Factors Affecting Instructors' Adoption of Learning Management Systems: A Theoretical Framework

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Abstract—Higher educational institutions have made a substantial investment in the adoption of Learning Management Systems to enhance their learning and teaching activities; however, these systems are not used by the faculty members with their fullest capabilities. This research mainly aims to verify the key factors that affect learning management system (LMS) adoption by instructors in Palestinian universities and to develop an integrated model of instructor adoption of e-learning management systems by incorporating existing literature and multiple empirically verified multiple theories. A theoretical framework is proposed based on Delone and McLean information system success model, Technology Acceptance model, and Self-Determination Theory Model. This framework gives a comprehensive look at the significant factors that control and affect the instructors' adoption to the learning management system. These key factors are related to the instructor, organization, society, belief, and technology.

Keywords-component; Instructors' adoption; IS success model; Learning management system; SDT; TAM.

I. INTRODUCTION

It has become evident that information and communication technology (ICT) development has opened up new fields and unlocked a lot of potential in education, communication, and business by providing benefits to mankind in an unprecedented level [1].

The impact of ICT in the educational sector has been mentioned as remarkable by many researchers [2], and it can be noted that a lot of improvement has been made on the instructional and interactive technologies whereby the institutions of tertiary education are consistently endeavoring to deliver a quality education to students community. Higher education institutions worldwide have progressively adopted information technology tools for teaching, student learning, course curriculum, and staff development. A major trend has been recognized widely and it is recently the advent of web-based interactive learning at all levels. Asiri et al., [3] highlighted that the breakthrough of information and communication technology and its broad applications in the field of education has contributed to the establishment of current related terms in the pedagogical field, such as learning management system (LMS).

Recently, LMS are employed in the educational activities, and the usefulness of these systems in higher education institutions have substantially been growing. Applying these systems in higher education institution is becoming more and more important in order to facilitate students learning, enhances instructors teaching performance and reduces educational cost. Although e-learning systems were introduced relatively late to the middle-eastern educational system; Change from traditional systems have started to take place [4]. LMS have become one of the innovations for delivering education in many parts of the world and has been facilitated globally by a rapid expansion of information technology. Successful management and implementation of LMS are basically contingent on its adoption [5]. As, the value of LMS is not fully utilized in Palestine higher education, these latest tools of educational technology are not being used to their full potential and capabilities and encounters vast refusal and resistance from lecturers [6]; As a result, instructor's adoption of LMS are still very low and unutilized and the significance of this mode of teaching delivery is currently being questioned [7].

Hence, the web-based technology is a new method of teaching and learning for both instructors and students in most of the universities, it is still not well known which moderating and mediating factors in the online environment contribute more to its success, adoption, and acceptance [8]. According to [9], as there are many researches and studies have been conducted regarding the students' adoption of web-based learning, only very few of them have been done on instructors' adoption. Especially, there is no research about instructors' adoption of web-based learning systems in Palestine. Accordingly, the main objective of this review paper is to propose an integrated framework that will capture the key factors by influencing the instructors' adoption of LMS in higher education in the local context. This paper is organized as follows: section two presents a review of the literature concerning web-based learning systems, user intention theories, and information system success. Section three presents the LMS adoption factors. Section four describes our theoretical model, and section five concludes this paper.

II. LITERATURE REVIEW

A. Learning Management Systems (LMS)

Higher educational institutions have developed different e- learning management systems intended for supporting e-learning activities. The web course homepage system, blackboard, Moodle, WizIQ, Olat, etc. are some examples of the latest technology-based academic tools that use the internet as a delivery mechanism [10]. Learning Management System is a software application , which supports the process of teaching and learning neglecting the barriers of time and space [11]. LMS have the ability to change not only the way society retains and accesses knowledge but also to transform and restructure traditional models of higher education, particularly the delivery and interaction with course materials and associated resources [12].

B. Instructors' Adoption of LMS

In general, similar to any other information system, user adoption, and acceptance are essential primary measures of information technology system success [13]. A main contributing factor of the successful implementation of educational technology is the instructor's acceptance of these technologies. Instructors have to change their habits, behaviors, and perspectives in order to implement, adopt, and accept the use of new IT systems. It has been concluded that e-learning is regarded as radical and challenging for both the instructors and learners alike. The different skills that instructors have to possess were also found to be important to influence their attitude regarding the adoption of e-learning system.

Al-alak and Alnawas [14] pointed out that instructors ought to acquire various skills and play different roles in order to be able to adopt the use of IT in learning. At the beginning, instructors should be aware of the implication of system complexity and technology obstacles in order to adopt such technology and improve students' learning experience. Afterward, instructors should be willing to use the technology. Consequently, instructors may possibly refuse to accept the use of such information system. As a result, the factors affecting instructors' use and adoption of LMS must be explained and exposed so as to guarantee a successful performance and results of these systems in the institutions of higher education [15]. Instructors' acceptance of IT is a multidimensional attitude affected by a variety of social, system, belief, individual, organizational, and technical factors.

C. Technology Acceptance Model (TAM)

TAM is constructed based on the theory of Reasoned Action which is a way of adaptation to the field of information systems. Davis [16] introduced TAM to clarify computer usage behavior based on beliefs, attitudes, intentions, and behaviors. TAM has been described as one of the established and applied models in a range of domains that include adoption studies of interrelated information technology systems. TAM looks at the mediating role of perceived usefulness and perceived ease of use in the relation between external variables and the probability of system adoption by the users as an indicator of system success [9]. Although TAM successfully explains and predicts some aspects of IS user acceptance, it has certain weaknesses. Ma et al. argued that TAM by itself is inadequate to clarify the entire relationship between an information system technology and the acceptance behaviors of its users since TAM only included perceived usefulness and perceived ease of use as explanatory factors.

D. IS Success Model

IS success model, also known as the DeLone and McLean IS success model [17], provides a general and comprehensive definition of information systems success. DeLone and McLean's model remains the most popular, comprehensive framework for guiding the development of the dependent variable in IS research and studies. The framework suggests that a systematic combination of individual measures from information system success categories can create a comprehensive measurement instrument. Through research and correspondence, DeLone and McLean developed six major categories of information system success, which are: service quality, information quality, system quality, user satisfaction, use, and net benefit. As DeLone and McLean [17] suggest, these dimensions of success are interrelated rather than independent. Though, from the IS point of view, empirical investigation of the web-based learning system is not studied exceedingly, some strong evidence suggests that success model of information system (IS) is able to provide explanation and also can forecast the usages of IS[18].

E. Self-Determination Theory (SDT)

The assumption of SDT presents that upon fulfillment of basic needs, human beings feel as wellbeing in their society and continue to grow and flourish, and accomplish goals [19]. The extrinsic and intrinsic motivations are the core components of SDT. These are also considered as a set of basic psychological needs that determines motivation. The theory suggests that the satisfaction of three basic psychological needs, such as, relatedness, competence, and autonomy, ensure the adoption of intrinsic motivation or incorporation of self-determined extrinsic motivation [20]. In a study conducted by Chen and Jang [20], it is presented that, for addressing motivation in an online learning environment, self-determination theory could be considered as a suitable model By integrating the issues in online learning, the model may serve as a theoretical framework. Self-determination theory can possibly address online learning issues, for example student attrition in the online learning

environment. Another advantage of self-determination theory is that it develops and introduces prescriptions for motivational enhancement in addition to describing individuals' motivation process.

III. LMS ADOPTION FACTORS

The successful adoption and implementation of LMS can be measured using various factors. Without the prioritization of the various critical factors, it is incredibly difficult to discover the most imperative factors that affect LMS success adoption [21]. Based on previous studies on e-learning success, and the different models and theories found in the literature; the study organized diverse factors into specifically related dimensions. The rationale for this selection is that these factors have presented significant effect on the actual use online learning system through the benefits and adaptability of usages.

A. User Belief Factors

The construction of this dimension is illustrated based on the perception-behavior relationship depicted in TAM and SDT. This dimension shows the mediating role between external variables and the probability of system adoption. This relationship has not been empirically verified in the context of e-learning systems from an instructor perspective [9]. User belief factors examine individual's cognitive perception that concerns the functionality of the system and it is believed that the usages of the system will create job-related or, in general, utilitarian outcomes.

The measurement of individual perception is performed by the factors of this dimension through the usages of information systems that deliver useful outcomes, such as improvement of effectiveness and efficiency to accomplish goals [22]. As a result, perceived usefulness, intrinsic motivation, and perceived ease of use are clustered under this dimension as the factors of indication to evaluate the effects of user actual adoption of systems through system's enjoyment, and easiness. However, only a few studies empirically tested the relationship between perception and actual adoption from higher education instructors' perspective in the context of e-learning systems [15].

Intrinsic motivation at the same time refers to the perception that individuals execute an activity without consideration of the opportunity of being rewarded [23]. An internally motivated action is achieved because of the interest, enjoyment, challenging goals, pleasure, usefulness, and satisfaction of the activity itself. The intrinsic motivation that represents an instructor's subjective feelings of joy, elation, pleasure, and positive holistic experience play a critical role in explaining user acceptance and usage behavior of web-based learning. Perceived usefulness is related to "the degree to which a person believes that using a particular technology would enhance their performance" [16]. Finally, Perceived ease of use terminology is described as "the degree to which a person believes that using the system would be free of effort" [16].

B. Organizational Factors

The Existing literature presents a little amount of empirical and theoretical studies that capture organization factors' influence on the adoption and uses of e-learning systems from instructor's perspectives. Organizational factors include top management support, user support, user training, and information technology facilities. The various organizational characteristics and factors that are sought to be important determinants of web-based e-learning system success adoption comprise of facilitating conditions, management support, user training, appropriate infrastructure, technical support, and technology alignment.

Facilitating conditions as an important organizational factor is the degree to which an individual or instructor believes that an organizational and technical infrastructure exists to support the use of the system. More specially, the availability of external recourses (time, money, and effort) and also the technological resources (PCs, broadband, etc.) are needed to facilitate the performance of a particular behavior; Accordingly, the backup from top management can be defined as an extent to which a trainer grow his beliefs that the existence of organizational and technical resources are for supporting the usages of the system [24].

C. Instructors Factors

Some studies have demonstrated that information technology tools and systems adoption, diffusion, or implementation are assessed at the individual level perspectives. Individual characteristics such as attitude, personnel IT innovativeness, self-efficacy etc. are significant predictors. Within the domain of e-learning adoption, instructors' characteristics that have been investigated by previous researchers include instructor competency, computer experience, self-efficacy, attitude toward the system, and computer anxiety and knowledge.

Internet or computer experience is the Instructors' experience with technology. It is also defined as the amount of skills and abilities that they gain through the usage of the technology over time [25]. Self-efficacy is a trust in instructor's capacity to execute specific behaviors or it is instructors' self-beliefs about his or her capability in using information technology products, systems, and tools [18]. Personnel IT Innovativeness Indicates the individual readiness to demonstrate any new IT system [26]. Resistance to change refers to the behavior that meant to restrict the use or implementation of an information technology tools and system. Attitude toward the System is Individual's positive or negative feeling about performing the target behavior. However, computer anxiety in information system literature is the degree of

an individual's apprehension or even fear when he faces with the possibility of using a computer and IT tools.

D. Social Factors

Social factors look at the effects of environment factors such as other people's attitudes, behaviors, and social pressure that are imposed on the individuals. Social factors capture that how individuals, who are important for end users, have an effect on them towards using e-learning systems [27]. Subjective Norm is grouped under social dimension and defined in the model to evaluate the effect of others' opinions on the instructors' decision, which was found to have a strong influence on information technology utilization. Many instructors decide to use certain e-learning system because of some recommendations from the actual system users, the users could be colleagues or students. Subjective Norms is a Person's perception that most people, who are important to him, think they should or should not perform the behavior in question [28]. Diverse researchers have shown that social factor has a major influence in determining instructors' adoption of new IT technologies.

E. Technology / Systems Factors

System factors consist of service quality, information quality, and system quality [29]. Information system oriented factors are found to have a direct effect on the intention to adopt LMS via instructors' perceived usefulness and perceived ease of use. Limited studies provide a comprehensive examination of system factors that influence the acceptance of the technology. From the learners' point of view, users' adoption of e-learning system is directly affected by the perceived system quality factors, which includes information quality, system quality, and service quality. The interpretation of information quality of specific web-based e-learning system is clarified as "the degree to which the instructors' teaching performance is enhanced because of the uses of the information acquired from or through such system" [17]. Furthermore, the system quality is described as "the extent to which their functions help instructors to conduct teaching activities and facilitate learning" [17], whereas the service quality is measured by "the effectiveness of the support provided to the instructors to facilitate the use of such systems" [29].

F. Net Benefit

Literature provides an ample evidence of the advantages of e-learning systems adoption at both organizational and individual level. Fig 1 depicts the basic relationship between system adoption and net benefit. Benefits at the institutional level represent the influence of e-learning system usage on organization performance, such as service enhancement, cost saving, increased enrollment, and university image. On the other hand, the benefits at the individual level perspective

denote the effects of e-learning system on instructors' performance, such as individual productivity, individual efficiency, and individual effectiveness.

Figure 1. Relationship between adoption and Net Benefit

IV. PROPOSED RESEARCH MODEL

Within the domain of information system, different information system frameworks, theories, and models are regularly used in numerous studies that explore determinants of the adoption of the various types of e-learning tools and systems. These theories and models provide a useful guide for studies on technology adoption and deployment. The model of this study is conceptualized basically based on TAM [16], DeLone and McLean IS success model [17] and Self-Determination theory model [19, 30]. Models such as Ahmed [31], Lee et al., [32], Chen & Tseng [33], Al-Busaidi and Al-Shihi [26], Al-alak and Alnawas [14], Bhuasiri et al., [34], Wang and Wang [9], Findik and Ozkan [22] are considered as the major contributors of the proposed model. Most of these models and frameworks were established and proposed based on two main theories; theory of Reasoned Action [28] and theory of Planned Behavior Building upon these models, theories and the literature, various dimensions are found worth exploring, namely: instructor's factors, social factors, organizational factors, belief factors, and system factors.

The model presented in Fig 2 demonstrates the final proposed framework where the study grouped nine constructs into three dimensions. Based on their relevance, user belief is the first dimension which is based on the generic TAM and SDT and includes four factors: perceived usefulness, perceived ease of use, Intrinsic Motivation, and actual adoption and use. The second dimension which includes information system related factors is adopted from DeLone and McLean model where organizational factors, social factors, and individual factors are considered as external variables of TAM. The rationale for this selection is that these factors have shown to have significant effects on the actual use of web-based learning systems through perceived usefulness and perceived ease of use in the existing literature. The existing researches in the areas of technology adoption in education demonstrate that these factors have a direct effect and significantly related to the instructors' intention to adopt web-based learning management systems. The last dimension includes the net benefit which is adopted from D&M.

Technology and system related factors include information quality, system quality, and service quality; individual or instructor related factors include self-efficacy, attitude toward e-learning system, personal
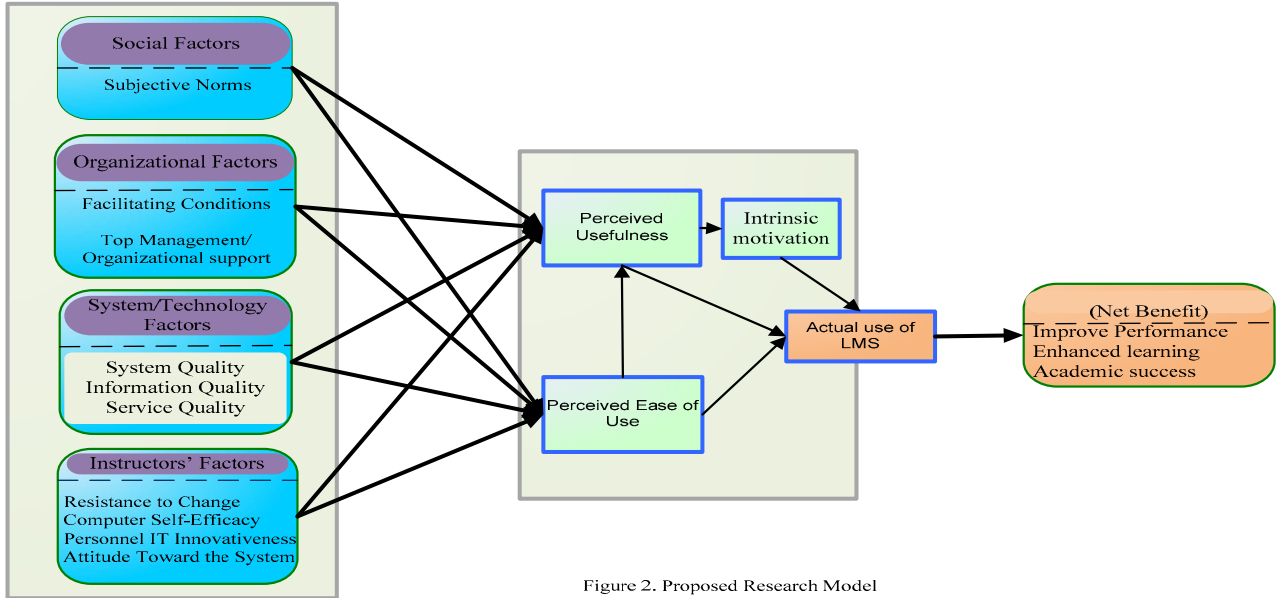
Figure 2. Proposed Research Model

innovativeness, and resistance to change; organizational related factors combine management support, and facilitating conditions; social factors include subjective norms; user belief factors include perceived ease of use, Intrinsic Motivation, and perceived usefulness; finally, the outcome related dimension includes Net Benefit

In contrast to earlier existing models, frameworks, and works in the field of e-learning system adoption from instructors' perspectives, the current study extended the research scope by combining the most critical factors which are identified in the relevant literature and attempted to apply in the local context. Therefore, the proposed model contains variables that have not been integrated into any framework subject previously, thus allowing examining them simultaneously for validation and the establishment of relationships. From the identification of most of the studies, it is clear that e-learning adoption depends on TAM or its extension with different variables. These studies did not utilize any framework in developing the research models. So these studies present no clear pattern in selecting the external variables of the research structure. To evaluate individual attitude in e-learning system, it is suggested to avoid the usages of single linear methodology [35].

Therefore, a multidimensional approach is considered in this study to assess the intention of the instructors in higher educational institution towards adopting e-learning systems. The variables of the proposed research model are chosen under the control of related dimensions. In addition, even though some researchers have combined both TAM and IS success model together, the researcher has practiced the motivation factor based on SDT theory as it is not being investigated in such context and also not being considered as the main player for the adoption of the system. The justification of including motivation is based on the preliminary study and the literature. When discussing the issue of motivation in information systems studies; researches on information systems adoption and usage to a large extent concentrated on extrinsic motivation in the workplace, yet, few researchers examined the underlying intrinsic motivation [36]. Even though researchers believe extrinsic motivation plays a more central part in the adoption process of web-based e-learning tools and systems in developing countries. The researchers claim that intrinsic motivation will be a more effective player in the local context; one possible reason is that, in the local context, extrinsic motivation loses its dominant role to intrinsic motivation.

V. CONCLUSION

As learning management systems are progressively more adopted by higher educational institutions, e-learning systems adoption factors need to be examined, assessed, and taken into concern in the development of the e-learning system to deliver effective educational services. The success of e-learning management systems implementation in any institution of higher education begins with instructors' acceptance and usage. Accordingly, the main purpose of this review paper is to propose a theoretical framework that examines the key factors which have the greatest effect on the instructors' willingness to accept and adopt e-learning in the local context. The study found that there are different related factors. These include instructor's factors, social factors, organizational factors, belief factors, and system factors.

This study proposed a theoretical framework which may provide policymakers with information regarding the e-learning process and the demands to implement such systems and can be used by IS researchers and practitioners to assess the instructors' acceptance of e-

learning systems. Since this research is still in progress, future work should adopt reliable and valid measurements to evaluate the impact of these factors on instructors' adoption of LMS. An empirical analysis will be conducted in the next stage to validate the effects of all the related factors, and a quantitative investigation will also be conducted to authenticate the proposed model.

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