Factors influencing Behavioral Intention to Use Learning Management Systems among Instructors in Yemeni Universities

Fatores que influenciam a intenção comportamental de usar sistemas de gerenciamento de aprendizagem entre instrutores em universidades iemenitas

Factores que influyen en la intención conductual de utilizar sistemas de gestión del aprendizaje entre los instructores de las universidades yemeníes

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Abstract

This research intends to contribute to the literature of learning management systems by determining the factors influencing the behavioral intention to use learning management systems by Instructors. This is in order to enhance and improve learning-related procedures within relevant universities. The data was collected throughout a survey distributed to 70 instructors in Yemen using a stratified random sampling approach. Statistically, smart PLS-SEM has been employed to obtain the results of the study. A five-point scale was designed to measure four independent variables, which were adopted from previous studies. The results declared positive significant correlations between most of the independent variables and the dependent variable of the behavioral intention. The study findings show that Performance Expectancy, Effort Expectancy, Training have a significant impact on the instructors' attitude toward using LMS. Computer Self-Efficacy appears to be an insignificant predictor of the instructors' Attitude toward using. In addition, the study findings show that attitudes toward using learning management systems have a significant impact on behavioral intention to use learning management systems. This study confirms that the proposed model is applicable to be used in different technologies within different countries, which helps in filling the human factors gap in the literature in the context of learning management systems.

Keywords: acceptance, attitude, behavioral intention, technology, learning management systems, Yemen.

Resumen

Esta investigación pretende contribuir a la literatura de los sistemas de gestión del aprendizaje mediante la determinación de los factores que influyen en la intención conductual de utilizar los sistemas de gestión del aprendizaje por parte de los instructores. Esto es para mejorar y mejorar los procedimientos relacionados con el aprendizaje dentro de las universidades relevantes. Los datos se recopilaron a través de una encuesta distribuida entre 70 instructores en Yemen, utilizando un enfoque de muestreo aleatorio estratificado. Estadísticamente, se ha empleado el PLS-SEM inteligente para obtener los resultados del estudio. Se diseñó una escala de cinco puntos para medir cuatro variables independientes, que fueron adoptadas de estudios previos. Los resultados declararon correlaciones positivas significativas entre la mayoría de las variables independientes y la variable dependiente de la intención conductual. Los hallazgos del estudio muestran que la expectativa de desempeño, la expectativa de esfuerzo y la capacitación, tienen un impacto significativo en la actitud de los instructores hacia el uso de LMS. La autoeficacia de la computadora parece ser un indicador insignificante de la actitud de los instructores hacia el consumo. Además, los hallazgos del estudio muestran que la actitud hacia el uso de sistemas de gestión del aprendizaje tiene un impacto significativo en la intención conductual de utilizar sistemas de gestión del aprendizaje. Este estudio confirma que el modelo propuesto es aplicable para ser utilizado en diferentes tecnologías dentro de diferentes países, lo que ayuda a llenar el vacío de factores humanos en la literatura, en el contexto de los sistemas de gestión del aprendizaje.

Palabras clave: aceptación, actitud, intención de comportamiento, tecnología, sistemas de gestión del aprendizaje, Yemen.

Resumo

Esta pesquisa pretende contribuir com a literatura de sistemas de gestão da aprendizagem por meio da determinação dos fatores que influenciam a intenção comportamental de uso de sistemas de gestão da aprendizagem por Instrutores. Isso é para aprimorar e melhorar os procedimentos relacionados à aprendizagem dentro das universidades relevantes. Os dados foram coletados por meio de uma pesquisa distribuída em 70 instrutores no Iêmen, usando uma abordagem de amostragem aleatória estratificada. Estatisticamente, o PLS-SEM inteligente foi empregado para obter os resultados do estudo. Uma escala de cinco pontos foi desenhada para medir quatro variáveis independentes, que foram adotadas de estudos anteriores. Os resultados declararam correlações positivas e significativas entre a maioria das variáveis independentes e a variável dependente da intenção comportamental. Os resultados do estudo mostram que a expectativa de desempenho, a expectativa de esforço e o treinamento têm um impacto significativo na atitude dos instrutores em relação ao uso do LMS. A Autoeficácia do Computador parecem ser preditores insignificantes da atitude dos instrutores em relação ao uso. Além disso, os resultados do estudo mostram que a atitude em relação ao uso de sistemas de gerenciamento de aprendizagem, tem um impacto significativo na intenção comportamental de usar sistemas de gerenciamento de aprendizagem. Este estudo confirma que o modelo proposto é aplicável para uso em

diferentes tecnologias em diferentes países, o que ajuda a preencher a lacuna de fatores humanos na literatura, no contexto de sistemas de gestão da aprendizagem.

Palavras-chave: aceitação, atitude, intenção comportamental tecnologia, sistemas de gestão de aprendizagem, lémen.

Introduction

Technology is drastically changing the norm in today's society, economy and culture (Al-Mamary et al., 2021). As technology increases and its use becomes more integrated into our daily lives, the need to incorporate technology into education and produce technologically literate instructors become more apparent (Davidson, 2011). In education, many governments have invested in technology to enhance education (Al-Mamary, 2020a).

All educators and educational administrators who want to adapt technology to their teaching can use educational technology. Educational technology is viewed as the usage of proper tools, methods, or processes that encourage the application of senses, memory, and insight to upgrade and update learning outcomes (Aziz, 2010).

LMS is responsible for forming client groups and providing tools such as communication tool, access control, and delivery of learning content. Additionally, alternative definition for LMS is that it is a learning platform (Paulsen, 2002). Furthermore, a LMS is a set of applications or software tools aimed to track, deliver, and manage learning experiences (Cavus & Alhih, 2014; Dias & Diniz, 2013). Institutions have begun to utilize LMS as a typical stage where students and instructors can interact digitally. That means internet software is used to spread various solutions that help the cycle of learning and knowledge. This includes learning at all levels, both formal or non-formal, using communication network services like the Internet, an intranet (LAN) or extranet (WAN), for course delivery, collaboration, interaction and facilitation (Tinio, 2003). Teachers play a main part in the successful adoption of technology for educating and learning. Therefore, institutions choose the frequency, type, and quantity of new technology tools they use in their educational program design and lecture form (Teo et al., 2018).

The recognition of the problem of technology is related to the study, which emphasizes the significance of teachers' acceptance of LMS adoption, which is essential to its effective operation. Teachers' acceptance is crucial for widely using LMS. Therefore, the success of LMS in any educational organization begins with instructors' acceptance, which, in turn, advances students' use of LMS. Subsequently, the goal of this investigation is to build up a structure for assessing educators' acknowledgment of LMS dependent on the (UTAUA) Model. In view of previous investigations on e-learning achievement and the various models and theories found in the literature, the exam-

ination sorts out different variables into exactly linked dimensions.

Venkatesh and Davis (1996) viewed Training, System Design Characteristics, Computer Self-Efficacy, Implementation process nature, and the user involvement in design as external variables that can affect the intention to use a system through PU and PEOU.

Alharbi and Drew (2014) and Mouakket and Bettayeb (2015)particularly by university instructors. To fill this research void, the expectation-confirmation model (ECM demonstrated the need to recognize the factors that affect the instructors' acceptance. Thus, it is essential to examine the constructs that affect the instructors' acceptance, which lead to shed new light or suggest ways to avoid failure. By drawing on the established technology acceptance theories and literature, this study investigates and examines the factors influencing the instructors' acceptance.

If the institution understands the reasons that make the instructors behave to reject a learning management system, the institution will increase support for training and focus on institutional resources that can support instructors' use of technology. Instructors can choose to use the LMS for administrative support or enhance innovative pedagogy in the classroom (Sinclair & Aho, 2018). The institution can learn how to mitigate the reasons why instructors are not accepting the system. This study adds to the body of knowledge about the interaction of instructors and the electronic tools available to support teaching and learning. The knowledge gained from the relationship between instructors' technology acceptance and their perception of the technology helps inform higher education administrators and decision makers on the limits of the learning management use at their institution by removing barriers to using technology.

UTAUT parameters are valid and robust in the context of learning management systems. UTAUT have been broadly designed and empirically tested to elucidate the determinants that influence users' intention to operate technology in the developed world. Moreover, UTAUT Model is used to infer individual students' technology acceptance by explaining the variants in Behavior Intention (BI) (Raza et al., 2021; Rahman, et al., 2020; Buabeng-Andoh & Baah, 2020; Alshehri et al., 2020a; Alshehri et al., 2020b).

Since education today is seen as a key to progress and growth, it is necessary to follow best practices by knowing the factors affecting the intention to use learning management systems at the university level.

Based on previous studies and on the UTAUT model, this study attempts to answer the following question: What are the main factors affecting behavioral intention to use learning management systems by instructors? ; To answer the research question, the following study was conducted.

2. Literature Review

2.1 Overview of Learning Management Systems (LMS)

A learning management system is a set of software tools designed to deliver, track, and administer educational experiences (Cavus & Alhih, 2014; Dias & Diniz, 2013). Learning management systems are comprised of a variety of tools located within a surrounding user management system (Gautreau, 2016; Hampe, 2014)knowledge, and professional growth. Faculty development programs often overlook factors that promote or inhibit the use of technologies among professors. This study identified the motivation factors that faculty consider relevant to their personal decision to adopt a learning management system. A needs assessment evaluation methodology was applied to investigate two research questions. The first question analyzed the demographics of the participants in this study including gender, age, tenure status, department, and years of experience using a technology and using an LMS. The second research question investigated the intrinsic and extrinsic factors that motivate faculty to adopt a learning management system in their instruction. Participants (N = 42. The tools are designed to be used by instructors with little training with the intent to make instructors more productive and effective in their teaching (Lin et al., 2014)course management systems (CMSs. The three most commonly adopted learning management systems include Blackboard, Moodle, and Desire2Learn (Dahlstrom et al., 2014; Lang & Pirani, 2014). A wide variety of open source learning management systems such as Sakai and Canvas are gradually occupying a great percentage of the learning management systems in use. The functions common to learning management systems remain stable, but as technology improves and companies work to gain a greater market share of business, individual learning management companies are creating customized tools. Tools common to all learning management systems include email, a content area, gradebook, discussion area, and assignment area (Dahlstrom et al., 2014).

Learning Management Systems are electronic frameworks or website applications that empower students and instructors to share online lessons, send and receive projects, and convey on the web. Almrashdeh et al. (2011) mentioned that a LMS is a computer program utilized to arrange, execute and assess a particular educating procedure. LMS involves communication skills, gaining competences by all students and instructors, and a better concern to make instant communication and real implementation opportunities of common work, as the learning process happen in a participatory manner. For that, the instructor depends on specialized hardware devices and some software tools such as video conference, blogs, discussions sites, and chat rooms (Oliveira et al., 2017).

2.2 Theoretical Lens

2.2.1 Technology Acceptance Model (TAM)

In 1989, Fred Davis developed the Technology Acceptance Model (TAM), which aimed to determine and explain the factors of how and when users have contact with a technology and accept to use it. The TAM has influential extensions of the 1975 original Theory of Reasoned Action (TRA). Bagozzi (2007) stated that the TAM has a significant impact on the research of technology acceptance. The TAM has two independent variables: Perceived Usefulness (PU) and Perceived Ease of Use (PEOU).

Davis (1989) referred to PU as the "degree to which a person believes that using a particular system would enhance his or her job performance" and PEOU as the "degree to which a person believes that using a particular system would be free of effort" (p. 320). Davis (1989) hypothesized that the usefulness and the ease of technology use have positive impacts on the users' intention to use a system.

Chau and Hu (2002) proved the TAM ability to explain the variance in the Intention to Use (ITU) dependent variable. The TAM, shown in Figure 1, identifies the Usage Behavior (UB) level of IS as a superior indicator for the end users' technology acceptance level (Amoako-Gyampah & Salam, 2004). According to Karahanna et al. (2006) and Lee et al. (2003), the TAM proved the good predictive cogency for the initial adoption and the continual use over the last two decades. Wang and Liu (2005) also considered the TAM to be the most predominantly cited and used model. He and King (2006) referred that success to the TAM understandability and simplicity.

TAM focuses only on the technological characteristics by proposing only two variables and ignoring significant characteristics that may affect the technology use such as the Individual Characteristics (Cheng, 2011) Task Characteristics (Lu & Yang, 2014; Norzaidi et al., 2009), and Social Characteristics (Cheng, 2011; Lian, 2015). Moreover, TAM does not give any attention to evaluating IT aspects such as Performance Impact or User Satisfaction (Shih & Chen, 2013), which were widely used to measure the success of IS (Montesdioca & Maçada, 2015)
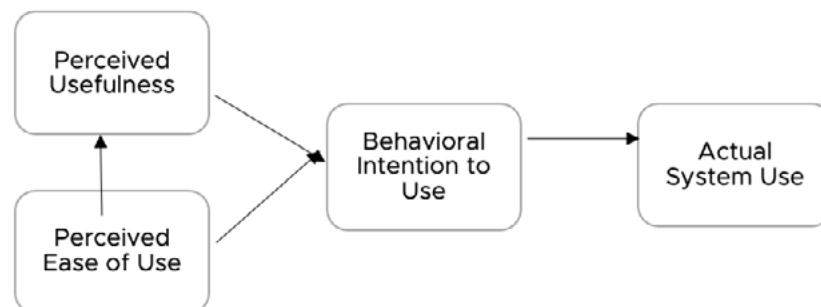

Figure 1: The Technology Acceptance Model (TAM)

2.2.2 Unified Theory of Acceptance and Use of Technology (UTAUT)

Venkatesh et al. (2003) reviewed and compared eight of the prior prevailing models/theories, which range from computer science to human behaviors in order to predict technology acceptance in the organizational settings. In order to overcome the limitations and weaknesses of the eight models, Venkatesh et al. (2003) proposed the UTAUT, as illustrated in Figure 2.

According to Lee et al. (2010), UTAUT was developed to support organizations in creating a holistic understanding of the users' acceptance of technology. Venkatesh et al. (2003) conducted their field study among individuals who were introduced to new technology, and sampled the differences between industries, organizations, technologies, nature of use (voluntary or mandatory), and business functions.

Venkatesh et al. (2003) proposed that seven independent variables can predict the dependent variable of Behavioral Intention (BI). Among the seven variables, only four variables have significant influences on the users' intention to accept a system. Those variables include Performance Expectancy (PE), Effort Expectancy (EE), Social Influence (SI), and Facilitating Conditions (FC). However, Self-Efficacy, Anxiety, and Attitude towards Using Technology variables have no effect on the users' intention. Thus, the three variables were dropped.

Venkatesh et al. (2003) found that PE, EE, and SI affect the BI directly, whereas BI and FC affect directly the Use Behavior (UB). They also found that Gender (GNR), Age, Experience (EXP), and VOU
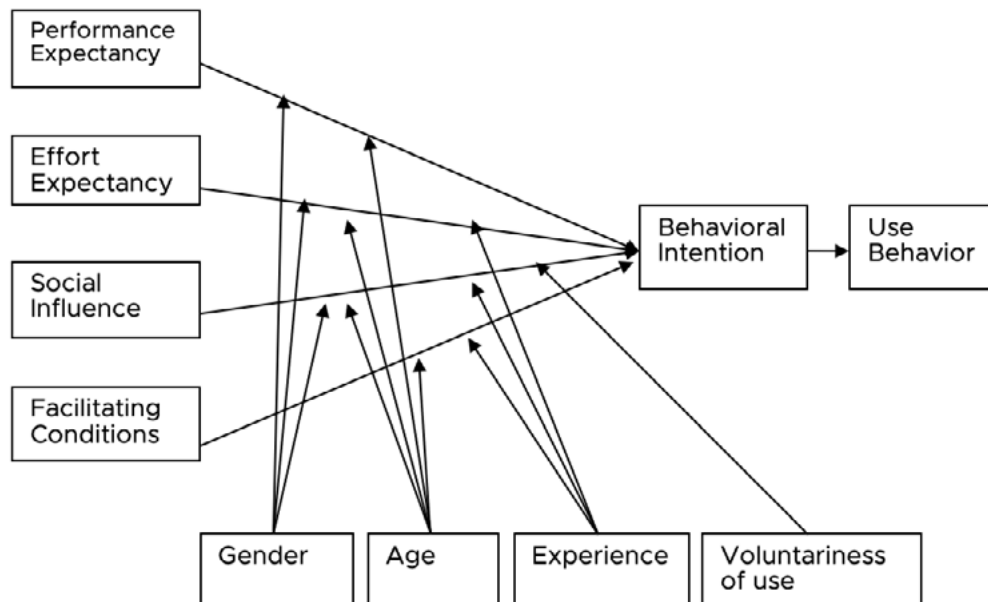

Figure 2: Unified Theory of Acceptance and Use of Technology (UTAUT)

moderate the relationships between the discussed variables as Figure 2 illustrated. The VOU is the degree to which the system usage is voluntary and can be applied only when the technology use is voluntary.

UTAUT merge a range of theories and models, cover more technology acceptance characteristics, and has wide acceptance. (Sara & Rabiaa, 2016) stated that it ignores the multidimensional views of IT/IS performance and provides only the IT acceptance aspect. The UTAUT also disregards critical characteristics related to technology use and system characteristics (Isaac et al., 2017).

2.3 Instructors' Acceptance

User acceptance of technology is characterized as a conduct or ability by a client to utilize innovation for the errands it is intended to help (Davis, 1989; Teo et al., 2008; Venkatesh & Davis, 2000). Investigation of client's technology acceptance is commonly centered around looking at the variables that are huge in affecting clients' behavioral intention to use (BI) or genuine utilization of innovations (Ma et al., 2005). Among the instructive clients of innovations are the teachers and learners. Understanding the triggers that affect teachers' and learners' acceptance of technology provides a significant knowledge about the condition of innovation joining in training. From the past literary works, analysts have created and tried models to study the components that shape client convictions and attitudes, which brought to tol-

erate upon the last's BI technology inside the expert spaces (He and King (2006); Chau & Hu, 2002). Access to information through the Internet greatly enhances classroom instruction for both students and instructors (Gunn & Hollingsworth, 2013). Factors influencing instructors' use of educational technology need to be tested in order to provide the necessary contingencies to support regular use. Understanding of factors relating to instructors' decisions to use educational technology would benefit all stakeholders in the educational community. In the hands of innovative, informed, and committed instructors, educational technology use can become a medium that helps students confidently face a technological future (Vannatta & Fordham, 2004).

Used adjusted Unified Theory of Acceptance and Use of Technology (UTAUT) as the research methodology to comprehend instructing staffs' use and acceptance of the e-Learning system. Pynoo et al. (2011) stated that the adoption of a digital learning environment (DLE) by secondary school instructors determines which construct highly contributes to the end user acceptance in smart schools. The study by Jong and Wang (2009) has adjusted UTAUT (Venkatesh et al., 2003) to see technology adoption of the web-based learning program by the Taiwan Technical University students. The research used group sampling and step by step regression analysis to assess the ties with each other through factors. The study outcome demonstrated that facil-

itating conditions, performance expectancy, self-efficacy, attitude toward using new technology and social influence have a positive impact on behavior intention. In addition, attitude to use the new technology, behavior intention, and social impact have a straight influence on the rate of system usage.

AlQudah (2014) examined the attitudes of the staff to use Model at the University of Jordan. A qualitative and quantitative methodology was utilized to gather necessary data by conducting semi-structured interviews and handout questionnaires. The outcome pointed out which perceived ease of use (PEOU) has more important impact on accepting Model. That means the teachers will go towards Model if they believe the Model is simple to use. PEOU alludes to how much educators trust Model utilization

would be free of exertion and simple to deal with.

3. Methodology

3.1 Research model

Based on the above review of related literature, investigating the influence of the selected factors on behavioral intention to use learning management systems, and based on the objectives and research problem. The previous discussion has confirmed that the most factors affecting attitude towards use learning management systems by instructors are performance expectancy, effort expectancy, computer self-efficacy, and training. Figure 3 below illustrates the conceptual framework of this study that was established for the purpose of answering the research question.
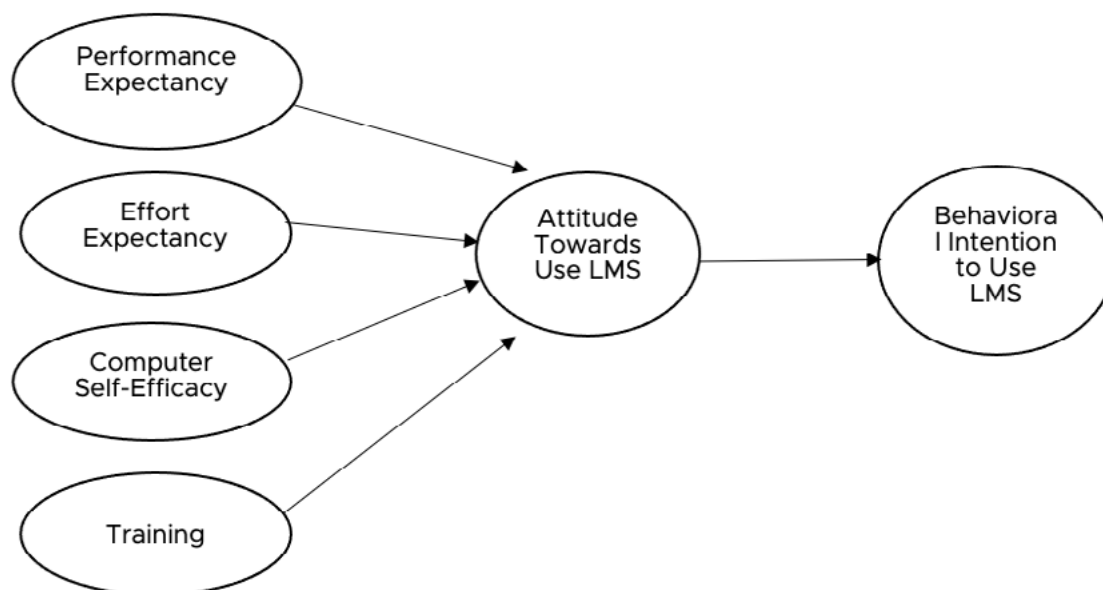

Figure 3: The Conceptual Model

Performance Expectancy (PE)

Performance expectation is described as the degree to which a client believes that current and emerging technologies can help improve the performance of jobs. It is one factor of the Unified Theory of Acceptance and Usage of Technology (UTAUT) model that received a lot attention from many researchers in various scopes of the human activities (Bugembe, 2010; Khayati & Zouaoui, 2013; Tossy, 2014; Venkatesh et al., 2003)perceived ease of use, attitude towards using and actual usage of a new financial & information system in Uganda National Examinations Board. A Technology Acceptance Model (TAM. Performance expectancy is generally defined by indicators for instance perceived usefulness, job-fit, extrinsic and Intrinsic motivation, comparative benefit and the result of the latest IT (Wu et al., 2012)the electronic ticket used by Kaohsiung MRT system, is a contactless electronic ticket developed on the basis of the Radio Frequency Identification (RFID.

The expectancy of performance has been found to be the most considerable construct used to clarify behavioral intention. It is a substantial and appropriate factor when talking about forecasting intentions using an assumed new technology (Venkatesh et al., 2003). A previous study proposed that performance expectancy has an explanatory argument influence regarding intention to use a new technology in a faculty situation (Bandyopadhyay & Fraccastoro, 2019).

Effort expectancy (EE)

Effort expectancy is the extent that a user assumes using a new technology will assist to free his/ her working effort. Effort expectancy is considered one of the UTAUT model constructs, which measures the degree of ease of use related with the using an information technology (Venkatesh et al., 2003).

Effort expectancy is an essential predictor of intention using a technology. Consequently, the high exertion seen for new technology use, the low uncertain user will expect to utilize it (Venkatesh et al., 2003). The effort expectancy is expected by new technology features such as social existence, nearness, simultaneousness, individuals and group characteristics, computers self-efficacy, technology knowledge, and awareness of others (Brown et al., 2010). Expectancy of effort was found to be influential in predicting use of particular technologies (Venkatesh & Bala, 2008). Knutsen (2005)investigated the effect of effort expectancy on attitude, which positively affects the attitudes of end clients to use services that they don't need to endeavor to comprehend or operate. According to Alawadhi and Morris (2008), the expectancy of effort has an important role in formative behavioral intention of clients.

Computer Self-efficacy (CSE)

Self-efficacy in the usage of computers refers to one's perception of his or her ability to use a computer in accom-

plishing a task (Compeau & Higgins, 1995). According to Abdulrab (2020) computer self-efficacy is related to a person's belief in the ability, understanding, and ability to use the technology to perform duties.

According to Tung and Chang (2008) CSE has a positive influence on the behavioral intention to use online courses. The results came in line with the results of the study by Alenezi et al. (2011). The finding of study by Shittu et al. (2018) supported the findings of Teo (2009), Anderson and Maninger (2007) regarding the significant influence of self-efficacy and its perceived usefulness as an indicator of instructors' intention toward the use of technology for future classroom use. Similarly, the findings of the studies carried out by Yeşilyurt et al. (2016), and Yeou (2016) revealed that computer self-efficacy was an important predictor of prospective instructors' attitude toward applying computer-supported education.

Training (TR)

Nelson and Cheney (2006) defined training as "a process needed to obtain IS skills required to perform specific tasks." Training is deemed as one of the organizational elements, which can affect the accomplishment of IS execution (Bradford & Florin, 2003). Training is deemed as an appropriate strategy to urge clients to change their attitude toward new information system (Igbaria et al., 1997; Spacey et al., 2003).

Training factor was used in the extended TAM model (Venkatesh & Davis, 2000). The more interesting the training, the more clients will see that the framework is free effort to utilize technology. Al-Sayyed and Abdalhaq (2016) showed a crucial positive relationship between design characteristics, perceived usefulness, management support, training, perceived ease of use and intention to accept e-Learning. Providing end clients with training is deemed significant. Training could be in the form of workshops, online instructional exercises and courses. Enhancing conditions, estimated by technical support, preparation and organization support influence educators' acknowledgment of innovation in learning process (Teo, 2009). Another examination done by Ayele and Birhanie (2018) indicated that behavioral intention and user training are main factors for real use of e-learning systems.

Attitude (ATT)

Attitude is the degree to which the end user is willing in particular new technology, which directly affects the behavioral intention to use in addition to utilization of these systems. According to Davis (1989), it is the way systems really utilized over a specific time are affected by the expectation to utilize.

Attitude seems a main construct to influence end users of IT. Consequently, know-how end users' attitude to use e-learning systems is crucial (Liaw et al., 2007). Positive attitude toward infor-

mation technology and high computer self-efficacy would be significant in incorporating and using computers in higher education institutions, as shown by Sam et al. (2005). Mahdizadeh et al. (2008) stated that instructors' attitude is considered as a crucial indicator of the use of educational technology. Learners' attitude to use computers is a concern in computer-based programs and electronic courses (Woodrow, 1991). The computer must be used as a learning and teaching tool. So that, observing the individual's attitudes toward computers must be a nonstop procedure. Teo et al. (2018)this study aims to examine intentions of English teachers in China to use technology in their classroom teaching. Based on the technology acceptance model, eight variables including perceived usefulness (PU reported that attitude has no significant impact on intention to use technology.

Behavioral Intention (BI)

The intentions to use a learning management system do not measure actual use of learning management system. Rather, Intention to Use is a self-reported measure where instructors predict intention to use the system. Intention to Use has been chosen for this study as a key indicator of an instructor's choice of either using or not using the learning management system. This adds to the body of knowledge of why users choose to utilize a new online technology. In particular, it adds information about why learning management systems are underutilized

(Gautreau, 2016)knowledge, and professional growth. Faculty development programs often overlook factors that promote or inhibit the use of technologies among professors. This study identified the motivation factors that faculty consider relevant to their personal decision to adopt a learning management system. A needs assessment evaluation methodology was applied to investigate two research questions. The first question analyzed the demographics of the participants in this study including gender, age, tenure status, department, and years of experience using a technology and using an LMS. The second research question investigated the intrinsic and extrinsic factors that motivate faculty to adopt a learning management system in their instruction. Participants (N = 42. Intention to Use technologies is used as an indicator of real use (Davis, 1989).

As specified by Schoonenboom (2014), the members of school in universities and faculties perform tutorial duties quite often by using LMS services unlike any other. Missing in studies is The TAM point of view that offers an evidence for those variations. In his research, LMS ease of use, benefits, and behavioral intention using LMS for tutorial duties were measured using LMS questionnaire. The outcome specified that the reasons for low intention using LMS are poor task performance, poor LMS ease of use, and poor level of LMS' usefulness.

Gibson et al. (2008) carried out a study of the attitudes of university col-

lege staff to exploit the TAM for online education. The findings urged perceived usefulness to be a highly significant determinant of acceptance of technology. Considering easy to use gives a few prognostic capabilities to the acceptance of technology by college staff. The study by Gibson et al. (2008) provided specific correlation levels for perceived usefulness and perceived ease of use with respect to technology acceptance and the TAM framework, which is therefore useful for this study.

Sanchez-Franco (2010)understanding the intrinsic and extrinsic individual factors and interaction effects that influence Information and Communications Technology (ICT suggested that perceived attractive quality is the subject of the research of information systems (IS), as it highlights the impact of interconnection influencing ICT adoption in higher education. The results of the study showed that the purpose of learners to use LMS is affected by their perceived usefulness and ease of use of this technology.

3.2 Procedures

The research design describes the research required data, nature of the adopted approach, and the methods of collecting and analyzing data (Cresswel, 2013). Selecting the proper research design can affect the use and kind of data collection, the budget, and sampling methods (Hair et al., 2006). In addition, the researcher should take in mind a set of rational decisions about the objec-

tives of the research, the nature of the research, the kind of research, the time horizon, the degree of data analysis, and the place of the research (Sekaran & Bougie, 2016).

There are three different types of research approaches: quantitative, qualitative and mixed approaches. Each of the three approaches is comprised of a combination of collective views, the designs and the methods (Cresswel, 2013). In the quantitative approach, the researcher uses a deterministic widely positivists, which depend on empirical observations, theory verification, and measurements to test those positivists by investigating the relationship between variables. Specific methods used in line with the quantitative approach include survey and experimental research, which involves identifying a population and sample, determining the type of design, gathering and analyzing the data, submitting the consequences, and interpreting and writing the study in a predictable way using a survey or experimental research. This kind of research is more appropriate for the positivist paradigm (Cresswel, 2013). According to Borrego et al. (2009) the quantitative approach is the most appropriate choice for a deductive research. Therefore, this study is deductive in nature and is based on a quantitative approach.

3.3 Research context and sample

The population is quite a community of organizations, individuals or whatever the researcher is willing to examine, and

the sample is a subgroup of the population (Sekaran & Bougie, 2016). The sample is a representative segment or part of the population. For generalizing the sample results on the whole population, the sample should be a microcosm of the population. Otherwise, the results that are provided from the sample will be misguiding when applied to the whole population (Yount, 2006). This study targets instructors at the Lebanese International University. A sample of 70 Instructors Countered to a Twenty-Six-Item. The minimum sample size for this study, which consists of at least 60 responses baes on G*power application.

3.4 Instrument used

There are several methods of collecting necessary data such as surveys, interviews and observations, but the survey method is generally considered as one of the fast practices to gather data from a large number of respondents within a limited period of time. The supposed framework for this study was empirically measured using a questionnaire approach.

The study chose the self-administering and electronic administrating method of questionnaire administrating. The distributions and preparations of the questionnaire was performed in three steps. In step one, the questionnaire was written in English language only, since the teaching language in the university is English. Second, papers-based questionnaire was hand-submitted by the researcher to instructors. The researcher was as-

sisted by faculty deans and administrative assistance staff in different colleges, who volunteered to help in the distribution of this survey. Moreover, online survey responses were received electronically through the Google Docs service. All teachers whose email addresses were provided by their school systems were sent an email. Participants consented by clicking the link embedded in the email and completing the instrument. The instrument was delivered to consenting participants via the Google docs system.

4. Data Analysis
4.1 Descriptive analysis

In order to offer an overview of the collected data, the information of respondents is summarized by utilizing basic descriptive statistics including frequencies and percentages. Table 1 shows that most of the respondents are males with 43 (61.4%), while the female respondents are only 27 (38.6%). This shows that the number of males in this study is higher than females. Table 1 shows that the respondents' most frequent age range is between 25 and 39 years old with 52 (74.3%) respondents. The second most frequent age range between 40 and 49 years old is scored by 12 respondents representing (17.1%). The age range between 50 years old and above ranks third in the frequency with 6 (8.6%) respondents.

Table 1 shows that the respondents' major (Years of experience) range is between 1 and 5 years with 37 (52.9%)

respondents. The range (more than 15 years) is the second most frequent with 17 (24.3%) respondents. The range between 6 and 10 years is the third frequent with 13 (18.6%) respondents. Finally, the respondents' minor Years of experience' range is between 11 and 15 years with 3 (4.3%) respondents.

Table 1 shows that the respondents' major educational rank is the Instructor with 38 (54.3%) respondents. The Assistant Professor rank is the second most frequent with 20 (28.6%) respondents. The Professor rank is the third frequent rank with 7 (10%) respondents. Finally, the respondents' least frequent educational rank is the Associate Professor with 5 (7.1%) respondents.

Table 1. Participants' demographics

Measure	Items	Frequency	Percentage
Sex	Male	43	%61.4
	Female	27	%38.6
Age	25-39	52	%74.3
	40-49	12	%17.1
	50 Years and above	6	%8.6
Years of experience	1-5 Years	37	%52.9
	6-10 Years	13	%18.6
	11-15 Years	3	%4.3
	More than 15 years	17	%24.3
Job Rank	Professor	7	%10
	Associate Prof.	5	%7.1
	Assistant Prof.	20	%28.6
	Instructor	38	%54.3

4.2 Measurement model assessment

This study addressed measurement model reliability and validity and employed composite reliability and Cronbach's alpha to evaluate a measurement item's internal consistency, as suggested by Ringle, Sarstedt, Mitchell, and Gudergan (2020). Cronbach's alpha for the item should be 0.7 or higher, according to Hair et al. (2017). In the same way, the construct's composite reliability value should be 0.70 or higher. Table 2 shows that all constructs in this study have a composite reliability and Cronbach's alpha of at least 0.70, which indicates good internal reliability.

Table 2. Loading, Cronbach's alpha, CR and AVE.

Constructs	Indicators	Loading (> 0.5)	Cronbach's alpha (> 0.7)	Composite Reliability (> 0.7)	AVE (> 0.5)
Performance Expectancy	PE1	0.88			
	PE2	0.88	0.90	0.93	0.77
	PE3	0.88			
	PE4	0.88			
Effort Expectancy	EE1	0.83			
	EE2	0.87	0.90	0.93	0.77
	EE3	0.91			
	EE4	0.90			
Computer Self-Efficacy	CSE1	0.74			
	CSE2	0.78	0.78	0.85	0.59
	CSE3	0.74			
	CSE4	0.79			
Training	TR1	0.83			
	TR2	0.92	0.87	0.92	0.79
	TR3	0.91			
Attitude Towards Use LMS	AT1	0.88			
	AT2	0.95	0.87	0.92	0.80
	AT3	0.85			
Behavioral Intention to Use LMS	BI1	0.77			
	BI2	0.92	0.90	0.93	0.78
	BI3	0.93			
	BI4	0.89			

According to Hair et al. (2017), discriminant and convergent validity should be investigated. Other measures, such as the load factor and AVE (average variance extracted), might be used to assess convergent validity. To assess convergent reliability, factor loadings, composite reliability (CR) and average variance extracted (AVE) were examined (Hair et al., 2017; Abdulrab et al., 2021; Abdulrab et al., 2020; Abdulrab, 2020; Al-Mamary et al., 2020; Al-Mamary, 2020a; Al-Mamary, 2020b; Al-Mamary et al., 2019). According to the literature, all indicators had loading values over 0.7, which is adequate in multivariate analysis (Hair et al., 2014).

According to the literature, all indicators had loading values over 0.7, which is adequate in multivariate analysis (Fornell & Larcker, 1981). The heterotrait-monotrait test (HTMT) was used to determine the discriminant value of components (Henseler, Ringle, & Sarstedt, 2015). The HTMT relationship values should be less than 0.85 in order to demonstrate discriminant validity. This reveals that all values were less than 0.85, showing adequate discriminating validity (Henseler et al., 2015). On the basis of these analyzes, we determined that the predictions of PLS-SEM are validated by the dataset employed.

Table 3. HTMT results.

	AT	BI	CSE	EE	PE	TR
AT	0.89					
BI	0.70	0.88				
CSE	0.61	0.56	0.77			
EE	0.74	0.67	0.67	0.88		
PE	0.75	0.66	0.53	0.69	0.88	
TR	0.73	0.68	0.59	0.70	0.61	0.89

Key: HTMT: Heterotrait-monotrait ratio, PE: performance expectancy, EE: effort expectancy, CSE: computer self-efficacy, TR: training, ATT: attitude towards Use LMS, BI: behavioral intention to use LMS

4.3 Structural model assessment

The structural model is used to determine if the structural model's hypotheses are supported by the data (Urbach & Ahlemann, 2010). The structural model can only be analyzed when the measurement model has been satisfactorily confirmed. A structural model may be assessed in PLS by utilizing the coefficient of determination (R^2) and path coefficients. The structural model evaluation, as shown in Figure 4 and Table 4, indicates the hypothesis testing, with five direct hypotheses. According to the findings, four of the five hypotheses were supported, while just one was rejected.

In more detail, it was shown that perceived susceptibility (PE) had a significant effect on attitude ($\beta = 0.37$, t = 3.34, p <0.001). H1 is therefore acceptable. Similarly, H2 effort expectancy had a substantial influence on attitude ($\beta = 0.22$, t = 2.21, p = 0.03). H3, on the other hand, is rejected since there is no influence of computer self-efficacy on attitude ($\beta = 0.09$, t = 1.30, p = 0.19). In addition, the findings showed that training has a significant impact on attitude ($\beta = 0.30$, t = 2.23, p <0.05), however H4 is accepted. With regard to H5, it was revealed that the behavioral intent to use LMS as the following is influenced significantly by attitude ($\beta = 0.70$, t = 9.46, p <0.001). H5 is therefore accepted.

Furthermore, according to Cohen (1988), the R^2 value ranges from 0.26 and above in terms of the thumb rule for acceptable R^2. As shown in Figure 4, 71% of attitude variance is explained by all independent factors. Additionally, behavioral variances are explained by 49.4 percent.

Table 4. Structural assessment results.

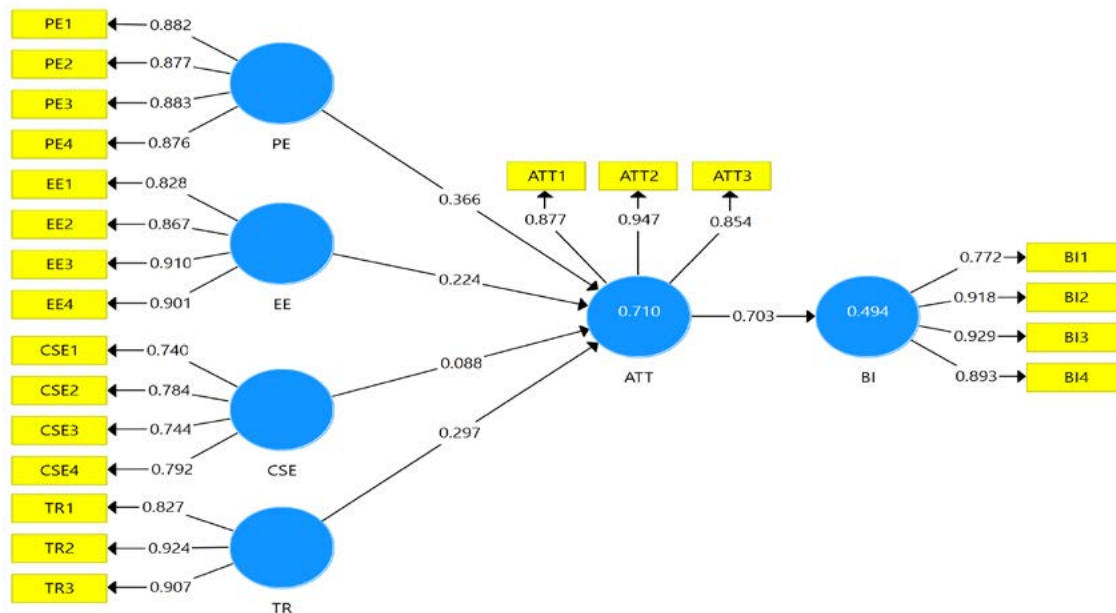| Hypothesis	Relationship	Std. Beta	t-value	p-value	Decision
H1	PE -> ATT	0.37	3.43	0.00	Accepted
H2	EE -> ATT	0.22	2.21	0.03	Accepted
H3	CSE -> ATT	0.09	1.30	0.19	Rejected
H4	TR -> ATT	0.30	2.23	0.03	Accepted
H5	ATT -> BI	0.70	9.46	0.00	Accepted

Figure 4: Path coefficient results

5. Discussion

The study found a significant impact of instructors' performance expectancy on their attitude to use LMS systems, which is in line with the previous studies done by AlQudah (2014), Brown (2017), and Teo et al. (2018). This means if the instructors find LMS more useful, their attitude to use will be affected positively.

In addition, the results of the study also asserts the presence of positive significant impact of instructors' effort expectancy on their attitude to use LMS. The results of the study are consistent with the outcomes of the previous studies by Dwivedi et al. (2017); Nysveen and Pedersen (2016), and Pynoo et al. (2011) which showed that instructors' effort expectancy has an important effect on their attitude to use LMS.

Moreover, the study found no significant impact of computer self-efficacy on their attitude to use LMS systems. This is different from the findings of the studies done by Anderson and Maninger (2007), Gialamas and Nikolopoulou (2010), Shittu et al. (2018), and Yeou (2016).

There are several reasons to explain the lack of significance in the CSE findings. Considering first reason, clarified that the absence of correlation between computer self-efficacy and intention to use technology and attitudes could suggest that computer self-efficacy has a vicarious impact on the perceived usefulness of variables as mediators. Moreover, Jeng and Tseng (2018) indicated the missing direct relationship between computer self-efficacy and intention to use technology. However, computer self-ef-

ficacy has an indirect influence on the perceived ease of use as a mediator. The second reason relates to the study by Marakas et al. (1998), which detailed the level of computer self-efficacy in two levels: General computing level and Specific application level. Agarwal et al. (2000) stated that specific computer self-efficacy has a direct and important impact on the perceived ease of use more than the general efficacy of the computer. Their findings suggested that the expectations of teachers about a particular application would become a better predictor of technology perceptions, which in effect reinforced the intention to use technology. However, this study follows the General computer Self-efficacy.

The results of the study also assert the presence of positive significant impact of training on their attitude. This is quite similar to the findings of the previous studies done by Ayele and Birhanie (2018), Al-Sayyed and Abdalhaq (2016), and Venkatesh and Davis (2000). This means training is required to increase intention to use concerning the individuals self-confidence in their willingness to use the e-learning system (Holden & Karsh, 2010), and the benefits of the e-learning system (Igbaria & Chakrabarti, 1990).

The results of the study also assert the presence of positive significant impact of instructors' attitude on their behavioral intention to use LMS systems at the Lebanese International University Sana'a campus. This is quite similar to the findings of the previous studies done by

Bhattacherjee and Premkumar (2004), Dwivedi et al. (2017), Sam et al. (2005), Sánchez et al. (2013). This means if the instructors feel LMS more exciting, their intention to use will be affected positively.

6. Limitations and directions for future research

This research has a few limitations. The study's findings cannot be generalized, for starters, which is a major restriction. This is owing to the fact that the study was based on an examination and study of a private Yemeni university. As a result, comparable research should be conducted in other Yemeni universities in order to generalize the study's findings. However, additional private and public universities must be included. As a result, the sample size will grow, and the findings may differ. Second, this research has proven the validity of a model that does not include any moderating variables. Future research should focus on the potential moderating variables that influence instructors' behavioral intentions to use learning management systems.

7. Conclusion

Performance expectancy (PE), effort expectancy (EE), training (TR) and attitude (ATT) have a significant impact on the instructors' intention to use LMS systems at the Lebanese International University Sana'a campus, but computer self-efficacy (CSE) does not have a significant effect. This means that one of the main

reasons for the keep high rate of the instructors' intention to use LMS systems is the high of awareness of the LMS service and the benefits that they would get in return of their adoption of the LMS service. In addition, there is a probability that the instructors, who do not use the LMS service, have a perception related to the complexity of using the LMS.

Therefore, the Lebanese International University must concentrate their efforts on: deliver the idea of learning management system (LMS) and its associated benefit to the academic staff and collage members. In addition, Lebanese International University must concentrate on delivering the benefits gained from adopting the LMS systems. In this regard, they can launch a university event aimed at explaining the gained benefits to the instructors and students through short videos. Moreover, must convey the idea to their instructors that LMS is easy enough to use.

They can also do that through producing tutorial videos in English and Arabic languages in order to ensure delivering the message. These videos would be shown in the reception or auditorium hall, as well as through social media networks. Moreover, it should establish a call service center specialized to help LMS users by providing them with solutions for any problem they may face. in addition, must concentrate on providing the instructors with training in the form of workshops, online tutorials, courses, and seminars. Lastly, must concentrate on things that

encourage instructors to think that using LMS is good, beneficial, pleasant, and likeable.

In general, in this study most of the propsed varaibles have been shown to be valid. This is designed to provide insight into the university's senior management and administrative decision-making process. All of these answers may benefit from a deeper dive into the social and technological factors that influence how people utilize learning management systems. Furthermore, the study's findings may aid in the development of a better strategy for promoting learning management system acceptability.

In addition, this empirical evidence of the study confirms that the proposed model is applicable to be used in different technologies within different countries, which helps in filling the human factors gap in the literature in the context of learning management systems.

Moreover, the proposed model helps in understanding behavioral intention to use learning management systems by instructors. Therefore, this study will help institutions to consider the factors for successful implementation of learning management systems in an academic setting.

References

Abdulrab, M., Al-Mamary, Y. H. S., Alwaheeb, M. A., Alshammari, N. G. M., Balhareth, H., & Al-Shammari, S. A. (2021). Mediating role of strategic orientations in the relationship between entrepreneurial orientation and performance of Saudi SMEs. *Brazilian Journal of Operations & Production Management, 18*(4), 1-15. https://doi.org/https://doi.org/10.14488/BJOPM.2021.029

Abdulrab, M., Alwaheeb, M. A., Al-Mamary, Y. H., Alshammari, N. G., Balhareth, H., Soltane, H. B., & Saleem, I. (2020) Effect of entrepreneurial orientation and strategic orientations on financial and nonfinancial performance of small and medium enterprises in Saudi Arabia. *Journal of Public Affairs,* e2305. https://doi.org/10.1002/pa.2305

Abdulrab, M. (2020). Factors Affecting Acceptance and The Use of Technology in Yemeni Telecom Companies, *International Transaction Journal of Engineering, Management, & Applied Sciences & Technologies. 11*(6), pp. 1-16. https://doi.org/10.14456/ITJEMAST.2020.115

Agarwal, R., Sambamurthy, V., & Stair, R. M. (2000). Research Report: The Evolving Relationship between General and Specific Computer Self-Efficacy - An Empirical Assessment. *Information Systems Research, 11*(4), 418–430. https://doi.org/10.1287/isre.11.4.418.11876

Alawadhi, S., & Morris, A. (2008). The use of the UTAUT model in the adoption of e-government services in Kuwait. *Proceedings of the Annual Hawaii International Conference on System Sciences.* https://doi.org/10.1109/HICSS.2008.452

Alenezi, A. R., Karim, A. M. A., & Veloo, A. (2011). Institutional support and e-learning acceptance: An extension of the technology acceptance model. *International Journal of Instructional Technology and Distance Learning, 8*(2), 3–16. http://itdl.org/Journal/Feb_11/article01.htm

Alharbi, S., & Drew, S. (2014). Using the Technology Acceptance Model in Understanding Academics' Behavioural Intention to Use Learning Management Systems. *International Journal of Advanced Computer Science and Applications, 5*(1). https://doi.org/10.14569/ijacsa.2014.050120

Al-Mamary, Y. H., Abdulrab, M., Jazim, F., Khan, I., & Al-Ghurbani, A. M. (2021) Factors influencing the use of technology in higher education in Saudi Arabia: A conceptual framework and future research directions. *Journal of Public Affairs*, e2683. https://doi.org/10.1002/pa.2683

Al-Mamary, Y. H. S. (2020a) Examining the factors affecting the use of ICT in teaching in Yemeni schools. *Journal of Public Affairs*, e2330. https://doi.org/10.1002/pa.2330

Al-Mamary, Y.H.S., Abdulrab, M., Alwaheeb, M.A. and Alshammari, N.G.M. (2020), "Factors impacting entrepreneurial intentions among university students in Saudi Arabia: testing an integrated model of TPB and EO", *Education + Training,* Vol. 62 No. 7/8, pp. 779-803. https://doi.org/10.1108/ET-04-2020-0096

Al-Mamary, Y. H. S. (2020b). the impact of transformational leadership on organizational citizenship behaviour: Evidence from Malaysian higher education context. Human Systems Management, (Preprint), 1-13. https://doi.org/10.3233/HSM-201068

Al-Mamary, Y. H. S., Al-Nashmi, M. M., Shamsuddin, A., & Abdulrab, M. (2019). Development of an Integrated Model for Successful Adoption of Management Information Systems In Yemeni Telecommunication Organizations. *International Journal of Scientific & Technology Research, 8*(11), 3912-3939.

Almrashdeh, I. A., Sahari, N., Zin, N. A. M., & Alsmadi, M. (2011). Distance Learning Management System requirements from students's perspective. *Journal of Theoretical and Applied Information Technology*, 17–27.

AlQudah Ahmed, A. (2014). Accepting Moodle By Academic Staff At the University of Jordan: Applying and Extending Tam in Technical Support Factors. *European Scientific Journal*, *10*(18), 183–200. Retrieved from http://eujournal.org/index.php/esj/article/view/3591

Al-Sayyed, F., & Abdalhaq, B. (2016). Interventional Factors Affecting Instructors Adoption Of E-Learning System: A Case Study Of Palestine. *Journal of Theoretical and Applied Information Technology*, *10*(1).

Alshehri, A., Rutter, M., & Smith, S. (2020b). The Effects of UTAUT and Usability Qualities on Students' Use of Learning Management Systems in Saudi Tertiary Education. Journal of Information Technology Education: Research, 19(1), 891-930.

Alshehri, A., Rutter, M., & Smith, S. (2020a). The Moderating Effects of Experience and Training on Students' Use of a Learning Management System. International Journal of Information and Education Technology, 10(9).

Amoako-Gyampah, K., & Salam, A. F. (2004). An extension of the technology acceptance model in an ERP implementation environment. *Information and Management*, *41*(6), 731–745. https://doi.org/10.1016/j.im.2003.08.010

Anderson, S. E., & Maninger, R. M. (2007). Preservice teachers' abilities, beliefs, and intentions regarding technology integration. *Journal of Educational Computing Research*, *37*(2), 151–172. https://doi.org/10.2190/H1M8-562W-18J1-634P

Arteaga Sánchez, R., Duarte Hueros, A., & García Ordaz, M. (2013). E-learning and the University of Huelva: a study of WebCT and the technological acceptance model. *Campus-Wide Information Systems*, *30*(2), 135–160.

Ayele, A. A., & Birhanie, W. K. (2018). Acceptance and use of e-learning systems: the case of teachers in technology institutes of Ethiopian Universities. *Applied Informatics*, *5*(1), 1–11. https://doi.org/10.1186/s40535-018-0048-7

Aziz, H. (2010). The 5 Keys to Educational Technology. *T h e Journal*. Retrieved from https://thejournal.com/Articles/2010/09/16/The-5-Keys-to-Educational-Technology.aspx/?p=1

Bagozzi, R. P. (2007). The legacy of the technology acceptance model and a proposal for a paradigm shift. *Journal of the Association for Information Systems*, *8*(4), 244–254. https://doi.org/10.17705/1jais.00122

Bandyopadhyay, K., & Fraccastoro, K. A. (2019). The Effect of Culture on User Acceptance of Information Technology. *Communications of the Association for Information Systems*, *19*. https://doi.org/10.17705/1cais.01923

Bhattacherjee, & Premkumar. (2004). Understanding Changes in Belief and Attitude toward Information Technology Usage: A Theoretical Model and Longitudinal Test. *MIS Quarterly*, *28*(2), 229.

Borrego, M., Douglas, E. P., & Amelink, C. T. (2009). Quantitative, Qualitative, and Mixed Research Methods in Engineering Education. *Journal of Engineering Education*, *98*(1), 53–66.

Bradford, M., & Florin, J. (2003). Examining the role of innovation diffusion factors on the implementation success of enterprise resource planning systems. *International Journal of Accounting Information Systems*, *4*(3), 205–225

Brown, L. A. (2017). *Instructor Usage of Learning Management Systems Utilizing a Technology Acceptance Model by Lisa Ann Brown A dissertation proposal submitted in partial fulfillment of the requirements for the degree of Doctor of Philosophy in Adult and Higher Education*. Montana State University.

Brown, S. A., Dennis, A. R., & Venkatesh, V. (2010). Predicting Collaboration Technology Use: Integrating Technology Adoption and Collaboration Research. *Journal of Management Information Systems*. https://doi.org/10.2753/MIS0742-1222270201

Buabeng-Andoh, C., & Baah, C. (2020). Pre-service teachers' intention to use learning management system: an integration of UTAUT and TAM. Interactive Technology and Smart Education.

Bugembe, J. (2010). Perceived Usefulness, Perceived Ease of Use, Attitude and Actual Usage of a New Financial Management System thesis (Makerere University). Retrieved from http://dspace3.mak.ac.ug/handle/10570/2806

Cavus, N., & Alhih, M. S. (2014). Learning Management Systems Use in Science Education. *Procedia - Social and Behavioral Sciences*. https://doi.org/10.1016/j.sbspro.2014.07.429

Chau, P. Y. K., & Hu, P. J. (2002). Examining a model of information technology acceptance by individual professionals: An exploratory study. *Journal of Management Information Systems*, *18*(4), 191–229. https://doi.org/10.1080/07421222.2002.11045699

Cheng, Y.-M. (2011). Antecedents and consequences of e-learning acceptance. *Information Systems Journal*, *21*(3), 269–299. https://doi.org/10.1111/j.1365-2575.2010.00356.x

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences. Hilsdale*. New York: Lawrence Erlbaum Associates, Publishers.

Compeau, D. R., & Higgins, C. A. (1995). Computer Self-Efficacy: Development of a Measure and Initial Test. *MIS Quarterly*, *19*(2), 189. https://doi.org/10.2307/249688

Cresswel, J. (2013). Qualitative, quantitative, and mixed methods approaches. In *Research design*.

Dahlstrom, E., Brooks, D. C., & Bichsel, J. (2014). The Current Ecosystem of Learning Management Systems in Higher Education: Student, Faculty, and IT Perspectives. *EDUCAUSE Center for Analysis and Research*. https://doi.org/10.13140/RG.2.1.3751.6005

Davidson, C. N. (2011). *Now You See It, Brain Science of Attention*. Retrieved from https://bit.ly/2UlpWXl

Davis, F.D. (1989). Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology. *MIS Quarterly*. https://doi.org/10.1016/j.cell.2017.08.036

Dias, S. B., & Diniz, J. A. (2013). FuzzyQol model: A fuzzy logic-based modelling of users' quality of interaction with a learning management system under blended learning. *Computers and Education*. https://doi.org/10.1016/j.compedu.2013.06.016

Dwivedi, Y. K., Rana, N. P., Jeyaraj, A., Clement, M., & Williams, M. D. (2017). Re-examining the Unified Theory of Acceptance and Use of Technology (UTAUT): Towards a Revised Theoretical Model. *Information Systems Frontiers*, 1–16. https://doi.org/10.1007/s10796-017-9774-y

Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of marketing research*, 39-50.

Gautreau, C. (2016). Motivational Factors Affecting the Integration of a Learning Management System by Faculty. *The Journal of Educators Online*, *8*(1). https://doi.org/10.9743/jeo.2011.1.2

Gialamas, V., & Nikolopoulou, K. (2010). In-service and pre-service early childhood teachers' views and intentions about ICT use in early childhood settings: A comparative study. *Computers and Education*, *55*(1), 333–341. https://doi.org/10.1016/j.compedu.2010.01.019

Gibson, S. G., Harris, M. L., & Colaric, S. M. (2008). Technology Acceptance in an Academic Context: Faculty Acceptance of Online Education. *Journal of Education for Business*, *83*(6), 355–359. https://doi.org/10.3200/joeb.83.6.355-359

Gunn, T. M., & Hollingsworth, M. (2013). The implementation and assessment of a shared 21st century learning vision: A district-based approach. *Journal of Research on Technology in Education*. https://doi.org/10.1080/15391523.2013.10782603

Hair, J., Black, W., Babin, B., Anderson, R., & Tatham, R. (2006). Multivariate data analysis (6 ed.). Englewood Cliffs, NJ: Pearson Prentice Hall. *New Jersey*.

Hair Jr, J. F., Sarstedt, M., Hopkins, L., & Kuppelwieser, V. G. (2014). Partial least squares structural equation modeling (PLS-SEM). *European business review*.

Hair Jr, J. F., Sarstedt, M., Ringle, C. M., & Gudergan, S. P. (2017). *Advanced issues in partial least squares structural equation modeling*: saGe publications.

Hampe, G. (2014). Learning in a virtual environment. *Acta.Fih.Upt.Ro*. Retrieved from http://acta.fih.upt.ro/pdf/2014-4/ACTA-2014-4-04.pdf

He, J., & King, W. R. (2006). A meta-analysis of the technology acceptance model. *Information and Management*, *43*(6), 740–755. Retrieved from https://www.sciencedirect.com/science/article/pii/S0378720606000528

Henseler, J., Ringle, C. M., & Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. *Journal of the academy of marketing science, 43*(1), 115-135.

Holden, R. J., & Karsh, B.-T. (2010). The technology acceptance model: its past and its future in health care. Journal of Biomedical Informatics, 43(1), 159–172.

Igbaria, Magid, Zinatelli, N., Cragg, P., & Cavaye, A. L. M. (1997). Personal Computing Acceptance Factors in Small Firms: A Structural Equation Model. *MIS Quarterly*, *21*(3), 279.

Igbaria, Magid, & Chakrabarti, A. (1990). Computer anxiety and attitudes towards microcomputer use. *Behaviour and Information Technology, 9*(3), 229–241.

Isaac, O., Abdullah, Z., Ramayah, T., & Mutahar, A. M. (2017). Examining the Relationship Between Overall Quality, User Satisfaction and Internet Usage: An Integrated Individual, Technological, Organizational and Social Perspective. *Asian Journal of Information Technology*, *16*(1), 100–124. https://doi.org/10.3923/ajit.2017.100.124

Jeng, R., & Tseng, S. M. (2018). The relative importance of computer self-efficacy, perceived ease-of-use and reducing search cost in determining consumers' online group-buying intention. *International Journal of Human and Technology Interaction (IJHaTI), 2*(1), 1–12.

Jong, D., & Wang, T.-S. (2009). Student Acceptance of Web-based Learning System. *Proceedings of the 2009 International Symposium on Web Information Systems and Applications (WISA'09)*, *8*, 533–536. https://doi.org/ISBN 978-952-5726-00-8 (Print), 978-952-5726-01-5 (CD-ROM)

Karahanna, E., Agarwal, R., & Angst, C. M. (2006). Reconceptualizing compatibility beliefs in technology acceptance research. *MIS Quarterly: Management Information Systems*, *30*(4), 781–804. https://doi.org/10.2307/25148754

Karahanna, E., Straub, D. W., & Chervany, N. L. (1999). Information technology adoption across time: A cross-sectional comparison of pre-adoption and post-adoption beliefs. *MIS Quarterly: Management Information Systems*, *23*(2), 183–213. Retrieved from https://www.jstor.org/stable/249751

Kass, K. D. (2014). Computer self-efficacy: Instructor and student perspectives in a university setting (Iowa State University, Digital Repository). https://doi.org/10.31274/etd-180810-3731

Khayati, S., & Zouaoui, S. K. (2013). Perceived Usefulness and Use of Information Technology: the Moderating Influences of the Dependence of a Subcontractor towards His Contractor. *Citeseer*, *III*(6), 1–28. Retrieved from http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.681.8822&rep=rep1&type=pdf

Kim, Y. H., & Kim, D. J. (2005). *A Study of Online Transaction Self-Efficacy, Consumer Trust, and Uncertainty Reduction in Electronic Commerce Transaction*. https://doi.org/10.1109/HICSS.2005.52

Knutsen, L. A. (2005). M-Service Expectancies and Attitudes: Linkages and Effects of First Impressions. *Ieeexplore.Ieee.Org*, 84a-84a. https://doi.org/10.1109/hicss.2005.395

Lang, L., & Pirani, J. A. (2014). The learning management system evolution. *Educause Annual Conference Research Bulletin*, 1–9. Retrieved from http://www.educause.edu/annual-conference/2014

Lee, D., Lee, S. M., Olson, D. L., & Hwan Chung, S. (2010). The effect of organizational support on ERP implementation. *Industrial Management & Data Systems*, *110*(2), 269–283. https://doi.org/10.1108/02635571011020340

Lee, Y., Kozar, K. A., & Larsen, K. R. T. (2003). The Technology Acceptance Model: Past, Present, and Future. *Communications of the Association for Information Systems*, *12*, 752–780. https://doi.org/10.17705/1cais.01250

Lian, J. W. (2015). Critical factors for cloud based e-invoice service adoption in Taiwan: An empirical study. *International Journal of Information Management*, *35*(1), 98–109. https://doi.org/10.1016/j.ijinfomgt.2014.10.005

Liaw, S. S., Huang, H. M., & Chen, G. D. (2007). Surveying instructor and learner attitudes toward e-learning. *Computers and Education*, *49*(4), 1066–1080.

Lin, S., Shih, T. H., & Chuang, S. H. (2014). Validating innovating practice and perceptions of course management system solutions using structural equation modeling. *Quality and Quantity*, *48*(3), 1601–1618. https://doi.org/10.1007/s11135-013-9864-y

Long, T., Cummins, J., & Waugh, M. (2018). Investigating the factors that influence higher education instructors' decisions to adopt a flipped classroom instructional model. *British Journal of Educational Technology*. https://doi.org/10.1111/bjet.12703

Lu, H. P., & Yang, Y. W. (2014). Toward an understanding of the behavioral intention to use a social networking site: An extension of task-technology fit to social-technology fit. *Computers in Human Behavior*, *34*, 323–332. https://doi.org/10.1016/j.chb.2013.10.020

Ma, W. W. K., Andersson, R., & Streitht, K. O. (2005). Examining user acceptance of computer technology: An empirical study of student teachers. *Journal of Computer Assisted Learning*, *21*(6), 387–395. https://doi.org/10.1111/j.1365-2729.2005.00145.x

Mahdizadeh, H., Biemans, H., & Mulder, M. (2008). Determining factors of the use of e-learning environments by university teachers. *Computers and Education*, *51*(1), 142–154.

Marakas, G. M., Yi, M. Y., & Johnson, R. D. (1998). The Multilevel and Multifaceted Character of Computer Self-Efficacy: Toward Clarification of the Construct and an Integrative Framework for Research. *Information Systems Research*, *9*(2), 126–163. https://doi.org/10.1287/isre.9.2.126

Montesdioca, G. P. Z., & Maçada, A. C. G. (2015). Measuring user satisfaction with information security practices. *Computers and Security*, *48*, 267–280. https://doi.org/10.1016/j.cose.2014.10.015

Mouakket, S., & Bettayeb, A. M. (2015). Investigating the factors influencing continuance usage intention of Learning management systems by university instructors: The Blackboard system case. *International Journal of Web Information Systems*, *11*(4), 491–509. https://doi.org/10.1108/IJWIS-03-2015-0008

Nelson, R. R., & Cheney, P. H. (2006). Training End Users: An Exploratory Study. *MIS Quarterly*, *11*(4), 547.

Norzaidi, M. D., Chong, S. C., Murali, R., & Salwani, M. I. (2009). Towards a holistic model in investigating the effects of intranet usage on managerial performance: a study on Malaysian port industry. *Maritime Policy & Management*, *36*(3), 269–289.

Nysveen, H., & Pedersen, P. E. (2016). Consumer adoption of RFID-enabled services. Applying an extended UTAUT model. *Information Systems Frontiers*, *18*(2), 293–314. https://doi.org/10.1007/s10796-014-9531-4

Oliveira, P. C. de, Cunha, C. J. C. de A., & Nakayama, M. K. (2017). Learning Management Systems (LMS) and e-learning management: an integrative review and research agenda. *Journal of Information Systems and Technology Management*, *13*(2), 157–180. https://doi.org/10.4301/s1807-17752016000200001

Oshiro, D. T. (2015). One hawai`i k-12 complex public school teachers' level of computer self-efficacy and their acceptance of and integration of technology in the classroom. *Dissertation Abstracts International Section A: Humanities and Social Sciences*, Vol. 75, p. No-Specified. Retrieved from http://search.proquest.com/openview/3c4f6899e60b24665a60bb-056693d79e/1?pq-origsite=gscholar&cbl=18750&diss=y

Paulsen, M. F. (2002). Online Education Systems : Discussion and Definition of Terms. *NKI Distance Education*, 1–8. Retrieved from http://www.porto.ucp.pt/open/curso/modulos/doc/Definition of Terms.pdf

Pynoo, B., Devolder, P., Tondeur, J., … J. V. B.-C. in H., & (2011), undefined. (n.d.). Predicting secondary school teachers' acceptance and use of a digital learning. *Elsevier*. Retrieved from https://www.sciencedirect.com/science/article/pii/S074756321000302X

Rahman, N. S. A., Rosman, A. N., & Sahabudin, N. A. (2020). Students' Continuance of Using E-Learning System: A Review of Conceptual Frameworks. In IOP Conference Series: Materials Science and Engineering (Vol. 769, No. 1, p. 012044). IOP Publishing.

Raza, S. A., Qazi, W., Khan, K. A., & Salam, J. (2021). Social isolation and acceptance of the learning management system (LMS) in the time of COVID-19 pandemic: an expansion of the UTAUT model. Journal of Educational Computing Research, 59(2), 183-208

Ringle, C. M., Sarstedt, M., Mitchell, R., & Gudergan, S. P. (2020). Partial least squares structural equation modeling in HRM research. *The International Journal of Human Resource Management, 31*(12), 1617-1643.

Sam, H. K., Othman, A. E. A., & Nordin, Z. S. (2005). Computer self-efficacy, computer anxiety, and attitudes toward the Internet: A study among undergraduates in Unimas. *Educational Technology and Society*, *8*(4), 205–219.

Sanchez-Franco, M. J. (2010). WebCT - The quasimoderating effect of perceived affective quality on an extending Technology Acceptance Model. *Computers and Education*, *54*(1), 37–46. https://doi.org/10.1016/j.compedu.2009.07.005

Sara, M., & Rabiaa, M. (2016). IS/IT performance measurement system: Literature review and a comparative study. *2016 International Conference on Information Technology for Organizations Development, IT4OD 2016*. https://doi.org/10.1109/IT4OD.2016.7479283

Schoonenboom, J. (2014). Using an adapted, task-level technology acceptance model to explain why instructors in higher education intend to use some learning management system tools more than others. *Computers and Education*, *71*, 247–256. https://doi.org/10.1016/j.compedu.2013.09.016

Sekaran, U., & Bougie, R. (2016). *Research methods for business: A skill building approach*.

Shih, Y. Y., & Chen, C. Y. (2013). The study of behavioral intention for mobile commerce: Via integrated model of TAM and TTF. *Quality and Quantity*, *47*(2), 1009–1020. https://doi.org/10.1007/s11135-011-9579-x

Shittu, A. T., Gambari, A. I., Gimba, W. R., & Ahmed, H. (2018). Modeling Technology Preparedness as an Antecedent of Mathematic Pre-service Teachers' Self Efficacy, Perceived Usefulness and Intention Toward Use of Information Technology in Nigeria. *MOJES: Malaysian Online Journal of Educational Sciences*, *4*(3), 39–48.

Sinclair, J., & Aho, A.-M. (2018). Experts on super innovators: understanding staff adoption of learning management systems. *Higher Education Research & Development*, *37*(1), 158–172. https://doi.org/10.1080/07294360.2017.1342609

Spacey, R., Goulding, A., & Murray, I. (2003). ICT and change in UK public libraries: does training matter? *Library Management*, *24*(1/2), 61–69.

Teo, T., Lee, C. B., & Chai, C. S. (2008). Understanding pre-service teachers' computer attitudes: Applying and extending the technology acceptance model. *Journal of Computer Assisted Learning*, *24*(2), 128–143. https://doi.org/10.1111/j.1365-2729.2007.00247.x

Teo, Timothy. (2009). Modelling technology acceptance in education: A study of pre-service teachers. *Computers & Education*, *52*(2), 302–312. https://doi.org/10.1016/J.COMPEDU.2008.08.006

Teo, Timothy, Huang, F., & Hoi, C. K. W. (2018). Explicating the influences that explain intention to use technology among English teachers in China. *Interactive Learning Environments*, *26*(4), 460–475. https://doi.org/10.1080/10494820.2017.1341940

Tinio, V. L. (2003). *ICT in Education (UNDP)*. Retrieved from http://www.apdip.net.

Tossy, T. (2014). (2014) Modeling the adoption of mobile payment system for paying examination fees in Tanzanian major cities. *International Journal of Computing and ICT Research*, *8*(1), 83–98. Retrieved from http://www.ijcir.mak.ac.ug/volume8-number2/article7.pdf

Tung, F. C., & Chang, S. C. (2008). Nursing students' behavioral intention to use online courses: A questionnaire survey. *International Journal of Nursing Studies*, *45*(9), 1299–1309.

Vannatta, R. A., & Fordham, N. (2004). Teacher dispositions as predictors of classroom technology use. *Journal of Research on Technology in Education*, *36*(3), 253–271. https://doi.org/10.1080/15391523.2004.10782415

Venkatesh, V., & Bala, H. (2008). Technology acceptance model 3 and a research agenda on interventions. *Decision Sciences*, *39*(2), 273–315. https://doi.org/10.1111/j.1540-5915.2008.00192.x

Venkatesh, V., & Davis, F. D. (1996). A Model of the Antecedents of Perceived Ease of Use: Development and Test. *Decision Sciences*, *27*(3), 451–481. https://doi.org/10.1111/j.1540-5915.1996.tb00860.x

Venkatesh, V., & Davis, F. D. (2000). A Theoretical Extension of the Technology Acceptance Model: Four Longitudinal Field Studies. *Management Science*, *46*(2), 186–204. https://doi.org/10.1287/mnsc.46.2.186.11926

Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User Acceptance of Information Technology: Toward a Unified View. *MIS Quarterly*, *27*(3), 425. https://doi.org/10.2307/30036540

Wang, W.-T., & Liu, C.-Y. (2005). The Application of the Technology Acceptance Model: A New Way to Evaluate Information System Success. *Proceedings of the 23rd International Conference of the System Dynamics Society*, 149. Retrieved from http://myweb.ncku.edu.tw/~wtwang/personal/Wang_Liu-2005.pdf

Wangpipatwong, S., Chutimaskul, W., & Papasratorn, B. (2008). Understanding Citizen ' s Continuance Intention to Use e- Government Website : a Composite View of Technology Acceptance Model and Computer Self-Efficacy. *The Electronic Journal of E- Government*, *6*(1), 55–64. Retrieved from www.ejeg.com

Weller, M. (2007). *Virtual learning environments: Using, choosing and developing your VLE*. Retrieved from https://content.taylorfrancis.com/books/download?dac=C2005-0-03011-0&isbn=9781134122547&format=googlePreviewPdf

Woodrow, J. E. J. (1991). A Comparison of Four Computer Attitude Scales. *Journal of Educational Computing Research*, *7*(2), 165–187.

Wu, M. Y., Yu, P. Y., & Weng, Y. C. (2012). A study on user behavior for i pass by UTAUT: Using taiwan's MRT as an example. *Asia Pacific Management Review*, *17*(1), 91–111. https://doi.org/10.6126/APMR.2012.17.1.06

Yeou, M. (2016). An Investigation of Students' Acceptance of Moodle in a Blended Learning Setting Using Technology Acceptance Model. *Journal of Educational Technology Systems*, *44*(3), 300–318.

Yeşilyurt, E., Ulaş, A. H., & Akan, D. (2016). Teacher self-efficacy, academic self-efficacy, and computer self-efficacy as predictors of attitude toward applying computer-supported education. *Computers in Human Behavior*, *64*, 591–601. https://doi.org/10.1016/j.chb.2016.07.038

Yount, W. R. (2006). *Research design and statistical analysis for Christian ministry*. WR Yount Fort Worth.