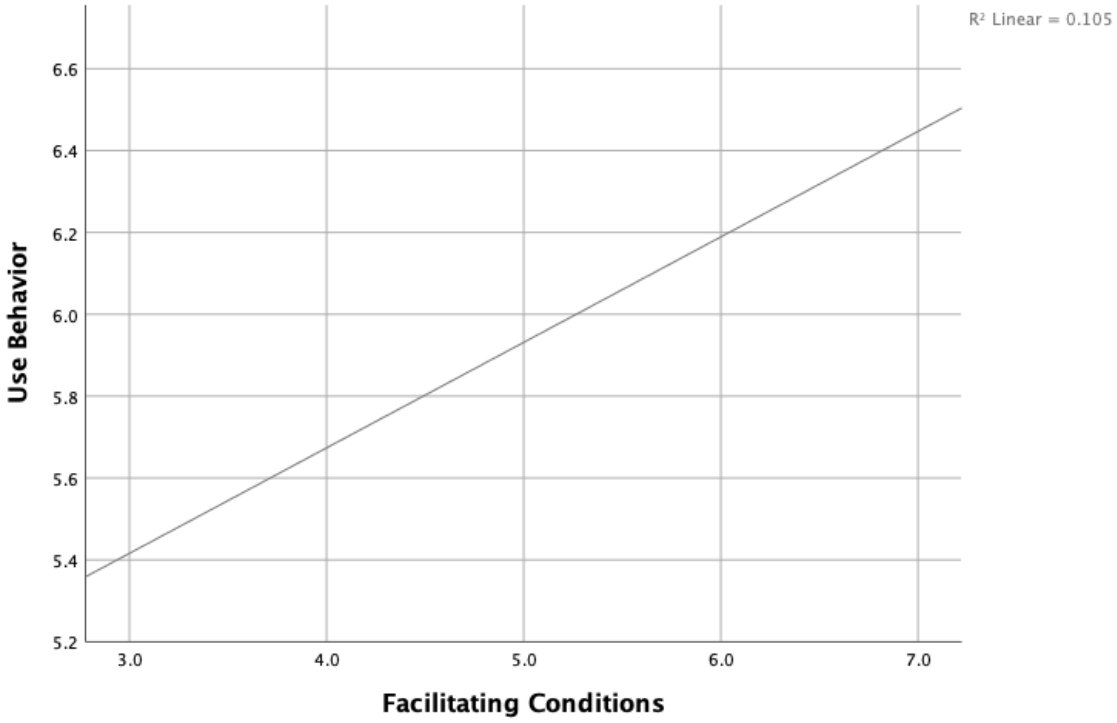
Coefficients[a] for H4

		Unstandardized Coefficients		Standardized Coefficients		
Model		B	Std. Error	Beta	T	Sig.
1	(Constant)	4.643	.361		12.863	.000
	Facilitating Conditions	.258	.066	.324	3.909	.000

a. Dependent Variable: Use Behavior

Figure 16

Simple Scatter with Fit Line of Use Behavior by Facilitating Conditions



Moderators for H4

H4a: Age will moderate the effect of Facilitating Conditions on Use Behavior of LMS.

To test the hypothesis that *Age* moderates the effect of *Facilitating Conditions* on the actual *Use Behavior* of LMS by faculty members, a moderation analysis was conducted using the PROCESS macro (Hayes 2017, Model 1). The results in Table 37 and Figure 17 show that none of the interaction effects between any of the three age groups and Facilitating Conditions were significant (*P*=.8582 and *P*=.5814). This indicates that Age does not have a moderation

effect on the relationship between Facilitating Conditions and Use Behavior among UOH faculty members.

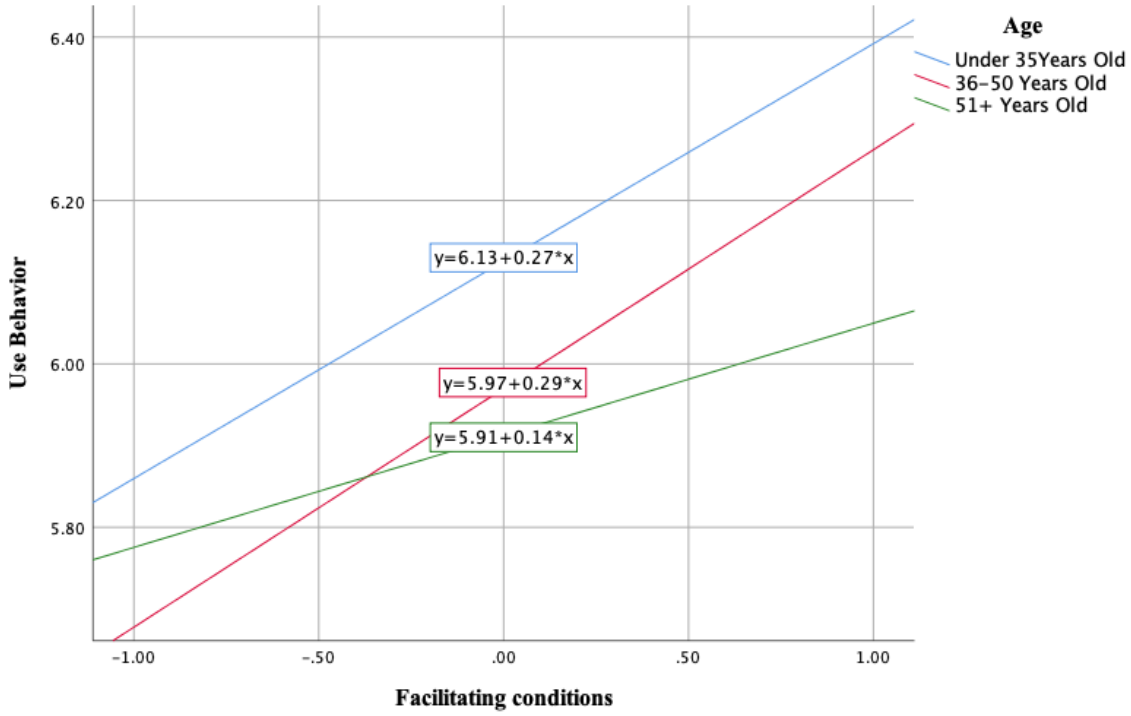
Table 37

Interaction Coefficients (Age Facilitating Conditions)*

	Coefficient	t	Sig
Under 35 Years Old vs 36-50 Years Old * Social Norm	.0260	.1791	.8582
Under 35 Years Old vs 51+ Years Old* Social Norm	-.1290	-.5527	.5814

Figure 17

Grouped Scatter of Use Behavior (UB) by Facilitating Conditions (FC) by Age



H4b: Experience will moderate the effect of Facilitating Conditions on Use Behavior of LMS.

To test the hypothesis that years of *Experience* in using computers moderates the effect of *Facilitating Conditions* on the actual *Use Behavior* of LMS by faculty members, a moderation analysis was conducted using the PROCESS macro (Hayes 2017, Model 1). The results in Table 38 show that none of the interaction effects between any of the four Experience groups and Facilitating Conditions were significant (*P*=.6603, *P*=.0890, and *P*=.1818). Thus, Experience does not have a moderation effect on the relationship between Facilitating Conditions and Use Behavior among UOH faculty members.

Table 38

*Interaction Coefficients (Experience * Facilitating Conditions)*

	Coefficient	t	Sig
Less than 3 years vs 3-6 years * *Social Norm*	-.1352	-.4406	.6603
Less than 3 years vs 7-10 years * *Social Norm*	-.4739	-1.7142	.0890
Less than 3 years vs Over 10 years * *Social Norm*	-.3596	-1.3427	.1818

H5: Behavioral Intention of LMS usage will have a positive effect on the Use Behavior of LMS.

A linear regression was conducted to examine whether *Behavioral Intention* predicts the actual *Use Behavior* of LMS by faculty members. Figure 18 presents a scatterplot which show that the relationship between Behavioral Intention and Use Behavior was positive and linear, and did not reveal any bivariate outliers. An analysis of standard residuals showed that

the data contained no outliers. Independence of residual errors was confirmed with a Durbin-Watson test (d = 1.993), see table 39. The results of the regression showed that the relationship between Behavioral Intention and Use Behavior was significant. Tables 40 and 41 indicate a significant regression equation was found F(1,130)= 31.974, p<.000.

Table 39

Model Summary[b] for H5

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.444[a]	.197	.191	.5890	1.993

a. Predictors: (Constant), Behavioral Intention
b. Dependent Variable: Use Behavior

Table 40

ANOVA[a] for H5

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	11.094	1	11.094	31.974	.000[b]
	Residual	45.106	130	.347		
	Total	56.199	131			

a. Dependent Variable: Use Behavior
b. Predictors: (Constant), Behavioral Intention

Table 41

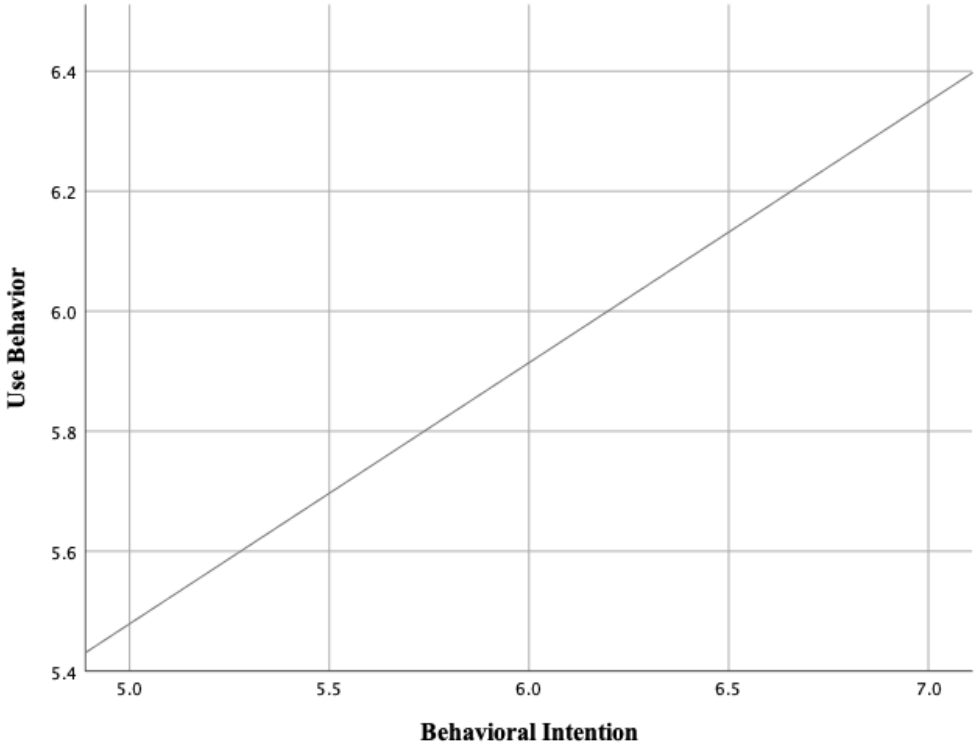
Coefficients[a] for H5

		Unstandardized Coefficients		Standardized Coefficients		
Model		B	Std. Error	Beta	t	Sig.
1	(Constant)	3.304	.486		6.794	.000
	Behavioral Intention	.435	.077	.444	5.655	.000

a. Dependent Variable: Use Behavior

Figure 18

Simple Scatter with Fit Line of Use Behavior by Behavioral Intention



Qualitative Analysis

The main purpose of the qualitative investigation was to gain a deeper understanding of faculty members' perceptions regarding the advantages and disadvantages of the implementation of Blackboard into their teaching practice. An online survey, which included two open ended questions, was used for data collection. The first question was related to the advantages of Blackboard utilization, and the second question was related to the disadvantages of Blackboard utilization. The questions were worded as follows:

1. From your experience, what are the key advantages of using Blackboard in your teaching?
2. From your experience, what are the key disadvantages of using Blackboard in your teaching?

Thirteen faculty members from University of Hai'l - Saudi Arabia, who had previous experience with the Blackboard LMS, responded to the online survey. The qualitative part of the study included five female and eight male faculty members from different age groups. The data were coded into sub-categories, and then into themes based on constructs from the Unified Theory of Acceptance and Use of Technology (UTAUT) model using a spreadsheet.

Data Coding

During the initial coding, all responses were thoroughly read, and the main ideas within these responses were identified based on the determination of key words. After the initial coding, a categorization cycle was used to identify similar key words related to faculty experience with Blackboard. These similar key words were grouped to form sub-categories (codes). Codes were then organized under major themes based on the meaning of each code. The two main themes in the qualitative part of the study serve the purpose of the survey questions – identifying the *advantages* and the *disadvantages* of utilizing Blackboard by faculty members. For more details see Tables 42 and 43 below.

Table 42

Initial coding of qualitative data (Blackboard Advantages)

Item	Codes	Category	Theme	Related UTAUT Construct
"I teach large classes and I find Blackboard to be very useful in managing large classes"	Beneficial, Manage Classes	Class management	Advantages	Performance Expectancy
"It is convenient for me and my students to record the lecture and post my slides so they can get back to them whenever they need"	Convenient, record lecture, get back, whenever	Flexibility	Advantages	Effort Expectancy
"Flexibility in time and place"	Flexibility, Time, Place	Flexibility	Advantages	Effort Expectancy
"It's easy to communicate announcements to my students"	Easy, communicate	Efficient Communication	Advantages	Effort Expectancy
"It is convenient to upload all assignments, readings, materials, and grades in one place where my students can easily find them"	Convenient, one place, upload	Efficiency	Advantages	Performance Expectancy
"The most important advantage of Blackboard is flexibility"	flexibility	Flexibility	Advantages	Effort Expectancy
"It has a user-friendly phone app that has all the tools needed for the students to browse the course"	user-friendly, phone app	Accessibility	Advantages	Facilitating Conditions

“The key advantage of using Blackboard is that it allows flexibility for both faculty members and students”	Flexibility	Flexibility	Advantages	Effort Expectancy
“It allows me to organize my course materials”	Organize	Class management	Advantages	Performance Expectancy
“I like that it allows us to post different types of content”	Post, content	Content delivery	Advantages	Performance Expectancy
“Students can access the course anytime of their choice”	Access, anytime	Flexibility	Advantages	Effort Expectancy
“Provides different ways of communication between students and faculty or between students themselves. For example, discussion boards and real-time online chatting rooms”	Communication, discussion	Efficient Communication	Advantages	Effort Expectancy
“Good course management tool”	Management	Class management	Advantages	Performance Expectancy
“It provides students with tools to independently keep track of their progress”	Tools, keep track, independently	Accessibility	Advantages	Facilitating Conditions
“It allows me to share course materials with my students”	Share, materials	Content delivery	Advantages	Performance Expectancy

Table 43

Initial coding of qualitative data (Blackboard Disadvantages)

Item	Codes	Category	theme	Related UTAUT Construct
"It is great platform, but it takes time to get used to, and requires more training"	takes time, training	Complexity	Disadvantages	Effort Expectancy
"A number of my students reported issues with connectivity"	Issues, connectivity	Technical issues	Disadvantages	Facilitating Conditions
"Not efficient for examination"	Not efficient, examination		Disadvantages	Performance Expectancy
"I found it a bit difficult to navigate and understand the functionality of some of the tools"	difficult, navigate understand	Complexity	Disadvantages	Effort Expectancy
"It is difficult to get my students into effective discussions"	difficult, effective, discussions	Complexity	Disadvantages	Effort Expectancy
"Not all students have the necessary hardware and internet connection"	hardware, internet	Inaccessibility	Disadvantages	Facilitating Conditions
"I find the grading book page tricky to work with"	tricky, work	Complexity	Disadvantages	Effort Expectancy
"from time to time, it is slow to load pages and sometimes it won't load at all"	Slow, load pages	Technical issues	Disadvantages	Facilitating Conditions
"The only disadvantage I experienced with Blackboard was its app. The app is very basic compared to desktop version and does not include all features"	Disadvantage, app, basic	Inaccessibility	Disadvantages	Facilitating Conditions
"I believe there is room to improve its interface to make it more user-friendly"	interface, improve, user-friendly	Complexity	Disadvantages	Effort Expectancy

"The biggest downside is the fact that your students need a high-quality internet connection to do the exams"	Downside, need, internet	Inaccessibility	Disadvantages	Facilitating Conditions
"it is not clear how to reply in the discussion board. Most students create a new thread in order to reply to another thread"	not clear, discussion	Complexity	Disadvantages	Effort Expectancy
"It usually has issues of slowing down especially while viewing posts with videos"	Issues, slowing	Technical issues	Disadvantages	Facilitating Conditions

Categories

Seven categories were identified as a result of the coding process. Each of the seven categories fall under one of the themes - advantages or disadvantages of Blackboard implementation.

Advantages. The major categories within the advantages theme, as determined by participants were: flexibility, class management, efficient communication, content delivery, and accessibility. Table 44 outlines these categories.

Table 44

Advantages Categories

Category	Theme	Related UTAUT Construct
Flexibility and Accessibility	Advantages	Effort Expectancy
Class management	Advantages	Performance Expectancy
Efficient communication,	Advantages	Performance Expectancy
Content delivery	Advantages	Effort Expectancy

Flexibility and Accessibility. Flexibility and accessibility were the most frequently mentioned advantages of using Blackboard as a teaching tool. Blackboard allows both faculty and students to access the course content at any time, and from wherever they choose. One faculty member who participated in the study stated that, "It is convenient for me and my students to record the lecture and post my slides so they can get back to them whenever they need." Another participant stated that one of the advantages of utilizing Blackboard was its, "flexibility in time and place." Yet another participant responded that, "The most important advantage of Blackboard is flexibility." Another faculty member also specified that, "It has a user-friendly phone app that has all the tools needed for the students to browse the course."

Class management. Class management was another frequently mentioned advantage of using Blackboard, according to the faculty members who participated in the study. Blackboard has a course management menu, which includes a number of features and tools that allow faculty members to create and post content in addition to managing and modifying the course. One faculty member responded, "I teach large classes and I find Blackboard to be very useful in managing large classes." Another faculty member indicated that Blackboard allows her to organize her course materials. Yet another participant referred to Blackboard as a, "good course management tool."

Efficient communication. Participants also pointed out that efficient communication was another advantage that Blackboard provided. Blackboard offers a variety of communication tools including discussion boards, blogs, wikis, live chatting, live video conferencing, and journals. A faculty member responded to the survey question indicating that using Blackboard makes it, "easy to communicate announcements to my students." Another participant indicated that Blackboard, "provides different ways of communication

between students and faculty or between students themselves." He then gave the example of using discussion boards and real-time online messages.

Content delivery. Participants indicated that content delivery was one of the primary benefits of Blackboard adoption. Blackboard provides faculty members with tools that allow them to upload course materials, and post various types of online content to their students. For example, a faculty member specified, "I like that it allows us to post different types of content." Another participant indicated that one of the advantages to using Blackboard was that, "It allows me to share course materials with my students."

Disadvantages. The major categories within the disadvantages theme, as determined by participants were: complexity, technical issues, and inaccessibility. Table 45 outlines these categories.

Table 45

Disadvantages Categories

Category	Theme	Related UTAUT Construct
Complexity	Disadvantages	Effort Expectancy
Technical issues	Disadvantages	Performance Expectancy
Inaccessibility	Disadvantages	Performance Expectancy

Complexity. Complexity was the most frequently reported disadvantage of Blackboard according to the participants. A number of faculty members indicated that Blackboard did not have a user-friendly interface. One participant stated that, "there is room to improve its interface to make it more user-friendly." Another participant indicated that he found it, "a bit difficult to navigate," and that it was not clear how to use some of the tools. A different participant mentioned that, "It is not clear how to reply in the discussion board. Most students

create a new thread in order to reply to another thread." Another faculty member thought that the gradebook page was, "tricky to work with."

Technical issues. Technical issues were another downside of Blackboard that the faculty members reported. The technical issues included connectivity problems and delays in loading pages. A participant specified that some of his students reported, "issues with connectivity." Another faculty member argued that Blackboard, "usually has issues of slowing down especially while viewing posts with videos." Similarly, another faculty member stated that, "from time to time, it is slow to load pages and sometimes it won't load at all."

Inaccessibility. According to a number of faculty members who participated in the study, inaccessibility was also a disadvantage of using Blackboard in their teaching practice. University of Hai'l is the only university in Hai'l province, and the area has the largest number of villages in the kingdom of Saudi Arabia. A large proportion of the university population comes from these villages where there is weak internet, or no internet connection at all. A faculty member indicated that, "Not all students have the necessary hardware and internet connection." Examinations through Blackboard require high quality internet connection. According to one of the participants, "The biggest downside is the fact that your students need a high-quality internet connection to do the exams." Within the inaccessibility category, a faculty member reported that the Blackboard app needed improvements to maximize the usability of the platform. He said, "The only disadvantage I experienced with Blackboard was its app. The app is very basic compared to desktop version and does not include all features."

Summary

The main goal of the current research was to explore the factors that might influence faculty members' adoption of Blackboard as a teaching tool at the university of Hai'l. The results from both the quantitative and the qualitative portions of the study were presented in this chapter. This chapter presented the sample and the survey, the scale items, the reliability estimates, and the descriptive statistics. Results from both the linear regression analysis between the independent and the dependent variables, as well as results from multiple linear regression focused on the moderation variables were reported. This chapter also shared the results from the qualitative portion of the study.

Chapter 5: Discussion and Conclusion

Introduction

The primary purpose of this study was to explore factors influencing faculty members' adoption and use of Blackboard as a teaching tool at the University of Hai'l. The study used a mixed methods approach and utilized the Unified Theory of Acceptance and Use of Technology (UTAUT) as a theoretical framework to answer the research questions. The quantitative part of the study examined the relationship between the UTAUT constructs and moderation effects using simple and multiple linear regression analysis. The study also explored faculty members' perceptions regarding the advantages and the disadvantages of Blackboard use using a qualitative approach. In this chapter, a brief summary of the results of the hypothesis testing and the answers to the research questions will be discussed and compared to the current literature. Additionally, the chapter presents the study implications as well as recommendations for future research.

Summary and Discussion of the Results

This section provides answers to the research questions, the major research findings, and hypothesis testing. For this study, the main research question was, "What are the factors that influence faculty members' decisions to adopt LMSs as part of their teaching in Saudi Higher Education?" A mixed methods approach was used to answer this research question. The quantitative portion was utilized to explore these factors based on the UTAUT model, whereas the qualitative portion was conducted to gain deeper understanding of the faculty members' perceptions regarding the advantages and the disadvantages of Blackboard implementation.

Through the quantitative approach, 17 hypotheses were tested.

Performance Expectancy

H1: Performance Expectancy will have a positive effect on the Behavioral Intention of LMS usage.

H2: Gender will moderate the effect of Performance Expectancy on Behavioral Intention of LMS usage.

H3: Age will moderate the effect of Performance Expectancy on Behavioral Intention of LMS usage.

The hypotheses listed here aimed to discover the relationship between the faculty members' perceptions of Blackboard usefulness as a teaching tool, and their Behavioral Intention to actually adopt this technology. Performance Expectancy is, "the degree to which an individual believes that using the system will help him or her to attain gains in job performance" (Venkatesh et al., 2003, p. 447). The survey items related to this construct explored the faculty beliefs that using Blackboard would help them to increase their productivity, accomplish tasks more quickly, and overall increase the quality of their teaching. According to the UTAUT, Performance Expectancy has a positive and direct effect on Behavioral Intention, and this relationship is moderated by age and gender (Venkatesh et al., 2003).

The results of this study revealed a strong and positive correlational relationship between Performance Expectancy and Behavioral Intention of Blackboard usage. This result is consistent with other studies in the literature (Alghatani et al., 2007; Alrawashdeh, Muhairat, & Alqatawnah, 2012; Brandyopadhyay & Fraccastoro, 2007; Dulle & Minishi-Majanja, 2011; Furner, 2013; Macharia, 2011; Venkatesh & Zhang, 2010). However, the

findings show no difference between female and male faculty members. Thus, the moderation effect of gender was not significant (P=0.37). The findings have also shown no difference between age groups, as the moderation effect of age on the relationship between PE and BI of Blackboard adoption was not significant (*P*=0.40 and *P*=0.29).

The findings from the qualitative portion of the study also supported the quantitative results, showing the significance of the effect of Performance Expectancy on the adoption of Blackboard. Several of the faculty members who participated in the interviews reported advantages to using Blackboard that were related to Performance Expectancy. For example, a faculty member stated, "I teach large classes and I find Blackboard to be very useful in managing large classes." In line with class organization and management, another faculty member pointed out that, "It allows me to organize my course materials." Participants have also reported other advantages that are related to Performance Expectancy such as accessibility and content delivery.

Effort Expectancy

H4: Effort Expectancy will have a positive effect on the Behavioral Intention of LMS usage.

H5: Gender will moderate the effect of Effort Expectancy on Behavioral Intention of LMS usage.

H6: Age will moderate the effect of Effort Expectancy on Behavioral Intention of LMS usage.

H7: Experience will moderate the effect of Effort Expectancy on Behavioral Intention of LMS usage.

H8: Computer self-efficacy will moderate the effect of Effort Expectancy on Behavioral Intention of LMS usage.

The hypotheses here explore the relationship between faculty members' perceptions of ease of use towards Blackboard as a teaching tool, and their Behavioral Intention to actually adopt it. According to Venkatesh et al. (2003), Effort Expectancy is, "the degree of ease associated with the use of the system" (p. 450). The survey items related to this construct explored faculty beliefs that using Blackboard would be clear, understandable, and easy to use. In the UTAUT model, Venkatesh et al. (2003) suggest that Effort Expectancy has a positive and direct effect on Behavioral Intention, and this relationship is moderated by four variables, namely, age, gender, experience, and computer self-efficacy (Venkatesh et al., 2003).

The results of the study revealed a strong and positive correlational relationship between Effort Expectancy and Behavioral Intention of Blackboard usage, indicating that Effort Expectancy is a strong predictor of Blackboard adoption. This result is consistent with Venkatesh et al. (2003) and others (Brandyopadhyay & Fraccastoro, 200; Dulle & Minishi-Majanja, 2011; Macharia, 2011). In contrast with these results, At least one study did not find Effort Expectancy to be a strong predictor of Behavioral Intention (Alghatani et al., 2007). In regards to the above-mentioned moderating variables, none of them was found to have a moderating effect on the relationship between Effort Expectancy and Behavioral Intention.

In contrast with Venkatesh et al.'s (2003) UTAUT model, the findings did not show differences between female and male faculty members, as the moderation effect of gender was not significant (P= 0.1436). Similarly, the results indicated that there was no difference between age groups, and the moderation effect of age was not significant (P=.8324 and P= .0675). Additionally, the results showed that there was no difference in the relationship

between Effort Expectancy and Behavioral Intention among faculty with different levels of experience and different computer self-efficacy scores.

The findings from the qualitative part of the study supported the impact of Effort Expectancy on the adoption of Blackboard. Participants from the qualitative portion reported a number of advantages and disadvantages of using Blackboard as a teaching tool that were related to Effort Expectancy. Flexibility was the most reported advantage of Blackboard, according to the participants. For example, a faculty member stressed that, “It is convenient for me and my students to record the lecture and post my slides so they can get back to them whenever they need.” Participants have also reported a few disadvantages that are related to Effort Expectancy such as complexity.

Social Norm

H9: Social Norm will have a positive effect on the Behavioral Intention of LMS usage.

H10: Gender will moderate the effect of Social Norm on Behavioral Intention of LMS usage.

H11: Age will moderate the effect of Social Norm on Behavioral Intention of LMS usage.

H12: Experience will moderate the effect of Social Norm on Behavioral Intention of LMS usage

H13: Voluntariness of use will moderate the effect of Social Norm on Behavioral Intention of LMS usage

Social Norm is one of the main constructs that form the UTAUT. According to Venkatesh et al. (2003), Social Norm is, "the degree to which an individual perceives that important others believe he or she should use the new system" (p. 451). The survey items related to this construct explored faculty beliefs that other people in their social circle, such as friends and peers, thought that they should use Blackboard. The UTAUT presents Social

Norm as a strong predictor of a user's adoption of systems, and this relationship is moderated by four variables, namely, age, gender, experience, and voluntariness of use (Venkatesh et al., 2003).

The findings from this study revealed a positive correlational relationship between Social Norm and Behavioral Intention of Blackboard usage, indicating that Social Norm could also be a predictor of Blackboard adoption. This result is consistent with Venkatesh et al. (2003), and other studies that found that Social Norm was a factor explaining some of the variance in users' acceptance of technology (Brandyopadhyay & Fraccastoro, 200; Dulle & Minishi-Majanja, 2011; Macharia, 2011). Although Social Norm was found to be significant, it contributed the least in predicting Behavioral Intention (r^2=.041). Other studies have also found that this construct has had the least predicting ability among the UTAUT constructs in the use of technology (Cullen & Greene, 2011; Vermeulen, Van Acker, Kreijns, & van Buuren, 2014).

The results also showed that the interaction effects between Social Norm and both the 7-10 year and over 10 year levels for computer experience were significant (*P*=.0237 and *P*= .0435), while they were not significant among the other experience levels (*P*=.3240). These results indicate that experience has a moderation effect on the relationship between Social Norm and Behavioral Intention of Blackboard adoption. However, the findings did not show differences between female and male faculty members, and the moderation effect of gender was not significant (*P*=.2691). Similarly, the results indicated that there was no difference between age groups., and the moderation effect of age was not significant (P=.2585 and P= .2462). Additionally, the results showed that there were no differences in the relationship

between Effort Expectancy and Behavioral Intention among faculty with different voluntariness levels (P=.8408).

Facilitating Conditions

H14: Facilitating Conditions will have a positive effect on the Use Behavior of LMS.

H15: Age will moderate the effect of Facilitating Conditions on Use Behavior of LMS.

H16: Experience will moderate the effect of Facilitating Conditions on Use Behavior of LMS.

The concept of Facilitating Conditions in this study refers to the perceived barriers or enablers in the instructional environment and infrastructure that support the use of Blackboard. Venkatesh et al. (2003) define Facilitating Conditions as, "the degree to which an individual believes that an organizational and technical infrastructure exists to support use of the system" (p. 453). The survey items related to the construct of Facilitating Conditions explored whether faculty members believed that they had the resources and the knowledge necessary to use Blackboard. According to the UTAUT, Facilitating Conditions can be a strong predictor of a user's adoption of a system, and the relationship between Facilitating Conditions and the actual use behavior is moderated by age and experience (Venkatesh et al., 2003).

The findings from this study revealed a positive correlational relationship between Facilitating Conditions and the use behavior of Blackboard, indicating that Facilitating Conditions are a predictor of Blackboard adoption. The findings were consistent with the work of Venkatesh et al. (2003) and others (Alrawashdeh et al., 2012; Dulle & Minishi-Majanja, 2011). In regards to moderating variables, none were found to have moderating effects on the relationship between Facilitating Conditions and the use behavior of Blackboard. The findings did not show differences between age groups, and the interaction

effects with Facilitating Conditions were not significant (*P*=.8582 and *P*=.5814). The results also showed that none of the interaction effects between any of the experience groups and Facilitating Conditions were significant (*P*=.6603, *P*= .0890, and *P*=.1818).

The findings from the qualitative portion of the study supported the impact of Facilitating Conditions on the adoption of Blackboard. Participants from the qualitative portion reported a number of technical issues related to using Blackboard as a teaching tool. For example, a faculty member stressed that, "A number of my students reported issues with connectivity" and another instructor stressed, "Not all students have the necessary hardware and internet connection."

Behavioral Intention

H17: Behavioral Intention of LMS usage will have a positive effect on Use Behavior of LMS.

The Behavioral Intention construct has been linked to actual Use Behavior for many years (Ajzen & Fishbein, 1980; Venkatesh et al., 2003). This relationship has been found to be strongly positive in many technology adoption studies (Venkatesh et al., 2003; Shiau & Chau, 2015). In line with what has been found in the literature, the findings of this study revealed a strong and positive correlational relationship between Behavioral Intention and the actual Use Behavior of Blackboard, indicating that Behavioral Intention is a strong predictor of Blackboard adoption.

Limitations

- The study was cross-sectional, and conducted to investigate the adoption of Blackboard at a single point. However, the UTAUT model used a longitudinal approach as perceptions might change over time.

- Another limitation of this study is that the study only investigated the constructs of UTAUT. However, the literature shows many other well-known acceptance models which were not used in this study.
- Due to the nature of the research model (inclusive of 12 variables), this study did not include other variables that might be relevant. For example, faculty tenure rank and faculty department may play a role. Additionally, due to the complexity of the model, and to avoid issues with multicollinearity, the study did not use multiple linear regression. Instead, it used simple linear regression for each hypothesis test.
- The sample size for the study includes only 16 participants who were 51+ years old, which was relatively small compared to the other two age groups. The under 35 years age group included 57 participants, and the 36-50 years age group included 59 participants. Thus, the sample may not have been a fully accurate representation of all faculty members.
- The study investigated the factors that may influence the adoption of Blackboard LMS by faculty members, the results of this study might not be applied to other LMSs.

Implications

Learning management systems have become an important component of today's higher education systems. Educational institutions in Saudi Arabia have become increasingly aware of the advantages of LMSs. However, the adoption of these technologies continues to be challenging in higher education institutions, particularly in developing countries. The main goal of this research was to explore the factors that might influence faculty members' adoption of Blackboard as a teaching tool at the university of Hai'l. The findings from this study will help educational institution leaders, instructors, technology consultants, and other

researchers through providing insights into what factors might enhance LMS usage. In order to increase the adoption of LMSs, we need to understand how users view them as teaching tools. In this section, practical implications from this study's findings are presented:

The study revealed a strong and positive correlational relationship between Performance Expectancy and Behavioral Intention of Blackboard usage. Since PE was found to be a strong predictor of Blackboard adoption, administrators should therefore promote the advantages and the usefulness of this LMS among instructors.

Effort Expectancy was also found to have a strong and positive correlational relationship with Behavioral Intention of Blackboard usage, and the ease of use of Blackboard is a strong predictor of Blackboard adoption. Faculty members are less motivated to use the system if they do not know how to use it. This may be because they find it complex and difficult to use, or they may lack the necessary knowledge for how to properly use it. This implies that Blackboard adoption could be enhanced if instructors receive the proper training. This may lead to increased confidence when using the system. The importance of Effort Expectancy as a predictor of LMS adoption should also encourage instructional designers to take this variable into consideration when designing the system.

Facilitating Conditions were also found to have a strong and positive relationship with the use behavior of Blackboard. Facilitating Conditions refer to the perceived barriers or enablers in the instructional environment and infrastructure that support the use of Blackboard. Participants from the study reported a number of technical issues related to using Blackboard, such as issues with internet connectivity and a lack of the necessary hardware. The findings imply that Blackboard adoption could be enhanced if institutions provide reliable infrastructure such as wireless networks, computer labs and high-speed internet.

Recommendations for Future Research

First, as mentioned in the limitations section, this study is cross-sectional in design, which means that it investigates the adoption of Blackboard at a single point in time. The UTAUT model originally used a longitudinal approach. A longitudinal version of this study might bring more insight into the factors affecting faculty adoption of Blackboard. For example, future studies could take a longitudinal approach to investigate the moderation effect of age on the relationships between the UTAUT constructs and the adoption of LMSs.

Second, the study used the UTAUT as a framework, which does not include the cultural factors that might affect faculty member decisions to adopt LMS. Researchers designing future studies are encouraged to take a closer look at the cultural factors, especially in developing countries like Saudi Arabia. Depending upon the culture, adoption factors could be different from what is typically found in western countries.

This study did not take into account the relationship between faculty tenure rank and the adoption of Blackboard. Additionally, this study did not investigate whether Blackboard adoption varied by department. These additional factors might add more valuable insight in future iterations.

The sample from this study includes only a small number of participants who were 51+ years old compared to the other two age groups. Having a larger sample size could provide a more equal distribution among faculty member age groups and therefore, more reliable results towards understanding the factors influencing faculty adoption of LMSs.

Although this study adopted a mixed-methods approach in order to achieve a better understanding of the problem, the qualitative portion paid limited attention to capturing the advantages and the disadvantages of Blackboard integration. Expanding the qualitative

portion to cover more dimensions of Blackboard adoption could yield more understanding of the problem in future research.

Conclusion

The purpose of this study was to determine the factors influencing the adoption of learning management systems (LMSs) by faculty members in Saudi Arabian higher education using the Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh, 2003). The study also sought to analyze the relationship between these factors. Specifically, the study was developed to determine the extent at which Performance Expectancy (PE), Effort Expectancy (EE), Facilitating Conditions (FC), and Social Norms (SN) influence faculty members' Behavioral Intention (BI) to adopt the Blackboard LMS. It also examined the moderating roles of age, gender, experience, perceived voluntariness, and computer self-efficacy on PE, EE, SN, and FC.

The results of the study revealed a strong and positive correlational relationship between Performance Expectancy and Behavioral Intention of Blackboard usage. The study also found Effort Expectancy, Facilitating Conditions and Social Norms to be significant predictors of Behavioral Intention of Blackboard usage. Additionally, the findings showed no moderation effects of age, gender, perceived voluntariness, and computer self-efficacy on PE, EE, SN, and FC. Experience was found to have a moderation effect on the relationship between Social Norms and Behavioral Intention.

Findings from this study can be used by university leaders, instructors, instructional designers, and policy and decision-makers in Saudi higher education by giving them insight into the factors that may influence faculty adoption of LMS. This insight may provide them

with solutions that they may use to promote the utilization of LMSs in Saudi higher educational institutions.

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APPENDIX A

BRANY SBER IRB Approval

BRANY SBER IRB

DATE: 09/03/2019
TO: Ken Potter, Ph.D.
CC: Mohammed Alshammari, commercialirb@vt.edu
FROM: Raffaella Hart, MS, CIP, BRANY SBER IRB (IRB00010793)

SUBMISSION TYPE: SBER-Modification (Event ID# 156622)
PROTOCOL NUMBER: VT19-331-568(TRX) / 19-331
STUDY TITLE: Investigating the Faculty Behavioral Intentions to Adopt Learning Management Systems (LMSs) in A Higher Education Institution in Saudi Arabia

REVIEW TYPE: Revised ICF (Version A), Survey (revised 7/3/19), Protocol (updated 8/26/19)

Thank you for your submission, which was approved by BRANY IRB under expedited review categories 4 and 7, as provided in 45 CFR 46.110. This approval requires that all procedures and activities are performed in accordance with relevant state and local law (including tribal law, when applicable).

BRANY SBER IRB has approved the following for the above-referenced research:

- **Revised Informed Consent Form (Version A)**
  - Refer to the enclosed document(s) with tracked changes for all modifications.
  - Re-consent Required: If the research remains open to accrual at your site, use the enclosed to obtain consent from new subjects. For previously consented subjects still active or in follow-up, you can either use the enclosed to re-consent, or use the previously provided consent form addendum or letter (BRANY stamp version 5/31/19).
- **Survey (revised 7/3/19)**

Non-Expiring IRB Approval Period:
This study was reviewed under the Revised Common Rule (2018 requirements) and therefore **does not require continuing review in accordance with 45 CFR 46.109(f)(1)(i).**

However, BRANY SBER IRB requires you "check in" at least annually to ensure your study status is up to date and in compliance. **Your Annual Report to BRANY SBER IRB is due on 05/02/2020.** If your research is completed before then, you must submit a notification of study closure to BRANY SBER IRB (use the xForm called: SBER-Study Status Change (Closed/Enrollment Closed)).

If you have any questions or require any additional information, please call me at 516-470-6909 or send an email to me at rhart@brany.com. Thank you.

APPENDIX B

Approval to Conduct the Study at University of Ha'il

Ministry of Higher Education
University of Hail
Vice Rector For Graduate
Studies & Scientific Research

وزارة التعليم العالي
جامعة حائل
وكالة الجامعة للدراسات
العليا والبحث العلمي

مكتب الوكيل
Vice Rectors Office

To whom may concern

We would like to inform you that University of Hail has no objection to grant Mr Mohammad Alshammari, at Virginia Teach University permission to conduct his data collection for his study titled "investigating the faculty Behavioral intentions to Adopt Learnings to Adopt learning Management Systems (LMSs) in A Higher Education Institution in Saudi Arabia" at University of Hail. His department will provide any assistant he may need during the data collection stage.

2019 Vice Rector for Graduates
Studies & Scientific Research
08
26
Dr. Majed Alhaisoni

الرقم : ٦٤٤٢٥ / ٤٠ / ٤ التاريخ : ١٤٤٠ / ١٢ / ٢٥ المرفقات :

المملكة العربية السعودية - حائل هاتف : ٠٦ - ٥٣٥٨٢٣٠ فاكس : ٠٦ - ٥٣١٠١٩٢ ص.ب : ٢٤٤٠ حائل
Saudi Arabia Hail Tel.: 06 - 5358230 Fax : 06 - 5310192 Post Box No. Hail 2440

APPENDIX C

Research Subject Consent Form

RESEARCH SUBJECT CONSENT FORM

Title:	Investigating the Faculty Behavioral Intentions to Adopt Learning Management Systems (LMSs) in A Higher Education Institution in Saudi Arabia
Protocol No.:	19-331
Sponsor:	Virginia Polytechnic Institute and State University
Principal Investigator:	Kenneth Potter 109 Northview Dr, Apt 6 Blacksburg, VA, 24060 United States
Daytime Phone Number:	276-252-7000
Sub - Investigator:	Mohammed Alshammari

You are being invited to take part in a research study. Participation is voluntary. You can choose not to take part, or agree to take part and later change your mind. There will be no penalty or loss of benefits to which you are otherwise entitled.

The purpose of this research is to ask you questions and determine your feedback. Your participation in this research will last until you have completed the questionnaire. The only risk is effort involved in the questionnaire. You will not be paid for being in this study. There are no benefits to you from your taking part in this research. Others may benefit from the information gained during this research. Your alternative is to not take part in the research. We may publish the results of this research. As we are not collecting any identifiable information, your information will be confidential.

If you have questions, concerns, or complaints, or think this research has hurt you, talk to the research team at the phone number listed above. This research is being overseen by an Institutional Review Board ("IRB"). An IRB is a group of people who perform independent review of research studies. If you have any questions about your rights as a research subject or complaints regarding this research study, or you are unable to reach the research staff, you may contact a person independent of the research team at the Biomedical Research Alliance of New York Institutional Review Board at 516-318-6877. Questions, concerns or complaints about research can also be registered with the Biomedical Research Alliance of New York Institutional Review Board at www.branyirb.com/concernsabout-research.

By continuing in the survey, you are consenting to continue.