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The Adoption of ICT in Libyan Higher Education Institutions (LHEIs): Theoretical Models and Challenges

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Abstract

The adoption of eLearning in developing countries is rare when a comparison is made against the developed nations. Therefore, this study answered calls from numerous literature demanding for more research to investigate the adoption, usage, and application of eLearning systems and applications in Libyan higher education institutions (LHEIs) to contribute to this crucial knowledge gap. Thus, a systematic literature review (SLR) was conducted focusing on the eLearning technology acceptance theories and models and open issues and challenges facing the LHEIs. Hence, the findings revealed that the technology acceptance model (TAM) is the most dominant theoretical model applied to test the adoption of eLearning in LHEIs. The finding further revealed that there are limited studies based on other technology acceptance theories such as the unified theory of acceptance and use of technology (UTAUT), the theory of reasoned action (TRA), and the theory of planned behavior (TPB). Hence, this study recommends the adoption of the UTAUT framework for future research due to its foundation from eight different technology acceptance models, including the dominant TAM theory, which could offer new insights. The findings of this study have the potential for academic researchers wanting to study the acceptance and use of technology for teaching and learning especially in developing countries.

Keywords

ICT, educational models, factors in ICT implementation, higher education, developing countries



INTRODUCTION

Libya is one of the countries faced with a high literacy rate among the Arab countries and North Africa (Hamdy, 2007; Almgadmi, 2018). Also, there is a growing number of studies suggesting that there is a need for aggressive reform in all sectors inclusive of education. A report by Hamdy (2007) stated that the development of ICT infrastructure and its integration into education is one of the key components founded in the development plans of Libya. Several literature studies (Merhi, 2015; Islam and Azad, 2015; Cheung and Vogel, 2013) stated that successful application of ICT resources to facilitate teaching and learning is not dependent on the technology solution but also on the influence of social and behavioral context. Boateng et al. (2017) argued that these findings can still be adapted in the context of developing countries like Libya. However, other authors criticized and opposed Boateng et al. (2017) opinion, indicating that the direct transfer of knowledge and experiences from stakeholders in developed countries to stakeholders in the developing nations will not provide a comprehensive understanding of the user's behavior and social context (Heeks and Bailur, 2007; Avgerou, 2003; Dasuki et al., 2015). Moreover, Libya is facing civil unrest and the adoption of technology in education could offer new insight.

Libya has recognized the importance of ICT to facilitate the sustainable development of socio-economic activities (Hassan & Jamaluddin, 2016). Hence, the importance of new technology usage has been seen from a wider application, inclusive of university education (Šumak, & Šorgo, 2016). Recently, there are huge investments in ICT resources in developing countries to facilitate learning (Yakubu & Dasuki, 2019). This change in education service delivery is generally termed electronic learning which is coined as eLearning. The mediation of ICT resources such as computers, the internet, and smart devices in education is not considered by previous studies as a paradigm to replace the traditional based methods but seen as a supporting tool and an improvement to the scope of learning (Islam & Azad, 2015).

The term eLearning is the application and use of technological resource tools and techniques to facilitate teaching and learning (Boateng et al, 2016). Few examples of these tools include Moodle Blackboard, Web 2.0 platforms, and WebCT (Tarhini et al., 2013), others comprise social network tools, and cloud computing (Elkaseh et al., 2015; 2016; Yedder et al., 2019; Aburagaga et al., 2020). Various studies empirically investigated the adoption of ICT, eLearning, or blended learning from the literature in developing countries (Alkhasawneh & Alanazy, 2015; Kisanjara et al., 2017; Yakubu & Dasuki, 2019) and Libya in particular (Othman et al., 2013; Salem & Mohammadzadeh, 2018; Ramadan et al., 2019).

Although, despite the contributions of various studies in terms of factors and determinants of ICT adoption and usage in LHEIs, the outcome of the literature suggest that, none of the existing studies conducted a literature review based on the emerging systematic literature review (SLR) that revealed the technology acceptance theories and their application in LHEIs context. We assumed that theoretical models that seek to investigate user's behavior and their application in a country confronted with challenges are paramount to the success of its recovery and re-development.

Therefore this study focused its attention to review the empirical application of technology acceptance theories, models, and frameworks from the existing literature. Hence, the objectives guiding this literature review study include;

- To identify technology acceptance theories and models applied empirically in LHEIs context.
- To identify issues and challenges still facing ICT adoption and usage in LHEIs from the literature.
- To examine commonalities between these theories and identify favorable theory or constructs for future research

In order to address the aforementioned objectives, research questions are formulated to help in achieving each of the objectives and to assist the researchers to measure the progress of the work. Moreover, the research questions are coined to support the researchers in evaluating the literature and to identify gaps for future research. Precisely, this study aims to examine technology acceptance theories and models applied in the context of LHEIs and to identify favorable theory, model, or constructs, to investigate the factors that are influencing the use and acceptance of ICT in LHEIs.

Q1. What are the technology acceptance theories and models that are applied empirically from LHEIs perspectives?

Q2. What are the issues and challenges currently facing the ICT adoption and usage in LHEIs?

Q3. What is the most dominant theoretical model for the investigation factors influencing the adoption of ICT in LHEIs?

To address the research questions, in Section 2, the literature review methodology is discussed based on SLR which is applied to systematically address the research objectives and research questions. Sections 3 presents the various technology acceptance theoretical models used in LHEIs to investigate the adoption of ICT and furthered presents the common theory, and open issues and challenges facing the ICT adoption in LHEIs. Section 4 outlines the outcome of the literature investigation and the gap for the future endeavor, and section 5 presented the conclusion.

RESEARCH METHODOLOGY

The SLR process was conducted based on the recommendations identified in several studies (Kitchenham & Charters, 2007; Hansen & Schaltegger, 2016; Qasem et al., 2019; Bukar et al., 2020). Research identification, selection of study, assessment of paper quality, data extraction, organization, and synthesis are some of the main SLR stages reported by the literature. During the study selection phase, the criteria for inclusion and exclusion are the main activities to ensure that the papers that were selected for full-text reading contribute to achieving the aim of this study.

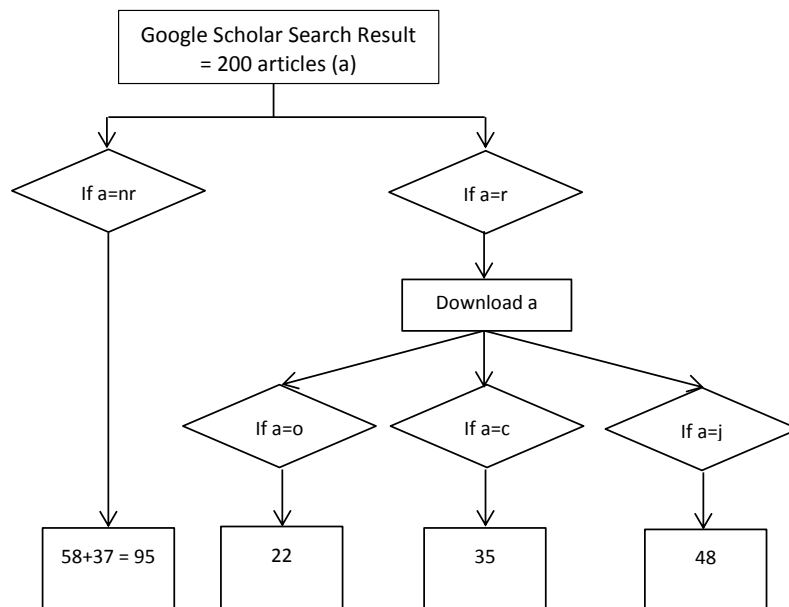
Therefore, the SLR procedures adapted for this research can be seen from Figure 1 and the phase includes the papers search process, the papers selection process, quality assessment, and data extraction and synthesis.

Paper search process

Google scholar search is the primary online search engine used for this article search. The decision to use this search engine was motivated by the fact it is specifically designed to search academic and scholarly resources from various sources, cutting across all digital databases. Keywords relevant to the aim of the research and in relation to the research question formulated from the objectives were adapted from previous studies. Thus, the following keywords were used in google scholar search, "Factors"+"ICT"+"higher education"+"Libya".

Paper selection process

The first 200 articles returned by the query were considered for this study. Title and abstracts scanning were applied, and the 95 articles were excluded for further download and evaluation. The exclusion criteria are non-English text, thesis, report, and duplicates. The criteria used for the inclusion of papers are indexed JCR Journal, Scopus papers, conference papers, and review papers. The approach used for inclusion/exclusion criteria in considering and selecting papers for full-text reading is consistent with what has been used in previous studies (Qasem et al., 2019; Bukar et al., 2020). Finally, 105/200 articles are the final sample for full-text reading as presented in Figure 1.



Key;

a = articles, **nr** = not relevant, **r** = relevant, **o** = others, **c** = conferences, and **j** = journal

Figure 1: Literature review search and selection process

Quality Assessment

To ensure that the articles considered for this study have high-quality ratings. We examined the journal of the selected article to find out if the journals have been indexed in journal citation report (JCR) or index in Scopus. The findings revealed that 5/142 are journal articles indexed in JCR, and 43/142 are journal articles indexed in Scopus, 57/142 were either conference papers, book chapters, or thesis. Many of the studies found in the conferences were re-published in journals. The remaining articles (37/142) were expunged for further analysis due to their low-quality ratings. Figure 2 present the distribution of the articles across various classifications adapted for the study.

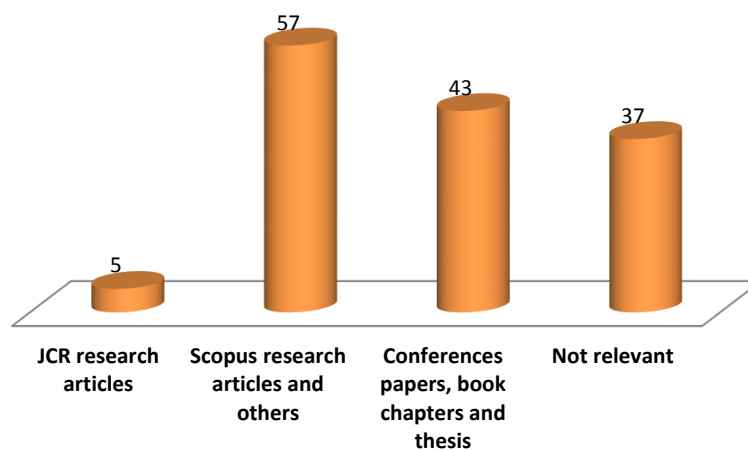


Figure 2: Quality Selection and Classification of Search Result

Data Extraction and Synthesis

The distribution of articles from google scholar search collected for full-text reading is presented in Figure 2. The extraction of data from the selected articles enables the classification of articles based on their contributions and to identify empirical studies for rigorous studies. The literature summary was created for all the studies conducted based on empirical studies as presented in Table 1 to Table 3. Further, data synthesis was applied through thematic analysis as shown in Table 4. Empirical studies based on traditional technology acceptance theories and models were assessed to identify construct and variables investigated more frequently in previous studies.

RESULTS

The initial query was applied and the first 200 results returned were considered for this study. A total of 95 articles were expunged for further reading after assessing title and abstract and applying inclusion/exclusion criteria (58 after the title and abstract 37 after inclusion/exclusion criteria), which took the total article for full-text reading to 105. While the results of the findings and outcome of the SLR activity are discussed with respect to the questions and research objectives presented in the previous sections.

Technology Acceptance Theoretical Models from LHEIs Perspectives

Shiratuddin et al. (2014) reviewed three popular theoretical models which consist of the TAM theory, the Theory of Reasoned Action (TRA), and the Theory of Planned Behaviors (TPB), and then adapted TAM as more appropriate with additional external variables in their studies. Also, Smeda et al. (2017) adapted the extended TAM to examine factors influencing student's behavior toward mathematics and statistics e-book and the results were significant. A study conducted by Salem & Mohammadzadeh (2018) identified attributes based on the work of Rogers (1995) which contributes to the adoption of ICT in Libya. Also, there several studies that investigated the determinants that affect the adoption of ICT for teaching and learning in the context of LHEIs based on technology acceptance theory (TAM) (Elkaseh et al., 2015; 2016; Smeda et al., 2018; Mohamed et al., 2018a; 2018b). Elkaseh et al. (2016; 2015) investigated the factors that influence the use of technology (social networking media) for learning based on TAM and the findings stated that the perceived ease of use and the perceived usefulness are significant factors that predict the behavioral intention of student's and teachers' to use the social networking site for learning. Also, the result of the studies added the perceived enjoyment construct is a significant predictor of perceived ease of use by teachers and students.

Moreover, Smeda et al. (2018) divided the TAM construct into three groups; self-efficacy and resistance to change are found in the first group, mobility, facilities, and library service quality are found in the second group, and the initial TAM constructs are found in the third group. The model was adapted to investigate the adoption of an e-book by students in LHEIs. The findings suggest that the variables in the first group were less important as compared with the second and the third group respectively (Smeda et al., 2018). Also, Mohamad et al. (2018a) applied TAM and TPB constructs including attitude, perceived usefulness, perceived ease of use, social influence, and behavioral intention to explain the adoption and use of ICT. Recently, Aburagaga et al. (2020) adapted TAM to explain the influence and effects of factors and variants on faculty's acceptance of social networking tools for learning and teaching. The study employed TAM as an internal variable while adapted infrastructure, privacy, access devices, and institutional support as external variables. The results indicate that privacy and institutional support were significant (Aburagaga et al., 2020).

In addition, the Technology, Organization, and Environmental (TOE) model was adapted to study and investigate the factors that are influencing the adoption and use of cloud computing (Yedder et al., 2019). Also, the literature also suggests the application of the SWOT model (Strengths, Opportunity, Threats, and Weaknesses) to examines the application of ICT in LHEIs environment (Kenan, 2012; 2013; Elzawi, 2015; Othman et al., 2013; Salem & Mohammadzadeh, 2018) and situational framing theory is used to explore and examine the influencing factors that affect the student engagement in LHEIs (Almarghani & Mijatovic, 2017). The summary of additional models and theories applied in the technology acceptance for LHEIs is presented in Table 2. Moreover, Mohamad et al. (2019) findings revealed that the difference between gender, age, language, and culture are significant toward ICT usage by lecturers.

Table 1: Empirical Studies Published Based on TAM

S/N	Ref	Theoretical Model	Aim/Objectives	Method/Analysis	Constructs/Variables	Participants	HEIs
1	Abodher (2014)	TAM	The extent of ICT use in University of Tripoli, Libya.	Semi Structure Interview	External variables, attitudes towards using, perceived ease of use, perceived usefulness, behavioral intention, and actual use.	Teachers and Students	1
2	Elkaseh et al. (2014)	TAM	Dominant teaching and learning styles to influence the higher possibility to adopt and use eLearning.	Survey	Honey and Mumford's learning style, Behavioral intention to use,	Mixed	4
3	Elkaseh et al. (2015)	TAM	Factors affecting the application of e-learning in LHEIs for teaching and learning	Survey/ SEM	Social Influence and Perceived Enjoyment	Teachers and Students	4
4	Elkaseh et al. (2016)	TAM	The acceptance factors influencing students and teachers social media technologies used for learning and teaching	Survey/ SEM	Perceived usefulness, perceived ease of use, behavior intention, and actual usage	Lecturers and Students	
5	Smeda et al. (2017)	eTAM	Factors influencing students' behavioral intention to adopt e-book.	Survey/ SEM	Perceived usefulness, students' attitude, perceived ease of use, self-efficacy, behavioral intention, and social influence	Students	
6	Smeda et al. (2018)	TAM	Student acceptance of e-book on mathematics and statistics (MAS)	Survey/ SEM	Intrinsic variables (Self-Efficacy and Resistance to Change). Extrinsic variables (facilities, mobility, and library service quality). TAM constructs (Perceived ease of use, attitude, perceived usefulness, and Behavior Intention.	Students	3
7	Mohamad et al. (2018)	TAM and TPB	The behavior to use ICT tools and its influence societal change in Libya university.		Attitude, perceived usefulness, perceived ease of use, social influence, behavioral intention, self-efficacy, and behavioral control.		
8	Aburagaga et al. (2020)	TAM	The acceptance of faculty stakeholders adopting social networks as an educational delivery platform.	Survey/ SEM	Privacy, institutional support, infrastructure, access devices, attitudes towards using, perceived usefulness, perceived ease of use, behavioral intention, and actual use.	Mixed	6

Table 2: Empirical Studies Published Based on Other Models

S/N	Ref	Theoretical Model	Aim/Objectives	Method/Analysis	Constructs/Variables	Participants	LHEIs
1	Almarghani & Mijatovic (2017)	Situational Framing	Influential factors on student engagement in LHEIs	Survey	The university's reputation and teachers' activation, student engagement in HEIs.	Students	4
2	Othman et al. (2013)	SWOT model	Investigating awareness, attitude, and motivation in relation to IT of Libyan students studying abroad.	Mixed	Strengths weakness, opportunity, and threats	Students	Diverse
3	Salem & Mohammadzadeh (2018).	Attributes (proposed by Rogers, 1995)	The attitudes of Libyan EFL teachers toward ICT adoption for the subject of English Language	Mixed/Descriptive	Advantage, complexity, compatibility, observability, and trialability.	EFL teachers	1
4	Elzawi et al. (2015)	SWOT Model	The impact of ICT on collaborative learning processes in LHEIs.	Survey/SWOT analysis	Intelligent multimedia, Internet technologies, and knowledge management.	Lecturers	4
5	Kenan et al. (2012; 2013)	SWOT Model	Analyzed the current implementation of information management and eLearning in Libya	Survey/SWOT analysis	Weakness: lack of infrastructure, mismanagement, internet access, lack of development in HEIs operations, and promotes the importance of Libya's geographic and width area. Opportunities: Language and IT skills acquired, comfortable education, time management, and new method.		1
6	Kenan et al. (2013)	SWOT Model	The social and cultural and issues affecting eLearning performance and implementation in LHEI.	Survey	Intelligent multimedia, internet technologies, knowledge management, innovative learning environments that inspire collaboration.	Lecturers	1

Open Issues and Challenges in the ICT Adoption and Usage in LHEIs

The adoption and use of eLearning is a strategic and effective response to close the call for learning flexibility in higher education (Aburagaga et al., 2020). But eLearning is not recognized by Libyans as a valid model for education (Mustafa and Hussin, 2017). Several open issues, challenges, and factors may have fueled this nation. Like any other system, the inclusion of ICT into any sector comes with its own issues and challenges; lack of skilled human resources and poor existing infrastructure is reported to be leading these challenges (Hamdy, 2007). However, a recent effort by the Government and overall return and improvement of normalcy in Libya is yielding positives outcomes. Despite these efforts, Almigheerbi et al. (2020) reported recently that there is a low implementation of information systems (IS) in LHEIs especially at the university level, and a lack of capabilities to handle system development within the universities. Nonetheless, the country is still facing a lack of usage of ICT tools and techniques, promising infrastructure, access to ICT resources, national ICT policy to cover all the different domains, and research activities are lacking behind (Kenan et al., 2012). In addition, well trained and qualified teachers and building sound technically qualified educators in the future is remains a promising challenge (Hamdy, 2007; Hbaci et al., 2020), while, the role of competent teachers to use ICT learning tools and techniques are influential on students engagement (Almarghani & Mijatovic, 2017).

Also, Mustafa and Hussin (2017) noted that the educational opportunities for all students in Libya are not the same due to inconveniences in geographical location. IT is becoming a major factor in LHEIs as most institutions are trying to automate the process (Othman et al., 2013). Almigheerbi et al. (2020) revealed that the HE sector is a vital segment needing significant support through IT, and universities in Libya are still facing difficulty in making a decision as to whether develop in-house IS solutions or adopt commercial ones. Other barriers such as complexity and cost to the adoption of cloud computing for teaching and learning are reported (Yedder et al., 2019).

Yet, the benefit of ICT usage is significant to the overall national development of the Libyan educational system (Almgadmi, 2018). The use of ICT in schools will help improve the knowledgeability of the young generation of students. Meerza & Beauchamp (2017) reported that there is increased use of ICT by the undergraduate students and its success towards the usage of the technology depends on them. But Kenan et al. (2012; 2013) and Elzawi et al. (2015) evaluate ICT implementation based on the SWOT model in LHEIs and highlighted issues such as lack of ICT infrastructure, mismanagement, lack of development in HEIs operations, lack of internet access, and geographic and width area of Libya. Also, intelligent multimedia, internet technologies, knowledge management, and innovative learning environments are important themes noted from the literature. Some of these issues and concerns are summarized in Table 3.

Table 3: Articles published based on adoption factors without a link to acceptance theories/models

S/N	Ref	Objectives	Methods	Constructs	Participants	LHEIs
1	Mohammed et al. (2019)	Impact of gender, age, language, and culture toward the use of ICT by lecturers in Libya.	Survey/SPSS	Age, gender, language, and culture.	lecturers	1
2	Taher and Dahari (2015)	Factors affecting the use of eLearning among educators in Wadi-Alhayat HEL, Libya.	Survey/Regression	Instructors' personal characteristics and user's positive attitude.	Educators	1
3	Abdelsadeq et al. (2014)	Student's acceptance and usage of the national Libyan e-services in HE.	Survey/	Awareness of e-services, intention and motivation, availability of e-services, trust in the ministry of higher education, risk and issue of privacy, and adoption of government	students	Diverse
4	Rhema & Miliszewska (2014)	The perceptions and experiences of engineering students from two Libyan universities about the technology-supported learning platforms	Survey/SPSS	Demographic characteristics, use of technology for learning, access to technology, satisfaction with technology, and skill in technology.	students	2

Moreover, an additional area of concerns that was re-emphasized by the literature includes awareness of e-services, availability of e-services, intention to use, motivation, risk, the issue of privacy, and trust in the ministry of higher education. Furthermore, other challenges include adoption by government, demographic characteristics, the learning technology, accessing the technology, skill in technology, technology satisfaction, the advantage of technology, complexity, compatibility, observability, and trialability (Abdelsadeq et al., 2014; Rhema & Miliszewska, 2014; Salem & Mohammadzadeh, 2018).

Dominant Theoretical Models of ICT Adoption in LHEIs

The result from the literature suggested that the TAM theory is considered the most used theoretical model in the technology acceptance literature. The literature has furnished the researchers to understand two main aspects of ICT acceptance and adaptation; the behavioral intentions to use, and the usage of the technology. Several theories have been introduced and applied by various researchers to explain behavioral intentions and technology usage. According to Shiratuddin et al. (2014), theoretical models such as TRA, TPB, and TAM are widely-used and most investigated in the literature (Shiratuddin et al., 2014). Moreover, Yakubu & Dasuki (2019) added that the TAM (Davis, 1989), and the unified theory of acceptance and use of technology (UTAUT) (Venkatesh et al., 2003) are perhaps the most dominant and cited theoretical models in the domain of technology acceptance. The findings of this study support Shiratuddin et al. (2014) and Yakubu and Dasuki's (2019) opinion regarding TAM dominancy, while the application of TRA, TPB, and UTAUT in the context of LHEIs is apparently lacking from the literature. Table 4 presents a critical assessment of the studies based on TAM from the literature in the LHEIs context. It illustrates how the initial TAM construct and additional external variables were adopted, adapted, and examine. Figure 3 depicts the dominant theories and models revealed from the literature.

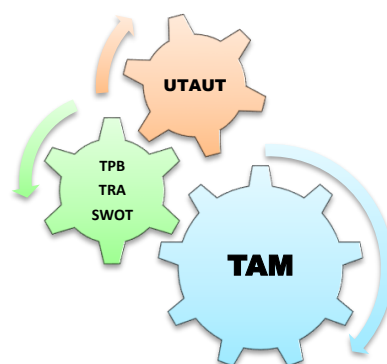


Figure 3: Technology Acceptance Theories and Models Adapted for LHEIS

Table 4: Literature Matrix Showing Critical Assessment of TAM Constructs from Prior Researches

Ref/Constructs	Abodher (2014)	Elkaseh et al. (2015)	Elkaseh et al. (2015)	Elkaseh et al. (2016)	Smeda et al. (2017)	Smeda et al. (2018)	Mohamad et al. (2018)	Aburagaga et al. (2020)
External variables	✓					✓		✓
Perceived usefulness	✓			✓	✓	✓	✓	✓
Perceived ease of use	✓			✓	✓	✓	✓	✓
Attitudes towards using	✓				✓	✓	✓	✓
Behavioral intention to use	✓	✓		✓	✓	✓	✓	✓
Actual system use	✓			✓				✓
4 Honey and Mumford's learning style		✓						
Social Influence			✓		✓		✓	
Perceived Enjoyment			✓					
Self-efficacy					✓	✓	✓	
Resistance to Change						✓		
Mobility						✓		
Facilities						✓		
Library service quality						✓		
Behavioral control							✓	
Privacy								✓
Infrastructure								✓
Institutional support								✓
Access devices								✓

DISCUSSIONS

Despite the opportunities and significant development and the inclusion of ICT offered to support and improve the teaching and learning process around the world (Tarhini et al. 2016; Zabadi & Al-Alawi, 2016), most developing countries still relied heavily on traditional teaching method and learning pedagogy due resources constrained (Tarhini et al., 2016). Therefore it is becoming even more important to investigate factors influencing the adoption of eLearning resources in African countries, specifically Libya as one of the countries still struggling with conventional face-to-face teaching and learning methods in HEIs (Ramadan et al. 2019). There is a need for more studies from academia and industry concerning the adoption, acceptance, or usage of eLearning and ICT in Libyan HEIs (Othman et al., 2013; Salem & Mohammadzadeh, 2018; Ramadan et al., 2019). Hence, the Libyan education system is one of the sectors viewed as vital for the redevelopment of the country (Ramadan et al., 2019). Thus, several LHEIs have acknowledged the impact of adopting the eLearning paradigm to enhance learning and teaching processes.

The application of ICT educational tools and systems is a student-centered approach, making the learners the major stakeholders in the educational ecosystem. There are various studies suggesting that the success of eLearning is depends on the satisfaction and perceptions of the students (Liaw et al., 2007; Ramadan et al., 2019), although, the acceptance by the instructors are also viewed as a major barrier to effective usage (Ghenghesh et al., 2018; Salem & Mohammadzadeh, 2018). Subsequently, user intentions, ease of use, and usefulness are the major factors influencing the adoption of ICT (Merhi, 2015; Islam and Azad, 2015; Cheung and Vogel, 2013). Empirical research to investigate the determinants of ICT adoption and usage in higher education is lacking from the developing countries (Boateng, et al., 2016; Muries and Masele, 2017). Consequently, Boateng, et al. (2016) insisted that more studies from various higher institutions could provide a means to complement or compare existing findings from the literature to suggest a way forward. Also, the application of more theoretical models such as TRA, TPB, and UTAUT in the context of LHEIs could offer additional knowledge.

UTAUT as one of the leading theoretical models in the technology acceptance domain and its extensions (UTAUT2) (Venkatesh, et al., 2012) introduced 3 additional constructs (hedonic motivation, price value, and habit). Since the TAM has been widely tested in LHEIs, while empirical studies based on UTAUT are lacking. But UTAUT theory incorporated the constructs of TAM (Yakubu & Dasuki, 2019). For example, TAM's perceived usefulness is covered in UTAUT's performance expectancy, and TAM's perceived ease of use is covered in UTAUT's effort expectancy respectively. Also, the TAM2 subjective norm construct is covered in UTAUT's social influence.

Therefore, the evaluation of the literature suggests that the UTAUT construct could be appropriate to examine technology adoption in LHEIs. But hedonic motivation, one of the 3 new additional constructs in UTAUT2 is relevant, while the other 2 constructs are unsuitable for the adoption of ICT in LHEIs. The decision to exclude the price value construct is motivated by the fact that the

LHEIs stakeholders and participants may not pay for eLearning technologies. While, the UTAUT2's habit construct was initially examined on mobile internet consumers (Venkatesh, et al., 2012) to form the addictive habit. In the use of eLearning, habitual use by academic staff or students is not anticipated in LHEIs. Also, Ain et al. (2016) findings stated that habit or hedonic motivation has no behavioral intentions influencing the use of eLearning systems. However, this study assumed that the hedonic motivation construct will be expected by the LHEIs stakeholders since they serve as facilitators and consumers for the effective implementation of eLearning resources.

Also, several other reasons funneled the researchers with insight to recommend UTAUT as the theoretical framework for future research. Straub (2009) stated that UTAUT can investigate and provides insight into behavioral intentions and the use of technology from an educational context. Moreover, numerous researchers are in the opinion that UTAUT explains a higher degree of variance than other technology acceptance theoretical models. Also, it is widely known that UTAUT incorporates constructs from eight different theoretical models (Venkatesh et al., 2003). Table 4 present the eight theoretical models and construct linked with UTAUT. The constructs and hypotheses in this study are aimed to investigate the factors influencing the adoption and use of eLearning technology by academic staff in Libyan HEIs.

Table 5: Eight Theoretical Models Linked with UTAUT

S/N	Ref	Theory	Constructs	Related Construct in UTAUT
1	Davis (1989)	TAM	Perceived usefulness	Performance expectancy
			Perceived ease of use	Effort expectancy
			Subjective norm	Social influence
2	Ajzen (1991)	Theory of planned behavior (TPB)	Subjective norm	Social influence
			Perceived behavioral	Facilitating conditions
3	Ajzen and Fishbein (1980)	Theory of reasoned action (TRA)	subjective norm	Social influence
4	Bandura, (1977)	Social cognitive theory (SCT)	Outcome expectations	Performance expectancy
5	Moore and Benbasat (1991)	Innovation diffusion theory (IDT)	Relative advantage	Performance expectancy
			Ease of use	Effort expectancy
			Image	Social influence
			Compatibility	Facilitating conditions
6	Thompson, et al. (1991)	Model of PC utilization (MPCU)	Job-fit	Performance expectancy
			Complexity	Effort expectancy
			Social factors	Social influence
			Facilitating conditions	Facilitating conditions
7	Taylor and Todd (1995)	Combined TAM and TPB (C-TAM-TPB)	Subjective norm	Social influence
			Perceived behavioral	Facilitating conditions
8	Davis, et al. (1992).	Motivational model (MM)	Extrinsic motivation	Performance expectancy

FAVORABLE ELEMENTS FROM UTAUT MODEL

Performance Expectancy (PE)

The PE is described as the degree to which an individual accepts that the use of a specific system will help in accomplishing gains in job performance (Venkatesh et al., 2003). The PE is widely seen as the most grounded indicator of intention. The PE construct was founded from five theoretical models based on the eight models adopted in the acceptance of the UTAUT theoretical model. Specifically, perceived usefulness from TAM, job-fit from MPCU, extrinsic motivation from MM, outcome expectations from SCT, and relative advantage from IDT are the reported theoretical model and corresponding constructs that were used to explain PE. The relationship between PE and behavioral intentions has been investigated widely from the literature and the perspectives of educational technologies. Šumak et al. (2016) findings reveal that the usage of interactive whiteboards by teachers is significant from the PE impact on behavioral intentions. Likewise, PE was recognized as a significant factor towards the behavioral intention of learning zone usage (Yamin et al., 2014), eLearning in the business environment and workplace (El-Masri and Tarhini, 2017), and in the organization and public sector (Wang, 2016). Therefore, this study is motivated by the fact that the PE from learning technologies will influence the behavioral intention to use such learning resources. Thus, there exists a relationship between PE and behavioral intention based on theories found from the literature Hence, the study hypothesized that PE will influence students' eLearning resources based on the students' perception about the usefulness of educational technologies in the performance of educational and learning activities.

Despite the theoretical justification of PE toward behavioral intention, the acceptance of educational technologies may still be depended on the faculty (instructor) commitment in designing and delivering effective course materials and not based on functionalities of the educational systems and applications.

Effort Expectancy (EE)

Effort expectancy (EE) is characterized by the potential of the technological system to be easy for use (Venkatesh et al., 2003). Several pieces of literature have proven that EE is a tough predictor influencing behavioral intention especially during the initial stage of the system usage (Wang, 2016; Sarabadani et al., 2017). Although, the EE construct may become less significant as the system acceptance is improved. This is evident since people will be acquainted with the technological system. The EE was grounded based on the popular TAM, MPCU (Thompson et al., 1991), and IDT (Moore and Benbasat, 1991) models. Specifically, the constructs explain the TAM's perceived ease of use, and complexity and ease of use constructs, respectively. Existing studies have shown the relationship between EE and behavioral intentions and the findings are significant (El-Masri and Tarhini, 2017; Wang, 2016; Sarabadani et al., 2017). Precisely, findings from previous research indicate that EE positively impacts the behavioral intentions of using

educational technologies resources which also affects the actual usage. Moreover, the EE explains how much effort is required from the users to use the technological systems. The potential to make more efforts could have a significant impact on the acceptance of the technology, whereas the potential to make little effort could have little impact. Thus, the effort is measure by how easy or difficult the technological system could be. Therefore, the EE is described as the ease of using eLearning technology. Hence, the EE construct has the potential to influence students' behavioral intention to use eLearning.

Social Influence (SI)

SI describes people's perception about the importance of a given system or technology and/or by showing how the system does become important to their daily activities (Venkatesh et al., 2003). The SI was grounded based on existing theories such as TRA, TPB, D-TAM-TPB, MPCU, and IDT. Specifically, the subjective norm, one of the indicators that explain SI is derived from TRA, TPB, D-TAM-TPB, the social factors are based on MPCU, and finally, the image was derived IDT. According to Yakubu and Dasuki (2018), the construct of the existing theories is not appropriate to explain the aim of social influencing factors, therefore, SI was viewed as the most applicable and undeviating determinant influencing behavioral intentions.

The original UTAUT model shows that voluntariness of use was a significant moderator of the SI variable. In normal perspectives, SI is considered to be a significant factor in the behavioral intention of an individual to use technology systems (Venkatesh et al., 2003). The application of e-learning in higher institutions has been widely used in the developed countries and its importance has been proven in the literature. Therefore, the use of eLearning systems by students is expected in this study since little is still known about effective usage in developing countries. A study by Tarhini et al. (2013) revealed that subjective norm has a significant impact on the behavioral intention for eLearning usage based on an extended TAM theoretical model. Similarly, several studies based on the UTAUT model have shown that SI has a significant impact on behavioral intentions for the use and acceptance of e-learning technologies (Dečman, 2015; Raman et al., 2014; Hsu, 2013; Fidani and Idrizi, 2012). Thus, finding from existing studies shows that SI is a significant factor of behavioral intention. Hence, this study expects that SI constructs will have a significant impact on behavioral intention to use eLearning.

Hedonic Motivation (HM)

The hedonic motivation (HM) is one of the 3 new additional constructs in UTAUT2 (Venkatesh et al., 2012). The other 2 remaining constructs are unsuitable for the adoption of ICT in LHEIs. Specifically, the decision to exclude the price value construct is motivated by the fact that the LHEIs stakeholders and participants may not pay for eLearning technologies. While, the UTAUT2's habit construct was initially examined on mobile internet consumers (Venkatesh et al., 2012) to form the addictive habit. In the use of eLearning, habitual use by academic staff or students is not anticipated in LHEIs. Furthermore, Ain et al. (2016) findings stated that habit or

hedonic motivation has no behavioral intentions influencing the use of eLearning systems. However, this study assumed that the hedonic motivation construct will be expected by the LHEIs stakeholders since they serve as facilitators and consumers for the effective implementation of eLearning resources.

The concept of HM describes the pleasure that is derived from technology usage (Venkatesh et al., 2012). Hence, Brown and Venkatesh (2005) reported that the pleasure derived from using a technology play a significant role in the technology acceptance literature. Previous studies have investigated that hedonic motivation, which sometimes refers to perceived enjoyment, has been understood to influence the adoption of technologies and use (van der Heijden, 2004; Thong et al, 2006). Thus, this study adopted hedonic motivation to influence behavioral intention to use eLearning.

Facilitating Conditions (FC)

Venkatesh et al. (2003) described FC as an individual's perception that the usage of a given system will be supported by the organizational and availability of technical resources to encourage usage. Similarly, the FC construct is grounded based on TPB, C-TAM-TPB, IDT, and MPCU. Specifically, the FC explains the perceived behavioral control from TPB and C-TAM-TPB, compatibility from IDT and MPCU. Venkatesh et al. (2003) indicated that there exists a mediation effect of FC on behavioral intentions by EE. Thus, the FC construct may not indicate a relationship and influence on behavioral intentions if EE is applicable in the model. However, Ajzen's (1991) finding indicates perceived behavioral control (FC) as a direct determinant of actual system usage. Moreover, several studies found that FC has a significant influence on the usage of the technology (Venkatesh et al., 2003; Zhou, 2011; Ain et al., 2016). Also, FC is characterized by the organizational ability to provide the system and meet up with the student's requirement by providing technical assistance. Thus, the FC construct is viewed as has a positive influence on the students' actual technological system usage.

Behavioral Intentions (BI)

The initial UTAUT model proposes that PE, EE, SI are significant determinants of behavioral intentions (BI). The UTAUT framework proposes that PE, EE, and SI influence an individual's behavioral intentions to use the technological innovation, whereas the UTAUT2 added hedonic motivation, price value, and habit to influence behavioral intentions (Venkatesh, et al., 2003). Thus, the BI explains the people prospect to engage in a specific behavior. BI describes the probability that individuals could participate or be involves in exhibiting some behavior. Furthermore, Ngai et al. (2007) reported that the BI variables examine the commitment of individuals to engage in certain behaviors. The theoretical model available in the literature such as TAM, TRA, and TPB all affirmed that that BI has a significant and positive influence on actual usage. Moreover, several studies that investigated the BI construct and its influence on actual usage revealed that BI has widely experimented as the significant factor of actual technological system

usage, showing that BI has a significant impact on actual usage (Raman and Don, 2013; Wang and Wang, 2009; Ain et al., 2016; Tarhini et al., 2013). Hence, this study expects that that BI will have a positive and significant effect on the actual usage of eLearning by students in LHEIs. Moreover, BI is acting as the mediating variable for actual system use.

Theoretical Model

E-learning has gained more popularity recently and this study aims to add to the literature the determinants of eLearning from Libyan perspectives. Therefore, the constructs identified in this study will investigate the factors influencing the adoption of eLearning for LHEIs which ground based on the original UTAUT model and UTAUT 2, respectively.

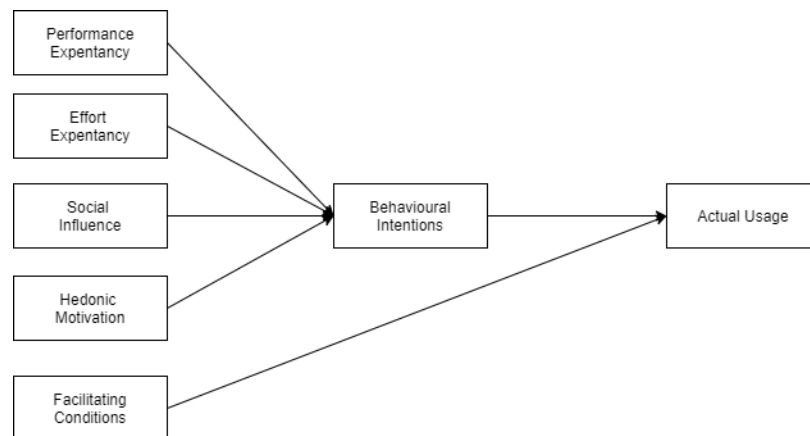


Figure 4: Theoretical Model

Thus, Mohamed et al. (2018a) emphasized that future research could conduct an empirical study to unveil new findings of the LHEIs stakeholder's behavior on the adoption and use of ICT. Therefore, by adapting the UTAUT model, future research will aim to identify factors influencing the adoption of ICT in Libyan higher education and to develop a model to evaluate the factors based on the structural equation modeling (SEM) approach seen from existing studies (Elkaseh et al., 2015; Elkaseh et al., 2016; Smeda et al., 2017; Smeda et al., 2018; Aburagaga et al., 2020). Based on the gap identified from the literature, the UTAUT framework is derived and recommended as shown in Figure 4. The independent variables include performance expectancy (PE), effort expectancy (EE), social influence (SI), hedonic motivation (HM), facilitating conditions (FC), and behavioral intentions (BI), while the dependent variable is the actual usage (AU). The BI is also acting as the mediator between the PE, EE, SI, HM, and AU.

CONCLUSIONS AND FUTURE DIRECTION

The emergence of information and communication technology (ICT) exposed educational stakeholders to the application of ICT tools and systems, and the nature of its application, acceptance, and use are faced with several challenges, while its advantages and opportunities have been proven to be effective to facilitate teaching and learning especially in developed countries. However, most developing countries still relied heavily on traditional teaching methods and learning pedagogy due to resources constrained. Therefore, it is important to investigate factors influencing the adoption of eLearning resources in African countries, specifically Libya as one of the countries still struggling with conventional face-to-face teaching and learning methods in HEIs.

Hence, the research aimed to review the application of the technology acceptance model by following the SLR approach for the adoption of ICT in LHEIs in facilitating teaching and learning. Firstly, despite the wider application of the TAM in understanding technology acceptance, there are limited studies that were carried out based on other theoretical models such as TPB, TRA, and UTAUT. Therefore, this study will contribute to the information system literature in the context of African countries, specifically Libya. Secondly, the UTAUT framework is derived for future research, the constructs to be adopted will provide recommendations to technology acceptance researchers to understand the key determinants to pay more attention to for the effective implementation of eLearning systems in various institutions. Therefore, this review contributes to the design of theoretical models, methodologies, and recommendations to heighten the adoption and acceptance of technologies used in educational settings in Libya and developing countries at large. Specifically, future studies may tend to investigate the research question “what are the factors influencing the adoption and use of eLearning technology by LHEIs stakeholders based on the UTAUT framework?”

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