OBSTACLES TO ACTIVATING E-LEARNING AT IRAQI UNIVERSITIES

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OBSTACLES TO ACTIVATING E-LEARNING AT IRAQI UNIVERSITIES

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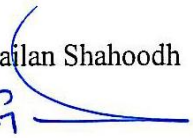
Signature	:	
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ABSTRACT

Obstacles to Activating E-learning at Iraqi Universities

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This study adopts a quantitative research approach to evaluate the research problem using collected data from a survey questionnaire administered to 124 respondents (professors, instructors, employee and students) from different Iraqi universities. Using both online and hardcopy questionnaires that were based on the TAM framework, it included questions related to the demographics of the respondents and any obstacles in activating e-learning. The reliability of the questionnaire was tested and a high degree of internal consistency was found. Our study provides an analysis of each variable using descriptive statistics. Using factor analysis, we extracted four factors (Perceived Ease of Use (PEU), Perceived Usefulness (PU), Attitude toward Using and Actual System Use (ATU), and Behavioral Intention to Use (BIU) which were used in the correlation and regression analysis. Per the results of the regression test, the impact of PEU and PU were shown to be statistically significant in predicting and explaining both ATU and BIU. The results revealed that the impact of Perceived Ease of Use and Perceived Usefulness is significantly positive in affecting the attitude and behavioral intention of Iraqi universities' users towards LMS/e-learning, which is consistent with the TAM theory. Moreover, it shows that the two factors play a significant role in the acceptance of the new technology; i.e. the LMS at Iraqi universities can help to reduce any obstacles to e-learning implementation. In addition, conclusions and suggestions for future work are highlighted.

Keywords: E-learning Obstacles, E-learning, Distance Learning, Technology Acceptance Model (TAM).

ÖZ

Irak Üniversitelerinde E-Öğrenmeyi Etkinleştirmenin Önündeki Engeller

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Bu çalışma, Irak'taki farklı üniversitelerinden toplam 124 katılımcıya (profesör, eğitmen, çalışan ve öğrenci) uygulanan bir anket formundan toplanan veriler kullanılarak araştırma konusunu değerlendirmek için niceliksel bir araştırma yaklaşımını benimsemektedir. Bu çalışmada katılımcılara TAM çerçevesine dayanan hem online hem de basılı anket materyalleri kullanarak katılımcıların demografik özellikleri ve e-öğrenmeyi hayata geçirmedeki engeller ile ilgili sorular sorulmuştur. Anketin güvenilirliği test edilmiş ve yüksek bir iç tutarlılık tespit edilmiştir. Çalışmamız, betimsel istatistikleri kullanarak her bir değişkene ait bir analizi sunmaktadır. Faktör analizi yöntemi kullanılarak, korelasyon ve regresyon analizinde kullanılan dört faktör (Algılanan Kullanım Kolaylığı (PEU), Algılanan Kullanışlılık (PU), Kullanıma Yönelik Tutum ve Gerçek Sistem Kullanımı (ATU) ve Davranışsal Kullanım Niyeti (BIU)) elde edilmiştir. Regresyon testinin sonuçlarına göre, hem ATU'yu hem de BIU'yu tahmin etmede ve açıklanmada PEU ve PU'nun istatistiksel olarak anlamlı olduğu gösterilmiştir. Sonuçlar, Algılanan Kullanım Kolaylığı ve Algılanan Kullanışlılığın, TAM teorisiyle tutarlı olan LMS/e-öğrenime yönelik Irak üniversitelerindeki kullanıcıların tutum ve davranışsal niyetlerini etkilemede, anlamlı derecede olumlu olduğunu ortaya koymuştur. Ayrıca, araştırmada yeni teknolojinin kabul edilmesinde iki faktörün önemli bir rol oynadığı görülmüştür; Irak üniversitelerindeki LMS, e-öğrenme uygulamasının önündeki herhangi bir engellin

kaldırılmasına yardımcı olabilir. Buna ek olarak, gelecekteki çalışmalar için sonuç ve önerilere de değinilmiştir.

Anahtar Kelimeler: E-öğrenim Engelleri, E-öğrenim, Uzaktan Öğrenim, Teknoloji Kabul Modeli (TAM).

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LIST OF ABBREVIATIONS

ATU	Attitude Toward Usage
BIU	Behavioral Intention to Use
BTS	Bartlett's Test of Sphericity
DoE	Department of Education
HR	Human Resources
ICT	Information and Communication Technologies
IS	Information Systems
IT	Information Technology
KMO	Kaiser-Meyer-Olkin
LCMS	Learning Content Management System
LMS	Learning Management System
PCA	Principal Component Analysis
PEU	Perceived Ease of Use
PU	Perceived Usefulness
SN	Subjective Norms
TAM	Technology Acceptance Model
TRA	Theory of Reasoned Action

CHAPTER 1

INTRODUCTION

1.1 Introduction

Information and learning technology is viewed as an essential component in the modern world to obtain a competitive advantage [1, 2]. Educational organizations also take learning as a serious motivation to gain a competitive advantage, and in order to stay ahead of this competition, it is necessary to focus more on communication and information technology and on how we can make use of these in fields of learning [3, 4]. Furthermore, it is important for some organizations and foundations to remain aware of any new advances with a specific goal, to maintain their status and gain a solid presence in the business sector as it is necessary IT based environments [5].

Organizations and institutes have exceptional opportunities to convey instructions and distinctive training methods through innovative means of web technology by basic utilization of the Internet [2]. Open, adaptable, and effective learning environments can be obtained via such modern innovations consolidated with suitable learning methodologies [6]. This approach in education technology has helped creative thinkers to produce modern ways to improve knowledge. Hence, e-learning and virtual learning has developed as another popular learning system to be used as mining tools for this improvement [5]. In addition, most government offices, numerous organizations and learning foundations have expanded their use of the Internet to improve knowledge and training methods in addition to providing educational instruction through e-learning systems [6].

Information and knowledge being conveyed electronically is an e-learning system. Thus, information and knowledge can be delivered in many ways, such as through photographs, videos, academic recordings, text files, PowerPoint files, Excel files and the utilization of an interactive whiteboard during a presentation. All of these elements can be considered interactive means of an e-learning framework. In addition, any use of the element of modern technology can be considered to be an application of this concept [7].

For distance learners, this advancement is considered to be an open door to reach a new and quality learning environment [7, 8]. Therefore, the universities are used the internet for deliveries the educational materials were established during the late 1990s and mid 2000s as a result of the ripped use of the Internet. In addition, online courses had been offered by other universities. However, online institutions have experienced different outcomes from this system [7]. During this time, many problematic issues were recognized by researchers, including course content, economic and financial issues, technological structure, management, support, computer literacy, staff preparation, logistical obstacles, and organizational culture (i.e., culture resistance) [9,10 and 11].

The arrangement of shared behaviors, values, objectives and practices that portray an organization or enterprise comes under the heading of organizational culture [12]. Thus, clients experiencing check resistance or cultural resistance contrarily influence the overall usage process. Therefore, to profit from the new system, it is important to alter the worker's mentality [13]. During the implementation of e-learning, even cultural contrasts among companions, learners and teachers could likewise produce numerous issues [14]. Thus, if cultural issues were ignored during the execution process, hindrances in the usage of e-learning might arise [15, 16].

1.2 Problem Statement

In comparison to numerous classical strategies for learning technology, e-learning, and web based learning have exhibited various potential advantages over traditional methods of learning. It is less costly, it is speedier to convey, it is easily accessible anytime and

anywhere, and it gives a learner more control over his learning forms [17, 18, and 19]. many of the institutions, companies and individuals have moved towards e-learning since they realize its productivity and efficiency. Some of these surprising e-learning statistics and facts for 2014 include [20]:

- ✓ Learning Management Systems (LMS) being used by 74% of companies in addition to using virtual classrooms/webcasting/video broadcasting.
- ✓ Rapid e-learning tools (ppt. conversion tool) having been used by 48% of companies.
- ✓ The Application Simulation Tool having been used by 33% of companies.
- ✓ The Learning Content Management System having been used by 25% of companies.
- ✓ Online Performance Support or the Knowledge Management System having been used by 21% of companies.
- ✓ Mobile Applications having been used by 18% of companies.
- ✓ Podcasting having been used by 11% of companies.

To take strategic and competitive advantage of ICT in education technology, various articles and books have been published, and most of this work shows that accreditation in ICT is helping in making e-learning methods more attractive [21]. In addition, there is much literature that results in the disappointment of using ICT in learning technology and how it negatively affects the classic usage process in any learning associations [22].

While other studies made by Morakul et al. [13] showed that the non-use of technology to serve education now would lead to the abandonment of the educational process. The study of the differences and the effectiveness of using information and communication technologies in education technology will greatly help to understand this difference and this study helps to understand the most important obstacles that stand in the activation of the use of these techniques at Iraqi universities.

Specifically, this study aims to answer the following questions:

1. What are the perceptions of Iraqi university students and faculty members about e-learning according to Technology Acceptance Model?
2. What are the possible obstacles when activating the e-learning at Iraqi universities? Are these obstacles concerning to Institutional Issues, Management Issues, Technological Issues, Pedagogical Issues, or Resource Support Issues?

There are limitations of this study. The first limitation of this study is applying the Technology Acceptance Model (TAM) in terms of ease of use and usefulness model. Therefore, the findings of this study are limited to reliability of TAM. The second limitation of this study is the participants. The participants represent the west region of Iraq. Therefore, the findings of this study do not represent all Iraq regions.

1.3 Aim of the Study

The main reason for this study is to learn the basic factors which might influence the implementation of e-learning at Iraqi universities. Researching the problems of e-learning and its usage would enable us to encounter fewer obstructions in future execution. In addition, to recognize a complete outline for associations to control the obstacles to e-learning systems will consequently open a new horizon of opportunities to make it work proficiently and effectively in the Iraqi environment. This research will be covering the following:

1. To identify the possible problems during e-learning activation in Iraq.
2. To develop guidelines for Iraqi universities regarding the obstacles during the activation of e-learning in order to manage the e-learning system effectively.

This study also presents the following aspects:

- ✓ Discuss the benefits and constraints in the implementation of information and communication in education technology.

✓ Establishment of a questionnaire regarding the use and effectiveness of the Learning Management System on Institutional Performance and the obstacles facing the activation of this technique at Iraqi universities.

✓ A qualitative questionnaire based on the TAM for 124 samples from different functional positions and age groups such as students, teachers and education administrators will be the focus area of this research.

✓ Analyzing the results of the questionnaire based on the TAM, discussing it and making some recommendations.

✓ Discuss the conclusion and future work.

This study opens new horizons and new opportunities to make e-learning work well and effectively in the Iraqi environment in the future.

1.4 Thesis Outline

This research consists of five main parts, as follows:

• Chapter 1: presents the Introduction, a Problem Statement and the Aim of the Study.

• Chapter 2: presents a literature review. This chapter provides some background and the theoretical part that is related to our thesis subject. Furthermore, this chapter also delivers an impression of the most vital components that serve our study benchmarks and the Technology Acceptance Model (TAM).

• Chapter 3: presents the research methodology evaluated according to the related research.

• Chapter 4: presents the questionnaire and analyses of the results.

• Chapter 5: presents conclusions in addition to suggestions for any future work.

CHAPTER 2

LITERATURE REVIEW

2.1 E-Learning

Various researchers have provided divergent interpretations of how e-learning is to be perceived. In the historical context, educators have considered e-learning as another means for the presentation of data and information to learners. On the other hand, from technical specialists in hardware and the point of view of corresponding software, their consideration is varied regarding the priority accorded by ICTs towards handling pedagogical and educational aspects [23].

However, there were seemingly major inroads in perceptions made towards the concept over time. Holmes and Gardner [24] identified major differences in the contextual perceptions of e-learning concepts from an academic perspective. The aforementioned discourse is indicative of the presence of a strong social scientific aspect concerning how ICT tends to influence educational institutes, learning groups and learners. However, researchers belonging to different schools of thought regarding the subject do not agree on the existing definitions of the concept. The following sections dwell upon various e-learning concepts with reference to definitions developed in relation to distance learning, technology and the associated pedagogy.

Today, e-learning is an environment of electronic learning which uses information and communication technologies (ICTs) as a platform for learning and teaching activities. It has been defined as “pedagogy empowered by technology” by (E-LEARNING CONCEPTS, TRENDS, and APPLICATIONS [25]. E-learning delivers to learners the

ability to fit learning from one place to another their existences and it efficiently permits the fullest person to a further line of business and gain new experiences. Computers, laptops, notebooks, smart devices and any modern mobile device can be used as a learning environment platform. E-learning has proposed the capability of sharing any type of material in every type of format. This includes, but is not limited to, the following: videos, slideshows, webinars (live online classes, word documents, PDFs, interactive materials such as games, simulations, animations and Flash). This material can be delivered by using any type of communication channel including communicating with instructors via web conferences, video conferences, e-mail, chat, and forums.

In addition, there are many other terms that are used in the context of e-learning, such as blended learning, which can defined as a combination of offline (face-to-face, traditional learning) and online learning such that one complements the other, while Web-based learning is defined as anything sensible that is associated with learning materials delivered in a web browser. Social and collaborative learning is defined as an e-learning approach where students are able to socially interact with other students as well as with instructors, while online learning terminology refers to any learning items associated with content readily accessible on a computer through the use of online terms via communication channels. The content may be found on the Web or the Internet, or simply installed on a CD-ROM or computer hard disk [26, 27].

2.2 Distance Learning

E-learning processes are considered to have originated from distance learning concepts in relation to the associated theories describing and discussing the same; however, this perspective has seemingly changed with the introduction of ICT concepts. Distance learning is generally referred to as a process in which the teacher and the student are considerably distanced from each other [28]. The concept is also considered to be self-learning, a type of public education, under which the students are not required to attend classes regularly or be in scheduled contact with the relevant course supervisor. Owing to the prevalence of modern technological tools and the significant contributions made

towards enhancing the associated communication processes and methodologies, learning processes can easily be conducted and executed in diverse locations. E-learning processes have, therefore, gradually morphed to become a midway between traditional classroom-based learning models having either the teacher or student as the center of the process.

The shortcomings identified with regard to distance learning methodologies and the input provided by technology has had a corresponding impact on how e-learning is defined. This is most certainly demonstrated in the input provided by Alarifi [29] in this regard when he seemingly proposes that e-learning processes are a convenient methodology towards enabling the dissemination of educational content over a wide area. It therefore provides multiple options towards connecting classrooms across vast distances utilizing various technological processes and associated networks.

Alsalem [30] has observed e-learning processes as offering training options for groups of individuals at different locations while utilizing interactive software and other relevant programs, such as the Internet, intranet and teleconferencing. They, therefore, provide an interactive learning process using synchronous and asynchronous sources. Almosa and Almubarak [31] have emphasized the contribution of technology towards the improvement of the learning experience in terms of time and resources. The same has also been asserted by Holmes and Gardner [24] when they have periodically referred to multiple online resources, which explains the association of self-learning with that of ICT.

Furthermore, Zeitoun [32] has emphasized that *"delivering learning content via electronic multimedia and computer networks, to give the learner the possibility of dealing actively with the content and with the teacher and with peers. Whether it is synchronous or asynchronous, as well as the possibility of the completion of the content in the time, place and pace which suits his circumstances and capabilities."* It can, therefore, be concluded that e-learning processes were initiated to create educational opportunities beyond the traditional boundaries associated with ordinary classroom-based educational systems and has seemingly been considered to be a different approach to teaching.

2.3 Learning and Information Technology

In explaining the technological aspects, various researchers have provided their own perspectives on what constitutes e-learning. Correspondingly, this has included aspects on how knowledge is acquired, its dissemination and distribution, the associated electronic hardware and software and any related Internet connections utilized in support of the measures undertaken. These include various technological aid and paraphernalia such as satellite, wireless and cellular phones, etc. [33]. In this regard, Nichols [34] concludes that e-learning is to be inclusive of the utilization of various technological tools that are based on, distributed to, and capable of being used through the Web with respect to fulfilling the learning requirements of, and propagating educational opportunities to, the maximum number of individuals. Although it may be argued by some that the efficacy of e-learning processes cannot necessarily be equalized in terms of the technical processes used, the statement provided by the UK Department of Education (DoE) [35] is of the opinion that the mere utilization of communication systems and associated information networks (ICT) amounts to implementing e-learning processes. In this regard, Watkins [36] defines e-learning processes as *"a term covering a wide set of applications and processes, such as web-based learning, computer-based learning, virtual classrooms, and digital collaboration. It includes the delivery of content via Internet, intranet/extranet (LAN/WAN), audio and video, satellite broadcast, interactive TV, CD-ROM, and more."*

Subsequently, Allan [37] has contributed further to the list by including various technologies such as audio-conferencing, email, mobile phones, video-conferencing, TV, audio graphics, webcams, DVD/CDs, telephones and websites as means to facilitate e-learning. Various web and computer-based applications are used to implement comprehensive e-learning processes, thereby contributing to create virtual classrooms through digital collaborative initiatives. In delivering and effectively communicating through the medium, we may rely on various options, including interactive TV programs, the intranet and the Internet, audio and video tools, satellite communication technologies and CD-ROMs, etc.

2.4 E-learning as Pedagogy

The definitions included above encompass much hardware and software which may be employed to develop an efficient and workable education system. Khan [6] considers this development as an "*approach for delivering electronically mediated, well-designed, learner-centered, and interactive learning environments to anyone, anyplace, anytime by utilizing the internet and digital technologies in concert with instructional design principles"* (p. 3). Therefore, the employed technology should be compatible with traditional educational processes. Conole and Oliver [38] consider e-learning processes in terms of conducting practical research projects, which contributes to bringing technological innovations, which could be easily implemented in an educational system. In any event, it was proved largely that technology needs to be considered pedagogically before educational any benefits can be gained from the involved and implemented processes.

Although being flexible provides multiple benefits in successfully concluding educational goals in consideration of time and place limitations, e-learning processes have positively contributed towards providing multiple educational opportunities for learners and has significantly contributed to their progress [39].

Correspondingly, the European E-learning Action Plan has various multimedia tools, and the options provided by the Internet have significantly improved learning opportunities in lieu of several successful collaborations [24]. Although conscientious learners could source multiple means to acquire various learning opportunities for themselves, Almuheisin [40] emphasizes the role of electronic media in ensuring the success of e-learning processes within the context of educational institutions. Aldrich's description [41] recommends a tripartite relation with regard to teaching, technology and educational administration in the context of the infrastructure implemented, the content extracted from the process and the respective network facilitating the process. All of this was required to be considered in the context of the same, thereby contributing to enhancing the overall

value chain of the learning process. This, therefore, included aspects of both delivery and the management of the involved processes.

Although there has been significant interest demonstrated in the equipment utilized in the process, it is indeed a challenge to conclude successfully any e-learning processes without aligning the concerned aspects of the technology, pedagogy and educational administration. Considering the impact of social sciences on the overall learning environment and towards how it both positively and negatively contributes towards e-learning initiatives, the related processes need to be included in the study. The existing debate regarding the effectiveness of e-learning methods questions the respective interest of the business sector towards their potential profits. However, this apprehension was not given much significance by the previous definitions of the concept. Moreover, considering the above discussion, various characteristics have been identified which tend to influence the said situation.

These properties are summarized thus:

1. E-learning processes are related to the effective utilization of ICT processes, similar and disjointed networks, compatible electronic devices, etc. It would contribute towards disseminating educational materials across the network, and amongst the various participants with regard to teaching and learning processes.

2. While e-learning processes are known to involve the circulation of relevant content, associated aspects related to administering and planning the various goals to be reached is included.

3. E-learning could either replicate standard classroom settings or it could also entirely replicate the original feel.

4. The process requires a degree of supervision.

5. It is not necessary to duplicate electronically the theoretical parts with the concepts of education since it is actually an alternative teaching process requiring input, incorporating various processes, the related output and feedback.

6. E-learning processes can be conducted both synchronously and asynchronously.

7. E-learning involves aligning the Learning Management System (LMS) and Learning Content Management System (LCMS).

8. E-learning provides opportunities to learn over a lifetime and it personalizes the information gained.

The processes can be interchangeably applicable in the context of both educational and training opportunities as well as within professional learning programs or in the context of workplaces. The preceding sections have discussed and debated the various e-learning definitions and have concluded three variants of the definitions of e-learning, i.e., the distance definitions, technological definitions and pedagogical definitions. Moreover, the three types of definitions have been integrated by means of their respective elements to present a new and all-inclusive definition of the concept. Figure 1 shows the key features associated with the various e-learning initiatives concluded in this regard.

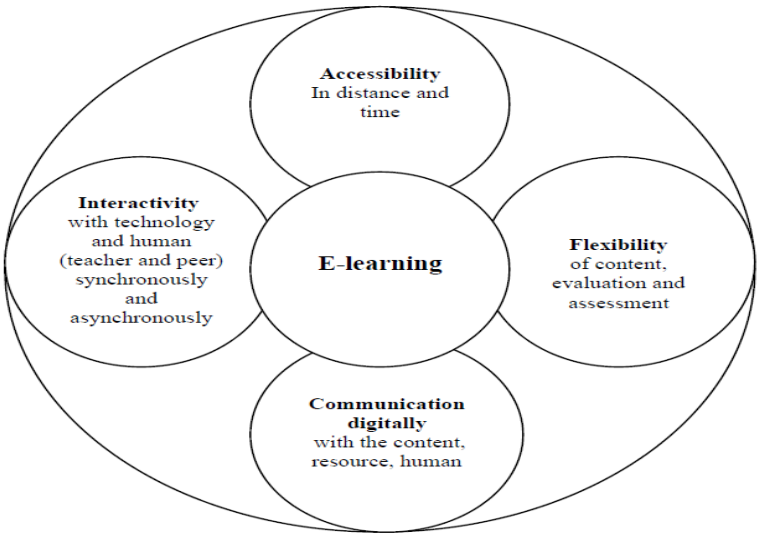

Figure 1: The essential characteristics of e-learning [81, p. 42].

The above diagram shows the key features related to the e-learning concepts mentioned in earlier literature. It can therefore be concluded that the definition of e-learning has gradually changed over time in terms of the nomenclature being employed for it. The

terms used to denote the e-learning process have become synonymous with each other due to the lack of proper definition.

Additionally, terms relative to digital, smart and virtual learning processes are combined by various researchers. Such overlapping terms are somewhat clarified within Figure 2, reflecting the contemporary trends within e-learning processes with regard to the various digital and distance learning processes. The theory can be further simplified using terms related to “e-L”, “eLearning”, “e-learning”, “E-learning” and also “e’Learning.”

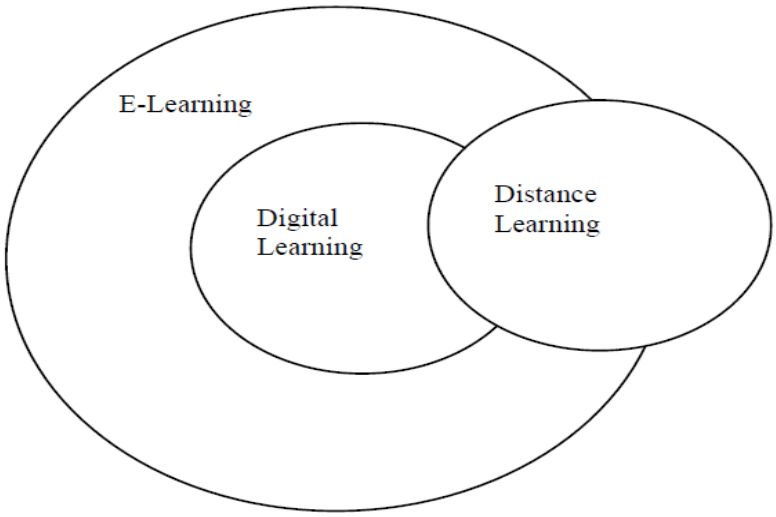

Figure 2 E-learning’s ambit [81, p. 43].

It can, therefore, be concluded that the earlier literature has exclusively used a single underlying definition with regard to the term.

2.5 Learning in an Organizational Context

In considering the relationship between the various instructors, students and the associated theory circulated within the same, it is concluded that the same is interrelated, and weaves a common theme amongst the various groups involved. It is therefore important to ensure that the term is used relative to the interests of the stakeholders so that it would reflect the learning concluded within the organization. The overall organizational culture is liable to

reflect multiple variations of learning concluded since the underlying environment would contribute much to the outcome against the respective input [42, p. 233].

Figure 3 shows the overall organizational learning process and the corresponding instructions delivered, inclusive of the input provided by the subject matter, the instructors, the students and the overall learning atmosphere. The interaction and assimilation of these four factors contribute to defining the currently existing organizational environment and the respective culture [42, p. 233-236].

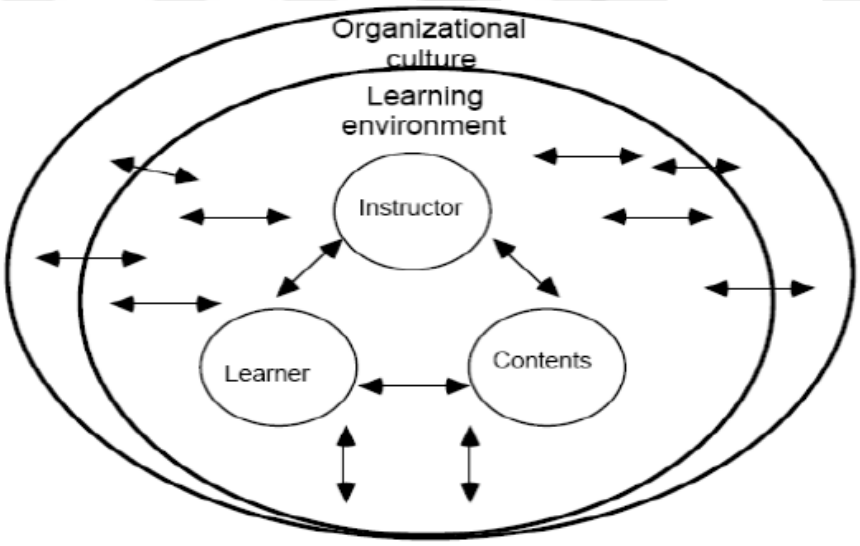

Figure 3: The extended system of learning in the organizational context [42, p. 233]

2.6 E-Learning Perspective

From an international perspective, e-learning processes are considered to be emerging paradigms with a growth rate of 36.5% in the market. Nevertheless, there still exist major drawbacks in the field [43]. It is observed that while a few organizations are perhaps making significant strides in adopting e-learning processes, they are nevertheless often hindered from effectively implementing and adopting the actual processes, which leads to shortcomings in implementing the said systems [44]. To ensure the overall success of the

systems, it is necessary to investigate the factors regarding the extent to which the designed systems are open, flexible and advanced with respect to the level of skill aimed to be delivered to learners [6].

The existing literature discusses the various factors influencing the process in addition to debates on the associated pedagogical, faculty and organizational issues. Moreover, the literature considers associated personal, cultural and other related facets [45]. Wong [22] considers that the majority of existing e-learning processes are generally hindered by various technological, personal and other limitations. Shortcomings with regard to available hardware, Internet coverage and bandwidth issues are also considered to be key technological barriers to the effective implementation of e-learning processes [22, 46 and 47].

Kember et al. [48] and Dearnley [49] assert that learners and teachers are liable to experience various personal issues. Therefore, it is important that teachers be aware of learner's' perspectives towards learning so that they are successfully able to guide new learners taking their psychological capabilities into account [22, 48 and 49]. In relation to early learners, this could impact their adaptability to e-learning processes. Thus, shortcomings in the extent of information gathered, barriers in communication and not being fully conversant and aware of the technology being adopted could all be major barriers in successful adoption of e-learning processes by new learners [22, 50, 51 and 52].

The freedom provided by e-learning processes could, at times, be considered detrimental to the interests of early learners considering various motivational and self-discipline issues affecting learners' ability to complete their assigned tasks in a timely manner [22]. The e-learning system is developed to provide a text-based learning environment, which is why individuals with poor comprehension and writing skills could find themselves at a disadvantage. Thus, barriers to effective communication may lead to misunderstandings between students and teachers [19].

There are other limitations related to ensuring 24/7 access to the system since the borderless paradigms associated with e-learning processes could perhaps be too intimidating for some individuals, especially so for those with learning disabilities. This feature has also been observed to stress teachers needlessly and have an impact on the quality of the learning being delivered, as the students may continue to place unending queries towards teachers, thereby taxing the efficiency of the latter [53].

Shortcomings in the design of the course could also be considered a major impediment since both teachers and students could be impacted by it [54]. Cronje [55] concludes that from a learner's perspective, the barriers to effective learning may include the inadequate level of cooperation provided by peers to the learner as well as the inadequacy of financial resources, which can contribute towards needlessly intimidating them and compelling learners to perceive themselves as being 'dropped out' shortcomings in financial opportunities. Institutional bias against the teachers and competition between peers could be listed amongst the pressures faced by teachers [55, 56].

In this regard, shortcomings in finances may occur in three areas with regard to the implementation of e-learning systems, namely the initiation costs, maintenance costs and the upgrade costs [55], which are normally observed at an organizational level. Inadequacies in the overall design of the course is a major impediment to the success of distance learning initiatives since it is not necessary that the process of simply converting a text into the electronic form would be enough in itself [55, 56]. Boondao et al. [57] is of the opinion that it is imperative to account for cultural contexts within teacher training exercises. Thus, cultural aspects would be considered very relevant in designing e-learning programs. Considering the divergence in cultural perspectives between different regions such as the East and the West, individuals from both societies would have to be cognizant of this aspect. Hence, failure to understand this aspect correctly could seriously affect the efficacy of all e-learning initiatives being implemented.

2.7 Learning and Acceptance of ICT

Hedman and Kalling [58] are of the opinion that it is not possible to operate new tools successfully without adequate and prior training. Correspondingly, cultural factors with regard to values, norms, demonstrated political inclinations, attitudes and beliefs are also contributing factors in this regard. Nevertheless, it is now acknowledged that there is a link between culture and the cognitive behavior as it is perceived that to comprehend something, it is necessary to be drawn towards the topic, thereby necessitating an understanding of the issue under consideration. The modern corporate world emphasizes the importance of norms and individual value systems, which subsequently continues to affect the overall organization. Therefore, neglecting this aspect has an adverse effect on the entire organization. It is important to conduct a preliminary survey of the project being conducted instead of assuming the conclusions ultimately derived through exercises executed directly.

Norms and values are often considered in the context of what is acceptable within management circles, which are liable to change with the passage of time. Thus, Agarwal [59] has identified the same to be impacted by beliefs and attitudes, individual differences, social influences, situational influences and managerial interventions, briefly discussed below, as shown in Figure 4.

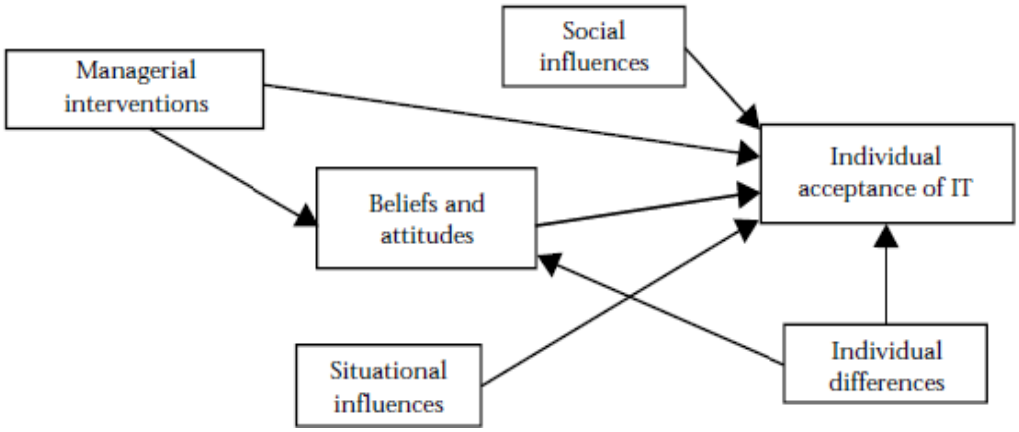

Figure 4: Individual acceptance of IT [58, p. 247].

- **Beliefs and attitudes:** Moore and Benbasant [60] are of the opinion that it is a common perception that new systems and processes would be an improvement of

the former. However, in this regard, it is also necessary that the systems thus implemented be easier to operate and comprehend. Ultimately, the new systems and processes would contribute towards enhancing the overall status of the operator [58 p. 248].

- **Individual differences:** Depending on the extent of accessibility to the IT processes instituted in the systems, it tends to affect the perceptions and the corresponding behavior of the individual. This would also be represented in relation to the factors associated with the levels of experience of the user, their gender, intellectual capabilities and age [58, p. 248].

- **Social influences:** Agarwal [59] has concluded that social influences determine how members within a given community perceive technological advancements. In other words, depending upon how individual users perceive a new process, it would ultimately be reflected in the reaction exhibited by the entire community. Extensive marketing campaigns are conducted in this regard to influence the mindset of individual users, contributing to ensuring the success of the processes involved in the end. Therefore, social norms significantly influence how new technologies and associated processes are to be introduced and established in the long run [58, p. 248].

- **Situational influences:** The combined effect of integrating various characteristics may differ from one situation to another, keeping in the mind the pertaining conditions and scenarios [58, p. 248].

- **Manager's interventions:** To ensure the success of new technologies and processes introduced in the market, it is necessary that the management wholeheartedly support the initiative undertaken. Therefore, the vision and foresight of the executive management in an organization has a far-reaching impact on the long-term sustainability of the technology being introduced. The market is perceived to be more willing to accept processes where the managerial

work processes implemented are perceived to be relevant to the functions executed vis-à-vis the technology being implemented [58, p. 249].

2.8 E-Learning Critical Obstacles

There are myriad barriers to successfully implementing e-learning initiatives. These may include and constitute instructional, organizational, technological, personal or situational barriers [44]. Additionally, the e-learning paradigm concluded by Khan [6] lists various other issues of equal importance, including pedagogical, ethical, institutional, interface design, resource support, management, evaluation and technical dimensions, as presented in Figure 5.

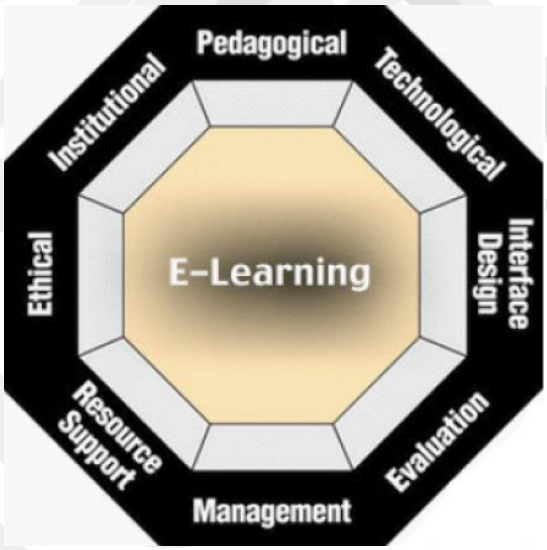

Figure 5: E-learning framework [6, p. 14]

2.8.1 Institutional Issues

It is important for organizations to have a road-map before initiating any e-learning implementation process [6, p 23] since initiatives undertaken in this regard need to be seamlessly linked with the strategic goals and objectives of the organization [56]. It is often concluded as a paradigm shift for the organization overall and it entails the

participation of multiple organizational hierarchies, including support services staff, administrators, students, technical personnel and any involved instructors [61]. It is, therefore, important to ensure that the various members of the organization involved in the initiative demonstrate an equal level of interest in the entire effort [10].

It is indeed important to be aware of the issues related to process development, strategic planning and change management [10]. Correspondingly, Khan [6, p. 23], addresses the institutional issues in terms of student, administrative and academic support services. Administrative affairs are concerned with aspects of financial aid, registration, course information, instructional design, budgets, course schedules, information technology services, catalogues, tuition fees and other related factors. Academic affairs are related to the aspects of intellectual property rights, instructional quality, staff support and associated policies. Finally, student support services include the aspects of various measures contributing towards successful implementation of an environment conducive to initiating e-learning initiatives, as summarized in Table 1.

Table 1: Institutional issues

Needs Assessment	Prior to undertaking investments in the e-learning process, it is important to evaluate the overall feasibility of the entire exercise. This should determine the goals intended to be achieved [6, p. 24, 10].
Readiness Assessment	It is important that organizations be able to evaluate their financial standing, in addition to their cultural and infrastructural readiness [6, p. 25].
Organizational change	Organizations should be primed to be able to deal with organizational changes necessitated by new technologies [6, p. 26, and 10].
Budgeting and return on investment	It is important for organizations to ensure their continued financial well-being in the course of implementing e-learning processes [61] [6, p. 28-29].

Financial Aid	First time adopters of e-learning processes should be helped financially in adopting technical and human resource processes [6, p. 32].
Policies	The broad parameters of the e-learning initiative should be communicated to all stakeholders [6, p. 35].
Instructional Quality	Communication processes should bring positive changes to the company [6, p. 35; 7; 11; 62 and 63].
Faculty and Staff support	The concerned stakeholders should be adequately trained in implementing the e-learning initiative [6, p. 41].
Intellectual property rights	The concerned stakeholders should be well aware of intellectual property rights [6, p. 39].
Learning Skills Development	The availability of user guides should be ensured as they help everybody involved in the process [6, p. 39; 22].

2.8.2 Management Issues

Shortcomings in management support are often the death knell for effective e-learning processes [64], which can be attributed to multiple causes, including the construction, delivery, scheduling, assessment, maintenance or design of the involved processes [9]. It is necessary to employ an integrated team approach in three segments of the system, i.e., the process, product and people related to e-learning processes [6]. Process management in relation to e-learning includes aspects of evaluation, designing, delivery, maintenance and design [6, p. 106]. The effectiveness of the output or the product generated from e-learning initiatives is concluded in terms of the plan of the project and the related content [6, p. 109]. The members of the team are classified in terms of their roles and associated responsibilities with regard to their multiple roles, examples of which include graphic artists, instructional designers, content experts or project managers [6, p. 105]. The key factors considered herein by Khan [6], are summarized in Table 2:

Table 2: Management issues

Project Manager's Skills	Executing supervisory, team motivation, planning, budgeting and scheduling tasks; adequate managerial skills are a major requisite [6, p. 109].
Managing content development process	Content development needs to be focused on the functions of production, evaluation, design and managing the security aspects.
Managing E-learning environment	The management of e-learning processes requires facilitating the smooth functioning of all related processes for learners [6, p. 114].
Updating and Monitoring of the E-learning Environment	The program should be regularly updated [63], and the same applies to the availability of related links and resources [6, p. 126].
Security Measures	Access control and information privacy should be maintained as being a part of security concerns [6, p. 126].

2.8.3 Technological Issues

E-learning processes are often impeded by technological barriers which could be attributed to the aspects of computer software, hardware, etc. [22]. Thus, issues of data loss, training, connectivity, data transfer, 24/7 support and navigation are some of the most commonly occurring problems [44]. Hardware and software issues hinder small firms from implementing e-learning processes [22]. Technological issues can be classified into three major categories (i.e., issues) pertaining to infrastructure management, hardware and software [65], as summarized in Table 3.

Table 3: Technological issues

Infrastructure Planning	Infrastructural issues are crucial to determining the success of e-learning initiatives. Proper strategies are therefore required [61, 66] with adequate digitized infrastructure being ensured [6, p. 154]. In addition, the organization must also plan ahead to address the issues related to hardware, software and networking [22].
Hardware	Computer hardware is as important a segment as the new learners need for continued access to computer systems [22, 47 and 48]. This could be related to the availability of networking, wireless devices, cameras, microphones, printers, modems, scanners, servers and related hardware [6, p. 158].
Software	The same applies for paid software and corresponding licenses [6, p. 158]. This could relate to Learning Management Systems (LMS), word processors, e-mail, browsers and plug-ins, presentations and spreadsheets, as well as related databases and enterprise software.

2.8.4 Pedagogical Issues

The success of e-learning initiatives depends upon the underlying pedagogic principles associated with e-learning initiatives [67]. These issues, being a major challenge to the effectiveness of e-learning, call out for an urgent need to design adequate course materials by trained staff [68]. Ertmer [69] is of the opinion that the extent of available technical expertise could contribute to the learning accrued. The following aspects (see Table 4) are relevant in this regard:

Table 4: Pedagogical issues

Content Analysis	The content of a course is of prime importance and this should reflect the periodic changes in the information available towards pre-empting the possibility of the data being outdated [70]. Correspondingly, content and task analysis are important functions for designing strategies, techniques, reclassifying content and thus creating an effective learning environment [6, p. 182].
Audience analysis	Since e-learning processes and systems can be hypothetically implemented anywhere, it is realized that they may have variable impacts over a culturally diverse audience [44]. In this regard, it is important that recipients' capabilities be assessed in relation to their traits, requirements, experience, proclivity to learn, and communication abilities. All this should be assessed by means of undertaking audience analysis exercises [6, p. 183].
Goal analysis	Identifying achievable goals contributes to the efficiency of e-learning processes [45] since it helps in deciding the pathway to be adopted in this regard [6, p. 185]. Thus, it is important to set identifiable goals and a corresponding perception to achieve them. This should be subjected to periodical analysis and evaluation [6, p. 185-186].
Medium analysis	The process can be implemented by adopting diverse methodologies, including the aid of the Internet, and utilizing associated digital media. Printed media can also be utilized in a support function. Media analysis provides a perspective on the efficient allocation of resources. Similarly, multimedia resources can also be utilized in this regard [6, p. 186-187].

Table 4: Pedagogical issues (cont.)

Design approach	Pedagogical viewpoints in relation to the design of the overall setup remains subjective if the content is incompletely structured [57, 58]. Objectivist philosophy is supported by instructive philosophy while the learner's objectives are considered in relation to constructivist initiatives and concept based strategies [71] and [6, p. 186-187].
Instructional Strategies	Instructional strategies in the e-learning context are inclusive of simulations, tutorials, presentations and demonstrations. Therefore, they can include audio and video content, photographs and graphics, animations and interactive presentations, various texts, video conferencing options, etc. [70]. Discussion forums enable participants to express their viewpoints on various issues [6, p. 190-195].

2.8.5 Interface Design Issues

Aspects of designing the structure of the system relate to the content uploaded and are considered a means to encourage the online exchange of thoughts, assignment submissions and other operations. The shortcomings in this regard may create hindrances for learners [72]. The measures of flexibility require that the design be simple to use and that it should contribute to the efficient usage of the site. Inconsistencies in this regard can be reflected through the increased dropout rates amongst students and decreased traffic on the website [73, 6, p. 325]. The various factors associated herein presented in Table 5:

Table 5: Interface design issues

Page and Site Design	The page should be easy to navigate and it should be written in a manner keeping in view the requirements of those with disabilities and senior citizens [6, p. 327].
Content Design	Nielsen [74] is of the opinion that written conventions should have minimal grammatical errors with respect to punctuation, paragraphing, usage, grammar, spelling, capitalization, etc., and they should be compatible with the ability of the intended audience. Moreover, audio and video should have clarity with regard to the sound quality [6, p. 327; 22 and 57].

Table 5: Interface design issues (cont.)

Navigation	Content designers should be mindful of the ease of the targeted audience [9] as learners are susceptible to being distracted if the texts is not easily understandable [6, p. 328].
Accessibility	It is important to be aware of the various challenges to an audience [9]. The same applies to technical issues in terms of the available Internet bandwidth and the quality of Internet services. Therefore, content should be compatible with available bandwidth [6, p. 329].

2.8.6 Resource Support Issues

Success in concluding e-learning initiatives is significantly dependent on the quality of services offered in relation to the demographics within the targeted area [56, 57] since this issue has been repeatedly concluded to be important from instructional perspectives and the level of technical support available [6, p. 352]. Therefore, it is important for institutions to ensure that round-the-clock support be available for the systems being implemented [44]. This could include the provision of counselling and instructional support, while technical troubleshooting could include aspects of networking, database errors or incompatibility with the available software. Possible resource support issues are listed in Table 6.

Table 6: Resource support issues

Instructional and Counseling Support	Most new learners are anxious [75], necessitating clarifications of the online options available in this regard by project designers. Students should also be made to understand course requirements in terms of periodic assignments and discussions, relevant reading material and the associated projects to be completed for successful completion of the course [9] and [6, p. 353].
Technical Support	The quality of online technical support significantly affects the success of e-learning initiatives since shortcomings in this regard can often dishearten and frustrate users [44]. The system should enable quick resolution of problems encountered in terms of issues with file transfers, database management, inconsistent networks, etc. [6, p. 353].
Online and Offline Resources	Students should be guided with regard to aspects of quality as shortcomings in this regard would certainly discourage and frustrate them [44]. Online resources could, therefore, include support provided by computer tutorials, journals or e-books, while associated offline resources would include various documents, journals, reference materials, newsletters, books, etc. [6, p. 355].

2.8.7 Evaluation Issues

Baker [76] and Wong [22] are of the opinion that in analyzing individual performances, testing the efficacy of the e-learning systems implemented may be quite helpful. Therefore, the system can be evaluated in terms of a learner's level of knowledge, tutors and the extent of satisfaction derived from the course. The teachers in this regard can provide the input separately and the students can be involved in the successful conclusion of the coursework. The exercise should, therefore, measure the effectiveness of the courses being taught [6, p. 379]. The associated paradigms are explained in Table 7:

Table 7: Evaluation issues

Evaluation of E-learning content development	Aspects related to the production, evaluation, design and planning of the course [6, p. 380]
Evaluation of E-learning environment	This includes support from instructors and other staff, including tutors, technical support persons, librarians, course development personnel, delivery and maintenance teams, instructional teams, members of learner support services and of administrative support [6, p. 3; 81].
Evaluation of E-learning at the Program and Institutional Levels	In analyzing the status of an institution, aspects of the quality of the institution and the associated e-learning processes should be considered with regard to the delivery of the content, the overall learning environment and any related support services [6, p. 385].

2.8.8 Ethical Issues

The ethical issues and concepts commonly associated with e-learning initiatives include aspects related to the cultural, social, geographical and political associations of the students in consideration of their perspectives related to integrity, privacy, legal issues, justice, diversity, equality, bias, etc., relative to standard educational concepts [6, p. 293].

2.8.8.1 Social and Political Influence

Social and political inclinations severely affect the success of e-learning initiatives [77, p. 113], which necessitates a close integration of the students involved in the initiative [63; 6, p. 294].

2.8.8.2 Bias

It is important for both the designer of a course and the developer to ensure that there is minimal bias in the manuscript. Therefore, the inclusion of needless viewpoints and articles may affect the focus of the students and defeat the purpose of the initiative by creating unnecessary controversy and diversions [62; 6, p. 297].

2.8.8.3 Geographical Diversity

E-learning processes often require coordination between varied and diverse geographical locations. Therefore, in synchronizing exercises involving simultaneous interactions with far-off sites as well as the aspects related to time-zone, locations, holidays and so on need to be considered and kept in perspective [44; 45; 61 and 6, p. 297].

2.8.8.4 Learner Diversity

Varied e-learning processes involve differing styles, especially with regard to students with disabilities and senior citizens [11]. This is a major institutional challenge while designing the layout of the courses to make them suitable for learners of varying abilities [78]. Therefore; the e-learning initiatives should be drawn up as such to contribute to the better understanding of the topic under consideration [6, p. 298].

2.8.8.5 Etiquette

Institutional recommendations should be made a part of the design with regard to netiquette and the behavioral protocols related to online activity. This is particularly relevant when considering the various options with regard to services such as instant messaging services [6, p. 301]. Therefore, instructors need to be aware that the synchronous and asynchronous interactions should not be personal so as to avoid needless controversies [6, p. 301].

2.8.8.6 Legal Issues

Institutional policies should be defined in relation to how various administrators, instructors, learners and support services should function with regard to copyright, privacy and plagiarism issues. Therefore, copyrighted materials should not be published without prior approval or acknowledgement of the author of the original text. Furthermore, it is important that academicians and students be made aware of the aforementioned aspects in the perspective of e-learning processes [6, p. 329].

2.8.8.7 Cultural Diversity

Various organizational, personal, disciplinary and societal aspects contribute towards the successful implementation of e-learning solutions. Sanchez and Gunawardena [79] recommend that e-learning course designers be aware that their students and users be located within differing geographical locations and claim title to varying religious, economic, social, linguistic and cultural backgrounds [6, p. 295]. In the context of a transnational audience, designers and associated developers need to be aware of the associated intricacies [80; 6, p. 295]. In this regard, Boondao et al. [57] have made a few recommendations regarding how cultural aspects are to be handled in relation to developing, designing and implementing the various e-learning options [6, p. 295].

2.8.8.8 Educational Value Differences

In dealing with international audiences, course and content designers need to be aware of the cultural diversities involved. To illustrate, since individuals in the Far East are perceived to be more studious, they expect greater precision in answers against their queries when compared to others [57].

2.8.8.9 Educational Cultural Background Differences

Since Far Eastern cultures lay a great deal of emphasis upon memorizing entire texts, students here are perhaps not very open to group discussions and may, therefore, be more critical of differing opinions in classroom settings. In such scenarios, it is a matter of pragmatism to initiate courses through initial group exercises with the aim to bring participants closer together [57].

2.8.8.10 Cultural Communication Differences

Western educational settings welcome classroom participation and discussions while Far Eastern methodologies are diametrically opposite. Therefore, confrontation is suppressed in the latter scenario. Further, students in the latter scenario are perceived to be more respectful of their seniors, and lecturers in such societies are not known to enquire about feedback to their lectures delivered in the classroom. Such differences in perception need to be considered by course designers [57].

2.8.8.11 Different Language Usages

Language is a direct reflection of culture. Since e-learning processes are applicable across varied cultures, it is important that courses be designed as neutrally worded and exclude slang and wordings from specific dialects [57].

2.8.8.12 Learning Style Preferences

There are differences in the learning preferences exhibited in Eastern versus Western societies. Therefore, course designers should be aware of such differences, and tailor their manuscripts accordingly [57].

2.9 Technology Acceptance Model

The TAM was proposed by Davis [82] and it has four areas of perceived benefits, resources such as human, financial and IT, in addition to external impacts such as the competitive environment, outside stakeholders, government regulation and policy, market structure, and internal factors such as power distance, organizational culture and dealing with uncertainty. All these factors are analyzed and their role for successful implementation and the adoption of technology are considered. It has been a consistent query of organizations as to why people accept or reject a technology [82]. In most cases, end-users are often unwilling to use a new technology that would increase the efficiency of an organization or an individual to some desired extent. With the aim of assisting those managers, past studies explored several variables. Consolidating them into a small number of fundamental variables, in 1986, Fred Davis proposed the Technology Acceptance Model (TAM), which is one of the most widely applied theoretical models in the information systems (IS) area. Although it was initially developed to investigate computer use behavior, later because of its applicability in a variety of contexts, TAM started to be used by IS researchers to examine the acceptance of various types of IS applications, including e-mail, Internet, e-commerce, software applications, knowledge management systems, modeling grammar, etc., just to mention a few. Although the applications are from different industries, the common theme shared among researchers is to provide better service to society. For instance, the acceptance of healthcare information systems may increase the quality of patients' lives; hence, researchers examine what makes health service providers accept the IS. Because of its simplicity and robustness, TAM became one of the models being used in different service economy studies.

2.10 Perceived Benefits

Per the utilization of the framework, the client acknowledges the technology on the premise of its apparent advantages. There are numerous ordinarily related qualities that require discussion. These are examined below:

2.10.1 Perceived Ease of Use

This is characterized as the extent to which the potential adoption has anticipated that an innovation is free of the exertion being used. Henceforth, the acknowledgment continues to expand in accordance with this perceived ease of use. Such a relationship mainly prevails for various acceptance levels, for example, in behavioral acceptance, attitudinal acceptance and intentional acceptance. It has been accounted for that there an aberrant impact by the perceived usefulness has been accounted for the technology acceptance [83]. Perceived usefulness is characterized as the degree to which a technological innovation is relied on to improve the performance of a potential adapter.

In some studies, it has been communicated that there is a roundabout impact of perceived ease of use. It has been observed that the perceived ease of use has been thought to be more crucial than the perceived usefulness; however, the general accord reveals that the latter is more critical than ease of use. It is further revealed that usefulness was more vital for the mentality of pre-acceptance and that the perceived utility is more basic for the attitudes taken after by the post acknowledgement. Moreover, it is revealed that the less adaptable an innovation is, the lower the apparent perceived ease of the utilization of technology would be [84].

2.10.2 Perceived Complexity

Perceived complexity may be defined as the extent to which an innovation is seen as being intricate to comprehend and use [84]. The general idea is that the multifaceted nature has diminished the technology acceptance.

2.10.3 Perceived Compatibility

Perceived compatibility is characterized as the degree to which a development is considered to be steady with the requirements, values and past experience of potential adopters. It is assumed that compatibility has expanded the technology acceptance and it has been found that the impact of perceived compatibility has been observed to be greater for behavior acceptance than for attitude acceptance. This is one issue that is connected to compatibility and it contrarily impacts upgrade adoption.

2.10.4 Perceived Trainability

Perceived trainability is the degree to which an innovation can be experimented with on a limited basis. It has also been revealed that personal experience with technologies that are new can increase the acceptance of technology [85]. It has been revealed that the trainability factor is important for pre-adoption attitude formation.

2.10.5 Perceived Visibility and Observability

This is characterized as the extent to which developments are noticeable to others and ease of an innovation to see the outcomes that are prone to improve acceptance [85]. Visibility is characterized as the extent to which a development is obvious through a user community amid dispersion. It is recognized that increased observability and visibility have expanded the acceptance of technology.

2.10.6 Perceived Result Demonstrability

This is defined as the degree to which the utility and benefits of innovation are readily apparent to potential adopters. It was concluded that demonstrability of result was more necessary for pre-adoption attitude formation.

2.10.7 Perceived Voluntariness

Perceived voluntariness is defined as the degree to which the use of innovation is perceived as being of free will or voluntarily. This factor is particularly important in an organization where enforcement of the use of new technology is more likely. The general consensus is that the acceptance of technologies has increased with the increase of voluntariness. All these factors suggest that the perceived benefits of technology are important for technology adoption.

2.11 Resources

Human resources are the most vital element for the adoption of technology. The human resource information and information sharing system has resulted in being of great importance. It has been found that change management is essential for the organization and acquisition of new technology within any particular organization require a planning from the human resource department that is found to be quite efficient [86]. Effective individuals with proficient skills in technology are required to achieve the desired results. Designing employee centric processes to achieve efficiency is important, so HR and every employee are vital for the adoption and implementation of the technology.

The resources of HR ought to be productive, somewhat developed, and, in fact, found to acquire and make an introduction of another technology within the organization. An organization that is found to be rich in human resources and ready to keep pace with the differing qualities of HR can have desirable personalities within any particular company

and it can adequately manage the challenges that are forthcoming in addition to being viably able to actualize the program of change management [86]. The powerful human resource guarantees that the organization will have a high rate of retention and a minimal turnover. Thus, these factors would assist in being acquainted with new technology or accepting new technology.

IT resources are additionally basic for the adoption of technology. In the event that the framework of information technology has to be taken into consideration, it would necessitate using scanners, computers, accessories and printers. Additionally, it requires software and individuals to run the software. Furthermore, it will require a firewall and a number of other security measures to secure the information utilized as a part of the framework. Therefore, to implement an adjustment in the organization and present another technology, essential resources are especially vital for the organization. There are certain threats to the security of data and to the efficient use of data sharing. Therefore, data management people are needed to manage the data and, until they are familiar with the IT resources, they cannot manage the data and they are not able to provide security to data. To upgrade the technology and introduce it into the organization, it is imperative to maintain sufficient resources of IT in order to manage the technology [86].

2.12 External Factors

There are different external factors, for example, government regulations and rules, and different stakeholders, for example, customers, investors, bankers, market structure, competitive environment, all of which present significant threats or opportunities for the acceptance of the technology. The outside stakeholders such as shareholders, bankers and customers are always important for organizations and if organizations are to adopt any technology, the perceived benefits of the technology for productivity of business and productivity of these stakeholders must be determined otherwise the technology may not be accepted by these people. Similarly, governmental regulations and rules shape the technological preferences emulated by the adoption. In cases that there is a need from government for the manufacture of cars producing minimal pollutants, such adoption of

technology would be convincing for an organization [87]. Therefore, if a government has favored that a specific innovation ought to be utilized by an organization; the organization has a mandatory requirement to purchase that technology. The competitive environment additionally shapes the organizational preferences in accordance with the individuals to acknowledge the innovation, as though the contenders are respecting the new technology and gaining great benefits from it; then the organization is compelled to adopt the new features of the technology to maintain its competitive intensity. Moreover, the market structure presents opportunities or threats for the company. If the market has the perfect competition structure, then for the organization to be competitive in the market, it would need to purchase and adopt the technology that makes it competitive [86]. If the market structure is oligopolistic and the organization has a monopoly in the market, the technology acceptance can be affected by this and it may be that the organization may not accept the new technology due to incurred costs.

2.13 Internal Factors

In the worldwide context, it is apropos to utilize innovative and creative technology in order to work better and to achieve effectiveness, communication and coordination. This diffuses the technology. Nevertheless, there are numerous cultural factors that shape the attitude and perception of individuals to acknowledge and embrace technology. It has been discovered that the behavioral model is not connected in a comparative manner across cultures. For this reason, the traits of personality for individuals are taken into consideration in order to evaluate them at an individual level [88]. It has been propounded that national society is of extreme significance for impacting decisions related to technology and technology acceptance.

The Davis model of technology acceptance is based on the theory of reasoned action that was developed by Fishbein and Azen, which was based on the theory of attitude. Their theory takes into consideration the attitude and behavior of a person [88]. The approach adopted by Davis on the basis of TRA theory posits that actual behavior occurs due to the intentions underlying in-person behavior and this has been elaborated by studying and

accepting a new technology. Hofstede dimensions are far more important to understand individual behaviors and for the adoption of technology. It is important to understand the dimensions first to acquire the knowledge of their role in the Technology Acceptance Model.

2.14 Masculinity/Femininity

Masculine values reflect that material success, work goals and assertiveness are the main elements, whereas feminine values represent life goals, nurturing and modesty [89]. Work goals are related to recognition, greater work centrality and achievement, whereas the quality of goals has placed a greater emphasis on cooperation and a friendly atmosphere as well as employment and decentralization. It is also important that masculinity and femininity not be synonymous with gender as it only measures the psychological gender, so an individual can be aggressive or caring in adopting technology. It has been revealed that the perceived usefulness of a change is regarded as important for people as they expect that new systems should improve the job performance of a person, which is closely related to work goals and achievement. These values are highly regarded as masculine values. Feminine values promote team work and masculine values promote individual gains, so it is obvious that feminine values are supportive for technology adoption. As there are elements that support the management of change, which requires more cooperation, more team work and caring of each stakeholder, it is important that the feminine factor be taken into consideration for the promotion of technology adoption.

2.15 Power Distance

This makes the acceptance of technology less demanding for an organization and people in general. At the point when there is a low power distance, individuals do not endure the disparity/inequality and they request that their voices be heard. Where there is a high power distance, a hierarchical order exists and individuals are arranged to follow the principles and controls; however, they are not encouraged to give inventive thoughts and

backing to settling on better choices that mirror their unwillingness and non-collaboration for the management of change and innovation.

2.16 Uncertainty Avoidance

This dimension expresses the degree to which a society or people feel comfortable or uncomfortable with ambiguity or uncertainty. A high degree of uncertainty in a society or organization assists in change management as people are more open towards uncertainty and ambiguity [89]. They are generally risk takers and take more risks and experiment with new things. They are, therefore, generally more comfortable with uncertainty and ambiguity. However, those societies within which people desire to be safe and secure or in those countries where the score in uncertainty avoidance is high, people tend to be more conservative and tend less to be risk takers. They eschew change and are generally suspicious of any new change or new technologies. They may not welcome a change in technology easily and in this scenario, bringing the desired change in an organization will be difficult. Their beliefs and attitudes are rigid and they are intolerant of change.

Where strong uncertainty prevails, people experience increased nervous stress and anxiety and there will be the need for predictability through the formal structure and rules in institutions, relationships and organizations. It has been revealed that the social environment is a valuable source of information for the reduction of uncertainty and ambiguity and it determines whether behaviors remain within the rules and regulations and whether they are acceptable or unacceptable. Therefore, subjective norms may reduce the ambiguity and uncertainty through normative and informational influences [90]. The informational influence can reduce uncertainty when friends and other people provide information, so it is imperative for organizations to provide more training and information in order to reduce feelings of uncertainty among employees regarding the acceptance of new technology.

2.17 Individualism and Collectivism

At the point when the individual factor is found to be high in an organization or society, then individuals have a concern for their own accomplishments and they deal with their requirements and their close families. This makes a system that is inexactly weaved and where sympathy toward the individual accomplishments and individual responsibility is favored. This type of organization or society cannot accomplish normal objectives and individual objectives replace hierarchical objectives.

2.18 Chapter Summary

In spite of the extensive effort that has been expended understanding the acceptance behavior of IT/IS by individuals, the overall success in terms of technology adoption and use is not satisfactory. A significant number of grand failures of IS/IT is reported every year. Hence, IS researchers put continual effort into developing a philosophical and methodological model that can correspondingly explain the behavior of users toward adopting and using an IS/IT.

CHAPTER 3

METHODOLOGY

3.1 Design of the Study

In this research, we utilized a quantitative research methodology. A questionnaire was developed according to the Technology Acceptance Model (TAM) and applied to a sample of students, professors and workers in Iraq. While the quantitative analysis strategies were originally developed within the natural sciences to check natural phenomena, in the current time, large samples of participants are simple to handle by quantitative analysis strategies if the study is strictly restricted, and it will need experimental means and structured surveys.

In this research, the Technology Acceptance Model (TAM) was used to create a quantitative questionnaire to be applied to a purposeful sampling of 124 participants while taking into consideration that the educational process is based on three elements, namely student, teacher, and educational institution. Our interest sample focused on groups of Iraqis students, Iraqi professors and Iraqi workers in the education sector from different educational institutions and different age groups. We designed online and paper-based questionnaires that included 25 questions distributed among sections that were based on our research study aims, and by using the Technology Acceptance Model (TAM), as seen in Appendix A, the questions have different form types (such as Likert scale, check box, multiple choice, and drop down list). Moreover, our results have been analytically discussed using the Google graphic analytic tool and Excel sheets.

The Technology Acceptance Model (TAM) is varied from the Theory of Reasoned Action in accordance with two significant aspects. To begin with, the Technology Acceptance Model presented two new aspects: the Perceived Ease of Use (the conviction that one's utilization of an application will be free of exertion), and the Perceived Usefulness (the conviction that the one utilizing an application will enhance his or her performance). Within TAM, both perceived ease of use and perceived usefulness may foresee an individual's mindset regarding the utilization of an application. Secondly, the Technology Acceptance Model did exclude subjective standards as a determinant of expectation. Since its introduction, the Technology Acceptance Model has been generally utilized to foresee the acknowledgment, selection, and utilization of IT. The power of explanation and prediction of TAM needs to be enhanced through the combination of other circumstances or constructs that are technically specific. Therefore, TAM is distinguished amongst the most compelling exploration models in investigations of the determinants of information frameworks and the acceptance of information technology to foresee any expectation by people to utilize and acknowledge information technology and information systems, For example, an update called (TAM2) [91] (Figure 1b), removed the ATU component from the model, which originally mediated some of the influence of PU and PEU. TAM2 also added a variable meant to capture the social influence (e.g., from colleagues or bosses) that compels end users to positively evaluate and accept IT, called subjective norm (SN).

The TAM has become an extensive consideration of researchers in the information framework field over the previous decade. In the Technology Acceptance Model, there are two determinants that include perceived usefulness and perceived ease of use. Perceived usefulness is the extent to which an individual holds a belief that would utilize a specific information framework or that information technology would upgrade his or her employment or life performance.

3.2 TAM and its Components

The Technology Acceptance Model [TAM] investigates factors, such as the perceived usefulness of technology, the ease of use of technology, the quality of information systems, and the degree to which an organization supports the use of information systems

to predict IS usage and performance. The TAM is possibly one of the theoretical models, if not the only one, "owned" by the IS domain. It is considered to be the most influential and most commonly employed model that explains individuals' acceptance behavior of an IS/IT. The TAM has been adapted from the Theory of Reasoned Action (TRA), a popular theory in social psychology. Many studies have found that TAM has a better explanatory power than TRA. The outcome variable of TAM is the Behavioral Intention (BI). BI is dependent on Perceived Usefulness (PU) and Perceived Ease of Use (PEU). Furthermore, PEU influences PU and the actual use of a technology is the final outcome of users' intentions for the same. Such relationships are supported by large empirical studies. The TAM covers the two most fundamental constructs used in the IS domain: PU (the extent to which a person believes an IT/IS or a technological innovation will enhance his or her (job) performance) and PEU (the degree to which a person believes that using a technology will be free from effort). However, an increasing number of TAM studies have found that PU has a greater influence on BI than PEU, while PEU has a stronger effect through PU than as a direct effect on BI [92]. However, IS scholars suggest employing caution with the results of cross-sectional studies (data obtained from a single point of time) since the perceptions, and hence the effect of the constructs, may change over time. For instance, during the pre-implementation stage, only PU is important for Intention to Use; whereas both PU and PEU are important during the post-implementation stage while PEU has an indirect effect through PU to Intention to Use. Interestingly, a number of empirical studies argued that TAM correlations possess better predictability when the relations are moderated by some other factors, including prior experience with technology.

3.3 Criticisms, adaptation and extensions of TAM

In order to fit into a specific technology setting, TAM has been modified and/or extended. One of the most significant criticisms of TAM is the lack of actionable guidelines to practitioners, especially because of not identifying the determinants of PU and PEU. Managers understand that a system is likely to be accepted when it is useful and easy to use; however, what makes the system useful and free from effort are even more important. Hence, many studies, including the TAM3, included the external factors as the antecedents

of PU (e.g. output quality, result demonstrability) and PEU (e.g. self-efficacy, playfulness). As a result, TAM is highly criticized for considering only the external factors (PU, PEU) and ignoring the individual characteristics of the user. It also excluded the notion that an IS/IT can be used outside an organizational setting, i.e., by a social individual who can be influenced by the behavior of other people around the individual. Therefore, researchers incorporated constructs from other relevant theories in order to increase TAM's predictive power, such as TAM2 including the element of social influence (subjective norm, image, and voluntariness) along with cognitive instruments (job relevance, output quality, and result demonstrability), while TAM3 included individual characteristics along with the external variables [93].

It is interesting here that TAM initially has excluded Subjective Norms (SN), which is considered to be one of the least understood aspects of TRA. However, TAM2 and TAM3 have included SN, which again makes researchers reluctant to raise confusion using this construct appropriately within the notion of TAM. TAM has experienced another major modification by incorporating contextual factors, such as gender, user type, trust, voluntariness, and expectation, as the control or moderating variables to produce different implications on contextual applications.

3.4 TAM in Culture and Volitional Contexts

TAM has been tested across technologies, persons, settings, and times and has been found to be a robust model with a satisfactory predictive validity across those settings. However, it is not universal in terms of 'culture'; generally speaking, TAM is more consistent in North America and Europe. In contrast, there are a number of reservations in Asia [94]. Similarly, TAM is more applicable in volitional contexts of an IS/IT but loses most of its explanatory power explaining mandatory adoption; therefore, it may produce "misleading guidance to an organization." Nevertheless, TAM2 has been tested in volitional and mandatory contexts and it has been found that TAM fares well in both contexts although other researchers believe that the use of the voluntariness construct (which is captured with only 'necessity') does not necessarily capture the difference of the volitional

contexts. Nevertheless, the applicability of TAM or its modified version is not obvious in both settings [95].

3.5 Subjects of the Study

A questionnaire based on TAM is applied to 100-150 samples from different functional positions and age groups, including students, teachers and education administrators. Our interest sample focused on groups of Iraqis students, Iraqi professors and Iraqi workers in the education sector from different educational institutions and different age groups. We designed online and paper-based questionnaires that included 25 questions distributed among sections that were based on our research study aims and used the Technology Acceptance Model (TAM), which can be seen in Appendix A. The questions have different form types, such as Likert scale, check box, multiple choices, and drop down list. Moreover, our results were analytically discussed using the Google graphic analytic tool and Microsoft Excel.

3.6 Data Collection Instruments

The study adopted a quantitative research approach to evaluate the research problem and it collected data using an online survey questionnaire from (124) respondents, (77) respondents that had been sent using e-mail, social media, direct interventions and a hard copy had also been sent to (47) respondents to our interest group (different functional positions and age groups such as students, teachers, and education administrators) from different Iraqi universities. The questionnaire was based on the TAM framework and included questions related to the demographics of the respondents and obstacles to activating e-learning. The reliability of the questionnaire was tested and a high degree of internal consistency was found. We also calculated the reliability coefficient, which is defined as the ratio of the true score variance to the total variance of test scores. It is important to examine the internal consistency or stability of the multiple items, which are based on the TAM analysis in this study. In Chapter 4, the internal consistency is tested using Cronbach's alpha (α), which measures variance proportion (ranging from 0 to 1)

consistent in test scores. As seen in Table 4.6, for the three constructs, the Cronbach's alpha value PEU is equal 0.829, PU is equal 0.918, and ATU is equal 0.727, which are acceptable thresholds. The (α) value of BIU is equal 0.528, which can be considered acceptable but weak. This suggests that the test items generate similar results that probe the same construct (due to a high degree of internal consistency). More detailed information is found in Chapter 4.

3.7 Procedures of the Study

Data were collected using an online survey questionnaire that had been sent using e-mail, social media and direct interventions to our interest group. A hard copy of the same questionnaire had also been sent to a number of interest groups. The results were analytically discussed using the Google graphic analytic tool and Microsoft Excel.

CHAPTER 4

RESULTS AND ANALYSIS

4.1 Introduction

In this chapter of the study, the research problem is analyzed using different statistical methods and techniques. The study aims to determine the factors affecting the implementation of e-learning at Iraqi universities based on the Technology Acceptance Model (TAM). Moreover, the study also evaluates the external variables that are related to the different obstacles or barriers to implementing e-learning initiatives at Iraqi universities.

In the following sections, data collected from 124 respondents (professors, instructors, employees and students) from different Iraqi universities are analyzed. The study uses descriptive statistics to evaluate the demographics, obstacles and influential factors affecting the implementation of e-learning. A reliability test is applied in order to measure the internal consistency of the test items, and a correlation and regression analysis is applied in order to discover the relationships between the given constructs.

4.2 Demographic Analysis

The demographic analysis is a method whereby we explore different variables related to the research participants, including age, gender, income, education, occupation, etc., in order to provide us with an understanding of the population under study [99] In this study, gender, age group, academic rank, experience in higher education and experience in the Learning Management System (LMS) are the variables used in the demographic analysis.

Table 8: Participants' gender distribution

	Gender	Frequency	Percent
Valid	Male	75	60.5
	Female	49	39.5
	Total	124	100.0

Table 8 shows statistics of the respondents' gender. According to the table, of the total of 124 participants, 75 were male and 49 females. Thus, the majority of the respondents who participated in the study were male. The percentage gender distribution is illustrated in the following figure:

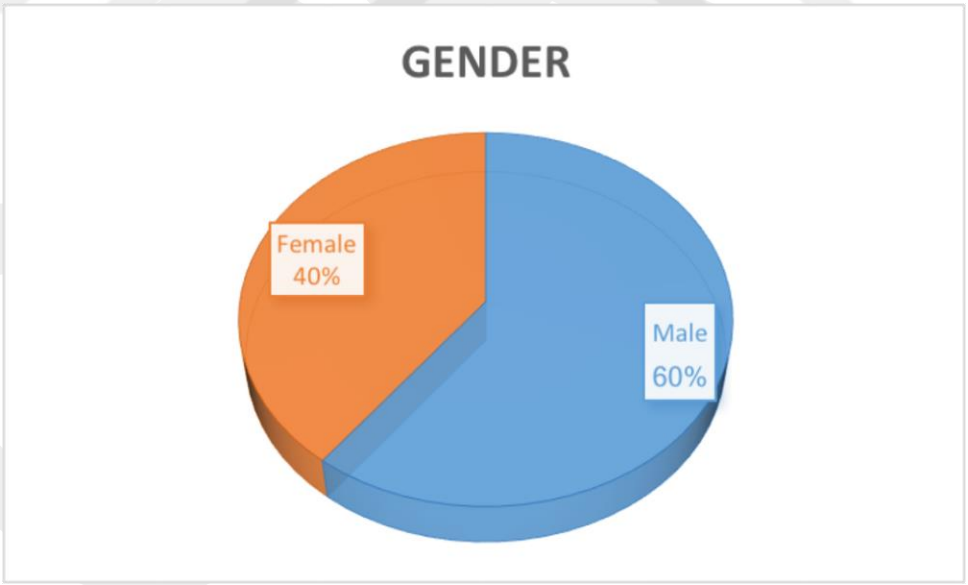

Figure 6: Gender Distribution

The frequency and percentage distribution of the age group of the participants can be seen in Table 9:

Table 9: Age Group

		Frequency	Percent
Valid	Under 18	11	8.9
	18-25	67	54.0
	25-45	23	18.5
	Over 45	23	18.5
	Total	124	100.0

According to the table, the majority of the respondents fall within the 18-25 age group, 54% of the total number of participants. It shows that most of the respondents in the study are relatively young. The age groups 25-45 and Over 45 were each 18.5% of the respondents. The respondents under 18 years of age were only 8.9%.

Table 10: Academic Rank/Occupation

		Frequency	Percent
Valid	Professor	11	8.9
	Associate Professor	13	10.5
	Assistant Professor	24	19.4
	Instructor	12	9.7
	Administrative Employee	2	1.6
	Employee	12	9.7
	Student	49	39.5
	Other	1	.8
	Total	124	100.0

According to Table 10 the majority of the respondents who participated in the study are students at different Iraqi universities, which is 39.5% of the total number of respondents. The assistant professors and associate professors were 19.4% and 10.5% respectively. The frequency distribution of all the respondents is illustrated in the figure below:

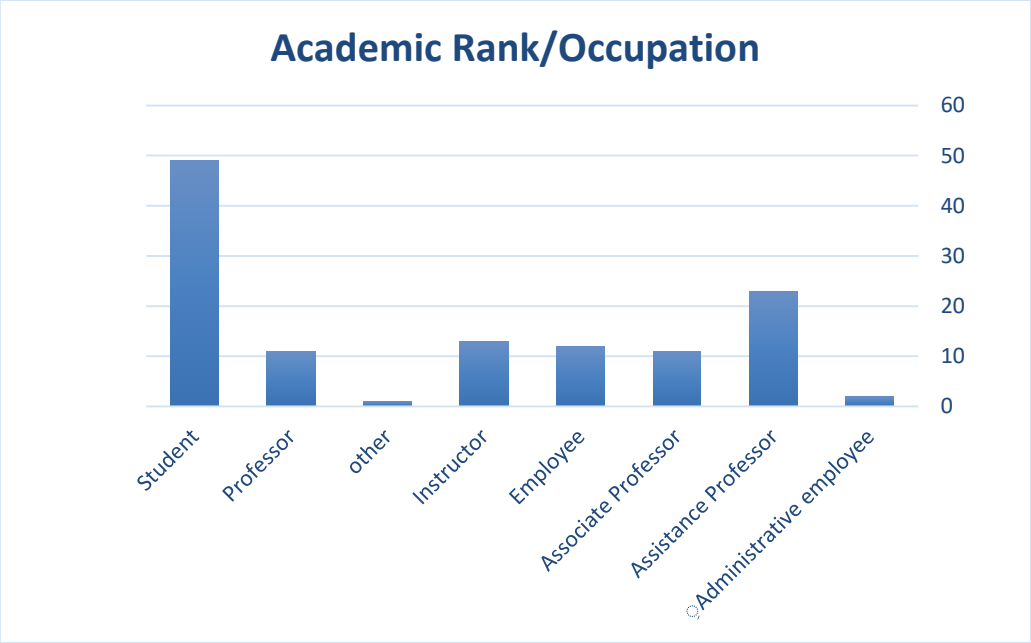

Figure 7: Academic Rank/Occupation

Figure 7 shows a bar chart for the different academic ranks/occupations who participated in the study. It shows that students were the most populous group; while administrative employees were the least populous group.

Table 11: Experience in Higher Education

		Frequency	Percent
Valid	Under 1 year	12	9.7
	1-3 years	12	9.7
	4-5 years	24	19.4
	6-10 years	27	21.8
	Over 10 years	12	9.7
	No Experience in Higher Education	37	29.8
	Total	124	100.0

Table 11 presents the statistics related to the experience of the respondents in higher education. It shows that the majority of the participants (29.8%) have no prior experience in higher education. 21.8% have 6 to 10 years, while 19.4% have 4 to 5 years of experience in higher education.

Table 12: Experience in LMS

		Frequency	Percent
Valid	No Experience	76	61.3
	Under 1 year	29	23.4
	1-3 years	8	6.5
	4-5 years	10	8.1
	Over 5 years	1	.8
	Total	124	100.0

The Learning Management System (LMS) is a computer-based application which is used to document, track, administer and report electronic education and learning. According to

the table, most of the respondents have had no experience in LMS. The percentage distribution of experience in LMS of all respondents is shown in the following Figure 8:

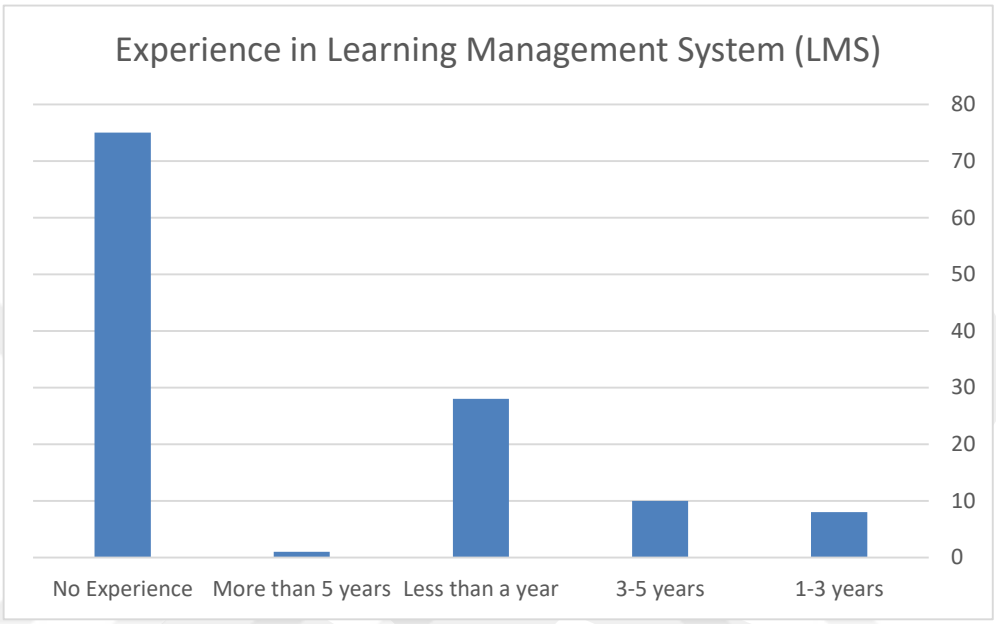

Figure 8: Experiences in LMS

According to Figure 8 the majority of the research population have no prior experience in the Learning Management System. It shows that there is a need to promote and implement e-learning mechanisms and the LMS at Iraqi universities in order to enhance e-learning adoption and the rate of use.

4.3 Reliability Test

Before conducting further statistical analyses, it is important to examine the internal consistency or stability of the multiple items, which are based on the TAM analysis in this study. In this section, internal consistency is tested using Cronbach's alpha (α), which measures the proportion of variance (ranging from 0 to 1) that is consistent in the test scores.

Table 13: Reliability Test

Reliability Statistics		
Construct	**Cronbach's Alpha**	**N of Items**
Perceived Ease of Use (PEU)	.829	6
Perceived Usefulness (PU)	.918	5
Attitude toward Usage (ATU)	.727	3
Behavioral Intention to Use (BIU)	.528	2

As per Table 13 Cronbach's alpha value for three constructs, PEU, PU, and ATU, are above the acceptable threshold. The α value of BIU is equal 0.528, which can be considered acceptable but weak, and is perhaps due to a lower number of questions [96]. It suggests that the test items generate similar results that probe the same construct (due to the high degree of internal consistency). The following table shows the values of item-total statistics, which include mean, variance and Cronbach's alpha if an item is removed or deleted.

Table 14: Item total statistics

Item-Total Statistics				
Items	**Scale Mean if Item Deleted**	**Scale Variance if Item Deleted**	**Corrected Item-Total Correlation**	**Cronbach's Alpha if Item Deleted**
PEU1	20.9677	4.308	.787	.771
PEU2	21.0403	4.218	.708	.780
PEU3	21.0645	3.963	.785	.761
PEU4	21.1210	4.871	.631	.806
PEU5	21.0726	3.775	.726	.773
PEU6	21.1855	4.982	.200	.898
PU1	14.3387	14.665	.929	.868
PU2	14.2177	15.570	.857	.885
PU3	14.1855	17.567	.742	.909
PU4	14.0323	16.649	.804	.896
PU5	13.9677	18.194	.622	.931
ATU1	8.1613	1.551	.785	.340
ATU2	8.3226	1.554	.582	.606
ATU3	8.3548	2.393	.336	.855
BIU1	4.0323	.910	.359	
BIU2	3.8790	1.018	.359	

According to the Table 14 if PEU6, PU5, and ATU3 are deleted, the values of Cronbach's alpha of the respective constructs will improve. The study considers keeping the three items as the constructs are already above the acceptable value.

4.4 Descriptive Statistics

This section presents descriptive statistics of the multiple items of each construct involved in the TAM analysis. The variables include Perceived Ease of Use (PEU), Perceived Usefulness (PU), Attitude toward Usage (ATU), and Behavioral Intention to Use (BIU). In this section, median and mode statistics are used to analyze the items based on the nature of the measurement of the items (ordinal variables).

4.4.1 Perceived Ease of Use (PEU)

Table 15: Perceived Ease of Use

		Frequency	**Percent**
Valid	Agree	84	67.7
	Strongly Agree	40	32.3
	Total	124	100.0
		Frequency	**Percent**
Valid	Neutral	6	4.8
	Agree	81	65.3
	Strongly Agree	37	29.8
	Total	124	100.0
		Frequency	**Percent**
Valid	Neutral	9	7.3
	Agree	78	62.9
	Strongly Agree	37	29.8
	Total	124	100.0

		Frequency	Percent
Valid	Disagree	2	1.6
	Neutral	10	8.1
	Agree	71	57.3
	Strongly Agree	41	33.1
	Total	124	100.0

		Frequency	Percent
Valid	Strongly Disagree	1	.8
	Disagree	4	3.2
	Neutral	5	4.0
	Agree	85	68.5
	Strongly Agree	29	23.4
	Total	124	100.0

		Frequency	Percent
Valid	Agree	103	83.1
	Strongly Agree	21	16.9
	Total	124	100.0

Table 15 presents a descriptive analysis in terms of frequency and percentage distributions. According to the above table, the majority of respondents strongly agree that the usage and interaction with LMS would be easy, clear and understandable. Moreover, the respondents perceived that it is easy for them to collaborate with and become proficient in using LMS.

Figure 9: Perceived Ease of Use

The Figure 9 shows that a majority (57%) agrees and that 33% strongly agree with the statement that the experience need to cope with LMS would be easy to learn.

Table 16: Perceived Ease of Use (Statistics)

Statistics							
		I have impression that using an LMS would be obvious and easy for me	**I have impression that my interaction with LMS would be clear and understandable**	**I have impression that it would be easy to become a proficient to using LMS**	**I have impression that LMS will be flexible to collaborate with**	**The experience need to deal with LMS would be easy to learn**	**It would be clear for me to get LMS to do what I want do**
N	Valid	124	124	124	124	124	124
	Missing	0	0	0	0	0	0
Median		4.00	4.00	4.00	4.00	4.00	4.00
Mode		4.00	4.00	4.00	4.00	4.00	4.00

The table shows statistics, in terms of median and mode, of the six items of PEU. The table also reveals consistent results for each of the six items, as both mode and median values are equal to 4, i.e., 'agree' for the six items. This means that the majority of the respondents perceives that they would be able to use LMS for e-learning easily.

4.4.2 Perceived Usefulness (PU)

Table 17: Perceived Usefulness

		Frequency	Percent
Valid	Strongly Disagree	10	8.1
	Disagree	26	21.0
	Neutral	28	22.6
	Agree	31	25.0
	Strongly Agree	29	23.4
	Total	124	100.0
		Frequency	**Percent**
Valid	Strongly Disagree	10	8.1
	Disagree	17	13.7
	Neutral	31	25.0
	Agree	37	29.8
	Strongly Agree	29	23.4
	Total	124	100.0
		Frequency	**Percent**
Valid	Strongly Disagree	4	3.2
	Disagree	19	15.3
	Neutral	35	28.2
	Agree	43	34.7
	Strongly Agree	23	18.5
	Total	124	100.0

		Frequency	Percent
Valid	Strongly Disagree	3	2.4
	Disagree	18	14.5
	Neutral	35	28.2
	Agree	31	25.0
	Strongly Agree	37	29.8
	Total	124	100.0

		Frequency	Percent
Valid	Strongly Disagree	4	3.2
	Disagree	14	11.3
	Neutral	32	25.8
	Agree	37	29.8
	Strongly Agree	37	29.8
	Total	124	100.0

Table 17 presents a descriptive analysis in terms of frequency and percentage distribution for PU. According to the table, relatively mixed responses are received for the usefulness of the LMS in the respondents' careers. However, still, 31% agree and 29% strongly agree that the LMS would allow them to fulfil tasks more quickly in their career. The majority also agree that the LMS helps in advancing career performance. A high proportion, namely 25% and 35%, are uncertain about the perceived usefulness of the LMS in their career progression and effectiveness respectively.

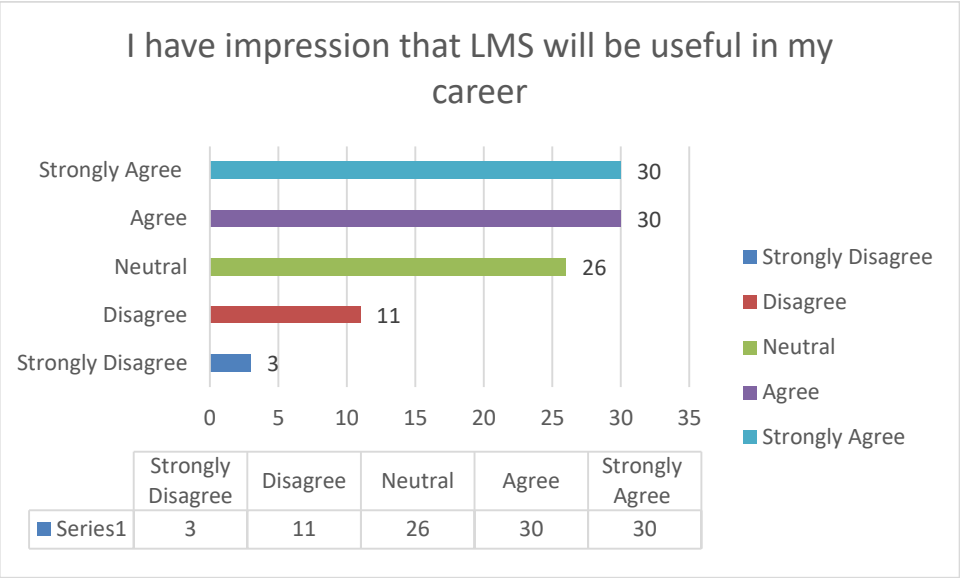

Figure 10: Perceived Usefulness

According to the Figure 10 a majority of the respondents from Iraqi universities perceives that the implementation and use of LMS will be useful in their careers.

Table 18: Perceived Usefulness (Statistics)

Statistics						
		Using LMS in my career would allow me to fulfil tasks more quickly	**Using LMS would advance my career performance**	**Using LMS in my career would development my productivity**	**Using LMS would exaggerate my effectiveness on my career**	**I have impression that LMS will be useful in my career**
N	Valid	124	124	124	124	124
	Missing	0	0	0	0	0
Median		3.00	4.00	4.00	4.00	4.00
Mode		4.00	4.00	4.00	5.00	4.00[a]
a. Multiple modes exist. The smallest value is shown						

The table above shows statistics for the five items of PU in terms of median and mode. According to the table, the median (which indicates the middle value) of each item is equal to 4, i.e., 'agree,' except for the first item. Similarly, the mode (most repeated value) is equal to 4 (agree) for each item, except for the fourth item where the mode is equal to 5 (strongly agree). The statistics show that a majority of participants perceives that the use of LMS is useful for their career progression and advancement.

4.4.3 Attitude towards Usage (ATU)

Table 19: Attitude towards Usage

		Frequency	Percent
Valid	Disagree	8	6.5
	Agree	68	54.8
	Strongly Agree	48	38.7
	Total	124	100.0
		Frequency	**Percent**
Valid	Disagree	8	6.5
	Neutral	19	15.3
	Agree	50	40.3
	Strongly Agree	47	37.9
	Total	124	100.0
		Frequency	**Percent**
Valid	Disagree	4	3.2
	Neutral	15	12.1
	Agree	74	59.7
	Strongly Agree	31	25.0
	Total	124	100.0

According to Table 19 the attitudes and perceptions of participants from universities in Iraq regarding the use of the LMS is positive, as a majority of the respondents agrees with the good and positive perception of using the LMS.

Table 20: Attitude Towards Usage (Statistics)

Statistics				
		I presuppose it is a good perception to use LMS	**I like the perception of using a LMS**	**Using a LMS is a positive perception**
N	**Valid**	124	124	124
	Missing	0	0	0
Median		4.00	4.00	4.00
Mode		4.00	4.00	4.00

The table shows similar results as the median and mode values for each of the three items of the ATU are equal to (4). This means that the respondents largely 'agree' that the perception of using the LMS is positive for them.

4.4.4 Behavioral Intention to Use (BIU)

Table 21: Behavioral Intention to Use

		Frequency	Percent
Valid	Disagree	15	12.1
	Neutral	26	21.0
	Agree	42	33.9
	Strongly Agree	41	33.1
	Total	124	100.0
		Frequency	**Percent**
Valid	Disagree	9	7.3
	Neutral	27	21.8
	Agree	39	31.5
	Strongly Agree	49	39.5
	Total	124	100.0

In the case of BIU, the results are similar to that of ATU, as the majority of respondents intended to use LMS in the future and be positive in dealing with it. It shows the relatively high levels of intention of the respondents to use LMS.

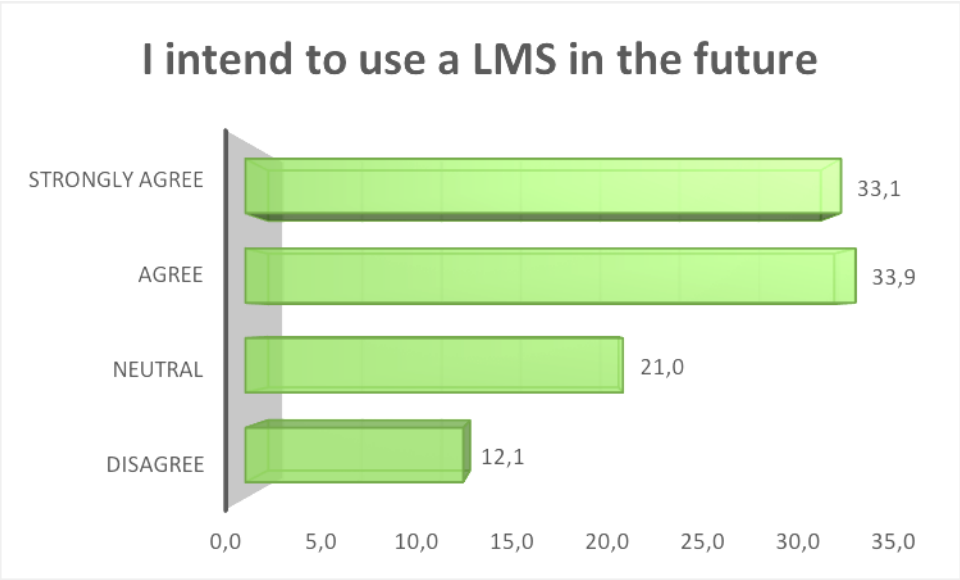

Figure 11: Behavioral Intention to Use

According to the above Figure, 33.1% strongly agree and 33.9% agree that they intend to use the LMS in the future. However, there are also 12.1% of people who are probably not interested in using the e-learning system.

Table 22: Behavioral Intention to Use (Statistics)

Statistics			
		I intend to use an LMS in the future	**I Intend to be positive in dealing with LMS**
N	**Valid**	124	124
	Missing	0	0
Median		4.00	4.00
Mode		4.00	5.00

The table presents the statistics, in the form of median and mode, for the two items of BIU. According to the table, the median and mode of both items suggest that the majority intends to use and be positive about dealing with LMS.

4.5 Factor Analysis

In this section, the factor analysis is conducted, using the Principal Component Analysis (PCA) method, to summarize and reduce the number of items related to each construct. It is a technique that reduces a large number of variables and items into smaller components [97]. The total number of original items is equal to 16 (PEU = 6, PU = 5, ATU = 3 and BTU = 2) and they are measured using a five-point Likert scale. However, one item each from PEU and ATU is removed due to no correlation with other items and cross loading respectively. It is assumed in this study that ordinal variables can be used in the factor analysis process.

Before running the PCA, the study measures its appropriateness and sampling adequacy using Bartlett's Test of Sphericity (BTS) and Kaiser-Meyer-Olkin (KMO) respectively.

Table 23: KMO and Bartlett's Test

KMO and Bartlett's Test		
KMO Measure of Sampling Adequacy.		.668
BTS	Approx. Chi-Square	1425.762
	df	91
	Sig.	.000

According to the above table, the sig. value of BTS is less than the 0.05 level (assumed threshold) showing that correlations exist in the data and it is appropriate to run the PCA. Moreover, the KMO is equal to 0.688, which shows that the sample of the study is adequate for running the PCA as the minimum acceptable value for the KMO, considered to be equal to 0.5 [98].

The PCA also computes commonalities, which shows how much variance in the each of the original items is explained by the extracted factors. According to Table A-1 (see Appendix), a relatively high amount of variance is explained in PEU1, PEU2 and PU1. The lowest amount of variance is explained in PU4, which equals 0.597.

The total explained variance by the extracted factors is also computed. According to Table A-2 (see Appendix), a total of four factors are extracted with a cumulative variance of 77.89%.

Table 24: Rotated Matrix

Rotated Component Matrix

Items/Variables	Component			
	1	2	3	4
Using LMS in my career would allow me to fulfill tasks more quickly (PEU1)	.938			
Using LMS would advance my career performance (PEU2)	.888			
Using LMS in my career would develop my productivity (PEU3)	.796			
Using LMS would exaggerate my effectiveness on my career (PEU4)	.896			
I have impression that LMS will be useful in my career (PEU5)	.771			
I have an impression that using an LMS would be obvious and easy for me (PU1)		.926		
I have an impression that my interaction with LMS would be clear and understandable (PU2)		.855		
I have an impression that it would be easy to become a proficient to using LMS (PU3)		.899		
I have an impression that LMS will be flexible to collaborate with (PU4)		.755		
The experience need to deal with LMS would be easy to learn (PU5)		.801		
I presuppose it is a good perception to use LMS (ATU1)			.901	
I like the perception of using an LMS (ATU2)			.919	
I intend to use an LMS in the future (BIU1)				.826
I Intend to be positive in dealing with LMS (BIU2)				.795

Extraction Method: PCA

Rotation Method: Varimax

The table of the rotated component matrix, which is regarded as the key output of the PCA, shows how the four factors are extracted. It shows the factor loadings of each item, which reflects the correlation between the items and the factors. As indicated earlier, two items (PEU6 and ATU3) are eliminated from the analysis. Now, every item has a strong correlation with their respective components and factors. Therefore, the four extracted factors are: Perceived Ease of Use (PEU), Perceived Usefulness (PU), Attitude toward Usage (ATU), and Behavioral Intention to Use (BIU), which will be used in the correlation and regression analysis to evaluate the TAM hypothesis.

4.6 Correlation Analysis

The components are computed by averaging the related items, as shown in the PCA. In this section, the relationship between the four factors/variables is explored using the Pearson correlation test.

Table 25: Correlations

Correlations					
		Perceived Ease of Use	**Perceived Usefulness**	**Attitude Toward Usage**	**Behavioural Intention to Use**
Perceived Ease of Use (PEU)	Pearson Correlation	1	-.059	.167	.128
	Sig. (2-tailed)		.514	.064	.158
	N	124	124	124	124
Perceived Usefulness (PU)	Pearson Correlation	-.059	1	.153	.319**
	Sig. (2-tailed)	.514		.090	.000
	N	124	124	124	124
Attitude Toward Usage (ATU)	Pearson Correlation	.167	.153	1	.054
	Sig. (2-tailed)	.064	.090		.553
	N	124	124	124	124
Behavioural Intention to Use (BIU)	Pearson Correlation	.128	.319**	.054	1
	Sig. (2-tailed)	.158	.000	.553	
	N	124	124	124	124
****. Correlation is significant at the 0.01 level (2-tailed).**					

Table 25 reveals that the relationship between PU and BIU is statistically significant at a level of 0.01 in the case of Iraqi university users and potential users. It suggests that perceived usefulness of the LMS may positively influence the behavioral intention of users at Iraqi universities. However, the strength of the correlation is moderate. There are no other significant correlations between the given variables.

4.7 Regression Analysis

Regression Analysis is a technique which evaluates the impact of one or more independent variables on a dependent variable. Using this technique, the study analyses the Technology Acceptance Model (TAM), which suggests that Perceived Ease-of-Use (PEU), Perceived Usefulness and some other factors related to a technology influence the decision of users to adopt and use it.

In this study, the impact of PEU and PU is investigated on Attitude Toward Usage (ATU) and Behavioral Intention to Use (BIU) of the e-learning users or potential users from Iraqi universities.

Table 26: Testing Significance

	Attitude towards Use (ATU)				**Behavioral Intention to Use (BIU)**		
Model	**B**	**t**	**Sig.**		**B**	**t**	**Sig.**
(Constant)	2.806	4.737	0.000**		1.651	2.131	0.035**
Perceived Ease of Use	.255	1.993	0.048*		.289	1.722	0.087*
Perceived Usefulness	.105	1.845	0.067*		.285	3.840	0.000**

* Significant at 0.1 level

** Significant at 0.05 level

Table 26 tests the TAM hypothesis and finds that the impact of PEU and PU is statistically significant when predicting and explaining both ATU and BIU. The coefficient (beta) values of both influential factors, PEU and PU, in both models are positive. It shows that the impact of Perceived Ease of Use and Perceived Usefulness is significantly positive in

affecting the attitude and behavioral intention of Iraqi universities' users towards LMS/e-learning, which is consistent with the TAM theory. In other words, the two factors (PEU and PU) play a significant role in the acceptance of the new technology, i.e., LMS at Iraqi universities. These factors can help universities to reduce or eliminate obstacles which hinder activation/implementation of e-learning.

4.8 External Variables

Institutional Issues	**Frequency**
Organizational change and Readiness Assessment	70
Financial Aid	75
Instructional Quality	62
Faculty and Staff support	41
Learning Skills Development	78
Total Responses	339
Management Issues	
Project Manager's Skills	55
Managing content development process	60
Managing E-learning environment	116
Updating and Monitoring of Security Measures	75
Total Responses	306
Technological Issues	
Infrastructure	95
Planning	78
Hardware	88
Software	94
Total Responses	355
Pedagogical Issues	
Content Analysis	56
Goal analysis	77
Medium analysis	69
Strategies	80
Total Responses	282
Resource Support Issues	
Instructional and Counseling Support	98
Technical Support	95
Online and Offline Resources	105
Total Responses	298

The final section of this chapter presents the results of every external variable that may affect the implementation of the LMS at Iraqi universities. The items within each variable show what needs to be improved before starting the use of the (LMS). According to the table, most of the respondents consider improvement in the Learning Skills Development within the institutional issues, managing e-learning environment within management issues, developing infrastructure and software within technological issues, improving strategies within pedagogical issues, and enhancing online and offline resources to resolve resource support issues.

CHAPTER 5

CONCLUSION AND FUTURE WORK

5.1 CONCLUSION

Information and communication technologies (ICT) are considered to be some of the most important tools in different sectors, including the education sector. In recent years, the reliance on the Learning Management System (LMS) has significantly increased among educational institutes and universities around the world. Educational institutes in various countries have benefitted from ICT and the LMS, while many are still in the process of growth and development. The current research study focused on the obstacles to activate the LMS and e-learning platform at Iraqi universities. It also analyzed the implementation of e-learning at Iraqi Universities based on the Technology Acceptance Model (TAM).

The study adopted a quantitative research approach to evaluate the research problem, and it collected data by using a survey questionnaire from 124 respondents (professors, instructors, employees and students) from different Iraqi universities. The questionnaire was based on the TAM framework and included questions related to the demographics of the respondents and obstacles to activating e-learning. Using factor analysis, it extracted four factors (PEU, PU, ATU, and BIU) which were used in the correlation and regression analysis. The reliability of the questionnaire was tested and a high degree of internal consistency was found.

In this study, we first investigated the perceptions of Iraqi university students and faculties about e-learning according to Technology Acceptance Model. The results of the study shows high degree of acceptance about e-learning (LMS) by students and faculties from

the Iraqi universities. According to the table (16), the majority of the participants perceive that they would be able to use LMS for e-learning easily, and the table (18) shows the majority of participants perceive that the use of LMS is useful for their career progression and advancement, and the table (20) shows the majority of participants are perception of using the LMS is positive for them, and the table (22) shows the majority of participants intend to use and be positive about dealing with LMS.

Furthermore, as per the results of the regression test in the table (26), the impact of PEU and PU is statistically significant at predicting/explaining both ATU and BIU. The results revealed that the impact of the Perceived Ease of Use and Perceived Usefulness is significantly positive in affecting the attitude and behavioral intention of the users at Iraqi universities' towards LMS/e-learning, which is consistent with the TAM theory. It shows that two factors play a significant role in the acceptance of the new technology, i.e., LMS at Iraqi universities and it can help to reduce the obstacles to e-learning implementation.

In this study, we also investigated the possible obstacles when activating the e-learning at Iraqi universities. In the light of the outcomes from this study, there might be some challenges related with the implementation of LMS at Iraqi universities. The study also found that most respondents from the universities considered the "development of learning skills" is the significant factor within the category of Institutional Issues, the "management of e-learning environment" is the most significant factor within the category of management issues, the "infrastructure" is the significant factor within the category of Technological Issues, the "Strategies" is the significant factor within the category of Pedagogical Issues, and the "Online and Offline Resources" is the significant factor within the category of Resource Support Issues .

5.2 FUTURE WORK

As discussed in the previous chapters, information technology is viewed as an essential component in the modern world to achieve a competitive advantage. Educational institutions in the Middle East are making serious efforts to accept, adopt and use technology-based learning models. This study has evaluated the case of Iraq and suggests recommendations based on its findings. The positive impact of the perceived ease of use of LMS on attitude and behavioral intentions of Iraqi universities' users towards LMS/e-learning suggests that, in the adoption or implementation and design of LMS, a university must consider the factor of ease of use. A university can employ LMS, which is easier for users to understand and use. Moreover, the system should effectively guide users, such as through a tutorial, with regard to its components and use. It may adopt a common user interface, and adhere to technology standards for portability and accessibility.

Similarly, it is important to enhance the usefulness, effectiveness and proficiency of the system (LMS) in order to affect the attitude and behavioral intention to use it. The usefulness of the system can be improved by adding all useful, important and informational content into the system. The LMS may also include videoconferencing, threaded discussions, emails and online forums in order to enhance the Perceived Usefulness. Moreover, the functions of administration, course documentation and evaluation could be added.

The study recommends addressing all indicated obstacles and issues hindering the implementation of the LMS system at Iraqi universities. Future studies on the subject, in the context of Iraq, should cover a greater sample size and increase the representation of the universities. For a deeper understanding of the problem, future studies may adopt a qualitative approach. It is also recommended to account for the design and components of the LMS.

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Appendixes

Table A-1

The questions form		
	Initial	Extraction
Using LMS in my career would allow me to fulfill tasks more quickly	1.000	.934
Using LMS would advance my career performance	1.000	.873
Using LMS in my career would development my productivity	1.000	.710
Using LMS would exaggerate my effectiveness on my career	1.000	.822
I have impression that LMS will be useful in my career	1.000	.633
I have impression that using an LMS would be obvious and easy for me	1.000	.860
I have impression that my interaction with LMS would be clear and understandable	1.000	.753
I have impression that it would be easy to become a proficient to using LMS	1.000	.824
I have impression that LMS will be flexible to collaborate with	1.000	.597
The experience need to deal with LMS would be easy to learn	1.000	.666
I presuppose it is a good perception to use LMS	1.000	.838
I like the perception of using a LMS	1.000	.856
I intend to use a LMS in the future	1.000	.787
I Intend to be positive in dealing with LMS	1.000	.753
Extraction Method: PCA		

Table A-2

Total Variance Explained						
Comp.	Initial Eigenvalues			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4.214	30.102	30.102	3.857	27.551	27.551
2	3.634	25.956	56.058	3.737	26.692	54.243
3	1.789	12.778	68.836	1.925	13.750	67.993
4	1.268	9.054	77.890	1.386	9.897	77.890
5	.739	5.281	83.172			
6	.588	4.199	87.370			
7	.550	3.928	91.299			
8	.393	2.808	94.107			
9	.226	1.616	95.722			
10	.203	1.449	97.171			
11	.160	1.145	98.316			
12	.140	1.003	99.319			
13	.074	.526	99.845			
14	.022	.155	100.000			
Extraction Method: PCA						

CURRICULUM VITAE

PERSONAL INFORMATION

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EDUCATION

Degree	Institution	Year of Graduation
M.Sc.	Çankaya University, Mathematics and Computer Science Dept. / Information Technology program, Ankara, Turkey.	2016
B.Sc.	College of Computer / Computer Science Dept. University of Anbar, Anbar, Iraq.	2008
High School	Alramadi secondary school, Anbar, Iraq.	2004

LANGUAGES

Language	Speaking	Reading	Writing
Arabic	Native	Native	Native
English	V.Good	V.Good	V.Good
Turkish	fair	Work on the development	Work on the development

HOBBIES

Travel, Books, Swimming