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MODELING E-LEARNING READINESS AMONG INSTRUCTORS IN IRAQI PUBLIC UNIVERSITIES

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UNIVERSITI SAINS MALAYSIA
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MODELING E-LEARNING READINESS AMONG INSTRUCTORS IN IRAQI PUBLIC UNIVERSITIES

By

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Thesis submitted in fulfillment of the requirements for the degree of

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LIST OF ABBREVIATIONS

IPUs	Iraqi Public Universities
SEM	Structural Equation Modeling
CFA	Confirmatory Factor Analysis
EFA	Explanatory Factor Analysis
TLI	Tucker-Lewis Index
CFI	Comparative Fit Index
NFI	Normed Fit Index
MVA	Missing Value Analysis
ICT	Information Communication Technology
CAI	Computer-Assisted Instruction
WBI	Web Based Instruction
KMO	Kaiser-Meyer-Olkin
USM	University Science Malaysia
AVE	Average Variance Extracted
CITM	Center Instructional Technology and Multimedia
RMSEA	Root Mean Square Error of Approximation
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNESCWA	United Nations Economic and Social Commission for Western Asia

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PEMODELAN KESEDIAAN E-PEMBELAJARAN DALAM KALANGAN PENSYARAH UNIVERSITI AWAM DI IRAQ

ABSTRAK

E-pembelajaran telah digunakan oleh banyak institusi pengajian tinggi seluruh dunia. Namun, adakah pensyarah di universiti bersedia untuk menggunakan e-pembelajaran dalam aktiviti-aktiviti pengajaran mereka? Apakah faktor-faktor yang mempengaruhi kesediaan e-pembelajaran mereka? Kajian ini berhasrat menjalankan pemodelan kesediaan e-pembelajaran dalam kalangan pensyarah di empat buah universiti awam terkemuka di Iraq. Berdasarkan sorotan literatur, sembilan faktor telah dikenalpasti boleh mempengaruhi kesediaan e-pembelajaran, iaitu iklim organisasi (kesediaan persekitaran dan kewangan), budaya (sosial dan komuniti), peralatan (peralatan/infrastruktur, kemahiran teknologi dan sumber manusia), kesediaan subjek/individu untuk berubah (sikap dan gaya pembelajaran atas talian) serta penglibatan. Oleh itu, matlamat utama kajian ini adalah untuk menyiasat kesan faktor-faktor berkenaan terhadap satu sama lain serta kesediaannya secara kolektif: (i) kesan langsung iklim organisasi terhadap budaya, peralatan, dan subjek/individu (ii) kesan tidak langsung iklim organisasi terhadap penglibatan melalui subjek, peralatan dan budaya, (iii) kesan langsung subjek terhadap peralatan dan penglibatan, serta kesan tidak langsung subjek terhadap penglibatan melalui faktor peralatan, (iv) kesan langsung budaya terhadap subjek, peralatan dan penglibatan, serta kesan tidak langsung budaya terhadap penglibatan melalui subjek dan peralatan, dan (v) kesan langsung peralatan terhadap penglibatan. Kaedah tinjauan melalui soal selidik digunakan untuk memungut

dapatan berkenaan dari kalangan pensyarah di universiti-universiti awam di Iraq. Soal selidik tersebut yang diadaptasi daripada beberapa kajian terdahulu, ditadbir kepada 409 responden. Kesemua responden merupakan pensyarah dari empat buah universiti awam di Iraq. Teknik persampelan berstrata digunakan untuk mengenalpasti sampel kajian. Data maklumbalas responden dari soal selidik tersebut dianalisis menggunakan pendekatan Pemodelan Persamaan Berstruktur (*Structural Equation Modelling*, SEM) dalam SPSS AMOS, di mana beberapa teknik analisis digunapakai untuk menguji model terhipotesis tersebut serta hubungan antara pembolehubah atau faktor-faktor yang dikaji. Analisis data mendapati (a) iklim organisasi memberikan kesan langsung yang signifikan terhadap subjek dan peralatan, serta kesan tidak langsung yang juga signifikan terhadap penglibatan melalui faktor peralatan, (b) iklim organisasi tidak memberi kesan langsung terhadap budaya, dan iklim juga tidak menunjukkan kesan tidak langsung terhadap penglibatan melalui budaya, (c) subjek/individu memberikan kesan langsung terhadap penglibatan dan alat, serta kesan tidak langsung terhadap penglibatan melalui peralatan, (d) budaya mempunyai kesan langsung terhadap subjek dan penglibatan, serta kesan tidak langsung terhadap penglibatan melalui subjek, (e) faktor budaya tidak menunjukkan kesan langsung secara signifikan terhadap peralatan, serta tiada kesan tidak langsung terhadap penglibatan melalui faktor peralatan, dan (f) peralatan menunjukkan kesan langsung yang signifikan terhadap penglibatan. Oleh yang demikian, melalui kajian ini yang menggunapakai analisis mendalam serta serentak terhadap beberapa faktor yang dikenalpasti sebelumnya, satu model kesediaan e-pembelajaran telah dicadangkan.

MODELING E-LEARNING READINESS AMONG INSTRUCTORS IN IRAQI PUBLIC UNIVERSITIES

ABSTRACT

E-learning has been used by many higher learning institutions around the globe. However, are the university instructors ready to use e-learning in their teaching and learning activities? What are the factors influencing their e-learning readiness? This study attempts to model e-learning readiness among instructors in four Iraqi public universities (IPUs). Based on the literature, nine factors involving organizational climate (environmental and financial readiness); societal/community readiness (culture); tools (equipment/infrastructure, technology skills, and human resources); subject/individual readiness for change (attitude and online learning style); and engagement readiness have been identified to influence e-learning readiness. Thus, the main purpose of this study was to investigate the simultaneous effects of these factors on each other and their collective readiness: (i) the direct effects of organizational climate on culture, tools and subject/individual readiness for change, (ii) indirect effects of organizational climate on engagement readiness through subject, tools, and culture, (iii) direct effects of subject on tools and engagement, and its indirect effect on engagement through tools, (iv) direct effects of culture on subject, tools and engagement, and its indirect effects on engagement through subject and tools, and (v) direct effect of tools on engagement. A survey research method using questionnaire was employed to collect the data among IPUs instructors. The questionnaire was adapted from several previous studies and administered to 409 respondents. All respondents were instructors from four public universities in Iraq. A stratified sampling technique was utilized to identify the sample.

Data from the questionnaire gathered was analyzed using structural equation modeling (SEM) in SPSS AMOS, in which several techniques of analysis were employed to test the hypothesized model and the relationships between the variables studied. The analyses indicate that (a) organizational climate has significant direct effects on subject and tools, and significant indirect effect on engagement through subject and tools, (b) organizational climate does not have direct effect on culture, and no indirect effect on engagement through culture, (c) the subject/individual has significant direct effects on engagement and tools, and a significant indirect effect on engagement through tools, (d) culture has significant direct effects on subject and engagement, and indirect effect on engagement through subject, (e) culture has no significant direct effect on tools and no indirect effect on engagement through the tools, and (f) tools have significant direct effects on engagement. Therefore, through this study in which a thorough and simultaneous analysis of several factors has been carried out, a new model on e-learning readiness among university instructors has been proposed.

CHAPTER 1

INTRODUCTION

1.1 Introduction

The continuing growth in the use of Information Communication Technology (ICT), in particular the Internet, has promoted the ability to adopt universal e-learning practices in all levels of education including colleges and universities to prepare the future workforce. The Internet is considered as an effective tool in providing accessible information to diverse learners from different places. In addition, not only ICT is applied in formal educational settings, but it is also used in informal learning situations that take place outside educational establishments, such as at home or work and through daily interactions among members of society. Electronic learning, or e-learning, is referred to as the learning practices that utilize various sets of online services available through the Internet. These services can be formulated and customized to carry out new models based on the adaptation of other learning technologies or by employing ICT via e-learning such as computer, multimedia, network communication, and mobile technologies to enhance learning, as well as to make education and information more accessible to everyone.

ICT has generally been an umbrella term that involves any communication device or application, encompassing: radio, television, mobile phones, computer and network hardware and software, several satellite systems, as well as the various services and applications associated with them that serve certain needs, such as videoconferencing and distance learning to increase skills of the learners (Tinio, 2003). Thus, as ICT is the

backbone for any e-learning activities, the successes (or failures) of e-learning programs or activities are sometimes attributed to its resources (Khalid, 2009). According to Keramati, Afshari & Kamrani (2011), it is important to determine the readiness factors in e-learning environment as it affects e-learning outcomes. Some of the significant factors identified in earlier study include culture, technical, environment, financial, content, personnel, and management (Abas, kaur, & Harun 2004).

The present study attempts to model the important factors of e-learning readiness in IPUs environment. It also aims to measure ICT skills among the instructors, their e-learning readiness and how they assess e-learning in order to use new educational technology, which in return, will increase the efficiency of the learning process among their learners. The effectiveness of e-learning in enhancing learning has been demonstrated in instructors' daily practice, including skill development, group study techniques, and their knowledge (Kozma, 2008). Adopting e-learning has helped to extract the required components that lead to enhanced learning and interaction among teachers, and collaboration with other institutions including universities (Tondeur, Van Braak, & Valcke, 2007). E-learning is an influential tool that improves both formal and informal learning opportunities (Aktaruzzaman, Shamim, & Clement, 2011) and enhances instructors' engagement (Concannon, Flynn, & Campbell, 2005; Richards, 2005).

This study is conducted to identify the readiness of IPU instructors to support different teaching practices in e-learning environment as well as to propose an e-learning model based on the nine dimensions: (1) technological skills, (2) equipment/infrastructure, (3) online learning style, (4) attitude, (5) human resources, (6)

cultural, (7) environmental, (8) financial, and (9) engagement readiness. Measuring these readiness factors would enable the IPUs to keep pace with other universities in embracing e-learning.

1.2 Research Background

Commonly, e-learning systems are used to boost knowledge, information sharing, collaboration and networks, as well as for training and development. However, before implementing e-learning, it is critical to assess the readiness of any institution, by identifying the relevant factors (Aydin & Tasci, 2005).

Different e-learning platforms may help expand access to education, strengthen the relevance of education to the increasingly digital workplace, and raise educational quality by helping to transform teaching and learning into an engaging and active process. However, the experience of introducing e-learning into the classroom and other educational settings all over the world over the past several decades suggests that the full realization of the potential educational benefits of e-learning is not automatic (Heemskerk, Brink, Volman, & Ten Dam, 2005). There are various factors that may influence or affect the acceptance of e-learning, including the readiness of the people involved and the organization/ institution (Nichols, 2008).

In addition, Robinson (2008) declared that effective integration of ICT via e-learning in educational environments is complex. Integrating e-learning in Iraqi educational environments help to identify important factors and effective use of ICT via e-learning, especially in the main public universities of Iraq, including Baghdad university, Mustansiriyah University, Technology University, Mosul University,

Salahaddin University and Basrah University and other universities which are suffering acute shortage in ICT. As these universities are trying to embark on e-learning system, the e-learning readiness among their communities including lecturers must be assessed (Elameer & Idrus, 2010a). The Iraqi educational environment must reckon with these challenges when making decisions about the integration of e-learning (Harb, 2008).

One important feature of e-learning is that it allows a greater access to information and communication and online collaborations to transcend time and space with regard to teaching and learning. Identifying the readiness of e-learning makes possible asynchronous learning, or teaching that is characterized by a time lag between the delivery of instruction and its reception by instructors (Stensaker, et al., 2007).

Previous studies have been carried out regarding factors of e-learning readiness (e.g. Mutiaradevi, 2009; Sadik, 2007). Even though these studies involve many organizations in the world, but no study has attempted to model those factors and investigate the simultaneous effects of the factors on each other. A sophisticated statistical analysis such as by using Structural Equation Modeling (SEM) can be used for this purpose. This approach of assessing e-learning readiness is in-line with the proposal from several researchers (for example: Chan & Ngai, 2007; Nichols, 2008; and Welsh et al., 2003). According to these researchers, in order to implement the systems successfully, it is crucial to assess the organizational readiness for e-learning. Meanwhile, Aydin and Tasciv (2005) who conducted research in developing countries found that e-learning is still lacking and there has been a lack of systematic research on its adoption, especially in Asia. Therefore, this study attempts to identify and determine the important factors which might contribute in modeling e-learning readiness in IPUs. For instance, Elameer

and Idrus (2010b) who investigated the learning situation at the University of Mustansiriyah (UoMust) in Baghdad have reported on the difficulties and challenges in choosing a suitable mechanism for adapting technology into e-learning to revitalize the educational environment. They also found missing infrastructures and acute shortage in ICT to adopt e-learning. Furthermore, they stated that the university suffers from many problems, including security, technology, management, pedagogy, and ethics. Elameer and Idrus (2010a) also conducted another survey for e-learning readiness based on the strategy of Khan (2005), in which they distributed the questionnaire to 350 Iraqi professors and academic staff. Finding from the study demonstrated the need for a completely new approach to e-learning through technology. Thus, Iraqi public universities should embrace new techniques for e-learning that allow the instructors and their students to communicate, cooperate and collaborate effectively. In addition, the lack of ICT, human resource and infrastructures, such as no main network, no wireless access, and few available and accessible Internet connections for instructors, would discourage ICT use. As such, there is an urgent need for the IPUs to implement e-learning in solving the higher education sector's problems (Alhadithi et al., 2011).

In addition, instability has undermined normal academic activity in Iraqi higher education institutions and has triggered an unexpected brain drain that has further undermined the educational opportunities of Iraqi students (UNESCO, 2011b; Kubba, 2009). Moreover, the use of modern teaching methodologies is also an area of concern in Iraq higher learning environment. Also, according to the survey reports by UNESCO (2011a), UNESCO (2004), and Husain (2004), one of the major challenges of the highly centralized education system in Iraq is the lack of interaction among students and

lecturers. This gap often creates a mismatch between the knowledge and skills imparted in the institutions and those required in the workplace (Idrus, 2008). This was also acknowledged by Alhadithi et al., (2011) who claimed that it is very difficult to change the current educational system in IPUs directly before embarking on adopting any e-education system and online learning activities.

Enhancing the quality of education and training is a critical issue in several higher educational institutions in Iraq, particularly during this time of educational expansion. Thus, e-learning can enhance the quality of education in several ways, for instance, by increasing instructor' abilities and shaping positive attitude towards ICT, by facilitating the acquisition of basic skills, and by enhancing ICT training, and when it is used properly, e-learning can also provide transformational tools (Stensaker, et al., 2007). E-learning has also been used to improve access and the quality of lecturer training (Akerlind & Trevitt, 1999; Stromso et al., 2004).

1.3 Problem Statement

Readiness is measured separately by the magnitude of different factors in previous studies such as by Mutiaradevi (2009), Kaur et al., (2004), Aydin and Tasci (2005), and Sadik (2007). Although these factors have been identified to assess e-learning readiness for several organizations in different countries, but no researcher has attempted to investigate a modeling of these factors and discover the simultaneous effects of these readiness factors individually and collectively.

Elameer et al., (2011a) reported that many of the IPUs sectors have been already in poor form and most educational sectors have suffered deeply, a situation exacerbated in

the confusion associated with the invasion of 2003. Harb (2008) suggested that willingness in adopting e-learning strategies is necessary to improve educational methods in IPUs and to embrace new techniques by adopting e-learning for the Iraqi Higher Education Sector. Moreover, the readiness for applying e-learning in IPUs is a crucial issue in terms of rehabilitation and revitalization of the IPUs (Elameer & Idrus, 2011b).

The use of online learning in IPUs remains poor in terms of technology-enhanced learning, attitude and engagement of skills due to the absence of the institution' and technology' support (Alhadithi et al., 2011). Elameer and Idrus (2011c) have also claimed that, the Iraqi higher education sector could not investigate e-learning readiness, due to lack of ICT, network infrastructures, and communications and due to the traditional ways of management, especially in universities. They suggested that, before embarking on developing teaching and learning methodologies and sharing information on the latest pedagogical techniques and delivery systems, readiness must first be measured based on ICT knowledge and skills and other learners' factors to promote the use of ICT in educational management.

In addition, the United Nations Economic and Social Commission for Western Asia (UNESCWA) has acknowledged that most IPUs are facing "a great weakness in all of the ministry and university infrastructures with lack of computer networking, multimedia, and expertise in both fields of hardware and software" (Elameer & Idrus, 2010c) (pp. 12). Meanwhile, the United Nations Educational, Scientific, and Cultural Organization (UNESCO) reported that the educational system in Iraq faces serious shortcomings in many learning and teaching areas (UNESCO, 2011a).

Meanwhile, Elameer and Idrus (2011a) and Alhadithi, et al., (2011) acknowledged that IPUs are still lacking of the suitable infrastructures, environment, networks, as well as old practices between students and lecturers. They suggested that using e-learning can help IPUs to develop, facilitate content building, control, and manage the learning contents among learners and instructors in a centralized learner learning environment.

Based on the current problems and issues mentioned in the previous studies, this study is devoted to modeling factors readiness for e-learning based on nine dimensions for instructors, namely technological skills, equipment/infrastructure, online learning style, attitude, human resources, cultural, environmental, financial, and engagement readiness in the IPUs.

1.4 Research Objectives

This study attempted to model nine factors of e-learning readiness as identified from the literature review to propose a model on e-learning readiness among an instructors in IPUs environment. The nine factors identified are organizational climate (environmental and financial readiness); societal/community readiness (culture); tools (equipment/infrastructure, technology skills, and human resources); subject/individual readiness for change (attitude and online learning style); and engagement readiness. It also aimed to examine the effects of these factors on each other and their collective effects and to explain the reasons behind the strengths or weaknesses of the identified factors. These aims can be accomplished by applying Structural Equation Modeling technique among those factors. Therefore, the main objectives of this study are:

1. To investigate whether organizational climate has a direct effect on subject, tools, and culture readiness, and an indirect effect on engagement readiness through subject, tools, culture as mediating variables in the e-learning environment of IPUs.

2. To investigate whether subject has a direct effect on tools and engagement readiness and indirectly on engagement through the tools in e-learning environment of IPUs.

3. To investigate whether culture has a direct effect on subject, tools, and engagement readiness and an indirect effect on engagement readiness through subject and tools as mediating variables in e-learning environment of IPUs.

4. To investigate whether tools have a direct effect on engagement readiness in e - learning environment of IPUs.

1.5 Research Questions

1. Does organizational climate have a direct effect on subject, tools, and culture readiness, and an indirect effect on engagement readiness through subject, tools, culture as mediating variables in e-learning environment of IPUs?

2. Does subject have a direct effect on tools and engagement readiness and indirectly on engagement through the tools in e-learning environment of IPUs?

3. Does culture have a direct effect on subject, tools, and engagement readiness and an indirect effect on engagement readiness through subject and tools as mediating variables in e-learning environment of IPUs?

4. Does tool have a direct effect on engagement readiness in e-learning environment of IPUs?

1.6 Research Significance

The main aim of this research is to identify and model e-learning readiness in IPUs; as well as to provide a deeper understanding of important factors in adapting e-learning system in IPUs. Thus, this study may provide some important significance to the body of knowledge, especially in the field of instructional technology and e-learning.

This study – hopefully - will identify some of the important factors that may influence e-learning readiness among instructors in higher education institutions. As such, from the findings of this study, they will provide the pertinent factors that need to be considered in implementing e-learning in any higher learning institutions. In addition, the hypothesized model to be tested will provide a clearer picture of the factors that directly and indirectly influence instructors' engagement in an e-learning environment. Such model will provide a guideline for future work on e-learning readiness, which will further establish this body of knowledge. Also, this study will investigate how the readiness factors (that have been identified from the literature review) affect each other individually and collectively. No previous study has been carried out that test the factors simultaneously. In addition, those previous studies did not make an attempt to explain the reasons behind the strengths or weaknesses of the identified factors.

Furthermore, this study will assist in preparing IPUs instructors to use educational technology in any e-learning environment through the identification of related factors that will influence their engagement. Moreover, the findings of this study may indicate some factors that will not influence each other – although the literature review indicates otherwise. Perhaps this observation will provide the management and administrators of IPUs to look into the possible reasons of such findings. The findings will also help to reduce the gap in terms of e-learning involvement among instructors as the factors influencing their engagement can be traced and identified from the tested model. In long run, it will help to reduce the gap in e-learning use among the instructors from Iraq and those from other countries.

Finally, from this study, it will provide the data on the use of ICT among IPUs instructors as well as their ICT skills. Thus, the administrators and management of IPUs will be able to plan and implement the relevant trainings for those instructors to ensure that they are ready in e-learning environment.

1.7 Conceptual framework

In this study, nine dimensions or factors of e-learning readiness were identified and placed in five main constructs (organizational climate, subject, tools, community and objects). Four of these constructs: subject, tools, community and objects are proposed by Coleman and Coleman (2013), and these constructs were originally derived from the activity theory (Engestrom, 1999a). The organizational climate is identified as the independent variable, while Object is classified as the dependent variable. Meanwhile, three mediating variables were proposed, and they are subject, community, and tools.

The first construct, Organizational Climate, has two factors: financial and environmental readiness. Two factors were categorized in the Subject or individual readiness for change construct, involving attitude, and online learning style. Meanwhile, culture is identified as the factor in the third construct, i.e., Community or Societal Readiness. Also, there are three factors identified in the Tools or technological readiness: equipment/infrastructure, technology skills, and human resources. Finally, engagement readiness is identified as the only factor for the Object construct. Figure 1.1 depicts the conceptual framework with the nine dimensions. The details of each construct, its respective factors or dimensions, the related theories and previous studies on these factors will be explained in detail in Chapter 2.

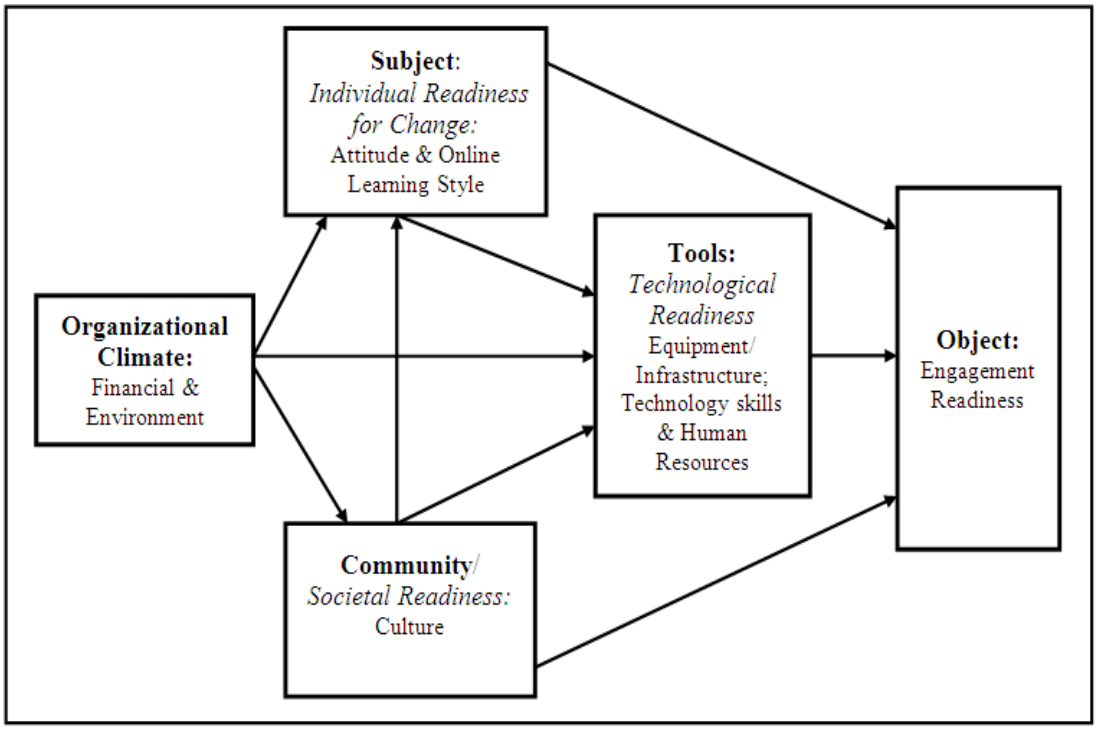

Figure 1.1: Conceptual framework of the study

1.8 Research limitations

This study was limited to four public universities in Iraq, namely, University of Basrah, University of Technology, University of Baghdad and University of Thi-Qar, as they are the biggest universities in Iraq in terms of the number of departments and instructors available. Therefore, it does not involve other public universities or private universities in Iraq. In addition, this research involved 409 instructors from several faculties of the four universities representing the targeted population. There is a possibility that these four universities do not offer every discipline and if so, there will be no instructors to represent those disciplines. The questionnaires were distributed to the departments' administrators of faculties from each university who then distributed to the instructors in their respective faculty to answer all questionnaires. Therefore, there is a possibility that the administrators are selective in distributing those questionnaires to their instructors. Also, this study attempted to model e-learning readiness among the instructors using the nine factors identified from the literature review: the technological skills, equipment/infrastructure, online learning style, attitude, human resources, cultural, environmental, financial, and engagement readiness in the IPUs (Appendix A). Thus, there are other factors that might also influence e-learning readiness among the instructors in IPUs.

1.9 Operational Definitions

1) **IPUs:** Iraqi Public Universities refer to the Iraqi public, government universities only and they are a sector of the government agency for Iraqi higher education which is responsible for higher education and scientific

research. In this study, only four biggest Iraqi public universities were involved: University of Basrah, University of Technology, University of Baghdad, and University of Thi-Qar.

2) **E-learning:** Is a learning program that makes use of an information network, such as the Internet and multimedia, for course delivery, interaction, and/or facilitating the learning process in different learning environments such as blogging tools, social networks, etc. During the learning process, instructors are not required to be present in a physical classroom. According to Charlton-Laing and Grant (2012), e-learning is also defined as "the delivery of training content via all electronic media". This viewpoint supported and defined by Kakbra and Sidqi (2013) who asserted that the e-learning is learning with the aid of ICT-technology.

3) **E-learning Readiness**: Borotis and Poulymenakou (2004) defined e-learning readiness as "the mental or physical preparedness of an organization for some e-learning experiences or actions." Learners must also be "e-ready," so a coherent and achievable strategy that has been tailored to meet their needs may be implemented (Kaur & Abas, 2004; Infodev, 2001). In summary, assessing e-learning readiness provides key information to institutions to formulate solutions that can cater to the specific needs of each learning group (McConnell International, 2000). In this study, e-learning readiness involves instructor readiness which included their technological skills, equipment/infrastructure, online learning style, attitude, human resources, cultural, environmental, financial, and engagement in the IPUs.

These dimensions were used for modeling of an institution's preparedness for e-learning in the IPUs.

4) **ICT:** Information and communication technology is a diverse set of technological tools and resources used to communicate, disseminate, store and manage information (Blurton, 1999). In addition, ICT has been an umbrella term that involves any communication device or application, computers, handheld devices, and interactive whiteboards; systemic' bases, such as the Internet or an Intranet; software, such as word processing, spreadsheets, database applications, and graphical software; and broadcasting technologies, such as radio, DVDs, applications associated with them that serve certain needs, such as videoconferencing and distance learning to increase skills of the learners (Gulbahar & Guven 2008; Tinio, 2003). In this study, adopting ICT into e-learning helps extract the required components that lead to enhanced learning and information will be used to assess instructors' readiness on e-learning system in IPUs.

5) **Attitude Readiness**: Is defined as a propensity of instructors toward embrace new technology on the individual's disposition towards learning and how instructors are eager to continually teach, learn and develop the capabilities required for embracing new technology. The individuals' attitude can be positive, negative or neutral. In this study, attitude refers to the degree of IPUs instructors' readiness in embracing new technology and how some factors such as motivation, enjoyment, anxiety, self-development, confidence, influence e-learning and their use of technology in the IPUs. In

this study, a questionnaire was adapted from Mutiaradevi (2009), and used to modeling instructors' attitudes towards the e-learning readiness in the IPUs.

6) **Technological Skills Readiness:** refers to sustainability in using technology tools and ICT facilities helps and ensures that instructors will be able to interact and collaborate with each other. In addition, using technology tools helps in increasing their technological skills and improving basic skills including ICT devices, materials, software, online reading, internet chat, etc. In other words, instructors feel prepared, ready and connected to manage their expectations and allow their skills to develop. This approach is supported by Rogers (2003) who notes that the sustainability in using technology tools helps learners in developing new basic technological skills to benefit from e-learning, and technology readiness is considered as one of the factors or tools that can be effectively used to adopt a technological innovation and develop technological skills in an organization. In this study, a questionnaire was adapted from Mutiaradevi (2009), and used to modeling instructors' technological skills through the use of educational technology tools.

7) **Online Learning Style Readiness:** Learning style is a core concept that indicates the willingness or preference of individuals in receiving information in new way of education. A learner will learn best if taught in a method deemed appropriate for his/her learning style. In an online learning environment, users have the options to read the content, watch video, listen

to audio clips, interact with others (e.g. through email, forum, chat), etc., and therefore, their learning style will influence their way of receiving the information, which in return, will affect their learning. Therefore, online environment may help to change the way individuals internally represent experiences, recall information, as well as manage their learning time which are crucial in e-learning system environment (McLawhon & Cutright, 2012). Thus, online learning style readiness from the perspective of the instructor is a critical factor to the implementation of e-learning system. In this study, a questionnaire was adapted from Mutiaradevi (2009), and how willingness or preference of individuals in receiving information in a new way of education.

8) **Equipment/Infrastructure Readiness:** equipment /infrastructure readiness refers to availability and provision of full technical support, availability of hardware and software and network within the university, accessible computers, accessible Internet/intranet-learning content delivery, ICT facilities and ability on adopting Learning Management System (LMS) by the instructors. In this study, a questionnaire to measure this readiness was adapted from Mutiaradevi (2009).

9) **Human Resources Readiness:** Human resources readiness is the availability and design of the technology system supportive of human and supportive instructors from top level management who have sufficient IT knowledge and ICT skills and the authority to lead the university towards new technology. If the university has more skilled staff, they are more likely

to successfully adopt e-learning. Therefore, in this study, human resources readiness involves management and support personnel. Management readiness refers to the university having a vision/mission or formulated policies, thereby being able to manage e-learning via different technological tools and to recognize the qualifications obtained via e-learning by administrative support. Meanwhile, personnel readiness refers to the readiness of the university in terms of having a central unit dedicated to e-learning initiatives to support the instructors via different educational technological tools deals with a team of dedicated instructional designers as well as staff to develop and implement e-learning plan. And this approach supported by Rogers (2003) claimed that technology readiness for organizations with more skilled human resources personnel related to technological tools have a better chance to succeed at e-learning. In addition, successful management in creating IT knowledge, ICT skills, responsibility and authority to lead the organization toward adaptations of an innovation. In this study, a questionnaire was adapted and modify from Mutiaradevi (2009).

10) **Financial Readiness:** Refers to organizational climate for university financially to be ready for e-learning programs as perceived by instructors in IPUs. In addition, financial readiness involves the allocated budget size or fund to develop and/or acquire e-learning and process in an institution. In this study, a questionnaire was adapted from Mutiaradevi (2009).

11) **Cultural Readiness:** Refers to the acculturation of e-learning in terms of Internet use and networked technologies to disseminate information, communication, interaction and teaching for instructors. In this study cultural readiness involves the readiness of all instructors, i.e. whether they are ready to accept e-learning as a style of teaching and learning in IPUs. In this study, a questionnaire was adapted from Mutiaradevi (2009).

12) **Environmental Readiness:** Refers to organizational climate in term of the readiness of the university as a whole including institutional policy in education, the role of mass media toward e-learning, plans, and intellectual property regulations. It also involves readiness for e-learning environment as perceived by instructors in IPUs to continuously engage with a learning environment as a flexible delivery option anywhere and anytime. In this study, a questionnaire was adapted from Mutiaradevi (2009).

13) **Engagement Readiness:** Engagement readiness is the case where the instructors involve and participate in the online learning environment and aware of their needs of the potential of the online learning environment (Dyment et al., 2013). In this study, engagement readiness provides an indicator that the instructors feel fully engaged and confident in e-learning environment that offers an engaging and effective form of learning. The engagement readiness examines the personal, professional, academic, intellectual and social dimensions of instructors in e-learning environment in IPUs. A questionnaire was developed from Dyment et al., (2013) to meausre this readiness.

1.10 Summary

The first chapter gives an insight into the present work by describing the factors that led to the selection of the area studied. It also explains the objectives for conducting the research and its significance on the real world situation. These elements are important because this significance inspires the implementation of the research results. This research focuses on modeling the readiness of e-learning based on a set of factors in the IPUs. The nine factors or dimensions that have been identified from the literature review are: technological skills, equipment/infrastructure, online learning style, attitude, human resources, cultural, environmental, financial, and engagement readiness in the IPUs. The next chapter provides a literature review that elaborates on related works that have been established in the same field.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

E-learning systems are generally used for the purpose of knowledge and information sharing, online collaboration and networks, training and development, and dissemination within the institution such as university. However, before embarking on implementing e-learning, it is critical to study the readiness of the university staff by identifying the factors that need to be considered in developing and implementing e-learning together with the modeling of readiness of the university, particularly at the IPUs.

Moreover, the application of e-learning services and Information and Communication Technology (ICT) in various instructional departments will require a wide range of attention from the parties concerned (Kleinbaum et al., 2010). However, the attempt to obtain such integration requires a fundamental awareness and readiness level of e-learning based on ICT component that can be accessed, created, edited and assembled virtually anywhere to address individual goals and needs. Instructional services were established to come into villages, schools, classrooms, workplaces, and community and increase from time to time depending on the main purposes of using ICT in the learning environment (Tinio, 2002).

Furthermore, different studies of e-learning have attracted many scholars and practitioners, particularly those in higher education institutions (Hill et al., 2004). ICT

and e-learning have been said to challenge the traditional way of teaching and learning, especially in higher education (Tinio, 2002). Several studies have indicated the advantages of e-learning such as time efficiency, location, accessibility, communication and flexibility (Poole, 2001; Chizmar & Walbert, 1999). However, it also poses several challenges, including technical difficulties and other knowledge delivering issues. A number of investigators have addressed the required attributes ranging from services provided by e-learning with a clear consideration of its readiness to use the learning tools (Mason & Weller, 2000). In addition, Lee et al., (2001) asserted that e-learning cannot substitute traditional instruction in education, but it still can bring us a new instructing and acceptable thinking model. Besides, teaching and learning in e-learning environments have many advantages and benefits.

According to Mercado (2008), a successful e-learning endeavor must always involve a more systematic process of planning, designing, developing, evaluating and implementing an e-learning environment and other important factors for the learning and teaching process to be actively fostered and supported. This can only happen when the e-learning environment is meaningful to all stakeholders in the organization, including the learners, teachers, support staff and the institution.

2.2 ICT

ICT has changed the ways how things are done by people irrespective of age, gender or social status. These changes include everything starting from day to day activities, such as how people communicate with each other, how students study and learn, and how teachers teach (Adams, 1998; Noudoostbeni, Yasin, & Jenatabadi, 2009).

Different educational institutions are currently using the advanced resources of ICT (such as a high speed network, a national computing grid, data resources, etc.) to improve their learning performances. ICT provides a distinct advantage to teaching by transforming every aspect of the teaching contents via e-learning. The adaptation of ICT resources into the learning process helps to increase the instructor's competitive advantages by improving the quality of their teaching services. This will help the learners to acquire various learning content available in the electronic format on the web. Institutions of higher education use different ICT tools and services via e-learning to enhance the direction of students' learning.

ICT readiness in e-learning environment has played a significant role in education and learning services, as it has in most other sectors (Tinio, 2003). E-learning aims to apply ICT to enhance and support the learning process by covering a wide range of tools and technologies including e-mail, internet, video streaming and virtual classroom. Thus, the accessibility and availability of ICT help to make e-learning projects successful, scalable and sustainable in developing countries (Gillani, 2000; Maurer & Davidson, 1999). ICT via e-learning brings positive experiences with the assistance of instructors to help students to contribute to the fields of educational equality, for instance, if e-learning system lacks the dynamic use of ICT in learning together with other different preferences related to ICT, this may influence the customization of the learning contents (Becta, 2002). Therefore, various studies such as those conducted by Gillani (2000) and Becta (2004) aimed to clarify the effectiveness and readiness of ICT in e-learning environment to be utilized in different educational sectors in which ICT may further promote education. In fact, the accessibility and availability of ICT can

enhance the quality of education in several ways such as by facilitating the acquisition of basic skills, and by increasing teacher training programmes, because ICT has become transformation tools via e-learning which when used rationally, can promote the change to a learner-centered environment (Tinio, 2003).

2.2.1 ICT Infrastructures

The flavor of the instructional formation of ICT which makes use of the appliances is the level to which the way the learning procedure is prepared through the use of units of learning span a range from complete curriculum in the course which usually is dispersed by the use of ICT towards e-learning. It is also known as a type of learning procedures that match with the degree and level of different group of learners in the learning environments. In this respect, implementing a university network infrastructures to create a suitable environment for e-learning in IPUs in the current time is a prerequisite, but to kick –start any learning process via e-learning, especially the IPUs, is quite impossible due to the lack of network infrastructures' basics to achieve the successful implementation of an e-learning system. Besides, it is also a very difficult task to be performed because of a lot of challenges that need to be faced, such as lack of ICT infrastructure which is urgently needed for all Iraqi university bodies (Elameer & Idrus, 2010a).

However, the argument is that every instructor in the teaching group will experience both undemanding as well as demanding challenges when dealing with the group. This experience will be formulated during the distribution of ICT resources as instructional plans based on different instructors' views that would also carry different learning