The Influences of Technical Support, Self Efficacy and Instructional Design on the Usage and Acceptance of LMS: A Comprehensive Review

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ABSTRACT
Innovation, globalization and the rapid expansion of technologies are the current trend now, which lead to the use of latest technologies in several different sectors, including education sector without exception. Learning management system (LMS) that is used for delivering education has become one of the most important innovative tools that is widely used and implemented by educational institutes and universities all over the world. Therefore, it is clear that LMS provides its users with huge benefits. Although LMS has been successful in developed countries and its huge benefits have been gained, the implementation of LMS in developing countries has failed either partly or fully, and its utilization is not complete and considered below the satisfactory level. For an example, in Saudi Arabia, which is considered as one of the developing countries, LMS has been implemented by universities for many years, however its utilization is still under the satisfactory level among both the academic staffs and the students. Organizational, technological and self factors, such as the technical support, self efficacy and instructional design of LMS are believed to be the barriers in Saudi Arabia that may have prevented or decreased the utilization of LMS. Therefore, this paper intends to review the literatures that are related to all the studies that used Technology Acceptance Model (TAM) recently to investigate empirically the influence of factors, majorly the technical support, self efficacy and instructional design, along with other factors that may influence the usage and acceptance of LMS. By reviewing the literatures, it is found herein that enjoyment and self efficacy factors within the context of LMS are mostly examined empirically by using TAM, while technical support, self efficacy and instructional design of LMS have not been empirically and simultaneously examined by using TAM at the global level.

Keywords: Learning management system, Technology acceptance model, external factors, self efficacy, technical support, instructional design.

INTRODUCTION
learning management system (LMS) is a web-based application that carries out the implementations of internet services and web based supporting mechanisms, namely producing, delivering and maintaining online courses, enrolling and administration of students, and performance reporting of students (Dagger et al., 2007). Furthermore, Goh et al (2013) explained that LMS supports and manages students with 24/7 (always available) mode to all subject materials, while also monitors and reports students activities. In term of features, the LMS platform provides an online based educational environment, including quizzes and questionnaires, which operate under web 2.0 platforms (Goh et al, 2013).

As an emerging technology, many academic institutions in higher education have adopted and operating LMS platform, whether it is in commercial perspective, through Blackboard platform, and open source perspective, through Moodle platform (Al-Busaidi & Al-Shihi, 2010). In order to prove the significance of LMS, it was found that 90% of the higher academic institutions in the United States of America (USA) provide its courses and programs via LMS platform (Jones, Morales, & Knezek, 2005, p. 219). Apart from the USA, countries in the Asia (Bonk, Lee, & Reynolds, 2009), some countries under the Gulf Cooperation (Dutta& Mia, 2011), the UK

Universities (Walker et al, 2011), and the Australian Universities have increasingly adopted the LMS platform into the operations (Curtis & Lawson, 2001 ; Ellis et al, 2006). Similarly, Middle East countries have realized the promising features of LMS and henceforth actively adopting the platform into the academic systems (Robinson and Ally, 2009). In a more detailed study, Abdallah (2010) reported that 96% of the Arab universities adopted LMS platform as the engine to operate the e-learning services to provide real-time support and learning environments.

Currently, most of the success stories of LMS implementations were limited to the educational institutes in developed countries, where these countries significantly benefitted from the advantages of LMS platform (Paulsen, 2003). However, LMS platform was not widely successful in the developing countries due to not meeting the requirements of a developing nation (Borstorff and Lowe, 2007; Khan et al, 2010; Saeedikiya et al, 2010). Khan et al (2010) reported that the developing countries are still lagging behind in the area of e-services compared to the developed countries, where there are several shortcomings including the limitations of human resources and technical competencies. As a result, the shortcomings lead to a further widening of gap between developed and developing countries toward the implementation of e-services. In a study conducted by Ssekakubo et al (2011), 5 Universities from the region of Africa were considered for the investigation of the underlying problems that induced the failure of LMS platform. The study revealed that low familiarity with LMS platform, insufficient know-how competency of the platform, insufficient support system, and poor marketing strategy were among the reasons that caused the failure of the implementation of the platform.

In other studies in Saudi Arabia, it was found that LMS is adopted and applied in higher academic institutions for many years, but the overall usage of LMS platform is insignificant and hence has not met the required usage level (Woods et al, 2004; Al-Judi, 2011; Bousbahi and Alrazgan, 2015). For LMS platform in Saudi Arabia, the factors that may have prevented the sufficient usage of LMS could be due to organizational, technology and personal barriers, which include the technical support, computer self efficacy and instructional design of LMS platform (Asiri et al, 2012). Therefore, this paper intends to review the recent literatures to investigate on the empirical studies that focused and examined on these particular factors, and how these factors relatively influenced the LMS use and acceptance by using Technology Acceptance Model "TAM". The following section will discuss on the details of TAM and justify on the candidacy of TAM to examine the factors within this review instead of other theories of technology acceptance.

Technology Acceptance Model (TAM)
The founding model of TAM was carried out by Davis (1989), and defined as a theory of information system that models and explains the user perception and acceptance toward a technology. In the exact context of Davis (1989), TAM provides "An explanation of the determinants of technology acceptance that is generally capable of explaining user behavior across a broad range of end-user computing technologies and user populations, while at the same time being both parsimonious and theoretically justified" (Davis, 1989, p. 985).

There are 5 different constructs in the TAM model, namely perceived ease of use "PEU", perceived usefulness "PU", attitude towards use "ATT", behavior intention to use "BI" and actual use "AU". As reported by Davis (1989) on TAM, PU and PEU are internal belief constructs, which are the initial determinants for users to create a positive or negative perception towards a technology. PU can be defined as "the degree to which a person believes that using a particular system would enhance his or her job performance" (Davis, 1989, p.320). PEU can be defined as "the degree to which a person believes that using a particular technology would be free from effort" (Davis 1989, p.320). It is clear from the definitions of PEU and PU that PU has a dependency to PEU, which means that if an individual finds a technology "easy to be used", then the perception towards the technology would be "useful". The overview of TAM Model is illustrated in the following figure.
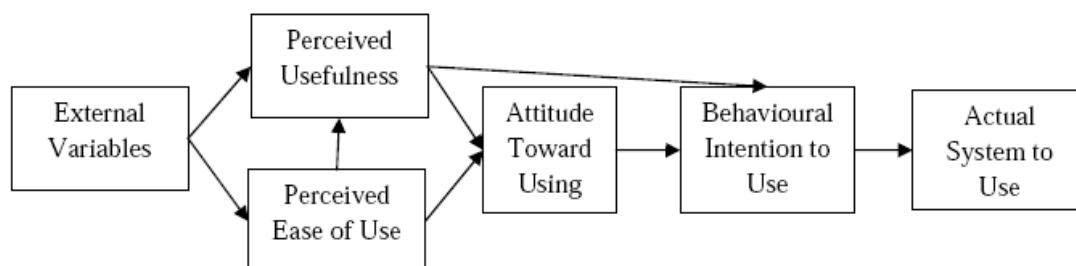

Figure: the Technology Acceptance Model (TAM)
Source: (Davis, Bagozzi & Warshaw, 1989)

There are theories that provide many different perspectives of users' aspect and acceptance towards a technology. The well known theories that cover users' aspect and acceptance are theory of the diffusion of innovation, theory of planned behavior (TPB), the DeLone and McLean model of IS success[36], and as well as the chosen TAM for the research framework herein. As stated, TAM is picked as the candidate for the research framework herein because the model was found to be widely used, greatly predictive, and directly influences the perception, acceptance and adoption of information technology (Davis, et al., 1989; Venkatesh & Davis, 2000; Venkatesh & Bala, 2008; Al-Busaidi & Al-Shihi,, 2010; Alharbi, Drew, 2014). Furthermore, TAM had been empirically validated and proven to be operated with exceptionally high quality (Chau, 1996; Adams, Nelson & Todd, 1992). TAM is also known for its flexibility towards applications since it can operate with wide range of external variables and dependent variables, namely varying work environment, culture, and various features within worldwide technologies (Seyal & Rahman, 2007; Chuttur, 2009). Besides, TAM is being widely adopted as the tool to examine the e-learning process, however, currently applying TAM to the LMS application is not a popular research work (Psycharis et al, 2011; as cited in Alharbi and Drew, 2014).Therefore, due to the enormous studies conducted on TAM without covering the essentials for LMS, the proposed investigation will analyse the recent empirical studies on the contribution of external factors toward the usage and acceptance of LMS. Some of the important external factors will be considered for this investigation are self-efficacy, technical support, instructional design and along with other minor factors,

The external factors that influence on LMS use
In this paper, the investigation will primarily focus on the analysis of the recent empirical studies on external factors that influenced LMS via TAM, namely self-efficacy, technical support, instructional design and along with other minor factors. However, it is also important to have a deep understanding of these factors prior to the meta-analysis that will be carried out and discussed in the upcoming sections.

Technical support
Technical support is one of the key external factors, which basically conducted by providing support when required by experts to end-users on software and hardware related products. The support can be carried out through various mediums, while the well known mediums are online, over the phone or fax, help desk, machine-readable method for knowledge bases, remote login, and other least used mediums (Ralph , 1991). In a study conducted by Igbaria (1990), the proposed techniques for technical support were carried out in two directions. The first direction was to support end-users through software tools, relevant documents and manuals, whereas the second direction was through the management support by directly providing large pool of resources.

In an actual e-learning environment, technical support is one of the essential elements that convince end-users to have a positive perception and accept a technology (Hofmann, 2002; Sumner & Hostetler, 1999; Williams, 2002; Sa´nchez et al 2013; Mirani & King, 1994). A very helpful technical support system will create a positive perception among the system users and information technology experts, which will lead to a higher chance of success for a new technology (Igbaria, 1990,; Sa´nchez and Hueros, 2010). Contrarily, a weak support system will be an obstacle for a technology to succeed. For an example, it is believed in Saudi Arabia that the technical support is considered as one of the organizational barriers that may prevent learners from using and accepting LMS (Asiri et al, 2012).

Computer self efficacy
Self-competency of using computers or better known as Computer self efficacy (CSE) is the ability of an individual to perform and organize multitasking actions to achieve the required performance. In this context, efficacy does not only refer to the skills possessed by an individual, but also the method of applying the relevant skills to achieve the desired goal (Bandura, 1986). As reported by Marakas et al (1998), CSE can be categorized as task-specific and general. The Task-specific CSE is the ability of an individual to use any applications or systems in a single generic computer domain, whereas an individual that is able to work on cross-platform computers is known to have the general CSE.

In the CSE domain, literatures revealed that technology acceptance is a primary criterion (Brown, 2002; Miller et al, 2003; Hayashi et al, 2004; Grandon et al, 2005). On the other hand, it was found that individuals who were weak in CSE lose the motivation of carrying out computer related tasks compared to those who were competent in CSE (Compeau and Higgins, 1995).

In the context and applications of LMS, CSE is achieved when an individual could operate and work based on self ability without requiring any external aid. In most cases, end-users with sufficient CSE will likely to have positive perceptions of PEU and PU toward a system. Contrarily, when end-users have lower CSE towards a

system, considering LMS system within this context, the users' judgment would be either "difficult to use" or "less useful" towards the system.

Instructional design

Instructional design is known as the complete system structuring and design cycle that can be categorized into several layers, namely understanding the desired knowledge, preparing all requirements for design, exhibiting the process of authoring, aligning the prepared materials and the requirement, followed by the evaluations of effectiveness and efficacy toward the material (Seels & Richey, 1994). As reported by Chang (1999) and Barker (2003), the processes of e-learning system design can be similar to a classroom format, where the processes are explaining the course details, followed by its contents, objectives, aims, purposes, and method of evaluation. Most importantly, meticulous considerations should be given to the interactions among students and instructors during the design and development phase of the content of the e-learning system (Picciano, 2001). Therefore, it is important that LMS adopts the instructional interactivities among students and instructors and correlate it with its content.

METHODOLOGY

The review of literature is an objective that requires summarising and analysing critically the related available literature regarding specific topic being studied (Hart, 1998). Its main objective is to make the reader aware of the latest available literature regarding a specific topic and build the basis for achieving another objective, such as the need and justification for carrying out further researches in that specific field. An ideal review of literature involves gathering information regarding a specific topic from many different resources. Literature review should be well written and well structured. It should also take account of a clear selection strategy and research (Carnwell and Daly, 2001). Moreover, the ideal structuring is of utmost importance for enhancing the readability as well as the flow of the review. The use of accurate terminologies is essential, jargons have to be kept to minimum, and the referencing should also be used accurately within the review (Colling, 2003). Therefore, all these aspects have been given due consideration while doing the current review. This study aims to review all the recent published articles that used Technology Acceptance Model (TAM) as the theoretical framework to examine the effects of external factors, namely technical support, computer self efficacy and instructional design of LMS along with any other factors related to the usage and acceptance of LMS. The initial approach adopted to conduct this investigation involves searching through numerous electronic databases, namely ProQuest, Web of science, IEEExplore, digital library and Google scholar. The keywords used to find the related publications include Technology Acceptance Model AND Learning Management System, TAM AND LMS, TAM and e-learning Systems. The search process resulted in more than 45 publications, which of only 12 are chosen as these papers were falling within the scope of the topic and were meeting the following criteria: 1- The study should use Technology Acceptance Model (TAM) to examine the influence of any external factors on LMS usage and acceptance, and 2- All studies should be published within the period of 2010 to present. By carrying out in-depth reading of the papers, combined with notes and discussions on TAM as well as the external factors that are mainly focusing on technical support, self efficacy, and instructional design along with other used factors, the influencing mechanisms on the usage and acceptance of LMS are summarised. The next section will present the results of the review, and will be followed by the discussions.

Result I

N	year	Author/s	Location	Technical support	Computer self efficacy	Instructional design	Other External factors used in the study	The purpose of the research/ scope of the study
1	2010	Al-hawari and Mouakket	United Arab Emirate "UAE"	✕	✕	╱	Enjoyment	To show the significance of TAM's original factors with some external factors of "enjoyment" on students' usage and acceptance of LMS
2	2011	Almarashdeh, Sahari, Mat Zin, and Lambadi	Malaysia	✕	✕	✕	None, the authors only used the original constructs of TAM	To examine the influence of original TAM factors on students and instructors' use of LMS, and to test the applicability of TAM
3	2012	Al-Aulamie, Mansour, Daly, and Adjei	UK	✕	✕	✕	Enjoyment and computer playfulness	Relying on TAM, this study aimed to propose an extended model to investigate the influence of enjoyment, computer playfulness on undergraduate and postgraduate, and students' use of LMS.

4	2013	Saʹnchez, Hueros and Ordaz	Spain	✓	✓	✗	None	to investigate the factors of technical support and self efficacy that determine the acceptance of LMS among students
5	2013	Cheng	Taiwan	✗	✗	✗	Interactivity and enjoyment	To examine the influence of interactivity and enjoyment factors on students' intentions to use and the actual application of LMS
6	2013	COŞKUNÇAY and ÖZKAN	Turkey	✗	✓	✗	Technology complexity, compatibility and subjective norms	To examine the factors of technology complexity, compatibility and subjective norms on academics' intention to use and the application of LMS.
7	2014	Alharbi and Drew	Saudi Arabia	✗	✗	✗	LMS usage experience and job relevance	To propose an extended TAM model, and examine the influence of LMS usage experience and job relevance toward the academics' intention of using LMS.
8	2014	Majdalawi, Almarabeh and Mohammad	Jordan	✗	✗	✗	GPA, academic year, and faculty	To examine the influence of some external factors, including GPA, academic year, and faculty on students' intention of using LMS
9	2014	Juhary	Malaysia	✗	✗	✗	None, the author used the original constructs of TAM	To investigate the influence of the original TAM constructs", including both PEU and PU on students' intention of using LMS.
10	2015	Bousbahi and Alrazgan	Saudi Arabia	✓	✗	✗	Motivation, load anxiety	To examine the influences of motivation, technical support and load anxiety on academics' usage and acceptance of LMS
11	2015	Shin and Kang	South Korea	✗	✓	✗	System accessibility and subjects norms	To investigate the influence of system accessibility and subjects norms on students' usage and acceptance of LMS through the mobile learning platform
12	2015	Fathema, Shannon and ross	United states	✗	✓	✗	System quality and facilitation condition	To investigate the factors of system quality, self efficacy and facilitation condition that influenced the academics' intention to use and the actual application of LMS.

As indicated in the table I, there are interests in investigating the factors that may have influenced the usage and acceptance of LMS by applying TAM. In the year of 2015, there were three studies that examined the influences of external factors on the usage and acceptance of LMS (Fathema et al 2015; Shin and Kang 2015; Bousbahi and Alrazgan 2015). These studies revealed the trend and value of using TAM to extend and investigate the LMS empirically into several different factors. Some of these studies focused the investigation of the influence of the external factors on the usage and acceptance of LMS towards academic members, students, or both. Furthermore, only two particular articles used the original TAM constructs of PEU and PU to examine the impacts on the usage and acceptance of LMS. Rest of the articles used TAM and extended it to include other external factors that influenced the usage and acceptance of LMS. The following section will elaborate the results into more details.

DISCUSSION

A- *The factors that influenced usage and acceptance of LMS:*

Based on the meta-analyses that has been summarized in table I, it is clear that several different external factors and their influences on the usage and acceptance of LMS have been investigated by using TAM. Some examples of these factors are instructional design, enjoyment, self efficacy, motivation, load anxiety, system actability and along with other factors. However, it is notable that some of the external factors, including enjoyment and self efficacy are used in several studies.

Most developing countries did not experience a successful implementation of the LMS system, hence the system could not apply its complete potential in these countries and resulted in partial or full failure. (Borstorff and Lowe, 2007; Khan et al, 2010; Saeedikiya et al, 2010). In the African continent, Ssekakubo et al (2011) carried out investigations across 5 universities and found the possible reasons that induced the failure of LMS, namely low familiarity, trouble to operate, insufficient support, little knowledge in ICT area among students, and poor marketing strategy. Based on the meta-analyses conducted herein, some of the failures in implementing LMS are low comfort level with the technology or low self efficacy, and insufficient technical support as stated by Ssekakubo et al (2011), have been examined by Saˊnchez et al (2013), COŞKUNÇAY and ÖZKAN (2013), and Bousbahi and Alrazgan (2015).

On the other hand, there were institutes implemented LMS in developed countries and successfully enjoyed its enormous advantages (Paulsen, 2003). Therefore, it is no surprise that most of the studies shown in the table I are focused toward developing countries, including Jordan, Saudi Arabia, United Arab Emirate, Malaysia and among others. Furthermore, these countries aimed to increase the utilizations of LMS among its users as the implementation of LMS has not been successful (Ssekakubo et al ,2011: Bousbahi and Alrazgan, 2015). However, the implementation of LMS cannot be successful until unless there are investigations into the factors that may have prohibited and prevented end-users, both students and academics, from using LMS. Adzharuddin & Ling (2013) reported on the importance of knowing the factors that changed the perception of students' toward a technology, because this will directly aid the academicians and administrators to attract increased number of students that preferred the learning environment that directly utilized a technology.

In Saudi Arabia, many studies have confirmed that the utilization of LMS was below the satisfactory level (Woods et al, 2004; Al-Judi, 2011; Bousbahi and Alrazgan, 2015). It is believed that some of the factors such as technical support, self efficacy and instructional design of LMS, as stated by Asiri et al (2012), may influence on the LMS usage. As indicated in the meta-analyses, only two studies are using TAM to probe and examine some factors that may influence the LMS usage in Saudi Arabia. Alharbi and Drew (2014) pioneered the research work on TAM that operated with many external variables, namely, user experience of LMS, job relevancy to investigate factors influencing on academic members' behavior intention to use LMS. Results showed that these factors either directly or indirectly influence on academic behavior intention to use LMS. Thereafter, Bousbahi and Alrazgan (2015) reported an alternative study involving external factors for TAM, including load anxiety; motivation and organization support, to examine the impacts of the these external factors on faculty members' usage and acceptance of LMS . Results showed that these external factors play a significant role in influencing the perception of usefulness of LMS among them. Both studies clearly demonstrated that external factors significantly influenced the academicians' perception toward the use of LMS. However, the studies by Alharbi and Drew (2014) and Bousbahi and Alrazgan (2015) did not unveil the behavior of students toward LMS, and concurrently failed to include some important factors suggested by Asiri et al (2012), namely technical support, self efficacy and instructional design for the usage and acceptance of LMS. Interestingly, based on the meta-analyses shown in table I , the three factors that believed to be barriers, have not yet investigated empirically and simultaneously together using TAM not only in Saudi context, but even globally. Therefore, there is a need to conduct an empirical investigation into these factors to find out whether these factors influence on students' intention to use and their actual use of LMS.

It is also notable from the table that even though there is a trend moving towards the usage of TAM to investigate the factors that influence the usage and acceptance of LMS, it is still considered insufficient amount of studies for TAM compared to other technologies, namely e-learning, digital technologies and others. As reported by Park (2009), usage of TAM was rapidly increasing as an explanatory tool to investigate the e-learning process, however applying TAM to predict LMS did not receive much attention so far (Psycharis et al, 2011; as cited in Alharbi and Drew, 2014). Therefore, there is a need for more researches to probe into the factors that may influence the LMS usage by applying TAM.

   B-   *The potential benefits of LMS and the importance of empirically examining the factors:*
        Benefits of LMS

The advantages of applying LMS was reported by Alecu et al (2011), namely easier learning compared to traditional classroom learning, creates interactive and collaborative learning experiences among students, facilitates learning at own pace, very flexible learning system, and students gain access to latest materials.

The advantages of LMS also affect institutions and academicians. Due to the benefits of reduced cost, higher efficiency, flexibility, scalability, accessibility, and improved learning experience, educational institutions in developing countries are actively implementing LMS system (Borstorff and Lowe, 2007; Cavus et al, 2007; Welsh et al, 2003). Similarly, academicians/instructors recognize the advantages of LMS and the possibility of improving learning experiences of students (O'Leary and Ramsden, 2002). Furthermore, LMS also inherently motivates the students in a positive manner (de Lange et al., 2003; Follows, 1999; Potter and Johnston, 2006).

On the other hand, it is important to understand that dedicated involvement with LMS is required to enjoy its enormous benefits. Klobas and McGill (2010) reported in a study that active involvement from students was required to observe a successful implementation of LMS. In other word, the benefits of LMS are directly proportional to the intensity of the involvement of the students (Klobas and McGill, 2010). As mentioned earlier, involving students and even instructors with LMS and increasing its utilization cannot be achieved without a proper understanding and a deep investigation into the factors that may influence on them with LMS use. Therefore, the meta-analyses that are shown in the table I, shows the more efforts toward investigating into the factors that my influence on LMS use and acceptance, as they aim to increase the utilization and the involvement of LMS by empirically understanding the factors that my influence on their users to accept LMS. Furthermore, many gaps related to the factors that need to be studied have been identified, where the suggestions will be discussed in the following section.

FURTHER SUGGESTIONS

It is clear that even though LMS is implemented in some developing countries to support the learning and teaching activities, the utilization of LMS is still below the satisfactory level. Therefore, there is a move towards investigating into the factors that may prevent or decrease the utilization of LMS among its users. Examining empirically the impact of some external factors that may lead to better and increased utilizations of LMS, hence gain the huge benefits of LMS as mentioned earlier. The review of the previous studies herein examined the impact of various factors on LMS usage and acceptance and revealed the factors that have already investigated and those that are not investigated. For example, in Saudi Arabia, there is a believe that technical support, self efficacy and instructional design of LMS are the factors that may prevent or decrease the utilization of LMS among its users. Based on the review, it is clear that these specific factors have not been empirically and simultaneously examined with TAM. Furthermore, it is a fact that some of these factors have been investigated individually or with other factors (self efficacy and technical support). Therefore, there is a need to empirically probe into these factors to provide a better understanding about its influences on LMS usage and acceptance. In the same regards, Ssekakubo et al (2011) identified the reasons of LMS failure, namely a low comfort level with the technology, the usability issues of LMS, insufficient technical and user support, high rates of illiteracy of ICT among students, and the poor marketing strategy. These particular factors have not been empirically and simultaneously examined by using TAM. In general, this review has provided researchers and even developers of LMS with many gaps that have not been empirically examined, and also revealed the factors that influenced the usage and acceptance of LMS. Therefore, the present review is considered as a benchmark where a researcher can start empirical probing into the factors that have not been investigated by using TAM, hence, increasing the utilization of LMS and even involvement that will result in gaining its huge benefits.

CONCLUSION

This paper has performed an end-to-end review on the literatures and revealed a shifting trend towards the investigation of the factors that may influence the usage and acceptance of LMS by applying TAM. It was found that the factors that were mostly investigated are enjoyment and self efficacy, while other factors have rarely been examined by using TAM. Part of the study, it was found that LMS provides its users, irrespective of students or instructors, with numerous benefits. However, those benefits cannot be gained without the maximum utilization and involvement with LMS, which inherently requires understanding and investigation into the factors that may influence the usage and acceptance of LMS among its users. Most importantly, this review provided researchers with many new information on the factors that have not been investigated, and also on those which were already examined within LMS by using TAM. Further investigations regarding the factors that may influence the LMS usage, using TAM are needed, because of its lacking literatures compared to other technologies, namely e-learning and other technologies.

REFERENCES

Abdallah, S. (Ed.). (2010). ICT Acceptance, Investment and Organization: Cultural Practices and Values in the Arab World: Cultural Practices and Values in the Arab World. IGI Global.

Adams, D. A., Nelson, R. R., & Todd, P. A. (1992). Perceived usefulness, ease of use, and usage of information technology: a replication. MIS quarterly, 227-247.

Adzharuddin, N. A., & Ling, L. H. (2013). Learning Management System (LMS) among University Students: Does It Work. International Journal of e-Education, e-Business, e-Management and e-Learning, 3(3), 248-252.

Alecu, I. N., Marcuta, L., Marcuta, A., & Angelescu, C. (2011). The role of an E-learning platform in the sustainable development of the online learning at the University of Agricultural Sciences and Veterinary Medicine. Distance Learning Department, Bucharest, Scientific Papers Series–Management, Economic Engineering in Agriculture and Rural Development, 11(2), 5-8.

Asiri, M. J., bt Mahmud, R., Bakar, K. A., & bin Mohd Ayub, A. F. (2012). Factors influencing the use of learning management system in Saudi Arabian Higher Education: A theoretical framework. Higher Education Studies, 2(2), p125.

Alharbi, S., & Drew, S. (2014). Using the technology acceptance model in understanding academics' behavioural intention to use learning management systems. learning, 5(1).

Almarashdeh, I. A., Sahari, N., Zin, N. A. M., & Alsmadi, M. (2011). Acceptance of learning management system: A comparison between distance learners and instructors. Advances in Information Sciences and Service Sciences, 3(5).\

Al-Busaidi, K. A., & Al-Shihi, H. (2010). Instructors' Acceptance of Learning Management Systems: A Theoretical Framework. Communications of the IBIMA, 2010, 2010.

Al-Judi, M. G. (2011, February). Enhancement of the performance of Taif University staff members in the area of information technology: A training need assessment. In 2nd international conference of e-learing and distance education: unique learning for next generation (pp. 21-24).

Al-hawari, M. A., & Mouakket, S. (2010). The influence of technology acceptance model (TAM) factors on students'e-satisfaction and e-retention within the context of UAE e-learning. Education, Business and Society: Contemporary Middle Eastern Issues, 3(4), 299-314.

Al-Aulamie, A., Mansour, A., Daly, H., & Adjei, O. (2012, June). The effect of interinsic motivation on learners' behavioural intention to use e-learning systems. In 2012 International Conference on Information Technology Based Higher Education and Training (ITHET).

Barker, A. M. (2003). Faculty development for teaching online: Educational and technological issues.

Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory*. Prentice-Hall, Inc.

Bonk, C. J., Lee, M. M., & Reynolds, T. H. (Eds.) (2009). Preface.A special passage through Asia e-learning. Chesapeake, VA: AACE, 2009.

Bousbahi, F., & Alrazgan, M. S. (2015). Investigating IT Faculty Resistance to Learning Management System Adoption Using Latent Variables in an Acceptance Technology Model. The Scientific World Journal, 2015.

Borstorff, P. C., & Lowe, S. K. (2007). Student perceptions and opinions toward e-learning in the college environment. Academy of Educational Leadership Journal, 11(2), 13.

Brown, I. T. (2002). Individual and technological factors affecting perceived ease of use of web-based learning technologies in a developing country. The Electronic Journal of Information Systems in Developing Countries, 9.

Carnwell, R., & Daly, W. (2001). Strategies for the construction of a critical review of the literature. Nurse education in practice, 1(2), 57-63.

Cavus, N., Uzunboylu, H., & Ibrahim, D. (2007). Assessing the success rate of students using a learning management system together with a collaborative tool in web-based teaching of programming languages. Journal of educational computing research, 36(3), 301-321.

Curtis, D. D., & Lawson, M. J. (2001). Exploring collaborative online learning. Journal of Asynchronous learning networks, 5(1), 21-34.

Cheng, Y. M. (2014). Roles of interactivity and usage experience in e-learning acceptance: a longitudinal study. International Journal of Web Information Systems, 10(1), 2-23.

Chau, P. Y. (1996). An empirical assessment of a modified technology acceptance model. Journal of management information systems, 185-204.

Chang, V. (1999). Evaluating the effectiveness of online learning using a new web based learning instrument. In Proceedings Western Australian Institute for Educational Research Forum.

Chuttur, M. Y. (2009). Overview of the technology acceptance model: Origins, developments and future directions. Working Papers on Information Systems,9(37), 9-37.

Colling, J. (2003). Demystifying the clinical nursing research process: The literature review. Urologic Nursing, 23(4), 297.

Compeau, D. R., & Higgins, C. A. (1995). Computer self-efficacy: Development of a measure and initial test. MIS quarterly, 189-211.

Coskuncay, D., & Ozkan, S. (2013). A Model for Instructors' Adoption of Learning Management Systems: Empirical Validation in Higher Education Context. Turkish Online Journal of Educational Technology-TOJET, 12(2), 13-25.

Dagger, D., O'Connor, A., Lawless, S., Walsh, E. and Wade, V.P. (2007), "Service-oriented e-learning platforms: from monolithic systems to flexible services", IEEE Internet Computing, 11 (3), 28-35.

Davis, F. D. (1989). Perceived usefulness, perceived ease of use and user acceptance of information technology. MIS Quarterly, 13(3), 319–340.

Davis, F. D., Bagozzi, R. P., & Warshaw, P. R. (1989). User acceptance of computer technology: a comparison of two theoretical models. Management science, 35(8), 982-1003.

De Lange, P., Suwardy, T., & Mavondo, F. (2003). Integrating a virtual learning environment into an introductory accounting course: determinants of student motivation. Accounting Education, 12(1), 1-14.

Dutta, S. &Mia,I (2011). The global information technology report 2010–2011. Geneva: World Economic Forum. Retrieved from http://www3.weforum.org/docs/WEF_GITR_Report_2011.pdf

Fathema, N., Shannon, D., & Ross, M. (2015). Expanding The Technology Acceptance Model (TAM) to Examine Faculty Use of Learning Management Systems (LMSs) In Higher Education Institutions. Journal of Online Learning & Teaching, 11(2).

Follows, S. B. (1999). Virtual learning environments. THE Journal (Technological Horizons In Education), 27(4), 100.

Grandon, E. E., Alshare, K., & Kwun, O. (2005). Factors influencing student intention to adopt online classes: A cross-cultural study. Journal of Computing Sciences in Colleges, 20(4), 46-56.

Goh, W. W., Hong, J. L., & Gunawan, W. (2013). Exploring Students' Perceptions of Learning Management System: An Empirical Study Based on TAM. IEEE International Conference on Teaching, Assessment and Learning for Engineering (TALE), (pp. 367-327). Bali Dynasty Resort, Kuta, Indonesia.

Hart, C. (1998). Doing a literature review: Releasing the social science research imagination. Sage.

Hayashi, A., Chen, C., Ryan, T., & Wu, J. (2004). The role of social presence and moderating role of computer self efficacy in predicting the continuance usage of e-learning systems. Journal of Information Systems Education, 15, 139-154.

Hofmann, D. W. (2002). Internet-based distance learning in higher education. Tech Directions, 62(1), 28–32.

Igbaria, M. (1990). End-user computing effectiveness: A structural equation model. Omega, 18(6), 637-652.

Jones, james g.; morales, cesareo; knezek, gerald a.(2005). 3-dimensional online learning environments: examining attitudes toward information technology between students in internet-based 3-dimensional and face-to face classroom instruction, educational media international, 42 (3), 219–236.

Juhary, J. (2014). Perceived usefulness and ease of use of the learning management system as a learning tool. International Education Studies,7(8), p23.

Khan, G. F., Moon, J., Rhee, C., & Rho, J. J. (2010). E-government skills identification and development: Toward a staged-based user-centric approach for developing countries. Asia Pacific Journal of Information Systems, 20(1), 1-31.

Klobas, J. E., & McGill, T. J. (2010). The role of involvement in learning management system success. Journal of Computing in Higher Education, 22(2), 114-134.

Majadlawi, Y., Almarabeh, T., & Mohammad, H. (2014). Factors affecting students' usage of learning management system at The University of Jordan. Life Science Journal, 11(6), 666-671.

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.

Miller, M. D., Ranier, R. K., & Corley, J. K. (2003). Predictors of engagement and participation in an on-line course. Online Journal of Distance Learning Administration, 6(1).

Mirani, R., & King, W. R. (1994). Impacts of end-user and information center characteristics on end-user computing support. Journal of Management Information Systems, 11(1), 141–166.

Nof, L., & Hill, C. (2005). On the Cutting Edge–A Successful Distance PhD Degree Program: A Case Study. The Internet Journal of Allied Health Sciences and Practice, 3(2).

O'Leary, R., & Ramsden, A. (2002). Virtual learning environments. Learning and Teaching Support Network Generic Centre/ALT Guides, LTSN. Retrieved July, 12, 2005.

Paulsen, M. F. (2003). Experiences with learning management systems in 113 European institutions. Journal of Educational Technology & Society, 6(4), 134-148.

Park, S. Y. (2009). An analysis of the Technology Acceptance Model in understanding university students' behavioral intention to use e-learning. Educational Technology & Society, 12 (3), 150–162.

Picciano, A. G. (2001). Distance learning: Making connections across virtual space and time. Merrill Prentice Hall.

Potter, B. N., & Johnston, C. G. (2006). The effect of interactive on-line learning systems on student learning outcomes in accounting. Journal of accounting education, 24(1), 16-34.

Ralph, W. (1991), Help! The Art of Computer Technical Support, Peachpit Press of Berkely,
California, CA.

Robinson, M., & Ally, M. (2009). Transition to e-Learning in a Gulf Arab Country. In The 2nd Annual Forum on e-Learning Excellence in the Middle East, Dubai, UAE.

Seels, B., & Richey, R. (1994). Instructional technology: The definition and domains of the field. Association for Educational Communications and Technology.

Seyal, A. H., & Rahman, N. A. (2007). The influence of external variables on the executives' use of the internet. Business Process Management Journal,13(2), 263-278.

Sumner, M., & Hostetler, D. (1999). Factors influence the adoption of technology in teaching. Journal of Computer Information Systems, 40(1), 81–87.

Sánchez, R. A., & Hueros, A. D. (2010). Motivational factors that influence the acceptance of Moodle using TAM. Computers in human behavior, 26(6), 1632-1640.

Saeedikiya, M., Mooghali, A., & Setoodeh, B. (2010). STAGES OF THE IMPLEMENTION OF E-LEARNING IN TRADITIONAL UNIVERSITIES. Edulearn10 Proceedings, 6620-6624.

Sánchez, R., Hueros, A., & 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.

Ssekakubo, G., Suleman, H., & Marsden, G. (2011, October). Issues of adoption: have e-learning management systems fulfilled their potential in developing countries?. In Proceedings of the South African Institute of Computer Scientists and Information Technologists Conference on Knowledge, Innovation and Leadership in a Diverse, Multidisciplinary Environment (pp. 231-238). ACM.

Shin, W. S., & Kang, M. (2015). The use of a mobile learning management system at an online university and its effect on learning satisfaction and achievement. The International Review of Research in Open and Distributed Learning, 16(3).

Venkatesh, V., & Davis, F. D. (2000). A theoretical extension of the technology acceptance model: Four longitudinal field studies. Management science, 46(2), 186-204.

Venkatesh, Viswanath, & Bala, Hillol. (2008). Technology acceptance model 3 and a research agenda on interventions. Decision sciences, 39(2), 273-315.

Walker, D., Livadas, L., & Miles, G. (2011). Key Influencing Factors Behind Moodle Adoption in Irish Small to Medium Sized Higher Education Colleges.European Journal of Open, Distance and E-Learning.

Welsh, E. T., Wanberg, C. R., Brown, K. G., & Simmering, M. J. (2003). E-learning: emerging uses, empirical results and future directions. International Journal of Training and Development, 7(4), 245-258.

Williams, P. (2002). The learning Web: the development, implementation and evaluation of Internet-based

Woods, R., Baker, J. D., & Hopper, D. (2004). Hybrid structures: Faculty use and perception of web-based courseware as a supplement to face-to-face instruction. The Internet and Higher Education, 7(4), 281-297.