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Running head: FACTORS AFFECTING INTENT TO USE E-LEARNING SYSTEM

Factors Affecting Faculty's Intent to Use E-Learning Systems at a University in the  
Kingdom of Saudi Arabia

by

Razan Al Suwailem

Dissertation

Submitted to the College of Technology

Eastern Michigan University

in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

Technology

Concentration in Information Assurance

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February 26, 2018

Ypsilanti, Michigan

Dedication

*This dissertation is dedicated to*

*My father (Ibrahim Alsuwailem) – whose spirit is always present with me, and who ingrained me with spirit of determination and insistence to reach life goals as well as love of learning.*

*My sweet and loving mother (Munirah Almuhadib) – whose affection, love, encouragement, and prayer of day and night make me able to get such success and honor*

*My beloved husband (Mohammed Almohazie) – who always supported me*

*My greatest brothers (Abdullah & Abdulaziz Alsuwailem)*

*My precious children (Layan & Fahad Almohazie)*

*All my lovely family*

*And to every researcher or scientist*

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I would like to acknowledge the faculty members of King Faisal University at the Kingdom of Saudi Arabia for their help and cooperation.

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### Abstract

E-learning systems provide instructors with a platform to create, deliver, and manage course content electronically. Faculty members' use of an e-learning system at Saudi universities concerns researchers, academics, and practitioners. Although most Saudi universities have an e-learning system, few faculty members are using an e-learning system. The Saudi Arabia Ministry of Education has seen massive investment toward the educational improvement in e-learning systems through building and maintaining an advanced level of Information Technology infrastructure, improving the utilization and flexibility of Information Technology resources, and enhancing and developing the privacy and security of e-learning systems. While previous research has examined factors affecting the acceptance of e-learning, few studies have examined the security of e-learning systems. Previous studies indicate the security of e-learning systems is important for motivating faculty to use e-learning systems due to issues of trust. Previous research has also examined the positive impact on users' attitudes toward using e-learning systems by two factors: perceived ease of use (PEOU) and perceived usefulness (PU). The goal of this study was to examine the relationship between faculty members' intent to use (ITU) the e-learning system at their university and their demographic characteristics, perceptions toward the existing e-learning system security, PEOU, and PU of the e-learning system in one of largest universities at the Kingdom of Saudi Arabia (KSA), King Faisal University (KFU), using an online survey available in Arabic and English. A sample of 219 faculty members from KFU completed the online survey. Results found faculty members' ITU the e-learning system at KFU was influenced by their previous teaching experience with an e-learning system, the ability to change the user password in the e-learning system, and the PU of the e-learning system. The

study findings encourage researchers to study other factors that may influence faculty members' ITU the e-learning system. Furthermore, the findings will help Information Technology practitioners, especially e-learning systems' developers, to design and develop systems that will be more likely accepted and useful by the University faculty members.

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## **Chapter 1: Introduction**

E-learning has been found and used since the early 1950s; e-learning has been considered as one of the most common types of distance learning (Clark, 2000). Distance learning comprised several formats like e-learning, correspondence, telephone, video and audio tapes, radio, and television. Currently, e-learning systems have become one of the most significant platforms to achieve the vision for wide-range, life-long training to a wide variety of audiences. In 2006, Mason, Chesemore, and Noord defined e-learning as a form of instruction delivered electronically to support learning through the use of tools like web conferencing, web-based tutorials, message boards, online assessments, and more. Mason et al. (2006) described the term e-learning in the following way:

E-learning includes self-paced learning; asynchronous facilitator-led learning, where the students and instructors interact at different times; and synchronous facilitator-led learning, where the students and instructors interact at a set time. The current trend among e-learning developers is to blend self-paced and facilitator-led modules to create a single, interactive experience. (p. 41)

E-learning systems are considered an innovation of information technology (IT), especially in the education field. Studies have shown that e-learning systems are very beneficial because they provide flexibility and ongoing access to learning resources (Bostrom, 2003; Parker, 2003). Online courses, or e-learning courses, are becoming an increasingly important part of higher education institutions (Ngai, Poon, & Chan, 2007). The e-learning courses and e-learning systems provide multiple features for the instructors and learners to save time and cost by eliminating distance. Therefore, the e-learners can access

the learning process from anywhere and at any time, which leads to increasing the students' learning productivity and efficacy (Vidyashree & Kumar, 2016). Khazaal (2015) and Yeh (2007) studies conducted on e-learning systems exhibited its importance in education to help e-learners achieve high educational goals and acquire problem-solving skills and critical thinking. Lee, Yoon, and Lee (2009) researched the success standards of e-learning by implementing an e-learning method for a core course in business. During this study the researchers focused on examining the system quality, information quality, service quality, use, user satisfaction, and net benefits. The results of this study showed that the perceived ease of use was the weakest factor that affected the intention to use e-learning. As reported by Arif et al. (2015), innovations in e-learning techniques began to circulate among the rapid development in internet communication technology and artificial intelligence techniques. Users are demanding new e-learning techniques that are accessible everywhere, an intense and powerful feature, but also cost-effective. Internet enabled e-learning techniques are increasing rapidly, but the need for self-assessment, self-examining, and self-tutoring technologies still exists.

Using e-learning systems could help solve many of the problems facing Saudi universities. The problem is the lack of capacity to annually absorb increasing numbers of high school graduates. This study focuses on examining the factors affecting the King Faisal University (KFU) faculty members' intent to use the e-learning system at KFU. The faculty members at KFU have the option to use the e-learning system for instruction.

KFU is located in the eastern province of Saudi Arabia. It is a public university that was established in 1975. At the time of inauguration, KFU comprised four colleges: Agriculture and Food Science, Veterinary Medicine and Animal Resources, Medicine, and

Architecture. By 2017, the number of colleges at KFU has risen to 14 and includes the following: Agriculture and Food Sciences, Veterinary Medicine and Animal Resources, Medicine, Engineering, Clinical Pharmacy, Science, Computer Science and Information Technology, Business Administration, Education, Arts, Applied Studies and Community Service, Applied Medical Sciences, Dentistry, and Law (King Faisal University, 2017a).

### **Statement of the Problem**

In spite of the demand for e-learning systems, the faculty members at Saudi universities have been slow to use this technology. Barakat and Hussein (2011) showed positive attitudes of Saudi universities' faculty members toward e-learning management systems, even though it has not been sufficiently activated as yet. Furthermore, Barakat and Hussein pointed out that the faculty members at Saudi universities need training in order to use the system and its tools effectively. This creates a need to study the factors that impact the intent of faculty members at a Saudi university to use the e-learning system.

### **Purpose of Study**

Using a quantitative methodology, this study examines the factors affecting faculty members' intent to use the e-learning system, which has not been studied, at a university within the Kingdom of Saudi Arabia (KSA).

### **Nature and Significance of the Problem**

Recently, the Saudi Arabia Ministry of Education has been investing toward improving the educational e-learning systems to make the learning accessible to many people regardless of their location. Besides faculty perceptions on e-learning, Santilli and Beck (2005) concluded that e-learning basically focused on the experiences of online learners. However, Clark (1993) found that respondents accepted distance education if they had

previous experience with the system. More importantly, there is a lack of research about the user's perceptions toward the e-learning system security, which needs to be studied in order to achieve the e-learning systems' effectiveness. Therefore, in this study the researcher assesses the effect of faculty perceptions toward the existing security of the e-learning system and if it impacts the faculty members' intent to use e-learning. Alsabawy, Cater-Steel, and Soar (2013) conducted a study on an academic staff sample, and confirmed the significant impact of IT infrastructure services on the success of e-learning systems via enhancing perceived usefulness and organizational value. The effects of IT infrastructure services on user satisfaction and customer value were not significant. However, perceived usefulness had significant effects on satisfaction and customer value. In addition, the results confirmed the critical role of usefulness and satisfaction in enhancing customer value. However, this study found perceived credibility as another important factor affecting users' intention to use e-learning. Ong, Lai, and Wang (2004) concluded that it is important "to develop e-learning with a trustworthy protection of education records to assure e-learners that they are free of privacy and security threats" (p. 801).

Many researchers have believed that the perceived usefulness (PU) and perceived ease of use (PEOU) are the most important factors that need to be investigated to see its influence on acceptance of using the e-learning system. Ong et al. (2004) indicated in their study that the most significant factors that affect users' acceptance of e-learning were PU and PEOU. According to Abu-Shanab (2014), students who used the EduWave e-learning system perceived the usefulness as low, but teachers perceived it as high. Also, students perceived the system easier to use than teachers. In this study, the result showed a significant influence of both PU and PEOU for both teachers and students (Abu-Shanab, 2014).

Available research on using e-learning systems in higher education institutes state that information security is one of the largest challenges facing the educational institutions due to the open environment through network connectivity. As reported by Koskosas, Kakoulidis, and Siomos (2011), the key purpose of information security is to protect information and, specifically, the integrity, confidentiality, authenticity, and availability of data through an organization's network and communication channels.

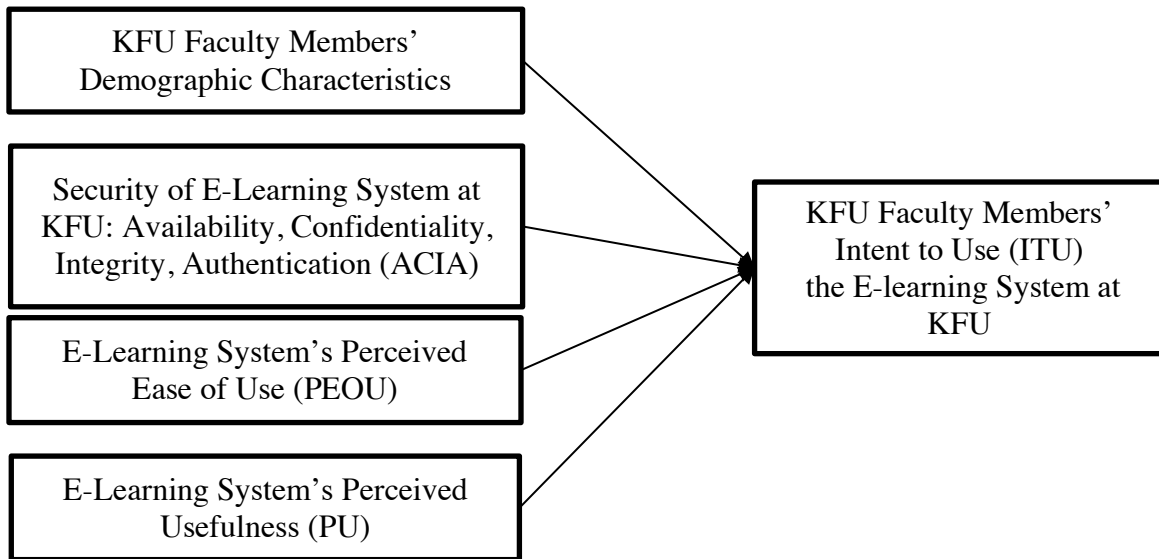
The outcomes of the current study help to determine the impact of the university's faculty members' demographic characteristics, perceptions toward existing security of the e-learning system, PEOU, and PU towards the e-learning system on their intent to use the e-learning system. The determination of such factors is expected to enhance the understanding of university faculty members' intent to use e-learning systems for their instruction.

### **Objective of the Research**

This study seeks to gain a better understanding of faculty members' demographic characteristics and perceptions toward three main factors: security for the e-learning system, PEOU, and PU of the e-learning system; and how those factors affect their intent to use the e-learning system at a university within KSA. Thus, the dependent variable for this study is intent to use the e-learning system, which has been widely applied in the prior technology acceptance research. As reported by Ajzen and Fishbein (1980), the individual behavioral intentions to use the system are considered a valid predictor of the actual system use. Figure 1 shows the conceptual model for this research study of KFU faculty members' intent to use the e-learning system at KFU. As shown in Figure 1, faculty members' intent to use the e-learning system is conceptualized to be related to their demographic characteristics, their



perception of the e-learning system's security, and their perceptions of the e-learning system's PEOU and PU.



*Figure 1.* The conceptual model of the study.

The main goal of this study was to investigate the effect of four independent variables (faculty members' demographic characteristics; Availability, Confidentiality, Integrity, and Authentication [ACIA]; PEOU; and PU) on the faculty members' intent to use the e-learning system at KFU (the study dependent variable). There were four specific goals of this study. The first specific goal of this study was to assess the effect of KFU faculty members' demographic characteristics, such as age, gender, college, and years teaching experience, on their intent to use the e-learning system. According to Abbasi, Tarhini, Hassouna, and Shah (2015), the demographic variables (e.g., age, gender, and experience) play an important role in the acceptance of technology. The second specific goal of this study was to assess the effect of KFU faculty members' perceptions toward the effectiveness of existing security for the e-learning system, including ACIA, on their intent to use the e-learning system.

Currently, the security of the system becomes the main challenge facing all types of organizations. Thus, this issue creates a need to assess and direct more efforts to this factor because the users will not intend to use the e-learning system until they trust it (Asmaa & Najib, 2016; Serb, Defta, Magdalena, & Petrel, 2013). The third specific goal of this study was to assess the effect of KFU faculty members' PEOU on their intent to use the e-learning system. The fourth specific goal of this study was to assess the effect of KFU faculty members' PU on their intent to use the e-learning system. According to Ong et al. (2004), the PU and PEOU were the most significant factors that affect users' acceptance of e-learning.

The target population for this study was KFU faculty members. In this study, the intent to use the e-learning system was measured in terms of the possibility of KFU faculty members' use of an e-learning system for e-learning course instruction. This study focused on Blackboard as the KFU e-learning system due to its features and also because it is the commonly used system by instructors in all colleges within the KFU to support the educational process.

### **Research Questions and Hypotheses**

This study addresses the following research questions:

1. To what extent do the demographic characteristics of faculty members affect their intent to use KFU's e-learning system?
2. To what extent do faculty members' perceptions of the e-learning system's security affect their intent to use KFU's e-learning system?
3. To what extent do faculty member's perceived ease of use of the e-learning system affect their intent to use KFU's e-learning system?

4. To what extent do faculty members' perceived usefulness of the e-learning system affect their intent to use KFU's e-learning system?

The four study research questions were tested in the sample of KFU faculty members with the following research hypotheses:

H1o: There will be no significant effect of demographic characteristics on intent to use KFU's e-learning system.

H1: There will be a significant effect of demographic characteristics on intent to use KFU's e-learning system.

H2o: There will be no significant effect of perceptions of the e-learning system's security on intent to use KFU's e-learning system.

H2: There will be a significant effect of perceptions of the e-learning system's security on intent to use KFU's e-learning system.

H3o: There will be no significant effect of perceived ease of use of the e-learning system on intent to use KFU's e-learning system.

H3: There will be a significant effect of perceived ease of use of the e-learning system on intent to use KFU's e-learning system.

H4o: There will be no significant effect of perceived usefulness of the e-learning system on intent to use KFU's e-learning system.

H4: There will be a significant effect of perceived usefulness of the e-learning system on intent to use KFU's e-learning system.

### **Limitations and Delimitations**

The limitations and delimitations for this study are listed below:

1. This study is not exhaustive of all factors that affect faculty members' intent to use the e-learning system at their university; thus, this study examines only these factors: demographic characteristics, faculty members' perceptions of the e-learning system's existing security, PEOU, and PU.
2. This study is limited to only one university in Kingdom of Saudi Arabia, which is King Faisal University.
3. This study utilizes a random sample of faculty members who are teaching at KFU.
4. This study was conducted with faculty members in the academic year of 2017-2018.

### **Definition of Terms**

The following definitions are provided to ensure a clear understanding for some terms within the study.

- *E-learning Systems*: "A learning technology system that uses Web-browsers as the primary means of interaction with learners, and Internet or an intranet as the primary means of communication among its subsystems and with other systems. These systems work as platform to facilitate teaching and learning" (Ngai et al., 2007, p. 252).
- *Higher Education Institutions*: Public or nonprofit private institutions that provide an education after secondary schools including colleges, universities, graduate schools, professional schools, and other degree-granting institutions (U.S. Department of Education, 1998).

- *Information Security System*: “Effective implementation of policies to ensure confidentiality, availability, and integrity of information and assets to protect from theft, tampering, manipulation, or corruption” (Smith & Jamieson, 2006, p 24).
- *Intent to Use the E-learning Systems (ITU)*: In this study, the intent to use the e-learning system is assessed in terms of the likelihood of KFU faculty members using the e-learning system for teaching students rather than the face-to-face method (Ferdousi & Levy, 2010).
- *King Faisal University*: A public university that was founded in 1975 in the city of Al-Hassa in the eastern region of Saudi Arabia. The KFU contains a faculty population of 1,927 (62% are male and 38% are female). In contrast, the undergraduate population hosts 186,741 across its programs (39% male students and 61% female students, spread over 14 colleges and 75 different programs) and 1,778 students in postgraduate programs in 35 different programs (King Faisal University, 2017b).
- *Perceived Ease of Use (PEOU)*: “The degree to which a person believes that using a particular system would be free of effort” (Davis, 1989. p. 320).
- *Perceived Usefulness (PU)*: “The degree to which a person believes that using a particular system would enhance his or her job performance” (Davis, 1989, p. 320).

### **Assumptions**

Assumptions in this study are as follows:

1. Data were collected from actual faculty members of KFU who voluntarily consented to participate in the study.

2. Study participants were aware of the e-learning system regardless of their experience using it.
3. Study participants answered all items on the study survey truthfully.
4. The Arabic translation of four scales contained in the study survey was a culturally valid translation from the original English.

## **Chapter 2: Literature Review**

The purpose of this literature review is to examine the factors affecting the low number of a university's faculty members' intent to use the e-learning system. A quantitative method with the availability, confidentiality, integrity, and authentication (ACIA) threat modeling approach and technology acceptance model (TAM) are well suited to gain a better understanding of faculty members' perceptions toward these factors: perceived ease of use (PEOU) and perceived usefulness (PU) of the e-learning system, and how those factors affect their intent to use the e-learning system at a university within the Kingdom of Saudi Arabia (KSA). In their research, Davis, Bagozzi, and Warshaw (1989) noted that usage of an e-learning system displayed high levels of correlation with behavioral intention (BI) to use the system and that BI is a major determinant of a user's behavior. These theoretical frameworks provide a basis for the literature review, and most importantly, variables influence a university faculty members' intent to use the e-learning system.

### **E-learning Systems**

Online learning, or e-learning, provides an opportunity for learners to gain knowledge despite the amount of distance between learners and the learning environment. Almarashdeh, Sahari, Zin, and Alsmadi (2011) state that an e-learning system "provides instructors a platform to create and deliver the course content, assess learners' performance and monitor learner involvement" (p. 1). This gives an advantage for learners to access the learning process from different geographic areas. E-learning can be described in a simplified manner that consists of both information and communication technologies. According to Khan (2004), e-learning has an advantage by providing opportunities for learners to "create well-designed, learner-centered, engaging, interactive, affordable, efficient, easily accessible,

flexible and meaningful distributed and facilitated e-learning environments” (p. 39). The e-learning system has three key criteria: "updating, storing, exchanging information and its distribution; distributing the information to the end user using available Internet technology; and targeting a wide field of education" (Rosenberg, 2001, p. 36). There are various uses of an e-learning system in workplace learning, but common uses include “continuing education, computer-assisted training for professional development, computer-assisted occupational health and safety education, computer-assisted healthcare and nursing education, social media for informal learning, and knowledge management” (Cheng, Wang, Morch, Chen, Kinshuk & Spector, 2014, p. 65).

Chawdhry, Paullet, and Benjamin (2012) conducted a study on faculty perceptions toward e-learning systems used in April of 2009 by Central Michigan University academic affairs. The study results indicated that 51% of faculty members rated the factor of the online courses as very important to meet student needs for flexible access. In contrast, 80% of faculty members reported that the online instruction took more effort compared to face-to-face instruction (Central Michigan, 2009). Alexander, Perreault, Zhao, and Waldman (2009) conducted and compared a 2000 and 2006 study at business colleges in the U.S., which were accredited by the Association to Advance Collegiate Schools of Business, identifying and comparing the online learning experiences of students and faculty. Responses were collected from 140 faculty members in 2006 and compared with responses gained from 81 faculty members in 2000. This comparison indicated the faculty in both years possessed an overall satisfaction with their experience regarding online learning. Furthermore, 2000 and 2006 responses reported that faculty members felt the two most important factors for motivating enrollment in online learning courses were accessibility and flexibility (Alexander et al.,



2009).

There are various types of e-learning systems that have been used by several universities around the world to provide multiple features for instructors and learners (Al-Adwan, 2015). The King Faisal University (KFU) is characterized by a strong technical infrastructure, which makes private servers of e-learning systems work at a high level. The systems of e-learning management currently used at KFU are varied according to the objectives that the university seeks to achieve:

- Blackboard 9.0 system,
- Virtual Class Room system,
- Class Recording / Capturing Tools, and
- Online Exams. (King Faisal University, 2017c)

Despite the diversity of learning management systems applied in the universities in Saudi Arabia, it is clear that the pioneering approach of universities is to select the Blackboard system as a common system. This is due to the effectiveness of this system to achieve the goals that the universities wish to achieve. Therefore, this research focuses on Blackboard as the KFU e-learning system due to its features and because Blackboard is the commonly used system by faculty members in all colleges within KFU to support the educational process.

Blackboard is one of the most used systems by universities because it provides multiple services, as well as its reputation for security and prevalence over other systems. Blackboard is one of the most used applications that assist the delivery of asynchronous learning networks (ALNs). Kim, Hiltz, Scher, and Turoff (2003) stated that ALNs are

People networks for anytime-anywhere learning. ALN combines self-study with substantial, rapid, asynchronous interactivity with others. In ALN learners use computer and communications technologies to work with remote learning resources, including coaches and other learners, but without the requirement to be online at the same time. The most common ALN communication tool is the World Wide Web. (p. 5)

The Blackboard system is characterized by its wide spread and strength in terms of the stability of the electronic system and the comprehensiveness of its components of what the instructor needs, including supports by many functions, such as presentation of lessons and conversation between instructor and learner (Bradford, Porciello, Balkon, & Backus, 2007). Furthermore, it supports self-training and meets the requirements for building an independent virtual environment, while being the least expensive system between closed source learning systems (Ali, Hassoun, & Nima, 2009). A study by Almosa (2015) showed that American students choosing courses offered by distance learning have been increasing 150% over the past decade. E-learning is the second most valuable method of training because it provides 50% of the cost of instructors in the classroom, provides 60% of the time to prepare for lectures, and provides 90% of facility electrical energy (such as, lights, projectors, air conditions, etc.) compared to traditional education (Almosa, 2015). Furthermore, the growth rate of e-learning is 8.2% in the Middle East, which will return the gains of \$560 million in 2016 (Almosa, 2015).

### **Higher Education**

Since 2003, higher education enrollments in online programs have outgrown traditional education (Chawdhry et al., 2012). This leads to the need for universities to

provide students in online courses an ideal educational environment. Online programs have also become one of the most important challenges and threats facing Saudi universities, along with the separation of educational processes and distance from the requirements and developments of the labor market (National e-learning Center KSA, 2015). As reported by Khazaal (2015) and Yeh (2007), these courses provide students with skills in technology, problem-solving, and critical thinking. Students in these environments must seek out their own education and push themselves to achieve high educational goals, a skill which may not be learned in face-to-face classrooms. These technological skills are currently required by organizations providing physical goods or services. However, the curriculum and skillset presently offered by Saudi universities do not match the demand required. Saudi universities' current outcomes range from weak to medium in contributing to serving society (Al Harbi, 2012; Rawashdeh, 2012). The current learning method is not effective in training students for the workforce.

The Ministry of Education, in the Kingdom of Saudi Arabia, is moving to use e-learning and distance learning systems in all of its facilities and educational institutions (National e-learning Center KSA, 2015). The goal of the Saudi Arabian Ministry of Education is to make education accessible to many people at the lowest cost (Jabli & Qahmash, 2013). A study by Jabli and Qahmash (2013) concluded that if the e-learning system has been implemented correctly, it will have the ability to provide a higher education to a large group of people, regardless of their location, by sharing knowledge and information faster and cheaper via the internet and other communication technologies.

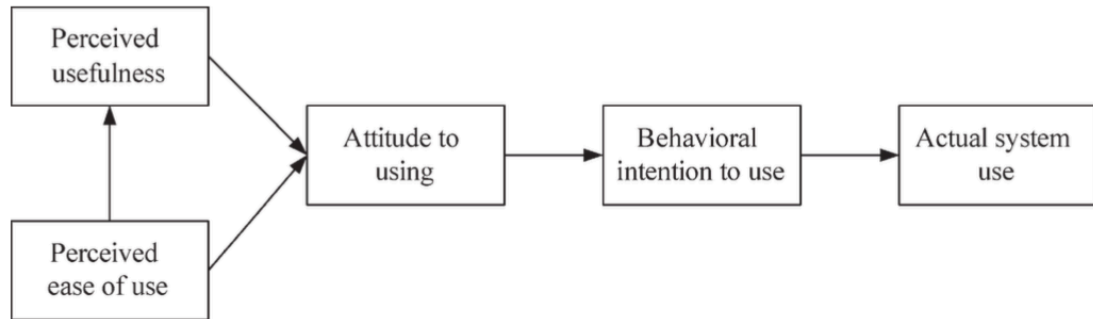
Walker et al. (2014) evaluated how using technology enhanced learning tools impacted pedagogic practices in UK higher education institutions. The study results showed

that most staff believed e-learning had a positive impact on their teaching practice.

Furthermore, the evaluations showed that the effective use of technology enhanced learning tools has a possibility to improve pedagogic practice.

### **Intent to Use and Actual Use of an E-learning System**

According to Roca, Chiu, and Martínez (2006), the technology acceptance model (TAM; Davis, 1989; Davis et al., 1989) adapted from the theory of reasoned action (TRA) (Ajzen & Fishbein, 1980; 1975) proposes that two beliefs, perceived usefulness and perceived ease of use, are the main drivers and are influential in acceptance of using technological systems. In 2008, Wu, Shen, Lin, Greenes, and Bates presented that the original TAM was based on two primary factors: perceived ease of use and perceived usefulness of a system. Both factors determine an individual's attitude towards using the system and then indicate that individual's behavioral intention to use that system for future work, ending with the actual system use (Figure 2). Perceived usefulness is defined as "the degree to which a person believes that using a particular system would enhance his/ her job performance," and perceived ease of use is defined as "the degree to which a person believes that using a particular system would be free of physical and mental effort" (Davis, 1989, p. 320). Moreover, "perceived usefulness and perceived ease of use both affect a person's attitude toward using the system, and consistent with TRA, these attitudes toward using the system determine behavioral intentions, which in turn lead to actual system use" (Roca, Chiu, and Martínez, 2006, p. 684). The causal relationships have been validated and tested by numerous empirical research studies of user acceptance (Mathieson, 1991; Moon & Kim, 2001; Taylor & Todd, 1995; Venkatesh, 2000; Venkatesh & Davis, 1996, 2000).



*Figure 2.* The original TAM. Reprinted from “User acceptance of computer technology: A comparison of two theoretical models,” by F. D. Davis, R. P. Bagozzi & P. R. Warshaw, 1989, *Management Science*, 35(8), 982-1003.

According to Khan, Hasan, and Clement (2012), the use of e-learning in schools can promote collaboration, active learning, and lifelong learning. Additionally, this study mentioned that the use of e-learning could increase student motivation and deepen understanding. Furthermore, the research claimed e-learning provides better access to information and shared working resources and helps students to think and communicate creatively. The study by King and Boyatt (2014) found 48 faculty members at the University of Warwick were surveyed to investigate the factors that influence the use of e-learning in higher education. The researchers found that to reach the successful implementation of e-learning, university administration must continuously develop the institutional infrastructure and culture to support e-learning use. Furthermore, the researchers suggested, to reach the success of using e-learning, universities need to develop an institutional e-learning strategy, with a shared vision of the staff needs and concerns, for whom are responsible for implementation. Additionally, the strategy must determine the outlining expectations for staff and students and must also reflect the obligation of the leadership team.

Emelyanova and Voronina (2014) indicated “much of an e-learning program success or failure can be attributed to how it is organized, managed, and adopted” (p. 273). Al-Busaidi and Al-Shihi (2012) showed that the factors that influence the faculty’s satisfaction were the technology’s acceptance and the personal innovativeness. The Stewart, Bachman, and Johson (2010) study sought to predict the faculty intention to teach online courses. The researchers found that the faculty who perceived the system as easy to use were more likely to use it; in contrast, the faculty who endorsed the traditional learning were hesitant to use the e-learning (Stewart, Bachman, & Johson, 2010). Abdekhoda, Dehnad, Mirsaeed, and Gavgani (2016) indicated that the behavior intention had direct and significant effects towards use of e-learning by faculty members in Tabriz University of Medical Sciences. A study by Binyamin, Rutter, and Smith (2017) investigated the acceptance of learning management systems, such as Blackboard, at King Abdulaziz University based on the Saudi students’ perceptions. Results showed that students’ actual use is influenced by the behavioral intention that is affected by students’ attitude and perceived usefulness. Moreover, the perceived ease of use has an effect on the students’ attitude and perceived usefulness as alike towards students’ acceptance of learning management systems in Saudi Arabia. In 2014, Muniasamy, Ejalani, and Anandhavalli investigated learners’ perception and acceptance of the e-learning system in King Khalid University through assessment of the relationships among perceived usefulness, perceived ease of use, attitude towards using, and behavioral intention to use the technology. The research results indicated that the TAM played a core role in predicting and understanding users’ behavior and intention to use the e-learning system. Moreover, the study findings showed that the perceived ease of use and

perceived usefulness directly affected the students' attitude toward using the e-learning system, as well as predicting application usage.

A study by Hua (2009) concluded that both perceived ease of use and security have a significant impact on users' use. Moreover, this study found that the perceived ease of use factor is less important than security and clarified that "security is the most important factor influencing user's adoption" (p. 1). In research by Roca et al., (2006) the results indicated that users' continuance intention is determined by satisfaction, which in turn is determined jointly by perceived usefulness, information quality, confirmation, service quality, system quality, perceived ease of use and cognitive absorption. Research by Alfayyaz, Gómez, and Ivanov (2016) explored the relationship between technology readiness, attitudes, and behavioral intentions towards e-learning technologies use within an education institution context. This study's results showed that there are no significant differences among the research variables between instructors at two universities located in Egypt and UAE. A 2016 study by Kisanga provided evidence of teacher perspectives towards using e-learning having a significant effect on students' attitude towards e-learning due to the key role played by teachers as primary stakeholders of education.

Investigating the use of e-service in Saudi Arabia, research by Al-Ghaith, Sanzogni, and Sandhu (2010) found that Saudi women were more likely to use e-learning services than Saudi men. As presented by Heerink, Kröse, Wielinga, and Evers (2008), the acceptance of technology is determined through the behavioral intention to use a system and assumes this intention predicts the actual use. Thus, the faculty members' intent to use an e-learning system is considered a valid predictor of faculty members' actual use of an e-learning system (Premkumar & Bhattacharjee, 2008). This dissertation examines the factors that affect the

faculty intent to use an e-learning system rather than actual use by faculty members of an e-learning system, which is not included in this dissertation.

### **Demographic Characteristics**

Nawaz and Kundi (2010) stated that there are documented differences between success and failure factors, such as demographic variations, in developed and developing countries in regard to the development and use of e-learning in higher education institutions. These differences are largely due to demographic variations in the context of e-learning development and use. Nawaz and Kundi (2010) suggested the measuring and assessing of demographic variations is indispensable to obtain the true picture of phenomena in practice. Hussein (2011) revealed that faculty members in Saudi universities have positive attitudes towards using the e-learning management system, JUSUR. The researchers noted, faculty members at Saudi universities needed training in using the system, in particular, learning content management and file sharing, forums, and questions bank. Results indicated no difference in attitude towards using the system among the faculty members regarding gender or the types of colleges, whether humanities, scientific, or health.

As reported by Abbasi et al. (2015), the key demographic variables that play an important role in moderating the effect on individuals' acceptance of technology were age and experience. Research has shown (Chung, Park, Wang, Fulk, & McLaughlin, 2010; Porter & Donthu, 2006; Sun & Zhang, 2006; Venkatesh, Morris, Davis, & Davis, 2003; Wang, Wu, & Wang, 2009) age to be an important demographic variable that has direct and moderating effects on individuals' behavioral intention, use, and acceptance of technology.



### **Security of E-learning Systems**

Despite the benefits of e-learning, there are also some challenges in achieving successful implementation of e-learning (Alwi & Fan, 2010). Since the e-learning systems are open source, an important challenge in security is ensuring that only certain people have access to specific information at the specific times (Vadalasetty, 2003). Currently, the security of information systems is a major challenge for all types of organizations. Therefore, a need is created to study it and direct more efforts to the security of e-learning systems because people will not use e-learning systems until they trust them (Asmaa & Najib, 2016; Serb et al., 2013). Weippl (2005) indicated that the “information security includes computer security and communication security” (p. 4). A study by El-Khatib, Korba, Xu, and Yee (2003) stated that despite the importance of information security in e-learning to protect data from damages and maintain privacy, it has been ignored and rarely discussed. Asmaa and Najib (2016) stated that “the information system and the sensitive data of an organization are its most important capital, which should be protected against unauthorized access” (p. 194).

Due to multiple technical possibilities that are offered through internet connections, several risks and threats of cases are created via information system, such as violations of the integrity for the system through behavior made in a reckless manner. Furthermore, there are malignant people who exploit vulnerabilities in the system to infiltrate and collect sensitive information, via viruses or Trojans placed to harm the system (Asmaa & Najib, 2016). This was similarly found in a study by Webber, Lima, Casa, and Ribeiro (2007), which found a lot of effort had been put towards the e-learning system on the distributed learning environments that lead to security issues, which were difficult to address due to the diversity of clients, servers, databases, and components that need to be integrated. In order to avoid that, the

researchers found that the university IT staff needed to create, and implement, trustworthy systems that can be relied upon to face the malice.

Asmaa and Najib (2016) indicated that e-learning became a more interactive platform through the interactions between learners and instructors, or learners and learners, by using various learning tools. The e-learning tools provide for the learner the ability to share material in different formats, such as video, slideshows, and PDFs, and to communicate with the instructor via chat in live online classes. Therefore, it became the main objective in the e-learning security to ensure the availability, confidentiality, integrity, and authentication of information from loss or damages during interactions among the learners or learners with instructors (Alwi & Fan, 2010).

The availability, confidentiality, integrity, and authentication (ACIA) metrics need to be taken into consideration when creating a plan to protect an e-learning system from any threats that may cause harm for the system. Asmaa and Najib (2016) stated that availability “is best ensured by rigorously maintaining all hardware, performing hardware repairs immediately when needed and maintaining a correctly functioning operating system environment that is free of software conflicts” (p. 194). Network service can be unavailable due to heavy traffic conditions or hardware / software failure, but it can also disrupt the service due to malicious attacks that try to deny service. Confidentiality, defined by Mohammad, Awadhi, Kananah and Job (2012), is "measures undertaken to ensure confidentiality are designed to prevent sensitive information from reaching the wrong people, while making sure that the right people can in fact get it" (p. 484). Therefore, the main objective of confidentiality is to keep the information in an e-learning system from being disclosed to anyone not authorized to access it. Integrity is defined by Mohammad, et al

(2012) as "measures are taken to protect data from transmission errors, but users may also wish to be protected from a message being changed deliberately for malicious reasons, also defines what rights and services the end user is allowed once server access is granted" (p. 484). Integrity includes maintaining the consistency, accuracy, and trustworthiness of the data across its entire life cycle. Authentication, defined by Mohammad et al. (2012), is "a user may want to be sure that a received message was sent by the user whom they purport to be and not by someone masquerading as another. Authentication involves validating the end users' identity prior to permit them server access" (p. 484). These ACIA metrics played an important role to achieve the user acceptance of information technology applications, because the users will be more trusting of the e-learning system if it meets these main criteria.

Threats can lead to attacks that affect the availability and the quality of system resources, which requires the application to be aware of the possible effects to deal with and survive them (Mohammad et al., 2012). To avoid all of these threats, the e-learning system users need to consider the controls or countermeasures to make the e-learning system secure and impenetrable. There are several types of countermeasures in security used to protect the system from infiltration and damage, such as access control, which plays an important role in granting the four security metrics of computing: availability, confidentiality, integrity and authentication (Asmaa & Najib, 2016). These four metrics are important to protect the system and prevent unauthorized modification or disclosure of resources. This is done through ratification that the authorized user is only allowed and has the right to implement the required actions within the system (Wallace, Lin, & Cefaratti, 2011).

A study by Alwi and Fan (2010) was conducted to gather instructor's and IT support's perceptions from various institutions within higher education in the UK, towards the e-learning information security threat. To do so, the researchers in this study aimed to find the relationship between the information security awareness level among users and their perception of security. The result for this study reflected that there is no significant difference on users' perceptions of security in e-learning between the level of information security awareness and their effect of information security threats (Alwi & Fan, 2010). However, Eibl (2010) "concluded that organizational security and human behavior are of major concern for e-learning security, since technical aspects can more easily be established and controlled by protective systems" (p. 115).

#### **Perceived Ease of Use and Perceived Usefulness**

In 2013, Ho, Ke, and Liu stated the importance to understanding the factors that affect users' acceptance of e-learning systems in order to reach the success of using an e-learning system. Study results showed strengthened effects of perceived ease of use (PEOU) and weakened the effects of perceived usefulness (PU) on the users' attitudes toward using the system. Moreover, results indicated, when top management selects an e-learning system to implement in organizations, organizations tend to focus more on the PEOU aspects of the system. In contrast, students tend to focus more on PU when they use the system.

According to Emelyanova and Voronina (2014), the study results showed that the instructors' perceptions toward the PEOU factor is dependent on their way of using the system, and their beliefs toward the effectiveness of this instructional tool. However, Almarashdeh et al. (2011) found that the key factor that impacted the instructor behavior intention to use the e-learning system was the PEOU more than PU. Ma, Andersson, and

Streith (2005) investigated on teachers' acceptance/use of computer technology through collected data from 84 completed surveys of teachers at a local university in Sweden. This study aimed to explore and identify the main intention determinants of teachers' computer technology use. The study result found that the two factors that determine use of computer technology were PU and PEOU. Moreover, teachers' PU of computer technology had a direct significant effect on their intention to use it. However, teachers' PEOU of computer technology had an indirect significant effect on intention to use.

The study results by Yuen and Ma (2008) were surprising to them due to contrary previous studies towards teacher attitudes, acceptance, and use of the e-learning technology. The PEOU became the only determinant to the predictions of a teacher's intention to use e-learning technology, and PU was non-significant to the predictions of a teacher's intention to use e-learning technology. Luan and Teo (2009) conducted a study investigating the technology acceptance of 245 Malaysian teachers. This study found the key factors that signify determinants of teachers' intentions to use computers were PU of computer technology, PEOU, and attitude towards computer use. Kisanga (2016) found similar results for teachers' behavioral intention to use e-learning was determined by teachers' attitudes towards e-learning in Tanzanian higher learning institutions and that the majority of teachers had positive attitudes towards e-learning. Hu, Clark, and Ma (2003) explained the technology acceptance decisions by teachers, suggesting a prominent and significant influence path from job relevance to PU and then user acceptance.

A study by Fathema, Shannon, and Ross (2015) found that system quality (SQ) had significant positive effects on PEOU and PU on the use of Learning Management System (LMS) by faculty members in higher educational institutions. Moreover, the study results

generally supported the research connecting the strong relationships among PU, PEOU, and attitudes toward using LMS. In line with previous findings, this study revealed significant impacts of PU (Holden & Rada, 2011) and PEOU (Lee, Hsieh, & Chen 2013) on faculty attitudes towards LMS.

### **Theoretical Framework**

The theoretical framework used for this study was the availability, confidentiality, integrity, and authentication (ACIA) threat modeling approach and technology acceptance model (TAM). ACIA has the advantage of testing the most important characteristics of an e-learning system for end-user security (Nickolova & Nickolov, 2007). The TAM is also appropriate to use since it is one of the most successful measurements for effective computer usage among practitioners and academics (Kabanda, 2014). The e-learning system is relatively new for the majority of faculty members at a university in KSA. The researcher investigates the relationship of various factors and if they have any effect on the faculty decision to accept and the intent to use this technology in the process of teaching, and as a result, replace the existing method of face-to-face teaching.

The ACIA represents an important role in the security management of LMS. Therefore, ACIA was applied in this study to examine the security requirements of the e-learning system. These four standards are used in order to evaluate the strength of e-learning system security at a university in KSA.

The TAM originally proposed by Fred Davis in 1986 has been "proven to be theoretical model in helping to explain and predict user behavior of information technology" (Park, 2009, p. 151). TAM is considered as an adaptation of the theory of reasoned action and is specifically tailored for modeling user acceptance of information systems. The TAM is

based on two main assumptions: PU and PEOU. The purpose of TAM is to assess the user acceptance of emerging information technology. Furthermore, the TAM is more specific and applies only to the use of computers (usage behavior) and addresses the human-computer interface. An important factor in TAM is to trace the impact of external factors on internal beliefs, attitudes, and intentions. To apply this model, the researcher should consider some elements. These elements are the key factors affecting the university faculty members' decision towards their intent to use the e-learning system. Two main factors are addressed through TAM. First, PEOU refers to the degree to which the prospective faculty members at a university in KSA expect the target system (e-learning) to be free of effort. PEOU could be tested through the following scales: easy to learn, clear and understandable, easy to become skillful, easy to use, controllable, and easy to remember. Second, PU indicates the degree to which the prospective faculty members at a university in KSA expect that use of the new technology (e-learning) will increase the faculty members' performance within the university context. PU could be tested through the following scales: work more quickly, job performance, increased productivity, effectiveness, makes job easier, and usefulness.

The previous studies' results demonstrated that the TAM is an excellent theoretical tool to understand users' acceptance of e-learning. Therefore, by using these frameworks, the researcher is able to understand the relationships between the research variables to reach results that decide the factors that affect the university faculty members' intent to use the e-learning system.

### **Chapter 3: Methodology**

This study examined factors affecting King Faisal University (KFU) faculty members' intent to use the e-learning system at KFU. This study utilized quantitative survey methodology, commonly used in information security research (Niekerk & Solms, 2010). This method was appropriate for examining the quantitative survey responses obtained from the faculty participants on their perceptions about the e-learning system and their intent to use the e-learning system at KFU. This chapter presents the study methodology in terms of research design, survey instrument development, validity and reliability of the study survey instrument, population and sample, human subjects approval, data collection, and data analysis.

#### **Research Design**

This quantitative research study was designed to investigate faculty members' intent to use an e-learning system. A cross-sectional survey design using anonymous survey data collected from KFU faculty members was utilized to test the relationship between four independent variables and one dependent variable. The researcher identified which independent variables affected the faculty members' intent to use the e-learning system.

#### **Survey Instrument Development**

The four independent variables in this study refer to (a) the faculty members' demographic characteristics; (b) the faculty members' perceptions of the security of KFU's e-learning system in terms of availability, confidentiality, integrity, and authentication (ACIA); (c) the perceived ease of use (PEOU) of KFU's e-learning system; and (d) the perceived usefulness (PU) of KFU's e-learning system. The survey instrument also measured the study dependent variable: KFU faculty members' intent to use (ITU) KFU's e-learning



system. Data were collected from an online survey instrument available in both Arabic and English languages.

The original version of the ACIA, PEOU, PU, and ITU scales (see Appendix C) needed to be translated into the Arabic language to verify that the original version of the scale matched the translated version in terms of meaning and concept. To do that, the researcher translated the original scale from English (the original language of the scale) into the Arabic language (the native language in Saudi Arabia). The researcher prepared a primary Arabic version of the ACIA, PEOU, PU, and ITU scales. Then, both versions, the English (original scale) and Arabic (translated scale), are applied in this study.

The original English versions of the ACIA, PEOU, PU and ITU scales and translated scale were sent to four experts who are proficient in both languages in the field of technology and research to gather their comments about match concepts and meaning. Two experts held leadership positions at their university as vice president and dean of computer science and information technology. The other two experts were university faculty members who specialize in statistics and research. The experts' comments and suggestions were incorporated into the final English and translated instruments.

The ACIA scale is comprised of 12 items scored along a 4-point Likert scale: 1 = *rarely*, 4 = *always*. The PEOU scale is comprised of three items scored along a 5-point Likert scale: 1 = *strongly disagree*, 5 = *strongly agree*. The PU scale is comprised of four items scored along the same 5-point Likert scale as the PEOU scale. The ITU scale is comprised of three items scored along a 5-point Likert scale: 1 = *very unlikely*, 5 = *very likely*. A request to the copyright owners of the ACIA scale (Mohammad et al., 2012), the PU and PEOU scales

(Selim, 2003), and the ITU scale (Brown & Venkatesh, 2005; Selim, 2003) were gathered to obtain permission to use the instruments in this study.

**Measure of the availability, confidentiality, integrity, and authentication (ACIA) scale.**

The ACIA scale measured faculty members' perceptions of the security of KFU's e-learning system in terms of availability, confidentiality, integrity, and authentication. Items in the ACIA scale were adapted from surveys developed and validated by Mohammad, Awadhi, Kananah, and Job (2012). The instrument used by Mohammad et al. included 15 items for ACIA. In their instrument, the internal consistency reliability for ACIA was .76. Items A1 through A12 in the ACIA measured university faculty members' perceptions toward the existing security of the e-learning system and if it would impact the faculty members' intent to use e-learning. These 12 items were used in this study instrument to measure the KFU faculty members' perceptions toward their intent to use the e-learning system.

**Measure of the perceived ease of use (PEOU).**

Items for PEOU in the instrument were adapted from surveys developed and validated by Davis. Davis' PEOU scale attained Cronbach's alpha reliability of .93. Selim (2003) adapted six items for the PEOU construct in his instrument from Davis's TAM model. The Cronbach's alpha composite reliability for the PEOU construct was .91. The items PEOU1 through PEOU3 in the instrument measured university faculty members' PEOU effect on their intent to use the e-learning system. The items PEOU1 through PEOU3 were adapted from the measures developed by Davis as well as by Selim.

**Measure of the perceived usefulness (PU).**

PU scale attained Cronbach's alpha reliability of .97. Selim (2003) adapted six items

for the PU construct in his instrument from Davis' TAM model. The Cronbach's alpha composite reliability for the PU construct was .91. The items PU1 through PU4 in the instrument measured university faculty members' PU effect on their intent to use the e-learning system. The items PU1 through PU4 were adapted from the measures developed by Davis as well as by Selim.

**Measure of the intent to use (ITU) the e-learning system.**

Items for ITU in the instrument were adapted from surveys developed and validated by Brown and Venkatesh (2005) as well as by Selim (2003). Brown and Venkatesh's instrument included one item for ITU. In their instrument, the internal consistency reliability for IU was .90. The items ITU3 in the instrument were adapted from Brown and Venkatesh's measure. The Cronbach's alpha for ITU in Selim's instrument was .91. The items ITU1 through ITU2 in the instrument were adapted from Selim's measure.

**Validity and Reliability**

The validity and reliability of the instrument was tested in the context of this study. The content validity and reliability of the study instrument were examined in order to develop a valid and reliable instrument. According to Baudreau et al. (2001), "Content validity is the degree to which items in an instrument reflect the content universe to which the instrument will be generalized" (p. 5). Therefore, this study assessed the content validity of the survey by sending both versions of the study instruments to four experts in the field of technology and research who are proficient in both languages (English and Arabic) to gather their feedback and opinion regarding the translation and matching concepts and meaning in order to reach the content validity.

The concept of reliability refers to the consistency of a given measure or instrument. This study measured the consistency of each of the four scales contained in the survey instrument via Cronbach's coefficient alpha test of internal consistency (Cronbach, 1951). Cronbach's coefficient alpha ranges from 0 (*completely unreliable*) to 1 (*perfectly reliable*) (Lewis et al., 2005). In this study, reliability of each scale was evaluated using alpha values  $\geq .7$  as statistical evidence of reliability (Cronbach & Meehl, 1955; Hinkin, 1998).

### Population and Sample

The study sample was randomly selected from the target population of faculty members at KFU. Email invitations to participate were distributed by the KFU Deanship of Information Technology to all faculty members who teach within the university. As shown in Table 1, the total study population in the 2017/2018 academic year was 1,927 faculty members from 14 colleges. The study population was comprised of 62% males ( $n = 1191$ ) and 38% females ( $n = 736$ ). The largest number of faculty in the population were from the Colleges of Arts, Education, and Science.

Table 1

*Study Population (KFU Faculty Members 2017 Distribution by Gender and College)*

College	Males	%	Females	%
Agriculture Sciences & Food	126	79.2	33	20.8
Applied Medical Sciences	21	50.0	21	50.0
Applied Studies	23	42.6	31	57.4
Arts	170	51.1	163	48.9
Business Administration	142	70.0	61	30.0
Clinical Pharmacy	53	63.1	31	36.9
Computer Sciences & Information Technology	68	73.1	25	26.9
Dentistry	21	91.3	2	8.7
Education	135	50.4	133	49.6
Engineering	58	95.1	3	4.9
Law	29	70.7	12	29.3
Medicine	140	69.0	63	31.0
Science	118	42.8	158	57.2

Veterinary Medicine	87	100.0	0	.0
<b>Total = 1,927 Faculty</b>	<b>1191</b>	<b>61.8</b>	<b>736</b>	<b>38.2</b>

*Note:* Adapted from Deanship of Faculty Affairs (2017). Statistics faculty members for 2017, Unpublished reports. King Faisal University, Saudi Arabia, p. (2).

To create a random sample of faculty from the population of faculty at KFU, the Deanship of Information Technology at KFU distributed an email invitation to participate to all faculty. The following steps were followed for selection of participants. First, lists of faculty members were obtained from the Deanship of Faculty Affairs at KFU, and the survey was distributed according to their colleges and their gender. Second, to ensure that the sample was representative of the real population, the researcher's determined the study sample according to the percentage of faculty in each college. After distributing the questionnaires to the study population (1,927), as shown in Table 2, the study sample was comprised of 219 faculty members, consisting of 127 (58%) males and 92 (42%) females, yielding a response rate of 11.3%. Similar to the population characteristics, the largest number of respondents in the sample were from the Colleges of Arts, Education, and Science.

Table 2

*Study Sample Distribution by Gender and College*

College	Males	%	Females	%
Agriculture Sciences & Food	13	59.1	9	40.9
Applied Medical Sciences	1	9.1	10	90.9
Applied Studies	2	40.0	3	60.0
Arts	21	61.8	13	38.2
Business Administration	11	45.8	13	54.2
Clinical Pharmacy	2	66.7	1	33.3
Computer Sciences & Information Technology	11	57.9	8	42.1
Dentistry	2	100.0	0	.0
Education	20	60.6	13	39.4
Engineering	12	100.0	0	.0
Law	3	75.0	1	25.0
Medicine	9	56.3	7	43.8

Science	15	51.7	14	48.3
Veterinary Medicine	5	100.0	0	.0
<b>Total = 219 Faculty</b>	127	58.0	92	42.0

### **Human Subjects Approval**

Human subjects approval was obtained from both Eastern Michigan University (EMU) and King Faisal University subjects review committees to ensure human subject safety and informed consent (see Appendix A for the study's informed consent). First, the researcher obtained approval from KFU subjects review committee. The researcher then submitted the KFU approval documents along with the EMU documents required to EMU Human Subjects Review Committee (see Appendix B).

### **Data Collection**

This quantitative research studied the factors affecting faculty members' intent to use an e-learning system. Data were collected from participants who completed an online survey using Qualtrics® survey software. To maintain privacy and the freedom to express perceptions, the participants' names were not used in this study. Study participants were recruited via email invitation, which contained a link to the online survey. All obtained anonymous survey data were stored in a password-protected computer file.

To facilitate data collection from the study sample, the study survey instrument was administered in either Arabic or English languages. Creation of an Arabic survey instrument required the original English version of each scale contained in the survey to be translated into Arabic. The content validity of the Arabic version of the study instrument was evaluated using four experts in the field of technology and research who are proficient in both the English and Arabic languages. These experts provided feedback regarding the Arabic and English versions of the survey to maximize content validity. The reliability of each of the

four scales contained in the survey instrument was evaluated by using Cronbach's coefficient alpha test of internal consistency. The English version of the survey (see Appendix C) consists of items that were found to be reliable and valid in the literature. The Arabic version of the survey is presented in Appendix D.

A link to the survey was delivered to university faculty members through email by the KFU Deanship of Information Technology. The participants were informed the survey would be available for one month. To increase response rate, the KFU Deanship of Information Technology sent weekly email reminders to faculty members. After the survey was closed, the data were automatically saved into the database of Qualtrics®, exported to Microsoft Excel, and then imported into SPSS 25.0 for data analysis.

### **Data Analysis**

As shown in Figure 1, faculty members' demographic characteristics, perceptions toward the existing security of the e-learning system (ACIA), PEOU, and PU toward the e-learning system were the four study independent variables; faculty members' ITU the e-learning system was the dependent variable in this study. The aim of this study was to assess the effect of each of these independent variables on faculty members' intent to use the e-learning system. After the pre-analysis data screening procedure, and reliability and validity tests, the final screened dataset was retained for further statistical analyses.

Data were analyzed using reliability analysis, and descriptive and inferential statistics. All statistical analyses were conducted via SPSS ver. 25 and all available data were used for analysis. Reliability analysis was conducted using Cronbach's coefficient alpha test of internal consistency (Cronbach, 1951). Descriptive statistics were used to (a) describe the respondent demographic characteristics in terms of frequency and percentages, (b) describe

the four study constructs using mean and standard deviation across the demographic characteristics, and (c) describe the normality of the distribution of the four study constructs using the Kolmogorov-Smirnova test of normality (Lilliefors, 1967). Finally, inferential statistics were used to test the four study hypotheses.

Results of the Kolmogorov-Smirnova test of normality found the underlying assumption of normality was not met for the four study constructs. Thus, non-parametric inferential statistical tests were used for hypothesis testing. First, the Mann-Whitney  $U$  test was used to determine whether there was a significant difference in the dependent variable (ITU) scores across gender and experience teaching using an e-learning system. Next, the Kruskal-Wallis  $H$  test was used to determine if there were significant differences in ITU scores across age, college, academic title, and years of teaching experience. Finally, Spearman's rho correlation analysis was used to test the relationships among the study constructs: ACIA, PEOU, PU, and ITU.

### **Summary**

This study examined the factors affecting KFU faculty members' ITU the e-learning system at KFU. To this end, quantitative survey data were collected from a random sample of KFU faculty using an online survey available in Arabic or English. Nonparametric inferential statistics were used to test the effect of faculty demographic characteristics, faculty perceptions of the e-learning system's security (ACIA), PEOU, and PU on the faculty's ITU the e-learning system.



## Chapter 4: Results

The study results are presented in this chapter. First, the results of the pre-analysis data screening procedure are presented. Second, the results of the reliability and validity test analyses are presented. Next, descriptive statistics are presented of the demographic characteristics of the study sample and the four study constructs. Next, the results of inferential statistics using the Mann-Whitney  $U$  test, Kruskal-Wallis  $H$  test, and Spearman's rho correlation are presented.

This study utilized an online survey to examine the effect of King Faisal University's (KFU) faculty members' demographic characteristics, perceptions toward the existing security of the e-learning system at KFU according to availability, confidentiality, integrity and authentication (ACIA), perceived ease of use (PEOU) and perceived usefulness (PU), on their intent to use (ITU) the e-learning system. The survey was reviewed by an expert panel, who were proficient in both languages (English and Arabic) in the field of technology and research. The survey population was composed of all colleges' faculty members who teach within the King Faisal University at the Kingdom of Saudi Arabia (KSA). The survey was available for response over a one-month period. The data collected from the questionnaire in this study is anonymous.

### Data Collection and Analysis

**Data collection.** The survey invitation was sent to the entire population of 1,927 KFU faculty members (male and female) from 14 colleges in the 2017/2018 academic year. Responses from a random sample of 219 KFU faculty were collected via an online survey administered using Qualtrics® software, yielding a response rate of 11.3%. The sample was representative of the population in terms of gender distribution and distribution across the 14

colleges of KFU (see Tables 1 and 2), thereby increasing the generalizability of the study results.

**Pre-analysis data screening.** Pre-analysis data screening was applied in this study to ensure the validity of participants' responses before further analyses. There were multiple objectives of the pre-analysis data screening. The objective was to check the data for accuracy and remove unnecessary data (e.g., IP address, date survey finished). In this study, the Qualtrics® survey software was used to collect data and downloaded immediately for analyses, which reduced duplication and ensured data accuracy. Second, the invitation to take the survey was sent to the entire population of 1,927 of faculty members at all KFU colleges. Two cases were removed due to incomplete responses on more than 50% of the survey. Those two cases were eliminated before further analyses. As a result, the statistical analyses techniques were applied to a final sample of  $N = 219$  cases.

### **Instrument Reliability and Validity**

The instrument items selected for this study were previously shown to be reliable and valid in the literature (Brown & Venkatesh, 2005; Mohammad, Awadhi, Kananah & Job, 2012; Selim, 2003). According to Winter (2000), "reliability and validity are tools of an essentially positivist epistemology" (p. 7). Reliability was evaluated using Cronbach's coefficient alpha test of internal consistency (Cronbach, 1951), and validity was evaluated using content validity. Whereas internal consistency reliability refers to the consistency of the scores obtained on a survey instrument for each individual respondent (Fraenkel & Wallen, 2006), content validity refers to whether the appropriateness of the items on the instrument truly measures what it was intended to measure (Joppe, 2000). Additionally,

content validity of the Arabic version was evaluated first, followed by evaluation of the internal consistency reliability of the Arabic version.

The content validity of the instrument was evaluated by sending both the original English version of the survey and the Arabic translation version of the survey to four experts who are specialists in the field of technology and research and who are proficient in both English and Arabic. Comments and opinions from the experts regarding the validity of concepts and meaning were obtained in order to reach the content validity.

Afterwards, Cronbach's coefficient alpha test of internal consistency was obtained on each of the four survey scales to determine the internal consistency of each construct within the study instrument. Specifically, Cronbach's coefficient alpha test of internal consistency was conducted on the survey items measuring the ACIA, PEOU, PU and ITU scales in the study sample. Alpha values  $\geq .7$  were considered as statistical evidence of reliability (Cronbach & Meehl, 1955; Hinkin, 1998). As shown in Table 3, all four constructs demonstrated acceptable internal consistency reliability (alpha = .771-.903).

Table 3

*Reliability Analysis of the Four Scales Contained in the Study Survey Instrument*

Scale	Cronbach's Alpha'
ACIA	.771
PEOU	.873
PU	.903
ITU	.841

*Note.* ACIA = perceptions toward the existing security of the e-learning system according to availability, confidentiality, integrity and authentication, PEOU = perceived ease of use, PU = perceived usefulness, ITU = intent to use the e-learning system. 'Cronbach's coefficient alpha test of internal consistency conducted in the study sample of 219 KFU faculty.

### Descriptive Statistics

**Demographic characteristics.** Table 4 presents the results of the frequency analysis conducted on the demographic characteristics provided by the study respondents. As shown in Table 4, the study sample of 219 faculty members was comprised of 58% males ( $n = 127$ ) and 42% females ( $n = 92$ ). Thirty-two percent ( $n = 70$ ) of the respondents were 25-34 years of age, 39% ( $n = 86$ ) were from 35 to 45 years of age, and 29% ( $n = 63$ ) were 46 years of age and older. Sample distribution across the 14 colleges found sample sizes ranged from 2 to 34. The largest number of faculty members were from the College of Arts ( $n = 34, 16%$ ), College of Education ( $n = 32, 15%$ ), and College of Science ( $n = 29, 13%$ ). The smallest number of faculty members were from the College of Law ( $n = 4, 1.8%$ ), College of Clinical Pharmacy ( $n = 3, 1.4%$ ), and College of Dentistry ( $n = 2, .9%$ ). Sample distribution across the faculty member's academic title is also shown in Table 4. As shown, the highest percentage of faculty were assistant professors ( $n = 84, 38%$ ) and lecturers ( $n = 78, 36%$ ). The remaining faculty were assistant lecturers ( $n = 13, 6%$ ), associate professors ( $n = 31, 14%$ ), and professors ( $n = 13, 6%$ ). Regarding the faculty members' years of teaching experience, the two largest groups of faculties in the sample reported having less than 5 years of teaching experience ( $n = 58, 27%$ ) and 5-9 years of teaching experience ( $n = 54, 25%$ ). The three remaining groups of faculty members reported having 10-14 ( $n = 36, 16%$ ), 15-19 ( $n = 31, 14%$ ), and 20 and above ( $n = 40, 18%$ ) years of teaching experience. Finally, Table 4 presents the distribution of the study sample across previous teaching experience with an e-learning system. As shown, 124 faculty members (57%) reported "yes" to having previous experience teaching with an e-learning system; 95 faculty members (43%) reported "no" previous experience teaching with an e-learning system.

Table 4

*Demographic Characteristics of the Study Sample*

Demographic Characteristic	Frequency	Percent
Total Sample	219	100.0
Gender		
Male	127	58.0
Female	92	42.0
Age		
25-34	70	32.0
35-45	86	39.3
46+	63	28.8
College		
Agriculture Sciences & Food	22	10.0
Applied Medical Sciences	11	5.0
Applied Studies	5	2.3
Arts	34	15.5
Business Administration	24	11.0
Clinical Pharmacy	3	1.4
Computer Sciences & Information Technology	19	8.7
Dentistry	2	.9
Education	33	15.1
Engineering	12	5.5
Law	4	1.8
Medicine	16	7.3
Science	29	13.2
Veterinary Medicine	5	2.3
Academic Title		
Assistant Lecturer	13	5.9
Lecturer	78	35.6
Assistant Professor	84	38.4
Associate Professor	31	14.2
Professor	13	5.9
Number of Years Teaching Experience		
< 5 years	58	26.5
5-9 years	54	24.7
10-14 years	36	16.4
15-19 years	31	14.2
20+ years	40	18.3
Previous Teaching Experience w/E-Learning System		
Yes	124	56.6
No	95	43.4

**Study constructs.** The descriptive statistics of the four study constructs are presented in Tables 5 and 6. As shown in Table 5, the mean (SD) of ACIA, PEOU, PU, and ITU in the total sample = 24.25 (5.56), 5.48 (2.57), 8.41 (3.46), and 5.97 (2.64), respectively. Table 5 also presents the results of the Kolmogorov-Smirnova test of normality on the four study constructs in the total study sample. Results found all four study constructs violated the assumption of normality (i.e., the Kolmogorov-Smirnova test of normality was significant for each construct).

As shown in Table 6, the mean (SD) of ACIA, PEOU, PU and ITU are presented across the demographic characteristics of the study sample. Results found the mean scores for security of the e-learning system (ACIA) and PEOU of the e-learning system were higher in females than males (25.44 and 5.63 vs. 23.34 and 5.35); the mean scores for PU of the e-learning system and ITU the e-learning system were higher in males than females (8.91 and 6.29 vs. 7.75 and 5.52). Construct means across age for ACIA and PEOU were higher among younger faculty (25-34 years of age), whereas construct means across age for PU and ITU were higher among older faculty (46 years of age and older).

Table 6 shows the highest mean scores for perceived security of the e-learning system (ACIA) were found in lecturer and assistant lecturer faculty from the Colleges of Business Administration, Computer Sciences & IT, Clinical Pharmacy, and Applied Medical Studies. The highest mean scores for PEOU of the e-learning system were found in lecturer and professor faculty from the Colleges of Clinical Pharmacy, Dentistry, and Business Administration. Finally, the highest mean scores for PU and ITU the e-learning system were found in assistant lecturer and associate professor faculty from the Colleges of Arts, Medicine, Computer Sciences & IT, and Engineering. Table 6 also shows the highest mean

scores for perceived security of the e-learning system (ACIA) and PEOU of the e-learning system were found in faculty with less than 5 years of teaching experience. In contrast, the highest mean scores for PU and ITU the e-learning system were found in faculty with 20 years or more teaching experience.

Finally, Table 6 shows higher mean scores for perceived security of the e-learning system (ACIA), PU and ITU the e-learning system were found in faculty with no previous teaching experience with an e-learning system such as Blackboard compared to faculty with previous teaching experience with an e-learning system. The opposite relationship was found for PEOU of the e-learning system, with higher mean PEOU scores found in faculty with previous e-learning system teaching experience compared to faculty with no previous e-learning system teaching experience.

Table 5

*Descriptive Statistics of the Study Constructs*

Scale	Mean	SD <sup>1</sup>	K-S <sup>2</sup>
ACIA	24.25	5.56	.099**
PEOU	5.48	2.57	.169**
PU	8.42	3.46	.188**
ITU	5.97	2.64	.212**

*Note.* <sup>1</sup>Standard Deviation. <sup>2</sup>Kolmogorov-Smirnova test of normality. \*\*  $p < .001$

Table 6

*Demographic Characteristics of the Study Sample*

Demographic Characteristic	ACIA		PEOU		PU		ITU	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Total Sample	24.22	5.56	5.47	2.57	8.42	3.47	5.96	2.64
Gender								
Male	23.34	5.53	5.35	2.50	8.91	3.81	6.29	2.92
Female	25.44	5.41	5.63	2.68	7.75	2.85	5.52	2.15
Age								
25-34	25.91	6.04	5.81	2.98	8.01	2.69	5.97	2.05
35-45	23.96	5.36	5.35	2.48	8.32	3.47	5.67	2.37
46+	22.72	4.78	5.29	2.18	8.98	4.14	6.38	3.46
College								
Agriculture Sciences & Food	24.55	3.94	5.18	1.59	7.55	2.81	5.43	2.11
Applied Medical Sciences	27.00	6.90	5.82	3.43	8.00	2.05	5.73	1.68
Applied Studies	20.00	3.61	5.00	2.83	8.25	3.30	5.00	1.41
Arts	22.91	5.29	5.12	2.36	8.65	3.98	6.03	2.65
Business Administration	27.75	5.09	6.65	2.55	8.00	2.64	5.67	1.52
Clinical Pharmacy	27.67	10.07	7.67	2.08	6.00	2.00	5.67	1.15
Computer Sciences & IT	27.00	5.81	5.95	2.84	8.63	2.43	6.74	2.45
Dentistry	17.00	1.41	7.50	2.12	8.00	1.41	3.50	.71
Education	24.59	5.42	5.21	2.67	7.85	2.77	5.31	1.84
Engineering	23.60	4.65	5.58	3.15	9.17	4.20	6.17	2.52
Law	25.00	7.44	6.00	.00	7.00	2.00	4.50	1.73
Medicine	19.63	3.50	3.81	1.22	11.94	5.70	8.75	5.01
Science	23.41	5.06	5.69	3.05	8.31	3.36	5.97	2.50
Veterinary Medicine	20.60	2.61	5.40	1.14	7.20	2.77	5.20	3.90
Academic Title								
Assistant Lecturer	24.08	5.98	5.42	2.97	9.33	3.55	7.25	2.30
Lecturer	25.74	6.10	6.16	2.85	8.32	3.43	5.95	2.38
Assistant Professor	23.46	5.34	5.05	2.37	8.06	3.18	5.71	2.50
Associate Professor	22.87	4.36	4.87	2.05	9.61	4.06	6.70	3.77
Professor	23.77	5.10	5.54	2.40	7.92	3.68	5.00	1.65
Number of Years Teaching Exp								
< 5 years	26.56	5.94	5.90	3.07	7.98	2.26	5.69	2.02
5-9 years	24.02	5.62	5.85	2.68	8.79	3.48	6.28	2.36
10-14 years	23.25	5.34	4.72	1.97	7.26	3.26	5.08	2.26
15-19 years	24.20	4.77	5.23	2.50	8.57	3.40	6.10	2.77
20+ years	22.26	4.73	5.33	2.02	9.38	4.71	6.69	3.70
Prev Teach Exp w/E-Learn System								
Yes	23.43	5.43	5.58	2.67	8.02	3.06	5.57	2.61
No	25.28	5.57	5.33	2.45	8.93	3.90	6.49	2.62



### Inferential Statistics

This study tested four hypotheses using three nonparametric inferential statistics: the Mann-Whitney  $U$  test, the Kruskal-Wallis  $H$  test, and Spearman's rho correlation analysis. The first study hypothesis tested the null hypothesis  $H_{10}$ , "There will be no significant effect of demographic characteristics on intent to use KFU's e-learning system." Table 7 presents the results of six tests of the differences in ITU scores across the six demographic characteristics obtained in the study sample. As shown, results of the Mann-Whitney  $U$  test conducted on the differences in ITU scores across gender and experience teaching using an e-learning system found ITU scores were not significantly different across gender ( $p = .115$ ) but were significantly different across experience teaching using an e-learning system ( $p = .001$ ). Table 7 also shows that ITU scores were not significantly distributed across age ( $p = .339$ ), college ( $p = .359$ ), academic title ( $p = .163$ ), and years teaching experience ( $p = .095$ ). Thus,  $H_{10}$  was rejected only for experience teaching using an e-learning system. Combining this result with Table 6 shows faculty with no previous teaching experience with an e-learning system have significantly higher ITU the e-learning system then faculty who have previous teaching experience with an e-learning system.

Table 7

#### *Nonparametric Tests of ITU Scores Across Demographic Characteristics*

Demographic Characteristic	$U^1$	$Z^1$	Chi-Square <sup>2</sup>	$p^3$
Gender	4986.500	1.574	--	.115
Age	--	--	2.162	.339
College	--	--	14.214	.359
Academic Title	--	--	6.536	.163
Years Teaching Experience	--	--	7.919	.095
Experience w/e-Learn System	4246.000	3.299	--	.001

Note. <sup>1</sup>Mann-Whitney  $U$  and  $Z$ -score, <sup>2</sup>Chi-square from Kruskal-Wallis, <sup>3</sup> $p$  value of Mann-Whitney Test or Kruskal-Wallis Test

The remaining three study hypotheses were tested using Spearman's rho nonparametric correlation (see Tables 8-11). The second study hypothesis tested the null hypothesis H2o, "There will be no significant effect of perceptions of the e-learning system's security on intent to use KFU's e-learning system." As shown in Table 8, the correlation between ACIA and ITU was not significant ( $r_s = .012, p > .05$ ). This result suggests H2o is fail to reject. The third study hypothesis tested the null hypothesis H3o, "There will be no significant effect of perceived ease of use of the e-learning system on intent to use KFU's e-learning system." As shown in Table 8, the correlation between PEOU and ITU was also not significant ( $r_s = .089, p > .05$ ). This result suggests H3o is fail to reject. The fourth study hypothesis tested the null hypothesis H4o, "There will be no significant effect of perceived usefulness of the e-learning system on intent to use KFU's e-learning system." As shown in Table 8, the correlation between PU and ITU was significant ( $r_s = .589, p < .01$ ). This result suggests H4o is rejected; thus, the inference is that perceived usefulness of the e-learning system has a significant effect on intent to use KFU's e-learning system.

Table 8

*Spearman's Rho Nonparametric Correlations Between Study Independent Variables (ACIA, PEOU, PU) and Dependent Variable (ITU)*

	ACIA	PEOU	PU
ITU	.012	.089	.589**

*Note.* ACIA = perceptions toward the existing security of the e-learning system according to availability, confidentiality, integrity and authentication, PEOU = perceived ease of use, PU = perceived usefulness, ITU = intent to use the e-learning system. \*\*  $p < .01$

Table 9 presents the correlations between ACIA and ITU. As expected, each of the four subscales comprising ACIA are significantly correlated with the ACIA full scale score ( $p < .01$ ). Similarly, 11 of the 12 items measuring ACIA are significantly correlated with ACIA. In support of the non-significant correlation between ACIA and ITU, none of the four

ACIA subscales are significantly correlated with ITU. Additionally, 11 of the 12 items measuring ACIA are not significantly correlated with ITU. However, one item from the Authentication subscale of ACIA (Item A10, “I change my e-learning system password for security reasons”) was found to be significantly correlated with ITU ( $r_s = .192, p < .01$ ).

Table 10 presents the correlations between PEOU and ITU. As expected, each of the three items measuring PEOU are significantly correlated with the PEOU full scale score. In support of the non-significant correlation between PEOU and ITU, none of the PEOU items are significantly correlated with ITU.

Table 11 presents the correlations between PU and ITU. As expected, each of the four items measuring PU are significantly correlated with the PU full scale score. In support of the significant correlation between PU and ITU, all of the PU items are significantly correlated with ITU.

Table 9

*Spearman's Rho Nonparametric Correlations Between ACIA and ITU*

	ITU	ACIA	Ava. (A1- A3)	Con. (C4- C6)	Int. (I7-I9)	Aut. (A10- A12)
ACIA	.012					
Availability Scale (A1-A3)	-.007	.714**				
Confidentiality Scale (C4-C6)	.036	.742**				
Integrity Scale (I7-I9)	-.010	.825**				
Authentication Scale (A10-A12)	.101	.744**				
A1: I try to access my course material and I find the page is out-of-service	.077	-.027	.210**			
A2: The measures taken to protect e-learning system are good enough	-.051	.581**	.807**			
A3: E-learning system has enough help functions	-.004	.606**	.656**			
C4: My e-mail has been secure from hackers	.029	.651**		.871**		
C5: Course information and grades uploaded are secure and trusted	-.018	.499**		.748**		
C6: Firewall is strong enough to protect the network from hackers	.061	.727**		.890**		
I7: My personal information has been protected from leaked	-.060	.661**			.776**	
I8: Students unable to hack the course page	.030	.537**			.683**	
I9: E-learning system has tools installed to detect plagiarism.	-.018	.680**			.811**	
A10: I change my e-learning system password for security reasons	.192**	.202**				.622**
A11: KFU uses automated system to detect hackers	.021	.736**				.665**
A12: E-learning system requires password to meet specific conditions	-.061	.535**				.593**

*Note.* ACIA = perceptions toward the existing security of the e-learning system according to availability, confidentiality, integrity and authentication; ITU = intent to use the e-learning system. \*\*  $p < .01$

Table 10

*Spearman's Rho Nonparametric Correlations Between PEOU and ITU*

	ITU	PEOU
PEOU	.089	
PEOU1: Training programs towards using e-learning increases my ability to use the system easily	.119	.887**
PEOU2: Clear guidelines increase my interaction with e-learning system	.046	.878**
PEOU3: Availability of technical support increases the ease of use for e-learning system	.062	.879**

*Note.* PEOU = perceived ease of use of the e-learning system, ITU = intent to use the e-learning system. \*\*  $p < .01$

Table 11

*Spearman's Rho Nonparametric Correlations Between PU and ITU*

	ITU	PU
PU	.589**	
PU1: E-learning system enables me to accomplish instructional tasks more quickly	.484**	.777**
PU2: Using e-learning system provides an enjoyable learning environment	.549**	.875**
PU3: Using e-learning system provides an active interactive environment	.529**	.883**
PU4: Using e-learning system allows me to follow-up with students' academic tasks	.519**	.808**

*Note.* PU = perceived usefulness of the e-learning system, ITU = intent to use the e-learning system. \*\*  $p < .01$

## **Chapter 5: Discussion**

### **Introduction**

The aim of this research study was to examine the factors affecting the university faculty members' intent to use the e-learning system at King Faisal University (KFU). This chapter presents an overview of the study, discussion of the findings, conclusions, implications, study limitations, and recommendations for future research.

### **Overview of Study**

The purpose of this study was to examine the factors affecting faculty members' intent to use the e-learning system at a university within the Kingdom of Saudi Arabia (KSA). To this end, a random sample of 219 faculty from KFU in KSA were invited to participate from a total population of 1,927 faculty members at KFU. The study sample completed an online survey available in either Arabic or English languages to obtain respondent perceptions of intent to use (ITU) the e-learning system at KFU (the study dependent variable); respondent demographic characteristics (first independent variable); respondent perceptions of perceived security of the e-learning system at KFU according to availability, confidentiality, integrity, and authentication (ACIA; the second independent variable); respondent perceptions of perceived ease of use (PEOU) of the e-learning system at KFU (the third independent variable); and respondent perceptions of perceived usefulness (PU) of the e-learning system at KFU (the fourth independent variable).

This study set out to address the following research questions:

1. To what extent do the demographic characteristics of faculty members affect their intent to use KFU's e-learning system?

2. To what extent do faculty members' perceptions of the e-learning system's security affect their intent to use KFU's e-learning system?
3. To what extent do faculty member's perceived ease of use of the e-learning system affect their intent to use KFU's e-learning system?
4. To what extent do faculty members' perceived usefulness of the e-learning system affect their intent to use KFU's e-learning system?

To answer these four research questions, the following four hypotheses were tested in the sample of KFU faculty members:

H1o: There will be no significant effect of demographic characteristics on intent to use KFU's e-learning system.

H1: There will be a significant effect of demographic characteristics on intent to use KFU's e-learning system.

H2o: There will be no significant effect of perceptions of the e-learning system's security on intent to use KFU's e-learning system.

H2: There will be a significant effect of perceptions of the e-learning system's security on intent to use KFU's e-learning system.

H3o: There will be no significant effect of perceived ease of use of the e-learning system on intent to use KFU's e-learning system.

H3: There will be a significant effect of perceived ease of use of the e-learning system on intent to use KFU's e-learning system.

H4o: There will be no significant effect of perceived usefulness of the e-learning system on intent to use KFU's e-learning system.

H4: There will be a significant effect of perceived usefulness of the e-learning system on intent to use KFU's e-learning system.

### **Discussion of Study Results**

Data for this study were collected from an online survey that was found to be reliable according to Cronbach's coefficient alpha test of internal consistency reliability (see Table 3). The four study constructs measured by the study survey instrument (ACIA, PEOU, PU, and ITU) were found to violate the assumption of normality according to the Kolmogorov-Smirnova test of normality (see Table 5). Therefore, the study hypotheses were tested using three nonparametric tests appropriate for the data: the Mann-Whitney *U*, Kruskal-Wallis *H*, and Spearman's rho correlation analysis.

As shown in Table 9, results of the first hypothesis, which tested the effect of faculty demographic characteristics on ITU the e-learning system using the Mann-Whitney *U* and Kruskal-Wallis *H* tests, indicated that gender, age, college, academic title, and years teaching experience did not show any statistically significant effect on the faculty members' ITU the e-learning system at KFU. In contrast, previous experience teaching with an e-learning system was found to have a statistically significant effect on ITU such that faculty without previous teaching experience with an e-learning system reported higher mean ITU scores than faculty with previous teaching experience with an e-learning system.

Results of the second hypothesis, which tested the effect of faculty members' perceptions of the existing security of the e-learning system at KFU on ITU the e-learning system at KFU, found Spearman's correlation between ACIA and ITU was not significant (see Table 8). Results of the third hypothesis, which tested the effect of faculty members' perceptions of perceived ease of use of the e-learning system on the ITU the e-learning



system at KFU, found Spearman's correlation between PEOU and ITU was not significant. Finally, results of the fourth hypothesis, which tested the effect of faculty members' perceptions of perceived usefulness of the e-learning system on the ITU the e-learning system at KFU, found Spearman's correlation between PU and ITU was significant. Overall, these results suggest that if the KFU faculty members perceive the e-learning system to be useful, they are more likely to intend to use it. On the other hand, the KFU faculty members' perceptions toward the overall existing security of the e-learning system and perceived ease of use of the system do not seem to influence their intent to use the e-learning system. It should be noted that although there was no significant relationship found between the overall existing security of the e-learning system and ITU, the ability to change the e-learning system password was found to be significantly related to ITU (see Table 9). In fact, currently the KFU faculty members have the ability to voluntarily update the e-learning system password.

Table 12

*Summary of Study Hypotheses on Intent to Use the E-Learning System at KFU*

Hypothesis	Result
H1o. Demographic characteristics do not influence faculty members' intent to use the e-learning system.	
Gender does not influence ITU.	Fail to Reject
Age does not influence ITU.	Fail to Reject
College does not influence ITU.	Fail to Reject
Academic title does not influence ITU.	Fail to Reject
Years teaching experience does not influence ITU.	Fail to Reject
Previous experience teaching does not influence ITU.	Reject
H2o. Perceptions of existing security of the e-learning system does not influence intent to use the e-learning system.	Fail to Reject
H3o. Perceived ease of use of the e-learning system does not influence intent to use the e-learning system.	Fail to Reject

H4o. Perceived usefulness of the e-learning system does not influence intent to use the e-learning system.	Reject
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## Conclusions

To meet the study aims, four research questions were posed. The first research question asked, “To what extent do the demographic characteristics of faculty members affect their intent to use KFU’s e-learning system?” To answer this research question, respondents provided demographic characteristics on the study survey and completed three survey items on intent to use (ITU) the e-learning system at their university. Results of nonparametric inferential statistics testing found only one demographic characteristic was significantly influenced ITU: previous experience teaching with an e-learning system. Specifically, results found faculty without previous teaching experience more likely to report ITU compared to faculty who reported previous teaching experience. This result is contrary to previous research that demonstrated a significant relationship between gender and behavioral intention to e-learning acceptance (Tarhini, Hone, & Liu, 2014).

The second research question asked, “To what extent do faculty members’ perceptions of the e-learning system’s security affect their intent to use KFU’s e-learning system?” To answer this research question, respondents answered 12 survey items on perceptions of the security of the e-learning system at KFU (ACIA) and answered the survey items on ITU. Results of Spearman's rho correlation found no statistically significant relationship between ACIA total score and the ITU total score. However, additional analysis using Spearman’s rho correlation found one item on the ACIA scale, “I change my e-learning system password for security reasons” was significantly correlated with ITU (see Table 9).

These results are in accordance with the findings of the study by Saba (2012), which tested the relationships among the e-learning system quality to system use and system use to e-learning outcome in students' learning results for online courses at Wawasan Open University (WOU) in Malaysia. Saba (2012) indicated the relationships among these variables were not significant. The researcher explained a negative finding reached may be related to the mandatory nature of the e-learning system (Saba, 2012). On the other hand, this result is contrary to previous findings by Alshibly (2014), supporting that perceived system quality is significantly related to educators' intention to use the e-learning system. Alshibly (2014) indicated that the researchers in the literature agreed the system quality is one of the most highly important characteristics of all interactive computer systems. Alshibly (2014) suggested that the greater the perceived system quality of an e-learning system, the higher an educators' intent to use the e-learning system.

The third research question asked, "To what extent do faculty member's perceived ease of use of the e-learning system affect their intent to use KFU's e-learning system?" To answer this research question, respondents completed the three survey items in the PEOU scale and answered the survey items on ITU. Results of Spearman's rho correlation test found no statistically significant relationship between the university faculty members' PEOU and their ITU the e-learning system. These results are in contrast with prior research showing PEOU has been generally supported in the literature as being the major significant influence on the intention to use a computer application or actual usage behaviors (e.g., Davis, 1989; Taylor & Todd, 1995; Venkatesh & Davis, 2000; Venkatesh et al., 2003). These results are also in contrast to previous findings by Davis (1989), Alharbi and Drew (2014), and Selim

(2003) supporting a significant positive relationship between perceived ease of use and behavior intention to use.

The fourth research question asked, “To what extent do faculty members’ perceived usefulness of the e-learning system affect their intent to use KFU’s e-learning system?” To answer this research question, respondents completed four survey items on perceived usefulness of e-learning system at their university (PU). Results of Spearman's rho correlation test found a significant positive relationship between PU and ITU. These results strengthen previous findings by other researchers such as Davis (1989), Alharbi and Drew (2014), and Selim (2003) that perceived usefulness is a significant construct that affects individuals’ intention of a behavior. Moreover, these results support research by Chen and Tseng (2012) that identified perceived usefulness as the primary factor influencing behavioral intention.

### **Implications**

Previous studies have established the need of assessing the faculty members' perceptions toward the e-learning system and its effect on their intent to use the system. Recently studies have noted the importance to assess the security of the e-learning system and its effect on the academics’ behavioral intention of the e-learning acceptance especially with massive technological development (Asmaa & Najib, 2016; Serb et al., 2013).

This current study focuses on the main indicators that affect faculty members' intent to use the e-learning system as found in the literature. Study results contribute to the body of knowledge on factors affecting faculty members’ acceptance of e-learning systems and the body of knowledge on factors affecting ITU e-learning systems at KFU. Results of this study have important implications for researchers and practitioners interested in examining the

faculty members' intent to use an e-learning system in their university. Results suggest previous teaching experience with an e-learning system may have a negative effect on intention to use an e-learning system. Thus, it is important to understand the type of teaching experience that faculty have with e-learning systems as well as the type of e-learning system used in the university. For participants in the current study, the common e-learning system at KFU was Blackboard.

The current study also found faculty members' ability to change their user password and their perceived usefulness of the e-learning system are important for their intent to use the e-learning system. Perceived ease of use and perceived usefulness are constructs found in the literature to be important for impacting users' acceptance of an e-learning system (Davis, Bagozzi, & Warshaw, 1989). As a result, this study is expected to contribute in future research to deep understanding of the main factors affecting the academic acceptance of e-learning systems, especially factors related to security and perceived usefulness.

The importance of this study is to identify the key factors that influence the KFU faculty members' intent to use the e-learning system at KFU. The current study found a significant effect on intent to use the e-learning system by changing the security access password and the perceived usefulness. The findings of this current study indicate that faculty members' perceptions of the security control and perceived usefulness of an e-learning system are important for their intent to use the e-learning system. E-learning systems are described as helping faculty accomplish instructional tasks more quickly, provide an enjoyable and active learning environment among instructors and students, and allow instructors to interact and follow up with students' academic tasks.

In summary, one of the most important implications of this research concerns the positive relationship between updating the e-learning system password and faculty's intent to use the e-learning system in order to avoid the security threats. A second important finding is that university faculty experience with the e-learning system has an impact on their intent to use the e-learning system. Interestingly, the study found faculty who did not have experience with e-learning systems had a higher intent to use the system than faculty who had experience; thus, the type of experience is important for future intent to use an e-learning system, such as Blackboard. Another important implication of this study is directed to IT practitioners, especially those IT practitioners working with e-learning systems' developers, in order to increase the acceptance of e-learning systems by designing and developing e-learning systems that will be more likely to be accepted and useful by university faculty members. To this end, IT practitioners should aim to increase the security accessibility of e-learning systems and aim to increase the perceived usefulness of e-learning systems.

### **Study Limitations**

There were several limitations associated with this study. The first study limitation concerns the use of faculty member research participants from just one institution in the KSA (i.e., faculty from King Faisal University). The sample of faculty from KFU used in this study is a convenience sample due to the ease of access by the researcher. Thus, the study sample was not representative of faculty members teaching at other universities. A second study limitation concerns the survey invitation, which was distributed via the KFU faculty members' official e-mail to the entire study population. Thus, the KFU faculty members may not have gotten a chance to open their university official email or the survey may have gone to their junk mail.

Third, this study was limited to the test of just four main factors (demographic characteristics, ACIA, PEOU, and PU) and their influence on the KFU faculty members' intent to use the e-learning system (ITU). The results of this study did not find significant effects among the overall e-learning system security (ACIA) and perceived ease of use (PEOU) on the KFU faculty members' intent to use the e-learning system; study results did find the e-learning system password control and the perceived usefulness (PU) of the e-learning system affected their ITU.

### **Recommendations for Future Research**

This study examined faculty members' intent to use the e-learning at one of the largest universities in KSA. Future research should examine faculty members' perceptions from other universities in the KSA. For example, Abdekhoda, Dehnad, Mirsaed, and Gavgani (2016) found behavior intention had direct and significant effect on use of e-learning in a sample of faculty members at the Tabriz University of Medical Sciences in Iran. Furthermore, further research can focus on examining the students' and IT staffs' perceptions to use the e-learning system at KFU and at other universities in KSA.

Future research should also be conducted on additional factors that could influence ITU e-learning systems in order to understand the factors that influence faculty ITU e-learning systems. Other factors that could be investigated include level of trust in e-learning, quality of the system, network privacy, system privacy policy, computer self-efficacy, student conduct, faculty members' resistance to change, perceived value, and attitude toward an e-learning system.

Findings of this study will help the researchers who are interested on a study of e-learning system acceptance to direct more efforts to other more robust measures in order to

assess other security factors that may affect the university faculty members' intent to use the e-learning technology. Thus, future research may study different factors from different models or theories, such as the theory of information security awareness, systems theory, unified theory of acceptance and use of technology, planned behavior theory, interaction theory, diffusion of innovation theory, and social cognitive theory. All these are considered robust security and behavioral theories to determine the IT acceptance

Future research could also use a qualitative research design involving the use of interviews and open-ended survey questions in order to gain more in-depth perceptions of ITU and gather better understanding regarding the main factors affecting the faculty members' intent to use the e-learning system. Additionally, while this study investigated faculty members' intention to use the e-learning system, future research could investigate faculty members' actual use of the e-learning system.

### **Summary**

This chapter presented an overview of the study, discussion of the findings, conclusions, implications, study limitations, and recommendations for future research. This study examined a research problem in Saudi universities: how to increase faculty members' use of e-learning systems, such as Blackboard. Based on a comprehensive review of relevant literature, a conceptual model (see Figure 1) was developed in an attempt to examine the factors that affect the KFU faculty members' intent to use the e-learning system.

The main findings of this research showed KFU faculty members' history teaching with an e-learning system, faculty members' ability to control their user password in the e-learning system, and faculty members' perceived usefulness of the e-learning system influenced their intent to use the e-learning system. The most important recommendation of



this study is for IT practitioners, especially those who develop, manage, and optimize e-learning system, should design and develop an interactive system with a high level of security to protect data. Future researchers are encouraged to continue to study faculty members' intention to use and actual use of e-learning system. Future researchers should also implement qualitative research designs to gather deep understanding about the key factors that may influence the faculty members' intent to use the e-learning system. Also, future researchers are encouraged to study different factors from different models or theories to determine the acceptance of IT and e-learning among academics in the KSA and throughout the world.

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APPENDICES

### Appendix A: Informed Consent

Dear Faculty member,

As a Ph. D. student at Eastern Michigan University, I am conducting research for my dissertation that will examine the factors that are affecting the KFU faculty members' intent to use an e-learning system such as Blackboard. For this purpose, a questionnaire has been created and will be distributed through an anonymous Web-based survey. This survey will help in investigating the factors that are affecting the acceptance and intention to use online education as an instructional method. The findings of the study will be presented within my PhD dissertation and academic journals.

Whether or not you have experience teaching with e-learning systems, your participation in this study is extremely important. Completing this survey will take approximately 5-8 minutes, and I appreciate if you are able to respond by November 30, 2017.

Before participating in the survey, please read the study information below. This informs you of your rights as a research participant. If you have any questions or concerns, please feel free to contact me by e-mail listed below.

The survey questions are about your perception towards e-learning systems. Please, respond to the questions by choosing the answer that best represents your perception about the item.

Sincerely,

**Researcher:** Razan Alsuwailem



PhD Student at College of Technology, Eastern Michigan University, E-mail:

ralsuwai@emich.edu

## **Study Information**

### **Description of the Study**

As a faculty member at King Faisal University, you are being invited to participate in research to examine the factors, demographic characteristics, security for e-learning system, perceived ease of use, and perceived usefulness of the e-learning system and their effect on the university faculty members' intent to use an e-learning system such as Blackboard in the teaching process.

### **Risks/Benefits**

There are no tangible benefits and no anticipated risks associated with this study. As a result of participating in this study, you will be enhancing the understanding of the factors that are affecting the university faculty members' intent to use an e-learning system.

### **Costs and Payments**

There are no costs or payments for your participation in this study. Your participation is voluntary, and you can withdraw from this study at any time. However, although there is no payment for your participation, the emerging results could be beneficial to your profession.

### **Confidentiality and Privacy**

As a participant of this research, please be assured that your anonymity will be protected, since your response will be returned to me in a database that will include no means of identifying respondents. The data collected in this study is anonymous and all your responses will be kept completely confidential. Only the summary of the results will be

shared with participants and the public through the dissertation, publications and conferences.

**Contact Information:**

If you have any questions about the research, you can contact the Dissertation Chair, Dr. Dorothy McAllen at [dmcallen@emich.edu](mailto:dmcallen@emich.edu) or by phone at 734.487.4694.

For questions about your rights as a research subject, you can contact the Eastern Michigan University Office of Research Compliance at [human.subjects@emich.edu](mailto:human.subjects@emich.edu) or by phone at 734-487-3090.

**Right to Withdraw from the Study**

You may refuse to participate or to answer any question that you are uncomfortable with and discontinue the survey at any time without repercussions.

**Voluntary Consent**

Your participation is voluntary, and you are under no obligation to participate. By completing and submitting the Web-based survey, you are agreeing to voluntarily participate in this study.

Please click on the link below to agree to the study terms and conditions and to complete the survey; the survey will take only 5-8 minutes to complete. To access the survey, please click on the red arrow below:

## Appendix B: IRB-HIC Expedited Approval

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Razan Alsuwailem

School of Tech Prof Services, Users loaded with unmatched Organization affiliation.

Re: Exempt - Initial - UHSRC-FY17-18-91 Factors Affecting the Faculty's Intent to Use E-Learning Systems at a University in Kingdom of Saudi Arabia

Dear Dr. Razan Alsuwailem:

The Eastern Michigan University Human Subjects Review Committee has rendered the decision below for Factors Affecting the Faculty's Intent to Use E-Learning Systems at a University in Kingdom of Saudi Arabia. You may begin your research.

Decision: Exempt

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

Renewals: Exempt studies do not need to be renewed. When the project is completed, please contact [human.subjects@emich.edu](mailto:human.subjects@emich.edu).

Modifications: Any plan to alter the study design or any study documents must be reviewed to determine if the Exempt decision changes. You must submit a modification request application in [Cayuse IRB](#) and await a decision prior to implementation.

Problems: Any deviations from the study protocol, unanticipated problems, adverse events, subject complaints, or other problems that may affect the risk to human subjects must be reported to the UHSRC. Complete an incident report in [Cayuse IRB](#).

Follow-up: Please contact the [UHSRC](#) when your project is complete.

Please contact [human.subjects@emich.edu](mailto:human.subjects@emich.edu) with any questions or concerns.

Sincerely,

Eastern Michigan University Human Subjects Review Committee

King Faisal University  
Deanship of Scientific Research  
Research Ethics Committee (REC)



جامعة الملك فيصل  
عمادة البحث العلمي  
لجنة أخلاقيات البحث العلمي

## Memorandum

### Research Proposal Review

REC REF NUMBER	KFU-REC/2017 - 10 - 01	
INSTITUTION	EASTERN MICHIGAN UNIVERSITY	
PROJECT TITLE	Factors Affecting the Faculty's Intent to use E-Learning Systems at a University in the Kingdom of Saudi Arabia	
PRINCIPAL INVESTIGATOR	Mrs. Razan Al Suwailem	
SUPERVISOR	Dorothy K. McAllen, PhD	
APPROVAL DATE	G 10/08/2017	H 01/18/1439

Dear Mrs. Razan Al Suwailem

You are hereby informed that the Research Ethics Committee (REC) at King Faisal University has approved your subject proposal. Following a thorough review by the REC of the ethical aspects of the proposal, your research has been approved for one year from the approval date, under the following conditions:

- Approval Duration:** Twelve (12) months from the approval date.
- Amendments to the approved project:** Changes to any aspect of the project require resubmission of Request for Amendment to the Research Ethics Committee (REC).
- Future Correspondence:** Please quote reference number and project title above in any further correspondence.
- Safety:** the safety and well-being of all participants must be protected in accordance with the relevant research ethics guidelines of King Faisal University and the National Committee of Medical & Bioethics. Where required, **signed consent form** must be obtained from all participants.
- Monitoring:** Projects may be subject to an audit or any other form of monitoring by the Research Ethics Committee (REC) at any time.
- Retention and storage of data:** The Principal Investigator is responsible for the storage, retention, and security of original data pertaining to the project for a minimum period of five years.

Please be aware that **this memorandum constitutes ethical approval only**. If the research project is to be conducted at another site or under auspices of another organization, approval must be obtained from the appropriate respective authorities before the project may commence.

Dr. Abdullah M Alzahrani

Dean Scientific Research  
Vice Chair of Research Ethics Committee (REC)



## Appendix C: English Version of the Survey

❖ **Section One \_\_ Demographic Characteristics**

Please answer all questions, by marking click in front of phrases that meet your choice

- Gender:
  - Male
  - Female
- Age:
  - From (25) to less than (35)
  - From (35) to less than (46)
  - (46) years and older
- College:
  - Agriculture Sciences & Food
  - Veterinary Medicine
  - Education
  - Business Administration
  - Medicine
  - Science
  - Computer Sciences & Information Technology
  - Clinical Pharmacy
  - Engineering
  - Arts
  - Law
  - Dentistry
  - Applied Medical Sciences
  - Applied Studies
- Academic Title:
  - Assistant Lecture
  - Lecture
  - Assistant Professor
  - Associated Professor
  - Professor
- Number of Years Teaching Experience:
  - Less than 5 years
  - From (5) to less than (10)
  - From (10) to less than (15)
  - From (15) to less than (20)
  - 20 years and above
- Do you have Previous Experience Teaching with an E-learning System:
  - Yes
  - No

❖ **Section Two \_\_ Security of E-learning System:**

The following is a list of statements related to your intent to use the e-learning system in your university. Please read each item and rate how frequently it reflects your perception to each statement from: (1) 'Rarely' to (4) 'Always'.

<b>A. Availability</b>		Always	Frequently	Sometimes	Rarely
Items		4	3	2	1
A1	I try to access the e- learning system to view my course material and I find the page is down (out-of-service).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
A2	I think that the measures taken to protect the University e-learning system from invalid information are good enough (e.g. access is denied after a minimum number of tries).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
A3	The e-learning system has enough help functions and support available.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>B. Confidentiality</b>					
C4	My e-mail has been secure from hackers.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
C5	Course information and grades uploaded on the e-learning system are secure and trusted.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
C6	The firewall is strong enough to protect the university network from hackers.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>C. Integrity</b>					
I7	My personal information has been protected from leaked so that it hasn't fallen into someone else's hands.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I8	Students have been unable to hack the course page (e.g. students cannot view or make any changes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

in course content).

- I9 The e-learning system has tools installed to detect plagiarism.

#### **D. Authentication**

- A10 I change my e-learning system password for security reasons.
- A11 KFU uses an automated system to detect and respond to intruders and hackers.
- A12 The e-learning system requires password to meet specific conditions (e.g. password length, letters, numbers, or symbols).

#### **❖ Section Three \_\_ Perceived Ease of Use of E-learning System:**

The following is a list of statements related to your intent to use the e-learning system in your university. Please read each item and rate the level of agreement of your perception to each statement from: (1) 'Strongly Disagree' to (5) 'Strongly Agree'.

Items	Strongly Agree	Agree	Neither Disagree Nor Agree	Disagree	Strongly Disagree
	5	4	3	2	1
PEOU1 The availability of the training programs towards using the e-learning system increases my ability to understand and use the system easily.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PEOU2 Clear guidelines for use increase my interaction with the e-learning system.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PEOU3 The availability of technical support in each college increases the ease of use for the e-learning system.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

❖ **Section Four \_\_ Perceived Usefulness of E-learning System:**

The following is a list of statements related to your intent to use the e-learning system in your university. Please read each item and rate the level of agreement of your perception to each statement from: (1) 'Strongly Disagree' to (5) 'Strongly Agree'.

Items		Strongly Agree	Agree	Neither Disagree Nor Agree	Disagree	Strongly Disagree
		5	4	3	2	1
PU1	The e-learning system enables me to accomplish instructional tasks more quickly.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PU2	Using the e-learning system provides an enjoyable and fun learning environment.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PU3	Using the e-learning system provides an active interactive environment among my students and me.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PU4	Using the e-learning system allows me to interact and follow-up with students' academic tasks.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



❖ **Section Five \_\_ Intent to Use E-learning System:**

The following is a list of statements related to your intent to use the e-learning system in your university. Please read each item and rate the level of likelihood of your perception to each statement from: (1) 'Very Unlikely' to (5) 'Very Likely'.

Items		Very Likely	Likely	Neither Unlikely Nor Likely	Unlikely	Very Unlikely
		5	4	3	2	1
ITU1	I intend to use the e-learning system for one or more of these components but not all (e.g. lecture, discussion board, assignments, tests, etc.).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ITU2	I intend to use the e-learning system fully with all its components (e.g. lecture, discussion board, assignments, tests, etc.).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ITU3	I intend to develop the content of my courses that I teach to meet the requirements of the e-learning system (e.g. preparing lectures as PowerPoint slides or live lecture, online tests).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

## Appendix D: Arabic Version of the Survey

## استمارة الموافقة

عزيزي/عزيزتي عضو هيئة التدريس الموقر  
السلام عليكم ورحمة الله وبركاته وبعد ،

بين يديكم استبانة هي أداة لدراسة ميدانية عنوانها:

**العوامل المؤثرة في عزم أعضاء هيئة التدريس  
لاستخدام نظام التعليم الإلكتروني بجامعة في المملكة العربية السعودية**

وتعد هذه الدراسة استكمالاً لمتطلبات درجة الدكتوراه في تخصص أمن المعلومات – كلية التكنولوجيا بجامعة ميشيغان الشرقية- الولايات المتحدة الأمريكية، ونظراً لكونك أحد أعضاء هيئة التدريس بجامعة الملك فيصل، ولأن رأيك مهم جداً لنا في هذا البحث سواء كان لديك خبرة سابقة في التدريس مع أنظمة التعلم الإلكتروني أم لا.. لذا يرجو الباحث من سعادتكم التكرم بالمشاركة في هذا البحث من خلال الإجابة على بنود الاستبيان الإلكتروني المرفقة. علماً بأن متوسط الوقت لإكمال الاستبيان يستغرق ما بين (٥ - ٨) دقائق، مع العلم بأن المشاركة في هذه البحث اختيارية وتطوعية، كما يستطيع المشارك الانسحاب متى أراد دون أي شروط. وللإحاطة، فإن المعلومات المستقاة من هذا الاستبيان لن تستخدم إلا لأغراض البحث العلمي، وستحظى بالسرية التامة.

قبل المشاركة في الاستبيان، يرجى منك قراءة معلومات الدراسة أدناه، لتتعرف على حقوقك كمشارك بحثي. وإذا كان لديك أي أسئلة أو استفسارات، لا تتردد في التواصل مع الباحث عن طريق البريد الإلكتروني المدرج أدناه.

رزان بنت إبراهيم السويلم

الايمل/ [ralsuwai@emich.edu](mailto:ralsuwai@emich.edu)

اجابتك على أسئلة الاستبيان هي تعبير عن وجهة نظرك تجاه نظام التعلم الإلكتروني، لذا نأمل منك الإجابة بدقة وموضوعية على جميع بنود الاستبانة.

• للبدء الرجاء الضغط على أيقونة موافق أدناه، والتي تعبر عن موافقتك المشاركة في الاستبيان.

مع خالص الشكر والتقدير

الباحث/ رزان إبراهيم السويلم

## بيانات الدراسة

### وصف الدراسة

تهدف هذه الدراسة لقياس العوامل المؤثرة في عزم أعضاء هيئة التدريس لاستخدام نظام التعلم الإلكتروني "بلاك بورد" في تدريسهم من خلال استطلاع وجهات نظر المشاركين حول الأمن المعلوماتي لنظام التعلم الإلكتروني، وسهولة استخدامه، والفائدة المدركة من استخدام نظام التعلم الإلكتروني. وبما أنك عضو هيئة في جامعة الملك فيصل، فإن مشاركتك في هذا البحث تعتبر ذا فائدة قصوى بالنسبة لهذا البحث، علماً بأن عملية جمع المعلومات تتم في شهر نوفمبر من عام ٢٠١٧ بإذن الله.

### مخاطر / فوائد

ليس هناك فوائد محسوسة ولا مخاطر متوقعة مرتبطة بهذه الدراسة. كما أن لمشاركتك دور في تعزيز الفهم للعوامل المؤثرة على عزم أعضاء هيئة التدريس لاستخدام نظام التعلم الإلكتروني.

### التكاليف والمدفوعات

ليس هناك أي تكاليف أو مدفوعات للمشاركة في هذه الدراسة. مشاركتك تطوعية ويمكنك الانسحاب في أي وقت. كما أن نتائج هذه الدراسة قد تكون مفيدة لمهنتك.

### السرية والخصوصية

كمشارك في هذا البحث، كن على ثقة بأنه لن يتم الكشف عن هويتك، وكل المعلومات التي سوف يتم جمعها ستحظى بالسرية التامة ولن يتم نشرها، حيث أن استجابات المشاركين سوف تعاد للباحث في قاعدة بيانات لن تتضمن أي وسيلة لتحديد هوية المستجيبين. أضف لذلك، أن نتائج هذه الدراسة لن تستخدم إلا لأغراض البحث العلمي فقط وقد تنشر في المجلات العلمية المحكمة دون الإفصاح عن هوية المشاركين.

### معلومات الاتصال

إذا كان لديك أي أسئلة حول البحث، يمكنك الاتصال بالمشرفة، الدكتورة دوروثي ماكالين

عن طريق الهاتف ٠٠١٧٣٤٤٨٧٤٦٩٤

أو عن طريق البريد الإلكتروني dmcallen@emich.edu

### موافقة المشارك

قرأت كل المعلومات أعلاه، وأوافق على المشاركة في هذا الاستبيان الإلكتروني بالضغط على الأيقونة ادناه:

## المحور (١) بيانات أولية:

عزيزي/عزيزتي عضو هيئة التدريس.. يرجى الإجابة عن جميع الأسئلة، بوضع علامة أمام العبارات التي تناسب

اختيارك.

- الجنس:
- ذكر
- انثى
- العمر:
- من (٢٥) إلى أقل من (٣٥)
- من (٣٥) إلى أقل من (٤٦)
- من (٤٦) فأكثر
- الكلية:
- العلوم الزراعية والأغذية
- الطب البيطري
- التربية
- إدارة الأعمال
- الطب
- العلوم
- علوم الحاسب وتقنية المعلومات
- الصيدلة الاكلينيكية
- الهندسة
- الآداب
- الحقوق
- طب الأسنان
- العلوم الطبية التطبيقية
- الدراسات التطبيقية
- الدرجة الأكاديمية:
- معيد
- محاضر
- أستاذ مساعد
- أستاذ مشارك
- أستاذ
- عدد سنوات الخبرة في التدريس:
- أقل من (٥) سنوات
- من (٥) إلى أقل من (١٠) سنوات
- من (١٠) إلى أقل من (١٥) سنة
- من (١٥) إلى أقل من (٢٠) سنة
- (٢٠) سنة فأكثر
- هل لديك خبرة سابقة في تدريس مقرراتك باستخدام نظام التعلم الالكتروني:
- نعم
- لا

عزيزي/عزيزتي عضو هيئة التدريس.. يرجى وضع علامة (✓) أمام كل عبارة تعبر عن وجهة نظرك.

المحور (٢)	وجهة نظرك تجاه أمن نظام التعلم الإلكتروني الحالي	دائماً ٤	غالباً ٣	أحياناً ٢	نادراً ١
<b>أ/ التوفر</b>					
١/أ	واجه صعوبة تقنية عندما ارغب في عرض مقرري التدريسي بسبب تعطل الصفحة.				
٢/أ	التدابير المستخدمة لحماية نظام التعلم الإلكتروني من البيانات غير الموثوقة جيدة بما فيه الكفاية (مثال: يتم رفض الوصول للنظام بعد عدد من المحاولات).				
٣/أ	يمتلك نظام التعلم الإلكتروني ما يكفي من خدمات المساعدة والدعم.				
<b>ب/ السرية</b>					
٤/ب	بريدي الإلكتروني الجامعي آمن ومحمي ضد الاختراق.				
٥/ب	بيانات المقرر الدراسي والدرجات التي يتم تحميلها في نظام التعلم الإلكتروني آمنة وموثوق بها.				
٦/ب	جدار الحماية "Firewall" قوي بما فيه الكفاية لحماية شبكة الجامعة من انتهاك المتسللين "Hackers".				
<b>ج/ الكمال والموثوقية</b>					
٧/ج	يمتلك نظام التعلم الإلكتروني الحماية الكافية لمعلوماتي وبياناتي الخاصة ضد التسرب والوقوع في يد شخص آخر.				
٨/ج	صفحة المقرر الدراسي الخاصة بي محمية بما فيه الكفاية ضد الاختراق من قبل الطلاب (مثل: عدم تمكن الطلاب من اجراء أي تعديل أو تزوير لمحتوى المقرر الدراسي).				
٩/ج	يمتلك نظام التعلم الإلكتروني أدوات كشف السرقات العلمية "Plagiarism".				
<b>د/ التحقق من الهوية</b>					
١٠/د	أقوم بتغيير كلمة المرور الخاصة بحسابي في نظام التعلم الإلكتروني لأسباب أمنية.				
١١/د	الجامعة تستخدم نظاماً آلياً كفوئاً لكشف وحجب المخترقين.				

				يفرض نظام التعلم الإلكتروني شروطاً معينة لقبول كلمة المرور (طول معين/ حروف، أرقام، رموز).	١٢/د
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أعراض بشدة	أعراض	محايد	أوافق	أوافق بشدة	وجهة نظرك تجاه سهولة استخدام نظام التعلم الإلكتروني	المحور (٣)
					توفر البرامج التدريبية حول استخدام نظام التعلم الإلكتروني يزيد من قدرتي على استخدام النظام بيسر وسهولة.	١
					وضوح تعليمات وإرشادات الاستخدام تزيد من تفاعلي مع نظام التعلم الإلكتروني.	٢
					توفر فنيين متخصصين في الكلية لتقديم الدعم التقني لنظام التعلم الإلكتروني يزيد من سهولة الاستخدام.	٣

أعراض بشدة	أعراض	محايد	أوافق	أوافق بشدة	وجهة نظرك تجاه الفائدة المدركة من استخدام نظام التعلم الإلكتروني	المحور (٤)
					يمكنني نظام التعلم الإلكتروني من إنجاز مهامي التدريسية بسرعة أكبر.	١
					استخدامي لنظام التعلم الإلكتروني يوفر بيئة أكثر متعة للتعلم.	٢
					استخدامي لنظام التعلم الإلكتروني يوفر بيئة تفاعلية نشطة بيني وبين طلابي.	٣
					استخدامي لنظام التعلم الإلكتروني يسهل عملية متابعتي للطلاب في إنجاز مهامهم الأكاديمية.	٤

المحور (٥)	وجهة نظرك تجاه عزمك لاستخدام نظام التعلم الإلكتروني	محتمل جدًا	محتمل	محتمل إلى حد ما	مستبعد	مستبعد جدًا
١	أعزم استخدام احد أو بعض مكونات نظام التعلم الإلكتروني في تدريس مقرراتي (مثل: المحاضرات، منتديات الحوار، الواجبات، الاختبارات، ..الخ).					
٢	أعزم استخدام نظام التعلم الإلكتروني بشكل كامل وبجميع مكوناته في تدريس مقرراتي (مثل: المحاضرات، منتديات الحوار، الواجبات، الاختبارات، ..الخ).					
٣	اعزم تطوير محتوى مقرراتي التدريسية بحيث تتوافق مع نظام التعلم الإلكتروني (مثل: إعداد المحاضرات كعروض تقديمية أو محاضرات البث المباشر، الامتحانات الإلكترونية).					

انتهى الاستبيان ،،  
شاكراً ومقدراً وقتكم الثمين  
الباحثة/ رزان إبراهيم السويلم