

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

The purpose of this study is to characterize and measure working adults' e-learning adoption. It seeks to identify the technological, organisational, personal factors and the institutional forces that are associated with such adoption, as well as the impacts of e-learning on working adult's performance. Recognizing the gap in the literature related to the lack of empirical findings and theoretical frameworks on the factors that influencing working adult's to adopt e-learning in general and in the context of Jordan in particular. The next section provides an overview of e-learning. Literature review related to the theories that explain diffusion of innovation and adoption will be argued. At the end, discussion on the factors that influence individual's e-learning adoption and impacts of e-learning on working adults will be presented.

2.2 Definitions of E-Learning

Past studies have provided different definitions for e-learning (Table 2.1) and used various terms for e-learning such as Learning Management System (LMS), online learning, online education, distance education, distance learning and web-based learning (Hayen, Cappel & Roger 2004; Halawi *et al.*, 2009; Moore *et al.*, 2011). However, the common term for e-learning is the use of information and communication technology

(ICT) in the area of education, computer support instruction, online education or computer-aided enhance education (Mutula, 2002; Fallon & Brown, 2003).

Generally, e-learning modes consist of two categories (Behling *et al.*, 2007; Moore *et al.*, 2011). Firstly, Asynchronous e-learning, commonly facilitated by media such as e-mail and discussion boards, supports work relations among learners and with teachers, even when participants cannot be online at the same time. Second, Synchronous e-learning, commonly supported by media such as Videoconferencing and chat, has the potential to support e-learners in the development of learning communities. Learners and teachers experience synchronous e-learning as more social and avoid frustration by asking and answering questions in real time (Behling *et al.*, 2007; Moore *et al.*, 2011). Moreover, the two e-learning modes are used by several institutions that offer e-learning courses to their remote learners, there are differences between the e-learning asynchronous and synchronous (Chou, 2002; Moore *et al.*, 2011).

E-learning can be used for factual learning or as integrated learning where it is blended with distance learning or face-to-face learning. Urdan and Weggen (2000) highlighted that e-learning has a wide range of learning strategies and technologies from the use of CD-ROMS, live audio/video-conferencing, TV lectures, live chat, discussion forums, course announcements and virtual education based on web semantics. Gunasekaran, Ronald and Dennis (2002) had conceptualized e-learning as internet enabled learning at anywhere and anytime. Components of e-learning comprised of content delivery in multiple formats, management of the learning experience, and a networked community of learners, content developers and other information system

experts who worked in tandem to enable e-learning (Gunasekaran, Ronald, & Dennis 2002).

Khan (2005) argues that “e-Learning is intended to deliver information to the learner in the shortest time”. (p.6) in the same context, Begicevic, Divjak and Hunjak (2006) argue that e-learning is: “a type of learning supported by ICT that improves quality of teaching and learning”. (p.3). Similarly, Baptista-Nunes & Mcpherson, (2002) point out that “e-learning refers in this stage to the effective integration of a range of support to traditional teaching and learning”. (p.2). Hadjiathanasiou (2009) states that e-learning can occur in the halls of the universities, from home and at the work place, not limited to one place.

Table 2.1 Definitions of E-Learning

Author	E-Learning Definition
Daly (2001)	E-learning means using new multimedia technologies and the Internet to improve the quality of learning by facilitating access to facilities and services as well as remote exchanges and collaboration.
Wiggenhorn (2001)	E-learning could be defined as technology-enabled learning designed to increase workers' knowledge and skills so they can be more productive, find and keep high-quality jobs, advance in their careers, and have a positive impact on the success of their employers, their families and their communities.
Reiser and Dempsey (2007)	E-learning can also utilize offline (and non-networked) technologies on CD-ROM or DVD, and usually includes digital resources and computer-interfaced communications as tools for learning. E-learning is used interchangeably in a wide variety of contexts.
Liaw (2008)	E-learning can be defined as using network technologies to create, foster, deliver and facilitate learning, anytime and anywhere.
Nichols (2008)	E-learning is the use of technological tools, primarily those that can be made available over networks such as the internet, for education.
MacKeogh and Fox (2009)	Defined it as the use of ICTs to improve the quality and flexibility of learning for all students including adult workers, giving access to higher education to those who are unable to attend on-campus learning for whatever reason.

Lee, Yoon and Lee (2009)	E-learning is defined as web-based learning which utilizes web-based communication, collaboration, multimedia, knowledge transfer, and training to support learners' active learning without the time and space barriers.
Ho and Kuo (2010)	E-learning is defined as planned teaching/learning experiences that employ a wide variety of technologies, mainly computer-based or Internet-based, to reach learners in business environments.
E-learning definition in this study	The use of ICTs (tools such as the Intranet, Video, library, e-mail, chat, etc) to improve the quality and flexibility of learning for all students including adult workers, giving access to higher education to those who are unable to attend on-campus learning for whatever reason, in this case, it is part of distance learning

Table 2.1 above provides several e-learning definitions. E-learning is a common term used to describe the use of any electronic means in the area of education. Gunasegaram, McNeil and Shaul (2002) describe this mode of learning as internet enabled learning. However, as this study focuses on working adults, e-learning definition in this study will be adopted from MacKeogh and Fox (2009) who defined it as the use of ICTs to improve the quality and flexibility of learning for all students including working adult, giving access to higher education to those who are unable to attend on-campus learning for whatever reason.

2.3 Definitions of Distance-Learning

Distance learning is the most renowned descriptor used when referencing distance learning. It often describes the effort of providing access to learning for those who are geographically distant. During the last two decades, the relevant literature shows that various authors and researchers use inconsistent definitions of distance education and distance learning. As computers became involved in the delivery of education, a proposed definition identified the delivery of instructional materials, using both print and electronic

media (Moore, 1990). The instructional delivery included an instructor who was physically located in a different place from the learner, as well as possibly providing the instruction at disparate times.

Dede (1996, p. 1) elaborated on the definition by including a comparison of the pedagogical methods used in traditional environments and referring to the instruction as “teaching by telling.” The definition also stated that distance education uses emerging media and associated experiences to produce distributed learning opportunities. Both these definitions recognized the changes that were apparent in the field and attributed them to the new technologies that were being made available. Keegan (1996) went further by suggesting that the term distance education is an “umbrella” term, and as such, has terms like correspondence education or correspondence study that may have once been synonymously used, being clearly identified as a potential offspring of distance education.

King, Young, Driver-Richmond, and Schrader (2001) do not support the interchangeable use of the terms distance learning and distance education, because both terms do differ. Distance learning is referenced more as ability, whereas distance education is an activity within the ability (of learning at a distance); though, both definitions are still limited by the differences in time and place (Volery & Lord, 2000). As new technologies become apparent, learning seemed to be the focus of all types of instruction, and the term distance learning once again was used to focus on its limitations associated with “distance”, i.e. time and place (Newby, Stepich, Lehman, & Russell,

2000; Guilar & Loring, 2008). The term then evolved to describe other forms of learning, such as online learning, e-Learning, technology, mediated learning, online collaborative learning, virtual learning, web-based learning, etc. (Conrad, 2006). Thus, the commonalities found in all the definitions is that some form of instruction occurs between two parties (a learner and an instructor), it is held at different times and/or places, and uses varying forms of instructional materials.

2.4 Definitions of Mobile-Learning

Mobile learning or m-learning has been defined differently in different studies, which indicates that m-learning is still in an evolving phase (Peng et al., 2009). M-learning has been defined as “e-learning using mobile devices and wireless transmission” (Chang et al., 2003; Hoppe et al., 2003). Two important aspects of m-learning are its ubiquity and mobility. Ubiquitous computing is access to computing technologies whenever and wherever they are needed and mobility can be defined as learning on the go (Peng et al., 2009).

Current practice, academicians and practitioners worldwide define m-learning differently (Paliwal & Sharma, 2009). Among the definitions are:

- a) “*Mobile learning is learning through mobile computational devices.*”

Quinn (2000)

- b) *“Mobile learning is any sort of learning that happens when the learner is not at a fixed predetermined location or learning that happens when the learner takes advantage of the learning opportunities offered by mobile technologies.”*

O'Malley et al.(2003)

- c) *“Mobile learning or (M-learning) is a natural extension of e-learning.”*

Brown (2004)

- d) *“Mobile Learning is the acquisition of any knowledge and skill through using mobile technology, anywhere, anytime.”*

Geddes (2004)

- e) *“Any educational provision where the sole or dominant technologies are handheld or palmtop device.”*

Traxler (2005)

- f) *“A process of coming to know, by which learners in cooperation with their peers and teachers construct transiently stable interpretations of their world.”*

Sharples (2005)

- g) *“Mobile learning is a system and process that connects learners with distributed learning resources; while distance learning takes a wide variety of forms.”*

Horng and Horng (2009)

In conclusion, the definitions of m-learning earlier highlight three main characteristics: (i) there is a separation of place and/or time between instructor and learner, among learners, and/or between learners and learning resources; (ii) there is interaction between the learner and the instructor, among learners and/or between learner and learning resources conducted through one or more media (the use of electronic media

is not necessarily required) and (iii) the learner is an individual or group that seeks a learning experience offered by a provider.

2.5 Mobil Learning vs. Electronic-Learning

M-learning is considered as the next form of e-learning using mobile technologies to facilitate education for teachers and learners anywhere and anytime. M-learning definition has been on the focus of scholars attention in relationship with to e-learning; Moura and Carvalho (2008) defined m-learning as an extension of distance learning supported by wireless mobile technologies, Trifonova and Ronchetti (2003) defined it as e-learning through mobile computational devices. Quinn (2004) defined m-learning as the intersection of mobile computing and e-learning in terms of accessible resources wherever you are; strong search capabilities; rich interaction; powerful support for effective learning; and performance-based assessment. Moreover, the scholar believes that m-learning is an e-learning regardless location and time.

Learning systems offer different views about how people learn and what the best method of learning is. In the case of distance learning the learner or student is always physically distanced from the university; distance education serves the student through delivery modes such as compressed video and television. Although the 'e' in e-learning refers to *electronic*, most definitions explicitly state or imply that e-learning refers to online learning (Rosenberg, 2001). This assumption is due to computers and the Internet being the dominant media for learning in the digital and knowledge age. This more specific designation of e-learning distinguishes it from distance learning by including a

specific content and technology as evidenced by the difference on-campus and off-campus delivery modes of e-learning. Thus distance learning, as the name implies, is used only for off-campus students. In contrast, m-learning is not restricted to the distance learners and is not restricted by location; it can be used on-campus as well as off-campus and provides convenient, ubiquitous, and easy access to the materials. The relationship is illustrated in Figure 2.1. As seen in Figure 2.1, m-learning is a subset of e-learning and that e-learning is a subset of d-learning. Thus any m-learning event is an e-learning event and any e-learning event is a d-learning event.



Figure 2.1 Set Theory Perspectives of Learning Paradigms
Source: Gergiev et al., (2004)

On the another hand, Tick (2006) presents a different picture of the relationship among the three learning paradigms. D-learning is slowly transforming to e-learning because of ICT innovations but he argues that e-learning is not always d-learning. In

addition, m-learning provides flexibility of timing and autonomy for the learner. This relationship is depicted in Figure 2.2.

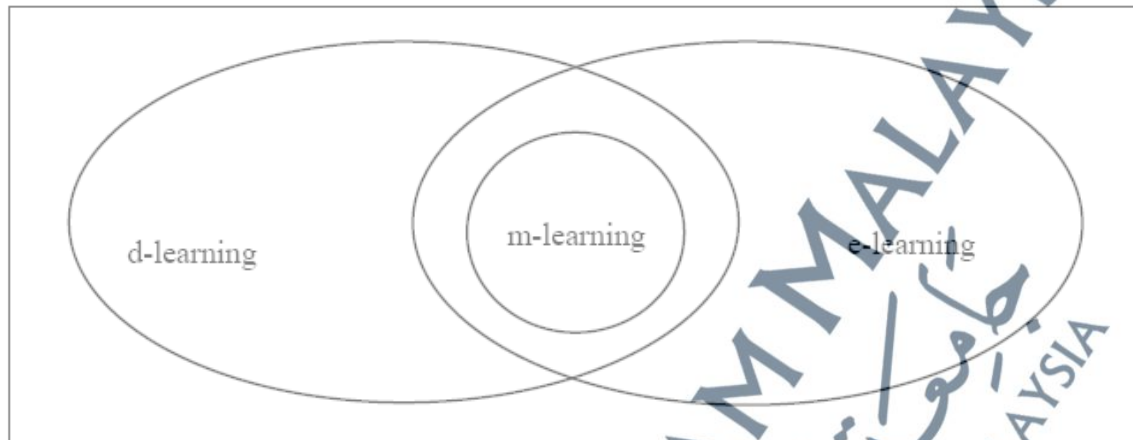


Figure 2.2 The Interrelationship of D-Learning, E-Learning and M-Learning
Source: Tick (2006)

In contrast, Low and O'Connell (2006) contradict the view that m-learning is a subset of e-learning provided by Georgiev et al., (2004). They believe that m-learning is linked to flexible learning's 'just enough, just in time, just for model. This point of view is depicted in Figure 2.3.



Figure 2.3 Mobile Learning's Link to Flexible Learning
Source: Low and O'Connell (2006)

This study approaches the differences between the learning paradigms in terms of possible range of learning space and flexibility available to the learner. When compared to traditional, distance, and e-learning, m-learning has the potential to offer greater range of learning spaces than the other methods. By being ubiquitous, and offering greater ease of access it can reach greater number of students and facilitate a larger learning space. Figure 2.4 represents this view in terms of range of learning space. In particular, m-learning learning space is greater than it is for e-learning as well as distance and traditional learning.



Figure 2.4 Learning Space Range and Ease of Access for Learning Paradigms

It is important to understand the similarities and differences between m-learning and e-learning since as discussed in the previous paragraphs many authors refer to m-learning as e-learning, stating that m-learning is e-learning using mobile or wireless devices (Quinn, 2000; Pinkwart et al., 2003; Georgiev et al., 2004). As a summary, Table 2.2 lists the terms found in literatures describing the change in terminology between e-learning and m-learning (Laouris & Eteokleous, 2005; Traxler, 2007).

Table 2.2 Differences in Terminology between E-Learning and M-Learning

E-Learning	M-Learning
Computer - fixed	Mobile device – portable
Broadband - wired	Mobile technologies such as G3, GPRS and Bluetooth – wireless
Intelligent Multimedia	Intelligent Objects
Passive	Interactive – spontaneous
Collaborative	Networked – Personal and private
Media-rich	Light weight bite-sized
Distance learning	Situated learning
Structured – more formal	Informal
Simulated situation	Realistic situation – context aware

Further, Table 2.3 lists the differences in the modes of communication between the instructor and students in both e-learning and m-learning.

Table 2.3 Instructor to Student Communication

E-learning	M-learning
Normally Asynchronous	Normally Synchronous
Delayed communication	Instant communication
Scheduled – passive	Spontaneous – Interactive

Nevertheless, Tables 2.4 lists the differences in the modes of communication between student and student communication in both e-learning and m-learning.

Table 2.4 Student to Student Communication

E-learning	M-learning
Face-to-face or e-mail-to-email	Flexible
Normally audio-teleconference	Video and Audio teleconference
Delayed communication –travel delay	Instant communication – no travel delay
Scheduled – passive	Spontaneous – Interactive
Poor due to group consciousness	Rich due to reduced inhibitions and one-to-one communication
Bound by location and time	Anywhere anytime

To summaries, e-learning modes consist of two categories namely Asynchronous e-learning and synchronous e-learning. Synchronous e-learning in this case, it is part of

distance learning; M-learning is a subset of e-learning. From the previous discussion and explanation of the differences between the e-learning, m-learning and d-learning, it can be concluded that the main focus of this study is on the e-learning stage. Specifically, this study focuses on the adoption of the e-learning among adult workers in Jordan. In addition, it tries to identify the factors that might influence this e-learning adoption. The following section discusses the e-learning in Jordan.

2.6 E-Learning in Jordan

Jordan like most countries is an ambitious country that usually takes into account the concentration towards employing appropriate techniques in order to be educationally developed. This can be achieved only by applying the concept of ICT through using different electronic and digital devices in almost all domains of life in Jordan especially at universities sector. There is a fast progress in the education sector and computerization, in addition to a rapid spread of knowledge centers in all areas in Jordan, and the establishment of a legal environment sustaining this progress (Khatib & Maayan, 2006). Jordan is considered to be one of the first Arab countries in the region that made use of the information technology. It provided this service in 1995 via the National Information Center.

The educational system in Jordan involves more than a third of the population. Recent statistics show that 75% of the populations of Jordan are under the age of 30 years and, that 53% are under the age of 18 (Ministry of Higher Education, 2013). This leads us to conclude that any change, whether economically or socially must begin in schools and

Universities. His Majesty King Abdullah II of Jordan has urged to focus on development based on knowledge and use of information technology (MoHE, 2013). The development efforts must focus on bringing about a revolution in the educational system through policies and strategies for the implementation of ICT as the main driver in the education (MoHE, 2013).

The Ministry of Education has implemented e-learning by providing educational resources and curriculum through computer networks that linked schools and universities (MoHE, 2013). Nevertheless, the road is still long and the challenges are many for e-learning to be linked to a network in the future that provides opportunities for continuous learning for all in Jordan (MoHE, 2013). The implementation of e-learning has provided opportunities for other individuals such as adult workers who wish to enhance their knowledge.

In Jordan, renewal recognition was given to the process of economy based on the fact that there are important challenges in attempting to move into a modern approach in order to meet the requirements of “learning” which leads to success. This new approach could replace the traditional “schooling” that is being used these days. Consequently, His Majesty King Abdullah II insisted for a “remodeling” of the pedagogical system to meet the requirements of the new and integrated economies.

The vision of Jordanian government regarding the application of e-learning was to participate and invest in information technology sector based on the needed infrastructure that is shaped by youth local talents and eligible scientific and technical scholars not only

in Jordan, but in all areas of the Arab World where the deployment of technology centres have been obviously notified (MoHE, 2013; McGregor, 2004). Also, a number of initiatives have been adopted in the education sector; the ultimate goal of those initiatives is to contribute effectively to continuous improvement by adopting flexible pedagogical and learning approaches such as distance learning and e-learning, which are aimed at accomplishing principles of education for all and democratization of education (McGregor, 2004).

Jordan e-learning initiative hopes to achieve a number of objectives and goals including: provide opportunities of higher education to a large population of qualified students, providing a forum of continuing education in various disciplines of knowledge, providing opportunities for professional training in response to market demands, providing special opportunities in higher education to a special strata of society, including females and those residing in remote areas, participating as a contributing partner in promoting research and scholarly activities deemed useful in development areas of special concern and promoting humanistic and Islamic values and ethics (MoHE, 2013).

However, El-Seoud *et al.*, (2007) highlighted that Jordanian universities faced many problems in delivering their educational programs. These problems are mainly related to the cost, availability of facilities and shortage of professors. They argued that using new technologies such as e-learning and web-based authoring tools in delivering the content of educational programs may solve many of these problems. In Jordan, the

teaching system includes the traditional approaches more than e-learning system. By adopting that system, the students lack the ability to interact with each other, lack the motivation which is necessary in the learning process, and the restricted feedback for them. In addition, few studies have been carried out in order to identify the importance of e-learning in Jordanian Universities (Abbad *et al.*, 2009; Dirani & Yoon 2009).

El-Seoud *et al.*, (2007) explains the disadvantages of the traditional approaches of education in Jordan. They states that traditional methods neglect the individual differences among students and they become bored in the learning process due to limited feedback and interaction between learners and their teachers. Hence, it is imperative to promote the use of e-learning within Jordan education system and examine its impact on students' educational attainment.

2.6.1 Arab Open University in Jordan

Prince Talal bin Abdul Aziz has established the Arab Open University (AOU) under the umbrella of the Arab Gulf Program for United Nations Development Organizations and its main campus is located in Kuwait. AOU is made up of seven branches in seven different countries. The first university was established in Jordan in 2002. Furthermore, the Arab Open University in Jordan (AOUJ) was the first branch to adopt e-learning on a widespread basis and plays a critical role in e-learning development in Jordan (Abbad *et al.*, 2009; Dirani & Yoon 2009).

The main purpose of AOU is to attract numerous students who cannot attend traditional universities due to financial reasons, age, work and other circumstances (Abu-Shawar, Al-Sadi & Hourani, 2004). In other words, Arab Open University of Jordan (AOUJ) is mainly attracting adult workers who wish to further their graduate studies rather than fresh graduates from the secondary schools. This thing is considered as the main purpose of constructing this university. The university has aimed to educate adult people especially who are working such as teachers and employees in the government and private sectors (Abu-Shawar *et al.*, 2004).

With regards to learning management system is allowing instructors to manage materials distribution, assignments, communications and other aspects of instructions for their courses. Virtual learning environments (VLE) or learning management systems (LMS) are web applications are run on a server and accessed by using a web browser. Both students and tutors can access the system anywhere with an Internet connection. LMS have numerous applications and activities such as forums, chats, surveys, online course material, and recording grades (Abu-Shawar *et al.*, 2004).

Moreover, based on the concepts of LMS, AOUJ provides six programs goals on its Web page to support their learners which are: promote an open system of higher education that provides wide opportunities of studies for professional development and lifelong learning, adopt the highest standards of excellence in the qualification and training of its students and in the stimulation of work generated by its faculty and staff, graduate students would be capable of embracing current and emerging technologies and competent in working in a global economy, foster an environment of intellectual

development and pursuit of research dedicated to the service of the Arab and human societies and instill the spirit of upholding deeply rooted social and ethical values of the Arab-Islamic heritage and an appreciation for other human cultures and heritages (Dirani & Yoon 2009).

2.7 Review of Empirical Studies on E-Learning Adoption

E-learning is a relatively recent innovation, yet it has attracted substantial attention and research not only in education but also in other fields. Generally, research on e-learning has revolved around two areas namely research on the impact of e-learning on the educational process or its effectiveness and comparing it to the traditional face-to-face mode of education (Piccoli, Ahmad, & Ives, 2001; Zhang, Zhou, Briggs, & Nunamaker, 2006; Aduke, 2008, p.290-295; Mulwa & Kalui, 2014). Secondly, research on e-learning environment design issues including human computer interaction (HCI), usability and design principles that impact on e-learning adoption (Chang & Wang, 2008; Mulwa & Kalui, 2014).

Pituch and Lee (2006) noted that although e-learning systems are increasingly being used, only few theory-driven researches examining the antecedents of e-learning adoption and use is available. The available literature offers merely rudimentary information about the students' experience and their personalities (Diaz & Cartnal, 1999; McManus, 2000; Harbeck, 2001). Further, recent report by the National Council for Science and Technology (2010) indicated that computer use in developing countries classrooms is still in its early phases resulting in a situation in which many schools have

missed out on the benefits of ICT such as access to educational content, information sharing and networking with other students and peers (Mulwa & Kalui, 2014).

The literature review highlighted that developing countries face numerous challenges in the adoption of e-learning such as lack of vital e-learning components, technological infrastructure, negative perceptions of online learning, skills and unstable socio-political environments (Enuku & Ojogwu, 2006; Rennie & Mason, 2007; Dirani & Yoon, 2009).

However, lack of research on e-learning adoption in developing countries remains the main challenge in this regard. That is because e-learning is still new, whereas in the developed countries there is far more research on e-learning being conducted in developed nations (Dhanarajan, 2001; Heeks, 2002; Rajesh, 2003; Andersson & Gronlund, 2009). Hence, developing countries should gain better understanding regarding the challenges of e-learning adoption to enhance its implementing in these countries (Andersson & Gronlund, 2009).

Whereas there are a number of researches done on the introduction, use and the potential impact of the ICT on learning especially in the context of the developed countries, there is no evidence of studies done on factors affecting adoption of e-learning in developing countries (Tucker, 2012; Adwan et al., 2013; Mulwa & Kalui, 2014; Fletcher et al. 2015; Maina & Nzuki, 2015; Osubor & Chiemeké, 2015). Therefore this study seeks to fill this gap and examine the factors affecting adoption of e-learning in developing countries in general and especially in the context of Jordan.

Broadly speaking, in researching factors influencing e-learning related behaviors such as acceptance, adoption and usage, four dimensions have been addressed: individual user, system characteristics, social pressure and institutional issues (Nanayakkara & Whiddett, 2005; Siritongthaworn, Krairit, Dimmitt & Paul, 2006). However, none of the reviewed studies combined these dimensions in one single research. Some researchers investigated the contribution of some selected characteristics of an e-learning system on the adoption and acceptance of e-learning (Pituch & Lee, 2006; Fu *et al.*, 2007; Masrom, 2007; Liao & Lu, 2008; Hsbollah & Idris, 2009).

For instance, Pituch and Lee (2006) extended TAM (Davis, 1989) to include three system characteristics, namely system functionality, interactivity and response time. Their research investigated the impact of these system characteristics on 259 college students' intentions to use an e-learning system. The findings of this study confirmed the suitability of TAM to study users' acceptance of new technologies. System characteristics, primarily, functionality, have had the strongest effect on users' intentions to use the system. All other system attributes, including TAM's core beliefs were also important in shaping intentions.

Furthermore, the literature review revealed that some studies have looked at the role of factors related to the user of e-learning (Wagner & Flannery, 2004; Chen & Chen, 2006; Abdel-Wahab, 2008). Self-efficacy and attitudes have been the most frequently addressed constructs from the individual dimension. For instance, computer self-efficacy was found significant in influencing intention to use e-learning (Pituch & Lee, 2006; Rezaei, Mohammadi, Asadi, & Kalantary, 2008).

Other researchers applied TRA (Fishbein & Ajzen, 1975) and TPB (Ajzen, 1985) which attribute a major role to the attitudes of the individuals in determining their intentions. Ndubisi (2004) applied this line of theory to investigate the adoption of a Blackboard system in a Malaysian university. Attitude was the most significant factor in determining the students' intentions to adopt the system.

Mahmod, Dahlan, Ramayah, Karia and Hasmi (2005) investigated whether attitude was related to the adoption of an online MBA program and further added several attitudinal beliefs to their model derived from Rogers (2003). Their finding supported the importance of attitude in shaping adopters behavior. The significant influence of attitude on intention to adopt e-learning has been further demonstrated in other studies (e.g. Wagner & Flannery, 2004; Gao, 2005; Ngai *et al.*, 2007; Jung *et al.*, 2008; Park, 2009). Nevertheless, the influence of attitude has not been consistent. Masrom (2007) reported that attitude was not significant in its impact on intention to use e-learning.

Moreover, in investigating e-learning adoption, some studies added a social dimension. In accordance with TRA (Fishbein & Ajzen, 1975) and TPB (Ajzen, 1985), social influence was investigated mainly in a generic sense. That is, the perceived pressure from important others' or significant others has been studied (Ndubisi, 2006). Other studies, however, decomposed this construct into specific relevant groups such as course leaders, teachers, friends, colleagues and managers (Ma & Clark, 2003; Lee, 2006; Selim, 2007).

Ma and Clark (2003) investigated online course acceptance involving both face-to-face versus online course instruction by using a paired sample experiment. Their findings revealed that perceived social pressure was stronger than the other factors in influencing intention. In investigating the use of internet in university education in Hong Kong, Cheung and Huang (2005) found that social pressure in the form of perceived pressure from close friends and classmates was correlated with the use of internet for university studies.

Few scholars have investigated the adoption of e-learning at micro-level and the influence of institutional dimension on the adoption decision (Cheung & Huang, 2005; Selim, 2007; Lau, 2007). Some authors argued that to have a successful implementation and usage of e-learning, ample access to technical advice, expertise and support is a critical success factor (Soong, Chan, Chua, & Loh, 2001). In this respect, Selim (2007) specifying e-learning critical success factors as perceived by university students and listed university support as one key factor. Although, Selim's study specified e-learning critical success factors by using the robust confirmatory factors analysis, the study did not test any structural model detailing the relationship between the critical factors and acceptance.

Few researchers have been done on investigating the factors that influence the adoption of new ICT outside the boundaries of the Western countries and specifically in the Arab region (Straub, Loch, & Hill, 2001; Talet, 2007). In fact, much of the available literature has focused on the perspective of faculty staff and administrators regarding web-based instruction. For example, Al-Fulih (2002) and Al-Mobarraz (2007) conducted

a research on the factors influencing the adoption of the internet for academic purposes by Saudi university professors.

The two studies adopted Rogers (2003). While Al-Mobarraz (2007) found all the characteristics of the model to be significant predictors of the decision to adopt, Al-Fulih (2002) reported that only image, relative advantage, compatibility, ease of use and visibility were significant in explaining faculty adoption of the internet for academic purposes. In addition, two studies by Al-Harbi (2002) and Al-Ghonaim (2005) which investigated factors that influence the attitude of faculty and administrators toward online courses, revealed demographic variable such as area of expertise, age and experience were significant factors that influenced attitude towards online courses. Other factors, such as increased workload and lack of technical and administrative support, were found to be major barriers to the adoption of online courses.

Al-Saif (2005) investigated faculty usage of web-based instruction. He reported that certain demographics (age and academic rank) have a significant impact on usage. Additionally, his study uncovered such barriers to using web-based instruction are lack of skills, lack of support, poor infrastructure and lack of reward.

Andersson and Gronlund (2009) examine the challenges for e-learning with a particular focus on developing countries in order for understanding how to adopt e-learning in developing countries. A comprehensive literature review including 60 papers on e-learning challenges was undertaken. In their study they found 30 specific challenges which were divided into four categories. These categories are: technology, individuals,

context and courses. The overall conclusion is that these challenges are valid for both developed and developing countries. However, Andersson and Gronlund's (2009) findings revealed that developing countries focus on access to technology and context for adoption of e-learning and individuals' characteristics was neglected, whereas in developed countries, researchers are concern about individuals' characteristics for its adoption of e-learning.

Based on the study by Andersson and Gronlund (2009) it is obvious from the comparison above, developed countries paid attention to the individual in implementing e-learning, whereas the developing countries concerned with the technology factors. It was stressed by Moussa and Moussa (2009) the current situation of education in Arabic generally and especially e-learning is quite poor because numerous factors. Some of the most essential factors are as follows: increasing number of commercialized universities and schools, lack of measures for quality assurance of e-learning and education, lack of accreditation by internationally acknowledged organizations, poor usage of modern technologies outside classrooms due to lack of financial and technological resources, little effort to update existing curricula giving higher priority to quantity against quality of material taught, neglecting interactive teaching and teamwork in class rooms and dependence on memorization instead of critically thinking, logically analyzing, objectively criticizing and creatively proposing by the students at universities and especially at schools.

In general, numerous studies have been undertaken on e-learning adoption and implementation issues (Newton & Ellis, 2005; Xu & Wang, 2006), e-learning readiness

(Smith *et al.*, 2003), e-learning evaluation (Piccoli *et al.*, 2001; Bernard *et al.*, 2004; Papastergiou, 2006; Wang *et al.*, 2007), quality standard (Frydenberg, 2002; Roffe, 2002; Julien, 2005) and e-learning infrastructure (Davis, 2004; Fahy 2004; McGreal & Elliott, 2004; Jones & McCann, 2005). Most researches seem to focus on technological, design and delivery issues (Soong *et al.*, 2001; Volery & Lord, 2000; Testa & de Freitas, 2003).

Liao and Lu (2008) and Ho and Kuo (2010) reported that numerous prior studies on e-learning are concerned with learning research have been performance and effectiveness. Thus, it can be stated that few theoretical researchers undertaken for e-learning in both higher education and workplace learning (Daneshgar *et al.*, 2008; Chu & Chu, 2010). Furthermore, McPherson and Nunes (2006) emphasized that few studies have discussed institutional and organizational aspects of e-learning adoption and implementation.

A study done by Ho and Kuo (2010) recommended direction for future studies to investigate the impact of the adult workers on organizational factors. Studies that have been conducted with the aim of identifying the antecedence factors associated with e-learning adoption has been limited in general especially in the context of adult worker adoption in the developing countries (Dirani & Yoon, 2009). For example, a study by Dirani and Yoon (2009) investigate the factors that affect Open Distance Learning (ODL) quality in the Arab Open University in Jordan (AOUJ). The study used a qualitative approach, which included semi-structured interviews with the program director, two instructors, and three students. The findings revealed that three significant conclusions can be drawn from the study about e-learning in the Arab region: (1) the existence of

adverse conditions, (2) the presence of strong instructional practices, and (3) the need to improve administrative support.

A study done by Abbad and Nahlik (2009) to identify the factors affecting students' adoption of an e-learning system and to identify the relationships among these factors in a university in Jordan. The sample of their study consists of 486 undergraduate students, who were using the TAM based e-learning system at the Arab Open University.

Tyan (2004) pointed out the challenges of the diffusion process of e-learning in corporate Taiwan. A number of factors affect the implementation of corporate e-learning, such as maturity of e-learning, corporate readiness, the cost of ownership, government support, and employees' personal characteristics such as attitudes, personality, background, gender and age. The findings of his study indicates that both situational factors such as infrastructure, politics, policies, organizational culture and personal factors such as age, gender, personality, values, prior experiences, attitudes, skills, knowledge are critical elements in obtaining successful e-learning outcome.

A study conducted by Mikalsen and Walderhaug (2009) to investigate the factors affecting healthcare workers acceptance and utilization of e-learning in post-school healthcare education in Norway. The findings of their study show that perceived compatibility and subjective norm explain e-learning tool usage amongst students. Also, the findings revealed the students considered e-learning to be compatible with the course and had a positive effect on e-learning tool usage.

Yang *et al.*, (2009) carried out a study on social influence on knowledge worker's adoption of innovative information technology. The objective is to improve the understanding of the impact of social influences on different types of users' perceptions and adoption of IT. The finding is that before workers consider adopting innovative IT, they are sensitive to general perceptions of its usefulness.

A study conducted by Nichols and Levy (2009) to investigate persistence in e-learning adoption groups of 187 college students in the United States. They investigated students' intrinsic and extrinsic motivation, students' attitude toward computers, students' perceived satisfaction and students' previous academic performance measures. The findings show these factors have shown tendencies toward persistence in e-learning courses adoption. Results of this study indicate that students' high school GPA was a significant predictor of e-learning course persistence for college students.

Table 2.5 Empirical Findings and Future Research of E-Learning Adoption Studies

Author and year	Objective	Findings	Direction for future research	Sample
Wu <i>et al.</i> , 2012	This study is a productivity review on the literature gleaned from SSCI, SCIE databases concerning innovation research in E-Learning.	The result indicates that the number of literature productions on innovation research in ELearning is still growing from 2005. The main research development country is England, and from the analysis of the publication year, the number of papers is increasing peaking in 25% of the total in 2010. Meanwhile the main source title is British Journal of Educational Technology.	The situation of current research on this topic can be well grasped for guiding the future research.	review on the literature gleaned from SSCI, SCIE databases
Al-adwan & Smedley, 2012	To explores the factors that influenced the development of	The results show attitude towards engaging in e-learning with outcomes demonstrating that training	Explore the strategic and operational opportunities focusing on	Full-time staff and students

	learning through technology at two Jordanian universities.	and development is required prior to implementation to adequately support the learning transition. The organizational infrastructure often presents the greatest barrier to such developments.	technological readiness, skills and attitudes alongside cultural influences before e-learning can have a significant impact to influence changing practices within the Jordanian student learning experience.	
Frimpon, 2012	To compile the critical success factors (CSFs) of e-learning from current literature; group CSFs that approximately attain the same objective into roles where the roles together accomplish the main goal of a best e-learning deployment.	17 critical success factors (CSFs) were obtained through an exhaustive search, and were partitioned into 4 natural roles of Student, Instructor, Technology, and Institution. The confinement of the CSF interactions to within roles resulted in a dramatic reduction of pair wise comparisons. Pair wise comparisons are a measure of interactions and concomitantly of complexity.	Partitioned into 4 natural roles of Student, Instructor, Technology, and Institution.	review on the literature
Zakaria <i>et al.</i> , 2012	To investigate the adoption of Web 2.0 in the classroom.	findings have revealed that Web 2.0 may not be necessarily the total solution for learning in the digital age. We found that the implementations across institutions have reached to a significant level although the level of actual e learning 2.0 implementation by teachers would vary according to the subject matter and their methods of learning delivery.	More researchers needed to carry further work in the field of e-learning 2.0.	Teachers and students
Mayoka & Kyeyune, 2012	Examination of e-learning Information Systems failures and adoption	Findings indicate that Assistant Lectures and Lecturers were more willing to adopt to e-learning than their senior	More researchers needed to carry further work in the field of Rogers and Shoemaker's	Staff and students

	problems in Ugandan universities based on Rogers and Shoemaker's Diffusion of Technological Innovation Theory.	counterparts, the Professors. The results also indicate that although students are aware of e-learning, many of them were not comfortable using the technology.	Diffusion of Technological Innovation Theory.	
Ozdemir, 2010	To identify reasons behind the repetitive problems which occur in the context of Turkey's e-learning efforts in primary and secondary learning.	Ministry of national education could not capture, organize, disseminate, or reuse the knowledge and experiences gained during the project life cycles in short; it could not keep its organizational memory which will be useful to guide the managers of future projects.	The project is designed to empower organizational structure and human resources through new policies, laws, regulations and in-service trainings. Since this project is at the planning phase, the results will be observed in the future.	Interviews interviewees who was an academician and charged by Ministry of national education.
Chu & Chu, 2010	To examine the mediation effects of Internet self efficacy between peer support and e-learning outcomes in Taiwan.	Fully mediates the relationship between peer support and learners' persistence in e-learning, and partially mediates learners' perceived learning and satisfaction. It is noteworthy that the findings do not support direct group-level contextual effects of group potency.	Further research could focus on learning environments for adult learners cross-culturally. Group effects in collaborative learning online also need more attention from researchers, and need to be analyzed with proper modelling methods, such as HLM.	Students who aged over 45 tend to be willing to continue to learn in e-environment.

Mikalsen & Walderhaug, 2009	The objective of the study presented here was to perform an empirical investigation on factors affecting healthcare workers acceptance and utilization of e-learning in post-school healthcare education in Norway.	The results show that perceived compatibility and subjective norm explain system usage of the e-learning tool amongst the students. This study also found support for factors such as facilitating conditions and ease of use leads to the e-learning tool being considered useful.	Future studies should also consider the effect of accreditation of the e-learning course on acceptance it receives.	The survey of 14 state-enrolled nurses and skilled-workers within the field of healthcare.
Yang <i>et al.</i> , 2009	To improve the understanding of the impact of social influences on different types of users' perceptions and adoption of IT in Korea.	The key finding is that when knowledge workers consider adopting innovative IT they are sensitive to general perceptions of its usefulness. The results have implications for management enquiry and practice.	Several directions for future research emerge from this study (which may be seen as current limitations i.e., its single location context).	The knowledge workers whose scores were beyond the average were included.
Ho & Kuo, 2010	To determinants of the IT professionals' e-learning outcomes by investigating the effect of IT professionals' computer attitudes on two personal outcomes: self-perceived flow experience and learning outcomes in Taiwan.	Results confirm that both computer attitude and flow experience generate positive and direct influence on learning outcome. Specially, the effect of personal computer attitude is amplified on learning outcome through experience of flow in an e-learning environment.	The participants' background information, participants' personal background, adult workers' structural variables can be explored.	Participants in 50 technological companies in Taiwan.

Wua <i>et al.</i> , 2010	To examine the determinants of student learning satisfaction in a blended e-learning system (BELS) environment in Taiwan.	The learning climate and performance expectations significantly affect learning satisfaction. Computer Self-efficacy, system functionality, content feature and interaction significantly affect performance expectations. Interaction has a significant effect on learning climate. The findings provide insight into those factors that are likely significant antecedents for planning and implementing a blended e-learning system to enhance student learning satisfaction.	The study provides insights into what determines student learning satisfaction in a BELS environment, it has several limitations that also represent opportunities for future research.	Students that had the opportunity to take courses via (BELS).
Bolliger <i>et al.</i> , 2010	To investigate the impact of podcasting on student motivation in the online environment during fall 2008 and spring 2009.	The indicate students were moderately motivated by the use of podcasts in their online courses. Statistically significant differences in student motivation based on gender, class standing, and prior online learning experience were found. Benefits of using podcasts and recommendations for improvement of the multimedia files were offered by users.	Further research is necessary to investigate how instructors implement and utilize podcasts in online courses.	Undergraduate and graduate students
Sorebo <i>et al.</i> , 2009	To examine the effects of self-determination theory constructs in the context of teachers' utilization of e-learning technology in Norway.	The results show that extension of IS-continuance theory with constructs that represent users' basic psychological needs and intrinsic motivation can be useful for predicting their e-learning continuance intentions .	Understanding such complex and dynamic chains as suggested here, although beyond the scope of the current study, represents an interesting and important area for future research.	Teachers

Abbad <i>et al.</i> , 2009	To investigate and identifies some of the major factors affecting students adoption of an e-learning system in a university in Jordan	Technology Acceptance Model (TAM) was developed to investigate the underlying factors that influence student's decisions to use an e-learning system. Whilst findings support existing literature about prior experience affecting perceptions, they also point to surprising group effects, which may merit future exploration.	Future research possibilities in that it could be explained by deconstructing perceptions of use and the nature of the payoff, to use the Efferson <i>et al.</i> , (2006) construct	486 undergraduate students, who were using the Model based e-learning system at the Arab Open University
Liu <i>et al.</i> , 2009	To the growing body of research on TAM by introducing and confirming the influence of media richness as an external variable on the user's intention to use e-learning technology in Taiwan.	Important to educators faced with the challenge of developing online instruction that motivates learners sufficiently to get them into a state of flow while simultaneously allowing developers to stay within the development budget.	Enrolled in a systems	Future research might determine the propensity with which user selection of accessible media combinations leads to increases in usage intentions.
Banday <i>et al.</i> , 2014	To examine adoption of ICT and e-learning tools in engineering institutions	The results are discussed in light of relevant research to suggest recommendations for improving e-learning implementations in engineering education	engineering institutions	recognized factors and known challenges must be undertaken.
Selviandro <i>et al.</i> , 2014	To encouraging the development of the concept of Indonesia Open Educational Resources (IOER) and as well as the adoption of concept of cloud computing.	the result of evaluation showed that Cloud-Based Open Learning has an investment of 35.61% efficiency, increase return on investment (ROI) of 60.95% and an increase in benefits (NPV) of 81.97% from the user's perspective. While from the provider's perspective, Cloud-Based Open Learning has an investment of 200% efficiency, increase return on investment (RoI) of 220.4% and an increase in benefits (NPV) of 109.55%.	Learners	In our future work, we will design and develop a semantic based search engine for enhanced the system and integration it with personalization e-learning.

Hossain et al., 2014	The study propose an ACO based multimedia content adaptation approach, which inherits the adoption of ACO-based path selection behavior in the path computation for appropriate learning content customization.	The proposed approach uses ant intelligence for searching suitable services in an E-learning environment according to user's context.	compare proposed approach with other two competitive algorithms,	Compare algorithms with others
Johar et al., 2014	To compare the e-learning acceptance of postgraduate students between Sri Lanka and Malaysia as these two countries have more similarities in terms of history, geography and culture.	It was found that both Sri Lankan and Malaysian postgraduates' e-learning acceptance is nearly similar.	postgraduate students	Using the same model and apply it to other sample
Yegon., 2014	To compare challenges affecting adoption of e-learning for capacity building in public service sectors of Kenya and South Africa.	The study findings identified challenges that hinder the adoption of e-learning in the public service and cuts across Kenya and South Africa. These include infrastructure problem, lack of funds, and lack of policies favoring the use of e-learning, provision of reliable e-learning portals to the government employees.	The study population represented participants who underwent through a capacity building course African leadership in ICT (ALICT) course offered by GESCI.	Further research can be done with a view of visiting the government offices in the two countries so as to do own analysis of the challenges and status of e-learning adoption.
Odeshi 2014	The study examined the attitude of students towards e-learning in selected south-west Nigerian universities.	Findings showed that students have a positive attitude towards e-learning because they find the system easy to use and useful for their course work. Also, attitude influences the intention to use an e-learning system.	postgraduate and undergraduate students	Future studies to determine if a significant relationship exist between attitude towards e-learning and these other variables.

Alamin & Elgabar 2014	to highlight the main factors that support the use of E-learning technologies, and the benefit of such applications in developing countries as general and in Sudan as a particular situation, toward the achievement of e-learning goal	The application of the concept of e-learning contributes significantly in finding solutions to the problems that stand in the way of the dissemination of science and knowledge in many countries of the world especially in the third world countries.	Students	Future studies Have to include different sectors of society such as health and business, banks and other institutions.
Marfo & Okine 2014	This study explores the implementation of e-learning in Ghanaian tertiary institutions with KNUST as a case study.	Many institutions of Higher Education and Corporate Training Institutes are resorting to e-Learning as a means of solving authentic learning and performance problems, while other institutions are hopping onto the bandwagon simply because they do not want to be left behind.	Student	An elaborate e-learning policy must be drawn out and used to implement e-learning
Chu & Montalbo, 2014	This paper evaluated students' satisfaction on the use of VLE as a support technology in teaching students in the Graduate School.	The VLE is found to be effective as a supportive tool to supplement traditional classroom instruction as revealed by satisfied students. Positive attitude is exhibited on the use of VLE regardless of gender. On the other hand, young and experienced users of e-learning platforms tend to be difficult to satisfy with regards to the use of VLE.	Students	As mentioned, the VLE can be utilized to facilitate learning and improve students' performance. Thus, the need for a periodic and continuous evaluation to identify strengths and weaknesses of such learning system is essential.

Based on the Table 2.5 above, this study varies from other studies in a sense it aims to characterize and measure e-learning adoption among adult workers in Jordan. However, there is little attention and lack of adoption of the e-learning among adult workers

in the context of developing countries and the Arab world in particular (Mikalsen & Walderhaug, 2009). Furthermore, the literature review of this study identifies the four major factors that influence on e-learning among adult workers. These factors are technological factors such as relative advantage, compatibility, complexity, system quality, information quality and serves quality, organizational factors such as top management support, culture and structure; personal factors such as social contact, social stimulation, professional advancement, external expectations, cognitive interest and institutional forces such as coercive pressures normative pressure mimetic pressures that are associated with such adoption, as well as the impacts of e-learning on adults working.

In addition, this study aims to evaluate the usefulness of Bloom's taxonomy of e-learning outcomes. DeLone and McLean's impact in terms of individual outcomes within organization was used in the current study in order to evaluate the performance of adult workers. Consequently, the current study attempts to provide a good starting point for further researches which links the organisational, institutional forces, technological, and the personal factors to any e-learning adoption. The next sections will provide a discussion of these factors that influence e-learning adoption on adult workers and their impacts performance.

2.8 Theoretical and Models of Technology Acceptance

Numerous theories have been developed to explain organization and individual's adoption of innovations. Among these are Fishbein and Ajzen's (1975) Theory of Reasoned Action (TRA); Ajzen's (1985) Theory of Planned Behavior (TPB); Davis's (1989) Technology Acceptance Model (TAM); TAM two; TAM three; Unified Theory of Acceptance and Use of Technology (UTAUT); Roger's (1995) Theory of Diffusion of Innovation (DOI) and Theory of Delone, McLean's (1992) Information Systems Success (IS).

2.8.1 Theory of Reasoned Action (TRA)

The theory of reasoned action (TRA) was proposed by Fishbein and Ajzen in (1975) to explain a wide range of behaviors depended upon particular situations integration of individual attitudes and beliefs, and the influence of beliefs of other relatives to the individual. Fishbein and Ajzen (1975) suggested that attitude refers to personal beliefs. The personal belief is interested with the behavior more than the beliefs about the objects in the world. Certain of relevant beliefs affect the personal's attitude toward the behavior, other beliefs are normative in nature that are beliefs where referents regard the individual must or must not carry the behavior. According to this theory, an individual behavioral intention emerges as a variable of one's subjective norm and one's attitude toward behavior. Subjective norm and attitude influence the individual behavioral intentions and consequently impinge on an individual behavior (Figure 2.5).

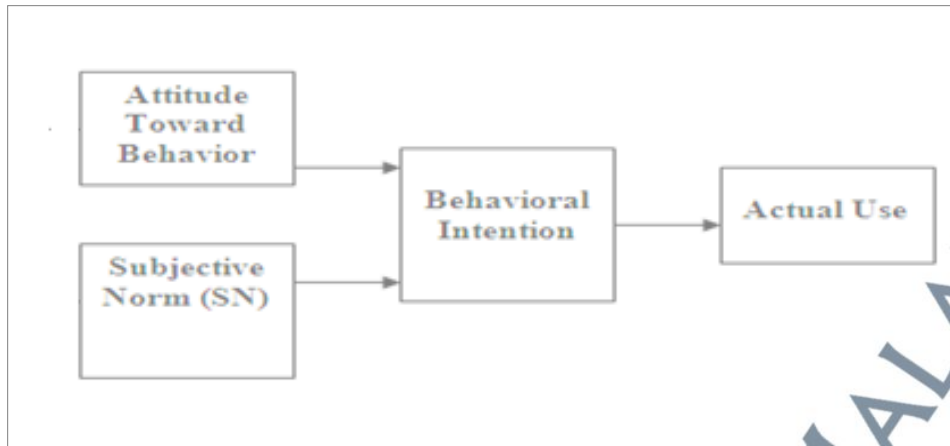


Figure 2.5 Theory of Reasoned Action (Fishbein & Ajzen, 1975)

2.8.2 Theory of Planned Behavior (TPB)

The theory of planned behavior (TPB) originated from the theory of reasoned action (TRA) which can be defined as a relationship among beliefs, behavior, intentions, perceived behavioral control, norms and attitudes (Figure 2.6). The attitude towards behavior; subjective norm and perceived behavioral control influence individual's intention to perform a given behavior (Ajzen, 1985).

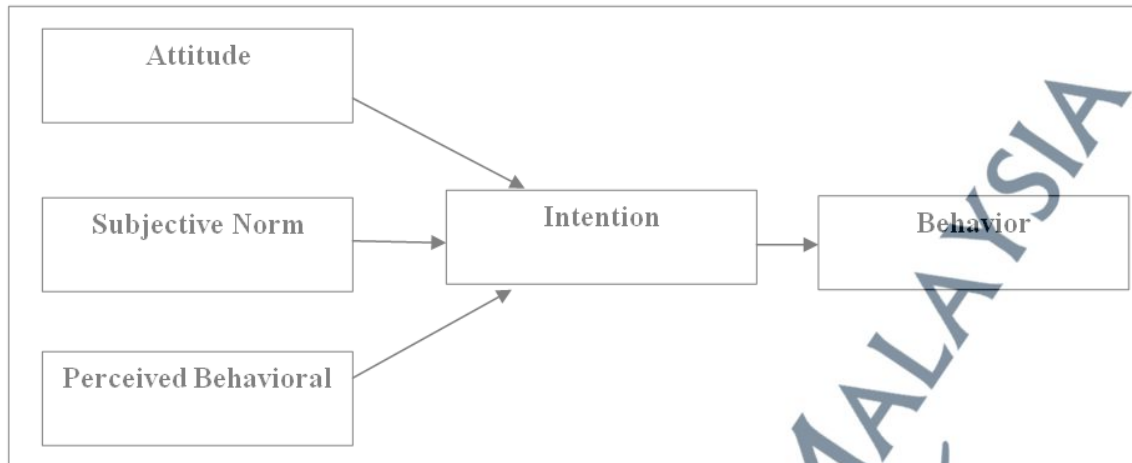


Figure 2.6 Theory of Planned Behavior (Ajzen, 1985)

The most significant difference between TRA and TPB is the third determinant variables that are perceived behavioral control which can be defined as the perceived ease or difficulty of performing the behavior (Ajzen, 1991). Perceived behavioral control is classified into two factors namely perceived facilitation on individual's evaluation of the significance of those resources to the accomplishment of results and control beliefs the availability of opportunities, skills and resources. More specific, control beliefs can be defined as the absence or presence of requisite opportunities and resources essential to perform behavior.

2.8.3 Technology Acceptance Model (TAM); (TAM2) and (TAM3)

Based on the two theories (TRA and TPB), several models have been proposed in order to explain individual acceptance and adoption of innovations. Davis (1989) developed TAM model which was based on TRA by Ajzen and Fishbein (1975) to explain diffusion and adoption of computer utilization behavior. TAM is widely used to examine technology acceptance and adoption in the information systems (Gefen & Straub, 1997).

As suggested by TAM model, two basic factors were developed to explain diffusion and adoption. These factors explain the variance in user's intention or behavioral intention. The two key factors in TAM model are Perceived Ease of Use (PEU) and Perceived Usefulness (PU). Davis (1989) defines PEU as the degree to which an individual believes the given information system would be free the intensity of their job. While PU can be defined as the degree to which an individual believes using the information system would improve his or her job performance. Based on the theory of reasoned action (TRA), technology acceptance model looks at how ease of use and perceived benefits could influence technology acceptance (Figure 2.7).

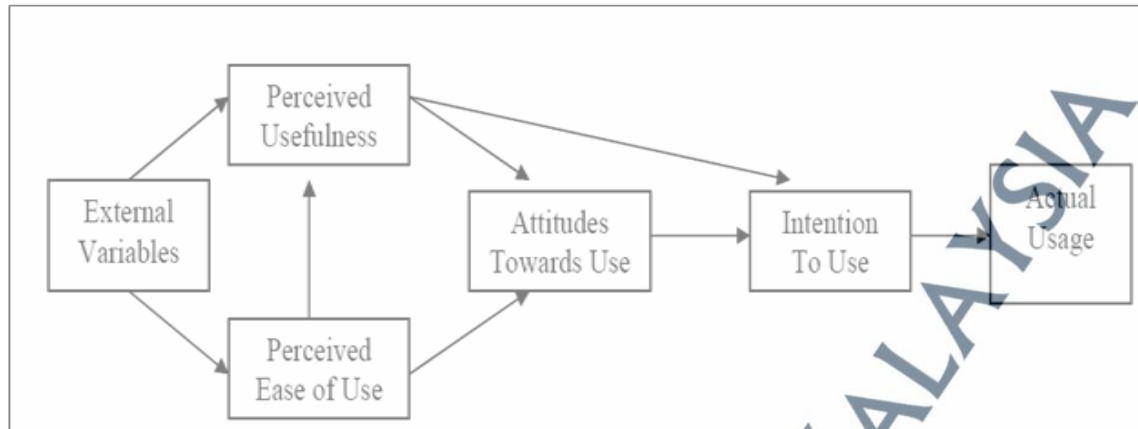


Figure 2.7 Technology Acceptance Model (Davis, 1989)

TAM has been used in prior studies in the adoption of virtual learning environment (Raaij & Schepers, 2008), Blackboard system (Liaw, 2008) and the WebCT (Ngai, Poon, & Chan, 2007). Specifically, TAM was also expanded and developed to include the attitude toward using Information Technology (IT) including computer utilization behaviors (McFarland & Hamilton, 2006; Roca *et al.*, 2006; Noyes & Garland, 2006; Nichols & Levy 2009; Duan *et al.*, 2010).

Moreover, technology acceptance model was also utilized to examine the part of perceived resources such as in online learning adoption (Lee, 2008), the impact of system attributes on e-learning utilize (Pituch & Lee, 2006), the influence of media richness and flow on e-learning technology acceptance (Liu, Liao & Pratt, 2009), and factors influencing engineers' acceptance of asynchronous e-learning systems in high tech companies (Ong, Lai, & Wang, 2004).

Beside TAM model, Venkatesh and Davis (2000) developed TAM2 model as an extension into the original TAM model developed by Davis, (1989). As suggested by

TAM and TAM2 models, individual's uptake to use a system is determined by two major factors. The key factors are perceived usefulness and perceived ease of use. In order to better perceive the determinants of perceived usefulness, TAM2 model incorporates two additional theoretical constructs: social influence processes and cognitive instrumental processes. Three social forces influence perceived usefulness namely subjective norm, image, and voluntariness. Four cognitive factors influence perceived usefulness namely job relevance, output quality, result demonstrability, and perceived ease of use (Figure 2.8).

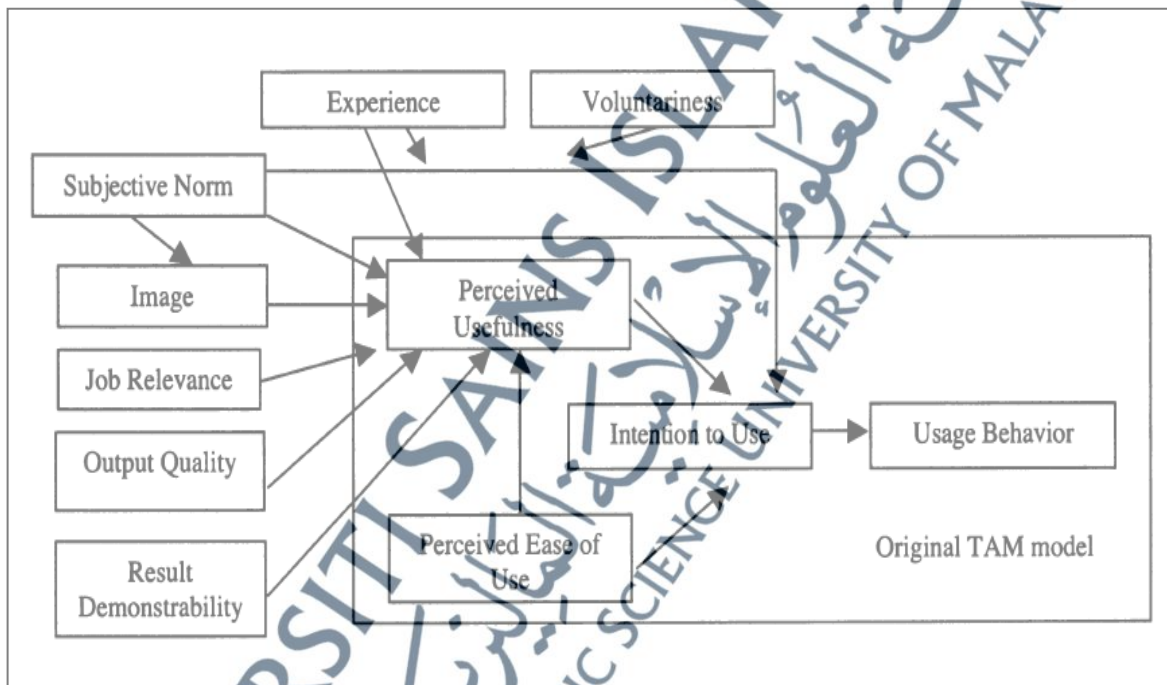


Figure 2.8 Technology Acceptance Model Two (Davis, 1989)

Job relevance is an individual's perception of the degree to which the technology is applicable to his or her job (Davis, 1989). Output quality is an individual's perception of how well a system performs tasks necessary to his or her job. Result demonstrability is

the tangibility of the results of using the technology. Perceived ease of use both directly and indirectly impacts on perceived usefulness. Subjective norm is defined as a person's perception that people who are important to him think he should or should not use the technology (Davis, 1989).

Image is the degree to which one perceives the use of the technology as a means of enhancing one's status within a social group. Finally, voluntariness is the extent to which one perceives the adoption decision as non-mandatory. To sum up, TAM and TAM2 emphasize that perceived usefulness and perceived ease of use of information Technology (IT) are the main determinants of IT usage (Alenezi, Karim & Veloo, 2010; Eke, 2011).

A third iteration of the TAM model (TAM 3) was created, combining TAM 2 and the determinants based on perceived ease of use by incorporating the findings of previous research in order to improve acceptance rates of new technologies (Figure 2.9). The TAM 3 model contains both factors influencing perceived ease of use (computer self-efficacy, computer anxiety, computer playfulness, perceptions of external control, perceived enjoyment and objective usability) and perceived usefulness (perceived ease of use, subjective norm, image, and result demonstrability). The goal of the revised model is to produce practical guidance and suggestions to practitioners (Venkatesh & Bala, 2008).

TAM3 longitudinal testing by Venkatesh and Bala (2008) identifies many new relationships between variables. Specifically, perceived ease of use, subjective norm, image, and result demonstrability are significant predictors of perceived usefulness at all

time periods. When participants experience increasing output quality, job relevance has a strong positive effect on perceived usefulness. Additionally, with increasing experience, the subjective norm has less effect than perceived usefulness. The anchors (computer self-efficacy, computer anxiety, computer playfulness, and perceptions of external control) are significant predictors of perceived ease of use at all points in time and adjustments of perceived enjoyment and objective usability become significant at later times to perceived ease of use. Finally, Venkatesh & Bala, (2008) argued that the perceived usefulness is the strongest predictor of technology acceptance and use at all times (Figure 2.9).

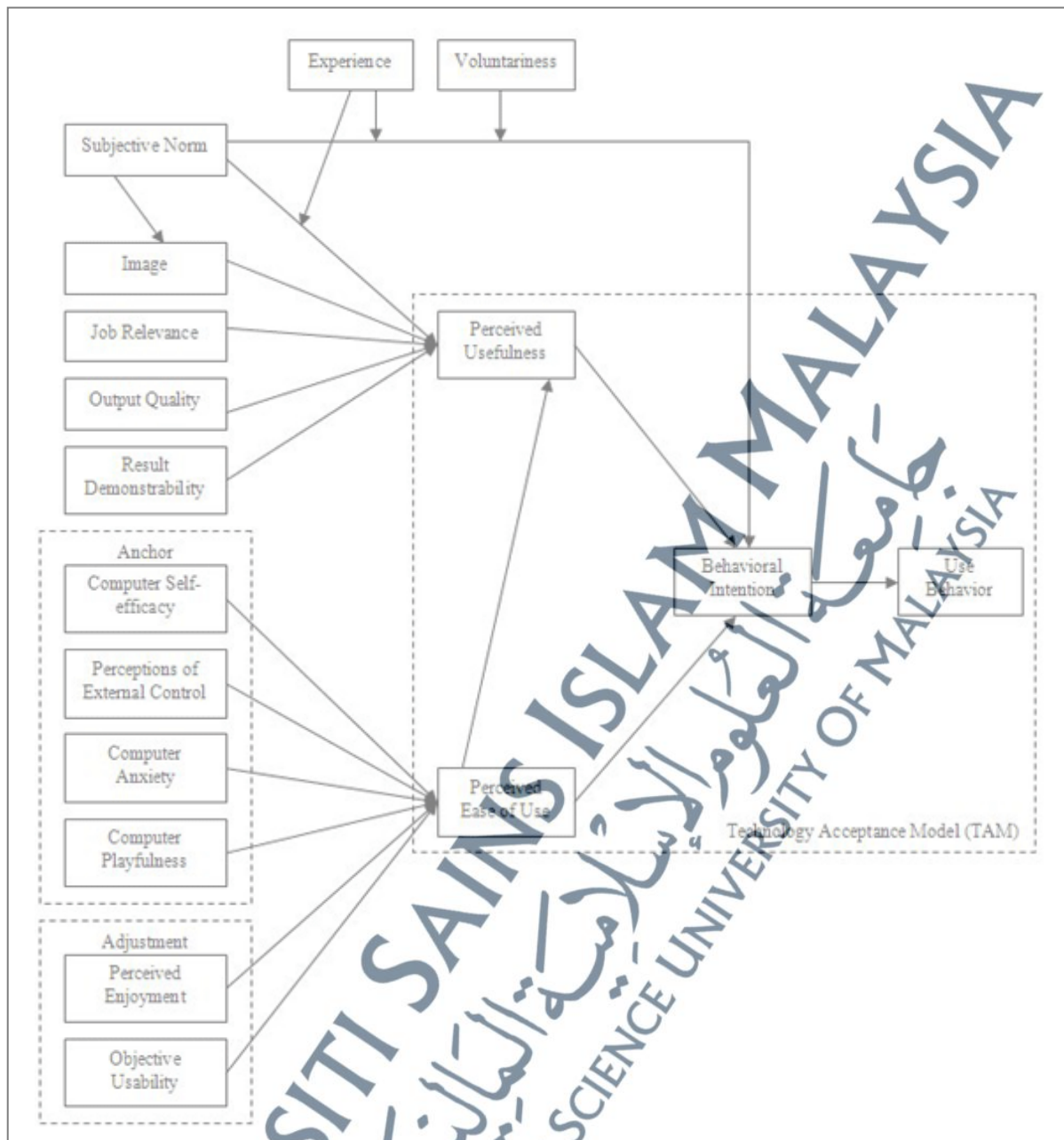


Figure 2.9 Technology Acceptance Model Three (Davis, 1989)

2.8.4 Unified Theory of Acceptance and Use of Technology (UTAUT)

UTAUT (Venkatesh et al., 2003) was introduced and formulated as a result of a meta-analysis of constructs of eight technology acceptance models, intended to explain the usage behavior over IT implementations. UTAUT has four key constructs: performance expectancy, effort expectancy, social influence, and facilitating conditions. In addition, there are four moderators: gender, age, experience, and the voluntariness of use as depicted in Figure 2.10. According to UTAUT, performance expectancy refers to the degree to which an individual believes that using the system will help him or her to attain gains in job. While, effort expectancy refers to the degree of ease associated with the use of the system. Next, social influence refers to *“the degree to which an individual perceives that important others believe he or she should use the new system”*, and, facilitating conditions refers to the degree to which an individual believes that an organizational and technical infrastructure exists to support the use of the system (Venkatesh et al., 2003).

In UTAUT, mediating factors might have certain impacts on the key constructs in use behavior. In addition, the key difference between UTAUT and other models is distinguished between the determining factors and mediating factors. Generally, UTAUT has been applied in a variety of research areas: Internet banking (AbuShanab & Pearson, 2007), wireless LAN technology adoption (Anderson & Schwager, 2004), mobile devices/services (Knutsen, 2005; Carlsson, Carlsson, Hyvonen, Puhakainen, & Walden, 2006).

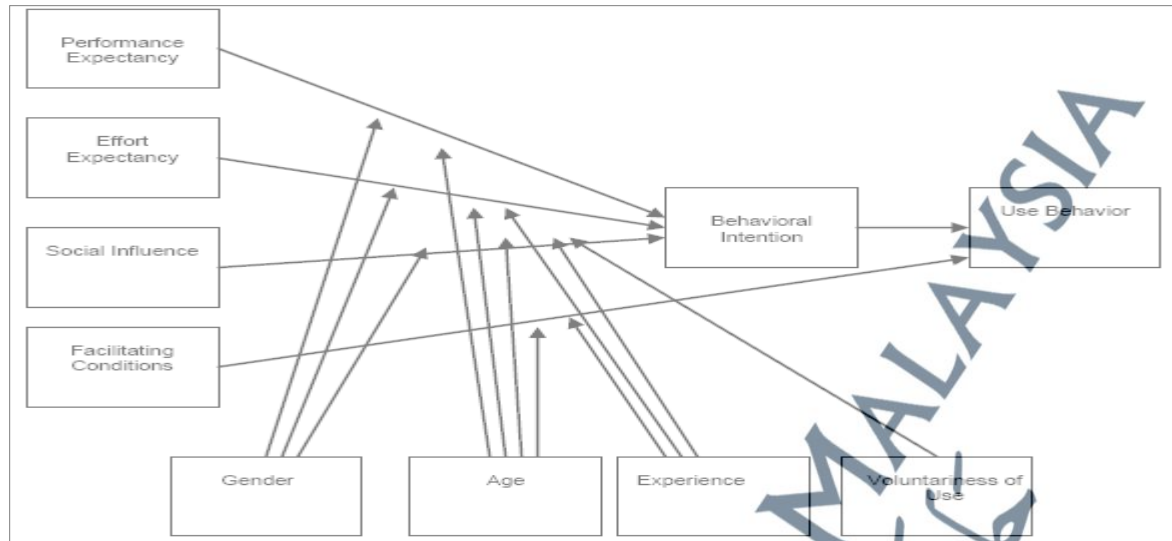


Figure 2.10 UTAUT Mode (Venkatesh et al. 2003)

2.8.5 Theory of Diffusion of Innovation (DOI)

The theory of adoption and Diffusion of Innovation (DOI) was developed by Rogers (1995) to explain diffusion of innovation and adoption of new technology. Rogers (1995) defined diffusion as the process by which an innovation is communicated through certain channels over time among the members of a social system. An innovation is a new idea, object, or practice that is described as new idea by the relevant unit of adoption. The novelty of the innovation for the individual determines his or her reaction to it. In other words, an innovation is regarded as new idea, practice or material artefact as perceived to be new by an individual or other unit of adoption (Zaltman *et al.*, 1973).

Rogers (1995) comments the rate of adoption as the relative speed which an innovation is adopted by members of a social system. Rogers's theory suggested that the

adoption of an innovation is effected through a number of factors, these factors are as follows: the individual's perception of the attributes of the innovation, the nature of the communication channels diffusing the innovation, the nature of the social system, and the extent of which change agents' efforts in diffusing the innovation. The adoption phase includes sub-phases of knowledge, learning and persuasion, and decision; these phases drive to the factual adoption decision. The implementation phase is described the events, actions, and decision involved.

Although adoption often includes usage, and has even been used to cover the entire process, usage is commonly referred to as implementation (Prescott & Conger, 1995). Scheirer (1983) described implementation as synonymous with usage evaluation. However, he highlighted the innovation implementation as a neglected area in a quickly growing literature on innovation research.

According to Rogers (1995) the stages of diffusion of innovation can be categorized as knowledge, persuasion, decision, implementation, and confirmation. Knowledge as learning of being (awareness-knowledge) and acquire an understanding of how it functions. In the persuasion stage as the development of a positive or negative attitude toward using the innovation through seeking information that reduces uncertainty about the expected consequences of the innovation. Adoption or rejection of the new idea is the decision stage. Confirmation stage as the feedback on the experiences that can lead to reconfirm or reverse the adoption decision. This sequence is showed in Figure 2.11.

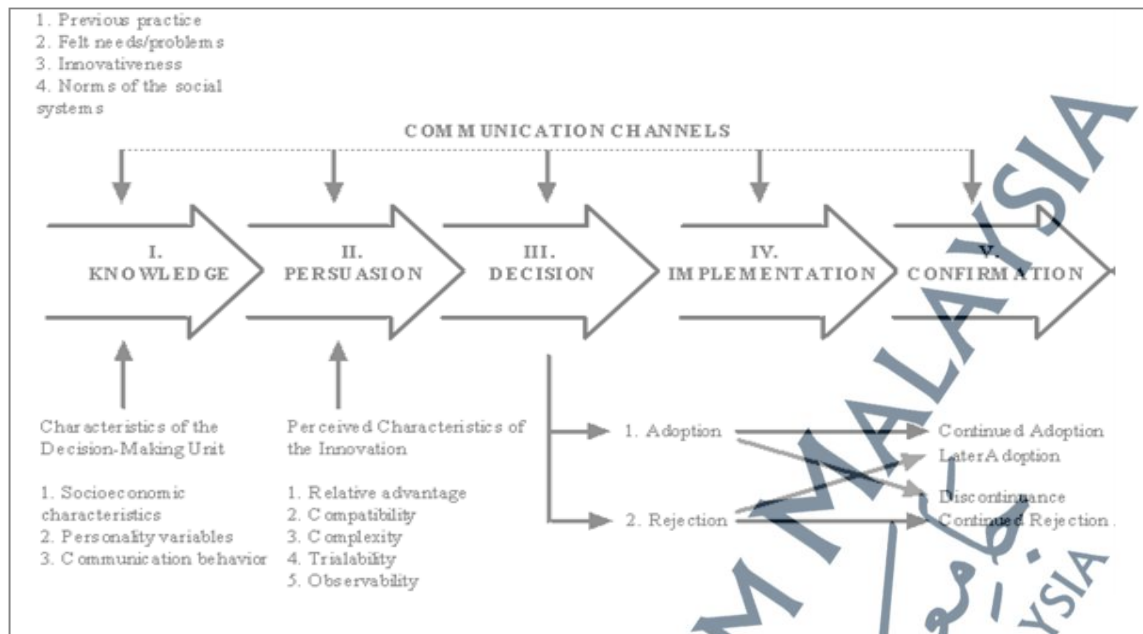


Figure 2.11 Theory of Diffusion of Innovation (Rogers, 1995)

Rogers (1995) examined the attributes that affecting the adoption and diffusion of innovation. These attributes are relative advantage, compatibility, complexity, trialability and observability. Engel, Blackwell, and Miniard (1995) and Hansen and Salter (2001) argued that the Rogers' diffusion of innovations model is the most important model for adoption and adaption and widely tested model and well suited as a research framework.

E-learning is an innovation method of learning. It is suitable to consider utilizing theory of diffusion of innovation in the study of e-learning adoption (Liao & Lu, 2008; Duan et al., 2010) and how potential adopters' perceptions of the innovation characteristics impact e-learning adoption. According to Moore and Benbasat (1991) one of the most important models which can explain and describe innovation characteristics is that from Rogers (1995).

2.8.6 Information Systems Success Model

The DeLone and McLean (1992) model is one of the most widely cited IS success models (Myers, Kappelman, & Prybutok, 1997; Gable, Sedera, & Chan, 2003; Heo & Han, 2003), suggesting that a systematic combination of individual measures from IS success categories can create a comprehensive measurement instrument. It consists of six dimensions, which are: (1) system quality, (2) information quality, (3) use, (4) user satisfaction, (5) individual impact and (6) organizational impact (Figure 2.12).

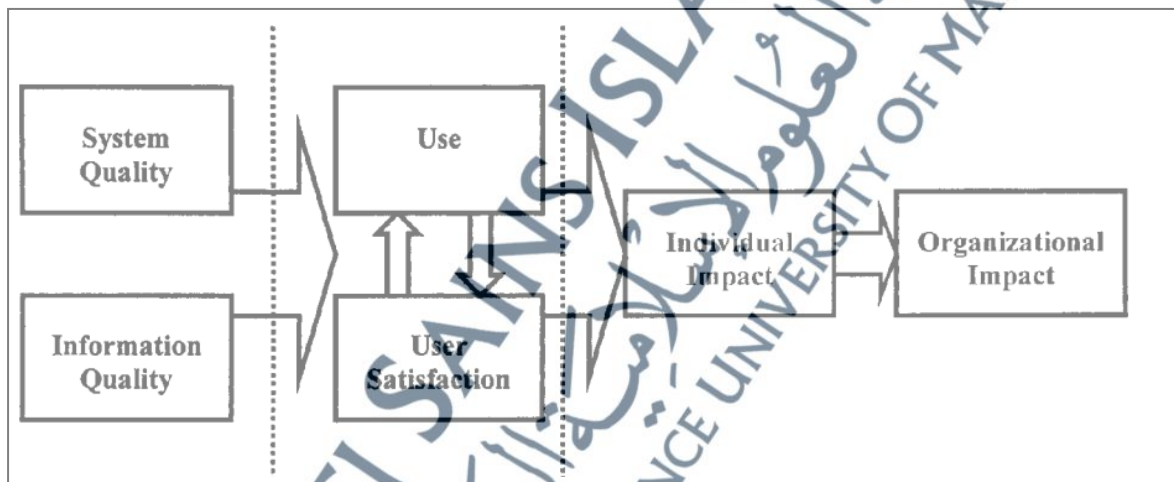


Figure 2.12 D&M IS Success Model (DeLone and McLean, 1993)

The DeLone and McLean model makes two important contributions to the understanding of IS success. First it provides a scheme for categorizing the multitude of IS success measures that have been used in the literature. Second, it suggests a model of temporal and causal interdependencies between the categories (Seddon, 1997; McGill, Hobbs, & Klobas, 2003). Since 1992, a number of studies have undertaken empirical

investigations of the multidimensional relationships among the measures of IS success (e.g., Seddon & Kiew, 1994; Goodhue & Thompson, 1995; Etezadi-Amoli & Farhoomand, 1996; Saarinen, 1996; Guimaraes & Igbaria, 1997; Igbaria & Tan, 1997; Jurison, 1996; Li, 1997; Rai et al., 2002). Seddon and Kiew (1994) tested part of the model through a structural equation model (SEM). These research into this model, however, had led to the addition of dimensions such as service quality, intention to use and Net benefits (replacing organization impact construct) (DeLone and McLean 2003).

Recently, DeLone and McLean (2003) proposed an updated IS success model and evaluated its usefulness in light of the dramatic changes in IS practice, especially the emergence and consequent explosive growth of Internet-based applications. Based on prior studies, DeLone and McLean (2003) presented this updated IS success model by adding “service quality” measures as a new dimension of the IS success model and by grouping all the “impact” measures into a single impact or benefit category called “net benefit”. Thus, this updated model consists of six dimensions: (1) information quality, (2) system quality, (3) service quality, (4) use/intention to use, (5) user satisfaction and (6) net benefits (Figure 2.13).

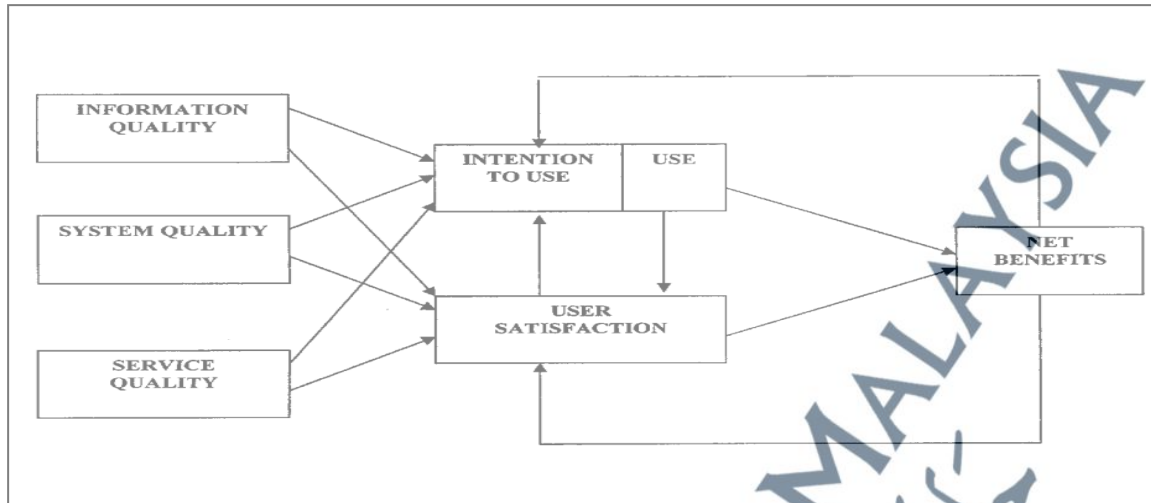


Figure 2.13 Updated D&M IS Success Model (DeLone and McLean, 2003)

Within the e-learning context, e-learners use the systems to conduct learning activities, making the e-learning system a communication and IS phenomenon that lends itself to the updated D&M IS success model. DeLone and McLean (2003) contend that the Internet applications process fits well into their updated IS success model and the six success dimensions, and encourage others to continue testing and challenging their model. DeLone and McLean's (2003) updated IS success model can be adapted to the measurement challenges of a new e-learning context. However, user satisfaction will remove from this study because poor instruments that have been developed to measure satisfaction (Galletta and Lederer, 1989; DeLone and McLean, 2003). The measurement of e-learning success should be based on educational outcomes rather than user satisfaction (Gill, 2006). Therefore, Bloom's model will be used in the current study in order to evaluate the learning outcomes instead of user satisfaction.

2.8.7 Models and Theories Discussion

The acceptance theories and models described in previous sections such as TRA, TPB, TAM, UTAUT, DOI and IS model have numerous factors that determine technology acceptance. A summary of these theories and models is provided in Table 2.6 which includes the main variables or construct and the level of analysis.

Table 2.6 Summary of Models and Theories in Adoption

Theories (Author)	Factors	Usage	Level of Analysis	Selected Articles using the Theory
Diffusion of innovation (DOI) (Rogers, 1995)	Relative Advantage Compatibility Complexity Triability Observability	Acceptance of any new innovation Such as e-initiative, computer, internet	Individual and Organizational	Duan <i>et al.</i> , 2010; Liao & Lu 2008; Hsbollah & Idris, 2009; Samarawickrema & Stacey, 2007; Wu, 2008; Martins <i>et al.</i> , (2004)
Technology Acceptance Model (TAM) (Davis, 1989)	Perceived Usefulness (PU) Perceived Easy Of Use (PEOU)	Acceptance of innovation of technology such as mobile, e-initiative, PDA, e-commerce, internet banking	Individual	Nichols & Levy, 2009; Lee, 2010; van Raaij & Schepers, 2008; Liaw, 2008; Ngai, Poon, & Chan, 2007; Nichols & Levy, 2009; McFarland & Hamilton, 2006; Lee, 2008; Liu, Liao, & Pratt, 2009
TAM2	PEOU PU Subjective Norm, Voluntariness, Image Job Relevance, Output Quality, Result and Demonstrability	Acceptance of innovation of technology such as mobile, e-initiative, PDA, e-commerce, internet banking	Individual	Lu, 2007; Chou, 2007; WU, 2011; Aggorowati, 2012
TAM3	PEOU, PU, Subjective ,Norm, Voluntariness, Image, Job Relevance, Output Quality, Result,	Acceptance of innovation of technology such as mobile, e-initiative, PDA, e-commerce, internet banking	Individual	Lu, 2007; Chou, 2007; WU, 2011; Aggorowati, 2012

	Demonstrability, Computer self- efficacy, Computer anxiety, Computer playfulness, Perceptions of external control, Perceived enjoyment and Objective usability			
Theory of Planned Behaviours (TPB) Ajzen's (1985)	Attitude toward Using (A) Subjective Norm (SN) Perceived Behavioral Control (BC)	Improved the predictability of intention in various health- related fields such as condom use, leisure, exercise, diet	Individual	Nichols & Levy, 2009; Lee, 2010
Theory of Reasoned Action (TRA) Fishbein and Ajzen's (1975)	Attitude Toward Behavior (A) Subjective Norm (SN)	Most use in medical innovation such as dieting, condom, limiting sun exposure	Individual	Nichols and Levy, 2009; Lee, 2010
UTAUT Venkatesh et al. (2003)	Effort expectancy Performance expectancy Social influence Facilitating conditions	Acceptance of technology such as (online stocking, mobile, Internet Banking)	Individual	Carlsson et al.(2006); Al-Qeisi, (2009).
IS Success Model (1993)	System quality, Information quality, Satisfaction, Individual impact, Organizational impact.	Use of Information Systems	Individual and Organizational	Becker, (2013) Kanuka & Kelland, (2008).

Khan and Woosley, (2011) and Olivera and Martins (2011) articulated that DOI by Rogers (2003) is developed to investigate organization as well as the individual level, while TRA, TPB, TAM and UTAUT are an individual level. Prior studies that have utilized TPB and TRA theories present that they can assist to predict health-related behavioural intention and enhance the predictability of intention in various health-related areas (Ajzen & Driver, 1992; Nguyen *et al.*, 1997; Sheeran & Taylor, 1999; Fishbein *et*

al., 2001; Conner *et al.*, 2003). Based on that, TRA and TPB are not used in the present study as they are not related to technological applications such as e-learning while the present study attempts to examine e-learning adoption among adult workers in Jordan.

The fields of origin for TAM, TAM2, TAM3 and UTAUT are technology usage (Davis, 1986). The fields of origin for the DOI are anthropology, education, sociology, communication and marketing (Katz *et al.*, 1963; Bishop, Shumway, & Wandschneider, 2010; Dingfelder & Mandell, 2011). In addition, based on the review of literature, TAM TAM2 and TAM3 models are widely applied to IT acceptance, specifically to explain computer usage behavior. Another reason for excluding UTAUT is that it focuses on the post adoption of innovations (Conrad, 2009; Khan & Woosley, 2011; Olivera & Martins 2011). This study argues that e-learning represents innovation adoption in educational services including e-learning adoption among adult workers, rather than just an IT technology.

By comparing DOI model with TAM model, it could be infer that in spite of its popularity and considerable empirical support, a common criticism about TAM is the parsimony when compare it with DOI model (Hu, Clark & Ma, 2003). Previous authors highlighted similarity between the TAM model and DOI model by comparing the factors utilized in the two models. They have found that relative advantage in Rogers's model is similar to the perceived usefulness in TAM, and the complexity construct is similar to the perceived ease of use (Moore & Benbasat, 1991; Premkumar, Ramamurthy & Liu, 2008).

Nevertheless, compatibility, trialability and observability constructs in Rogers's model have been not incorporated in TAM. As such, Rogers's model will be used in this research over the TAM model as it is more suitable in understanding the characteristics of adoption that impede or facilitate diffusion of innovation among individual and organization (Rogers, 1983). E-learning is an innovation and pedagogical approach utilizing emerging ICT. Although e-learning provision would be different in platforms terms, application contexts and technologies, the major innovation attributes remain the same.

The Model of IS success by Delone and McLean's (2003) can be used for studying both the individual impact and subsequent organizational impacts. Therefore, the DOI and the Model of IS success were employed in this context to study the perceived innovation characteristic and its influence on e-learning adoption among adult workers as these models more suitable for supporting the development of the framework of this study and most suitable for this study in compliance with the scope of this study. DOI and IS model have emerged and each has been the basis for studies examining systems successfully adoption. Integrated these two theories have numerous parallels as suggested by Premkumar et al. (1994), Fichman (2000), and others researchers. In DOI theory, "an organizational effort directed toward diffusing appropriate IT within a user community" is analogous to IS implementation (Cooper and Zmud, 1990, p. 124). Thus, this study is based on individual adoption innovation decision, in adopting a particular technology. The intention is on the adoption of e-learning among individuals (adult workers) that are being determined by e-learning technology itself. It was argued that e-

learning adoption is not only an IT acceptance, but also an adoption of new innovative educational services which are different from traditional ones.

In conclusion, the main goal of this research is to characterize and measure working adults' e-learning adoption, identify factors that influence the adoption of e-learning among adult workers and impacts of e-learning on working adults. This study integrated Rogers's DOI theory and D&M IS success model which focuses on the influence of the both organizational as well as individual level. However, the literature review identified that understanding of the motivation which drives adults to commit to, and complete, higher education through distance learning is an important requirement for the design and the delivery of adult programs (Abdullah *et al.*, 2008). In addition, several models have been proposed in the literature to understand e-learning adoption, in which social environmental factors are not primarily addressed (Jan *et al.*, 2013).

Hence, beside the organizational and the technological factors, social environmental factors and the personal factors will be other factors that will be used in this study. Additionally, the literature of the current study has indicated that Bloom's taxonomy is the most powerful and comprehensive taxonomy in the area of e-learning (Halawi *et al.*, 2009; Chen, 2010). Therefore, Bloom's model will be used in the current study in order to evaluate the learning outcomes. Consequently, DeLone and McLean's model to evaluate the impact on individual within organization will be used in the current study in order to evaluate the performance of adult workers (Wang *et al.*, 2007; Luor *et al.*, 2009).

2.9 Technological Factors

According to Rogers (1995) innovations are perceived to have attributes that have an impact on the decision to adopt, implement and use the innovations. Five characteristics of innovation were identified by Rogers (1995), which impact on individual's attitude in the adoption process. These attributes are relative advantage, compatibility, complexity, trialability and observability.

Relative advantage is the degree to which an innovation is perceived as better than the idea it supersedes. Compatibility is the degree to which an innovation is perceived as being consistent with the existing values and past experiences. Complexity is the degree to which an innovation is perceived as difficult to understand and use. Trialability is the degree to which an innovation may be experimented. Eventually, observability is the degree to which the results of an innovation are observable to others (Rogers, 1995).

Tornatzky and Klein (1982) had conducted a meta-analysis on 75 studies based on Rogers' five innovation characteristics and other attributes proposed by other researchers and found only relative advantages, complexity and compatibility had a consistent relationship with innovation adoption. In the same line, Prescott and Conger's (1995) review 70 IS-related researches on innovation adoption and they concluded that Rogers' proposed innovation attributes appear to be the most appropriate approach to study IS adoption. Although the findings by Tornatzky and Klein (1982) had identified three

characteristics that are significantly related to innovation adoption, it did not deter studies to examine the link between other innovation attributes and technology adoption.

Rogers, Daley and Wu (1982) conducted a study on diffusion of home computers. The findings show that the perceptions of compatibility, relative advantages, trialability and observability had significant effect on respondents' decisions to adopt home computers. Costs and complexity were negatively associated with innovation adoption and implementation. Technological characteristics that are perceived as not complex will be more likely to be adopted (Surry & Gustafson, 1994; Tornatzky & Klein, 1982). Furthermore, Surry (1997) found that relative advantages, complexity and compatibility were playing a crucial role in the diffusion to adopt new technology.

However, Duan *et al.*, (2010) conducted a study on Rogers' innovation attributes that affecting Chinese students' intention to adopt e-learning degrees programs for their postgraduate study. The findings show that only perceived compatibility and trialability have significant influence on e-learning adoption intention. Hsbollah and Idris (2009) investigated e-learning adoption as a teaching tool among University Utara Malaysia (UUM) lecturers' perception of the decision. The results suggested that only relative advantages and trialability specialization positively influence the adoption decision.

Liao and Lu (2008) carried out a study on the role of experience and innovation characteristics in the e-learning adoption websites. The objective of their study was to use diffusion of innovation perspective to understand factors that may impact the intention to use online e-learning in Taiwan. The sample consists of students who were enrolled in a

Project Management (PM). The results show that relative advantage and compatibility are significantly related to users' intention to use e-learning.

A study conducted by Martins *et al.*, (2004) found that relative advantage has few effects on adoption of the Internet as a teaching tool at a foreign language schools. This result is contradictory with prior studies such as Poon and Swatman, (1999); Premkumar and Robert, (1999); Mehrtens *et al.*, (2001); Kendall *et al.*, (2001) found that relative advantage is an important factor that affects the adoption of new technology.

Based on the Rogers' (2003) model, Fu *et al.*, (2007) investigated the adoption of e-learning among full-time undergraduates in China. They hypothesized that the five innovation attributes namely e-learning relative advantage, complexity, trialability, observability and compatibility could affect the level of e-learning adoption intention. The findings revealed higher perceptions of relative advantage, compatibility, trialability and observability resulted in higher level of intention to adopt e-learning. However, perceived complexity of e-learning was not significantly associated with e-learning adoption.

Hsbollah and Idris (2009) stated that relative advantages are positively associated with adoption decision. This finding shows that, teachers who believe that utilizing e-learning will improve their learning and teaching processes and will be more likely to adopt the instructional technology. Others studies that examined relative advantages of e-learning provides many benefits, such as access to education, reduced cost, improve students service, learning products by the internet, access to worldwide information,

speed up decision making, and improving operation effectiveness (Webster & Hackley, 1997; Lassner & McNaught 2003; Zemsky & Massy, 2004; Lu *et al.*, 2005; Hsbollah & Idris 2009; Duan *et al.*, 2010). Table 2.7 summarizes past studies on technological factors of e-learning.

Table 2.7 Previous Studies on Technological Factors of E-Learning based on Rogers

Author and year	Attributes	Study Objectives	Perspective	Findings
Hsbollah & Idris (2009)	Relative advantage Compatibility Complexity Triability Observability	To investigate Universiti Utara Malaysia (UUM) lecturers' perception of the decision regarding adopting e-learning as a teaching tool	Lecturers	Only relative advantage and triability specialization positively influence the adoption decision
Martins <i>et al.</i> , (2004)	Relative advantage Compatibility Complexity Triability Observability	To determined the factors influencing language schools in Brazil to adopt the Internet as a teaching tool	Pedagogical managers	The variables observability and triability were found to be the two most significant predictors of adoption
Duan <i>et al.</i> , (2010)	Relative advantage Compatibility Complexity Triability Observability	To examine, from an innovation adoption perspective, Chinese students' intention of taking up e-learning degrees.	Students	Only perceived compatibility and triability have significant influence on e-learning adoption intention
Samarawickrema & Stacey (2007)	Relative advantage Compatibility Complexity Triability Observability	To examines such factors related to adopting a learning management system in a large multicampus urban Australian university.	Participants who used web-based approaches to teach both on- and off campus learners	The study found that technology adoption has less to do with academic teachers' technology
Liao & Lu (2008)	Relative advantage Ease of use Compatibility Image Result demonstrability	Technology adoption model is developed to predict the users' intention of adoption and their continued use behavior	Students who were enrolled in a project management (PM)	Relative advantage and compatibility are significantly related to users' intention to use e-learning

	Visibility Triallability			
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Few studies have dealt with e-learning adoption in the perceptive of perceived innovation attributes (Liao & Lu, 2008; Duan *et al.*, 2010). The perceived innovation characteristics play an important role in adoption of innovation and have been examined by Völlink, Meertens & Midden, (2002); Al-Gahtani, (2003); Lee, (2004); Martins, Steil & Todesco, (2004); Hayati & Jowkar, (2008);. These studies indicated that the findings of perceived attributes can differ among countries to another (Al-Gahtani, 2003; Lee, 2004; Martins, Steil & Todesco, 2004; Hayati & Jowkar, 2008).

In summary, Tornatzky and Klein, (1982) analyzed the Rogers' attributes of innovation, finding that compatibility, relative advantage, and complexity had the most significant relationships with adoption across a broad range of innovation types. Three characteristics of innovations of e-learning adoption among adult workers will be used in this study and it will include relative advantages, compatibility and complexity (e.g. Tornatzky and Klein, 1982; Lee, 2004; Chokri, 2010). In line with the Rogers' attributes of innovation, the aim of this study is to integrate Rogers' attributes of innovation (compatibility, relative advantage, and complexity) with IS Delone and McLean model (information quality, system quality and service quality) for evaluating e-learning adoption. Due to, Rogers' attributes and IS Delone and McLean model have emerged and each has been the basis for studies examining systems adoption. These two literature

streams have numerous parallels as suggested by Premkumar et al. (1994), Fichman (2000), and others researchers. In Rogers' theory, "an organizational effort directed toward diffusing appropriate IT within a user community" is analogous to IS DeLone and McLean model (Cooper and Zmud, 1990, p. 124). Consequently, six factors are proposed for measuring e-learning adoption among adult workers: compatibility, relative advantage, complexity, information quality, system quality and service quality. The steps involved in the IS DeLone and McLean model are discussed next.

2.9.1 Technological Quality Factors

Numerous of the empirical researches supported the updated IS DeLone and McLean (D&M) model. The findings of these researches provided several important implications for using (D&M) model in the successful adoption of information technology such as e-learning. Understanding the successful adoption of information technology is largely based upon understanding the linkages among quality, system quality, service quality and adoption. Also, it encouraged Governmental and Private Authorities to include measures for information quality, system quality and service quality in their valuation techniques of information system success adoption (Dean et al., 2009; Jang, 2010; Udo et al., 2010).

System quality can be defined as perceived ease of use system and recently systems quality measures adaptability, availability, reliability, response time and usability (DeLone and McLean, 2003). Lin and Lu (2000) used the example of Internet to emphasize the importance of system quality on intention to adoption. They stated that despite the popularity of the Internet, many people resist using it due to the slow response

time, caused by poor design of the Web sites or simply heavy traffic on the Internet, and lack of system accessibility, induced by the availability of the web-related information system (computers, modems, on-line services, and software, etc.).

Therefore, the quality of the information system is considered important in affecting user's beliefs of a Web site (Lin & Lu, 2000). Saeed, Yi and Hwang (2003) have proposed system quality as one of the important drivers of consumer perceptions and subsequent online behavior. If consumers perceive that the web site is of high quality, they are likely to have high trusting beliefs about the web retailer's competence, integrity, and benevolence; and will develop a willingness to depend on the web retailer (Mcknight et al., 2002).

Information quality is identified as the extent to which users think that information is relevant, timely, accurate, and complete (Lee, Strong, Kahn & Wang, 2002). To simply put, information quality manifests the features of the content carried in a message. The importance of information quality has been highlighted and strongly validated in prior research on information seeking. Saeed, Hwang and Yi (2003) also suggested that information quality has great influence over user's online behavior. Information quality has proven to be strongly associated with system use in recent empirical studies (Rai, Lang & Welker, 2002) and especially in the context of e-commerce systems (Molla & Licker, 2001). The quality of information, provided by an information system, is a very important factor in leading people to believe in the usefulness of that information system (Lin & Lu, 2000). When people feel that an information system is useful to them, the chances that they will utilize that system will be

higher. On the contrary, an information system that provides high content quality will increase intention of users to engage in the services provided.

Service quality is incorporated as a dimension of information system success given the importance of information system support, especially in the e-commerce environment where customer service is crucial (Chung & Skibniewski, 2007). DeLone & McLean (2003) after reviewing and evaluating this debate, decided to add service quality in their updated IS success model stating that the changes in the role of IS over the last decade argue for a separate variable the service quality dimension. The service quality of the support that system users receive from the IS department and IT support personnel. For example: responsiveness, accuracy, reliability, technical competence, and empathy of the personnel staff. Service quality adapted from the field of marketing, is a popular instrument for measuring IS service quality (Pitt et al., 1995).

However, Ramayah, Ahmad and Lo (2010) conducted a study on the role of quality factors in intention to continue using an e-learning system in public universities in Malaysia. In their study, using a structured questionnaire derived from the literature, data was collected from 1616 undergraduate and post graduate students from public universities in Malaysia. The results indicate that service quality, information quality and system quality were positively related to intention to continue usage explaining a total of 59.1% variance. A closer examination reveals that in terms of predictive power service quality had the biggest influence followed by information quality and then system quality. Implications from these findings to e-learning system developers and implementers are further elaborated.

Alkhalaf, Drewa, AlGhamdib and Alfarrajc (2012) carried out a study on e-learning system on higher education institutions in Kingdom of Saudi Arabia: attitudes and perceptions of faculty members. The results indicate that the attitudes towards e-learning systems in higher education, helping faculty members to improve their job performance, and educational organizations to provide better and new products and services to users. Table 2.8 summarizes past studies on technological quality factors of e-learning.

Table 2.8 Previous Studies on Technological Quality Factors of E-Learning based on D&M

Author and year	Attributes	Study Objectives	Perspective	Findings
ALMARASH DEH, SAHARI, ZIN & ALSMAD (2010)	System quality, service quality, information quality, usefulness, ease of use, system use, behavioral intention to use, user satisfaction and system outcome	This study examines the success factors that influence learners' use of the Learning Management System (LMS) and tests the applicability of the propose model, in the context of distance learning practices in higher education.	Students who involved in distance learning instruction	The system design has a significant influence on user satisfaction and intention to use of the LMS which directly affect the use of the system. Consequently user satisfaction and system used show strong impact to the net benefit
Yen <i>et al.</i> , (2012)	User motivation, computer self efficacy, ease of use, perceived usefulness, system quality, information quality, service quality, attitude, user satisfaction and intention to Use	The study investigates the attitudes, degree of satisfaction and acceptance of e-Portfolio system users.	user	service quality utility has a greater influence on user satisfaction and intention than does system quality and information quality
Liu, Huang & Lin, (2012)	Top manager support, organizational learning culture, information security policy, institutional policy, system quality, system service and organizational benefits	how these factors influence organizational benefits in the view of IS success model and resource-based theory	Taiwanese companies	Eight of the 10 hypotheses were found to be significant, providing valuable insight into how organizational factors affect system quality, system service, and organizational benefits. The four organizational factors should be considered in

				aggregate when designing and implementing ELS.
Zaied (2012)	TAM, D&M IS Success Models Management support and Training	This study modified the dimensions of the TAM and D&M IS Success Models and added additional two success dimensions Management support and Training	Students of undergraduate and postgraduate	The information quality has a strong significant influence on IS success (81.9%) followed by Behavioral intention (80.2%); Perceived usefulness (78.8%); whereas the least one is user involvement (70%). The overall results show that the proposed model can be beneficial for decision makers in organizations on evaluating the implementation of information systems

Several researchers have emphasized that the understanding the system quality, service quality, information quality that influence users' adoption and use of e-learning, is important for a better adoption and implementation of e-learning (e.g. Almarashdeh, 2010; Ramayaha, 2010; Alkhalaf, 2012). Therefore, the system quality, service quality, information quality will be used in this study and will incorporate in the conceptual framework. The D&M model is believed to be one of the most important measurements which can be used to address this issue in the e-learning adoption field. Studies conducted by Holsapple and Lee-Post (2006); Lin (2007) and Lee-Post (2009) are believed to be supportive of this model. Nevertheless, this study proposes an integrated the theories of DOI and D&M model for more successfully applied in an investigation of individual adoption of e-learning (e.g. Jiwat et al., (2010); Sun & Zhang, (2011).

2.10 Organizational Factors

Altarawneh (2011) reported that organizational issues account for 70% of e-learning adoption system implementation problems. These organizational issues are insufficient funds to develop e-learning adoption system (83%), a lack of e-learning adoption system strategies and politics (67%), a lack of clear, accessible communication channels (51%), a lack of interest regarding e-learning education (49%) and a human resource strategy (43%).

Additionally, studies exploring the critical success factors of implementing e-learning adoption system in organizations reported that organizational factors are important for e-learning adoption success, such as top manager support, organizational culture and structure (Chen & Hsiang, 2007; Sela & Sivan, 2009; Sela & Sivan, 2009; Elliott & Clayton, 2009; Admiraal & Lockhorst, 2009). It can be concluded that e-learning adoption success depends on the support of other participants in organizations, such as the human resources, finance, and technology divisions. Thus, organizational factors cannot be ignored when considering the sustainability of e-learning adoption (Netteland, 2009). However, three most important factors are identified in this research. These are top management support, organization culture, and organization structure.

The increasing opportunities to use technology to achieve strategic advantage require the top management to be knowledgeable of its potential and proactively involved in its diffusion in order to manage it effectively (Higgins & Hogan 1999). Management support has been identified by researches as a key factor of diffusion of any innovation

(Lee *et al.*, 2006; Al Qirim 2007; Seyal *et al.*, 2007; Mosbeh & Soliman 2008; Tarofder *et al.*, 2010).

Top management support was among the factors that have been identified in the literatures as an important aspect in the adoption and implementation of any new technological innovations such as e-learning (DeLone & McLean, 1992; Yap *et al.*, 1992; Yap *et al.*, 1992; Thong, 1999; Huang, 2008; Hung *et al.*, 2009). Top management support and leadership are significant variables that positively affect e-learning in the workplace and support the e-learning team in their efforts to continually supply the best e-learning experience and solution (Waight & Stewart, 2005; Huang, 2008).

It was argued by Iacovou *et al.*, (1995) highlighted that top management on new technology will influence the decision whether to adopt the technology. In addition, Tang (2000) stressed on the importance of top management support for innovation implementing because it ensures adequate resources for implementing the innovations. Teo *et al.*, (2009) concerted on the importance and the need of top management support as it ensure that there is commitment of resources as well as cultivation of organizational climate conducive to adopting technological innovation. Other reason mentioned by Teo *et al.*, (2009) is that top management support is essential in overcoming barriers and resistance to change. Therefore, adoption of innovation among organizations is heavily reliant on the support by the top management. Hence, top management support is a key factor critical for effective information systems adoption (Thong *et al.*, 1996).

In the context of e-learning adoption and implementation in organizations, Huang (2008) has investigated the factors influencing the adoption of e-learning systems in organizations. He proposed that the acceptance of e-learning systems is proposed to be subject to seven factors. These are the influence of organization culture, top management support, organization facilitation infrastructure, training and education, perceived usefulness, perceived ease of use, and subjective norms.

Top management support is one of the most important factors that influencing organization to adopt new imitative such as e-learning as the importance of leaders in acting as role model to use e-learning system. He mentioned that top management should show a willingness to learn and search for new knowledge and ideas so that the employees would imitate them and increase the propensity of the employees to participate in e-learning. Therefore, the role of top management support in motivating their employees to use the e-learning is critical.

Huang (2008) further states four reasons of top management support in contributing to the implement and adoption of e-learning successfully in organizations. These include conveying the importance of learning to employees, maintaining their morale, creating a culture that promotes sharing, learning and creation, and finally provides resources and leadership for the implementation of information systems.

On the other hand, Waight and Stewared (2005) argued that for e-learning to be a success, leaders must understand and visibly support e-learning. Danechgar *et al.*, (2008) have provided three ways in which top management could support e-learning adoption

and implementation. These are creating opportunities for innovations and renewal of an e-learning solution, providing financial support and encouraging learning internally and externally. Further, Morison (2003) also emphasizes the importance of top management support in implementing e-learning.

It is clear that successful e-learning is based on top management support who must understand and visibly support e-learning adoption among individuals. The significant roles of top management support in e-learning adoption can provide opportunities for innovation and renewal of an e-learning solution, providing financial support and encouraging learning internally and externally (Waight & Stewart, 2005; Huang, 2008; Daneshgar *et al.*, 2008). Top management support who show interest to adopt and implement e-learning in their organization and regarded e-learning as significant for their organization success will ensure sufficient resources to be allocated for its adoption and implementation of e-learning.

Beside top management support, organizational culture is another important factor which has been identified in the literature that contributes to IT adoption in general and to e-learning adoption and implementation. Organization culture was defined by Conyers and Kaul (1990) as the underlying system of shared beliefs, attitudes and values which are reflected in the way the organization operates.

Similarly, McPherson and Nunes (2006) defined it as the values, beliefs, philosophies, ways of doing things and relating to other people exhibited by members of an organization. Kunzmann *et al.*, (2009) stated that organizational culture is the social

framework for acceptable and desired behavior in a company which constituted by unwritten rules, shared values, and a feeling of identity and comprises communication culture, culture of trust and culture of innovation among others.

Understanding organization culture is very critical for e-learning adoption and implementation success (Newton & Ellis, 2005). Cooper and Zmud (1990) have mentioned that innovation adoption is influenced largely by factors related to overall organizational culture. In the same vein, a study by Hung *et al.*, (2009) confirmed that organization culture is a factor positively influences e-learning adoption and implementation.

Conducted interviews with a sample of 40 firms, McDermott and O'Dell (2001) identified five firms that were recognized for their ability to exchange knowledge as a part of their corporate culture. They found that corporate culture plays a part in the success of knowledge management and knowledge exchange. In addition, Newton and Ellis (2005) pointed out that it is important to understand organizational culture when implementing e-learning. In the same vein, Waight and Stewart (2005) stated that organization has a strong learning culture; would create motivate and engage employees throughout e-learning process.

Marquardt (1996) defined the learning organization as having a supportive organizational culture. The learning organization supports learning collectively and powerfully, continually transforming itself to more effectively to manage knowledge. The major interest of the learning organization is improving organizational capacity by a

learning process that is performance based and tied to business goal (Senge, 1990; and Marquardt, 1996).

Organizational learning has a culture that results in improving performance levels and enhancement of organizational abilities influence management and the application of knowledge. Falconer (2006) describes organizational learning as includes the sum of individual learning within an organization. Further, the importance of learning organization has become the driving force for e-learning adoption in organization to facilitate lifelong learning and to retain adult workers (Servage, 2005; Garvin, 2000).

Moreover, the some researchers began to pay attention to the difference between workplace learning and school learning (Resnick, 1987). The most obvious differences between the two are learning at work is informal and while learning at school is formal (Eraut *et al.*, 1998; Marsick & Watkins, 1990). Another difference was that, school learning is decontextualised while workplace learning is embedded in everyday problem solving (Gherardi, 2001; Brown & Duguid, 2001; Billett, 2002; Eraut *et al.*, 2002).

Learning at work and learning at school has complemented features from each others in recent years. With the growing e-learning adoption, learning today may take place in different forms and different modes (Tynjala & Hakkinen, 2005; Daneshgar *et al.*, 2008).

In order to develop informal learning in the workplace, organizations design employees' work schedules to allow time and opportunity for collegial sharing and

integration (Lohman, 2006). Additionally, organizations ensure that workers have access to Internet and computer, which would then enable access to required information. This support would develop confidence and commitment in learning process (Eraut, 2004).

Ellinger (2005) and Eraut (2004) stated that organizational culture and top management which are committed to education are important in creating organizational environment that is positively affect informal learning and formal learning. Furthermore, organizational culture and top management support are variables associated with formal learning and informal learning in the workplace (Eraut, 2004; Ellinger, 2005; Lohman, 2006; Berg & Chyung, 2008; Li *et al.*, 2009).

In addition, Li *et al.*, (2009) highlighted without a supportive top management and organizational learning culture, it will be difficult for organization to design suitable knowledge management systems that are successful in promoting workplace learning and knowledge sharing. Organizational learning culture and capability to facilitate knowledge sharing are important variables which affect learning in the workplace. On the other hand, Chute *et al.*, (1999) found that the individuals and technology are important variables for the successful of e-learning adoption. Learning in the corporate setting needs four key supporting variables namely learning culture, management support, financial support and technology infrastructure.

Nevertheless, Tynjala and Hakkinen (2005) found the development of a successful e-learning solution for work organizations need to integrate research from various areas. Learning organization theories, learning at work and organizational

learning could provide a general framework for analyzing the possibilities and contexts for learning in the workplace. The theories of socio cultural learning including both workplace learning and school learning provide conceptual tools for understanding the social nature of learning. Finally, cognitive theories of learning and the development of expertise both in educational settings and in the workplace make it possible to examine learning at the individual levels.

Billett (1996) highlighted that the cognitive and socio-cultural theories are complementary and compatible in helping us to understand learning. Theories of the socio-cultural learning and learning organization approaches are fundamentals for the development of e-learning in the workplace (Tynjala & Hakkinen, 2005). Tynjala and Hakkinen (2005) noted the creation of e-learning in which individuals known each other are likely to operate in a conducive knowledge sharing environment.

In summary, previous studies on organizations found that top management support, organizational culture and organizational structure are major factors for the adoption e-learning among employees (Waight & Stewart 2005; Newton & Ellis, 2005; Daneshgar1 *et al.*, 2008; Li *et al.*, 2009). These organizational factors which are influence workplace learning by facilitating effective knowledge management in the organization (Eraut, 2004; Ellinger, 2005; Berg & Chyung, 2008; Li *et al.*, 2009).

Beside top management support and organizational culture, organization structure is another important factor identified in the literature that contributes to IT adoption in general and to adopt e-learning among individuals in workplace (Gwebu & wang 2007;

Hung *et al.*, 2009). Damanpour and Gopalakrishan (1998) identify organizational structure is one important component and it plays a crucial role in deciding the adoption and diffusion of innovation. In other words, Gwebu and wang (2007) and Damodaran and Olphert (2000) found that organizational structure is significantly associated with diffusion of innovations and adoption.

Mintzberg (1979) emphasized organizational factors originated from organizational structure can be defined as the sum total of the ways in which it divides its labor into distinct tasks and then achieves coordination among them. In other words, Scott (2003) defined organizational structure as patterned or regularized aspects of relationships existing among participants in an organization. The division of labor and pattern of coordination in the academic organizations have been molded for many years as a result of a complex interaction among social, economic and cultural forces. Despite its wide diversity, it is possible to identify several common organizational characteristics that shape and influence teaching and learning processes in academic institutions all over the world (Altbach, 1997).

Kwon and Zmud (1987) structures of an organization are always defined in terms of their centralization. Many concentrated decision making is connected with a centralized organizational structure. Although numerous literature have found that centralization to be negatively connected with innovation adoption of information technology (Zmud, 1982; Damanpour, 1991; Julien & Raymond 1994; Rogers, 1995).

Study by Hung *et al.*, (2009) identifies organizational variables such as organization structure and organization culture have a strong influence on e-learning adoption decision among individuals. Huang *et al.*, (2009) have investigated factors leading e-learning adoption in hospitals. The results show that organizational, technological, and managerial factors have significant influence on e-learning adoption decision in hospitals.

McPherson and Nunes (2006) found four key organizational factors to have significant influence on e-learning adoption. These factors are organizational leadership, structure and culture, technological, design and delivery. They also found organizational leadership, culture and structure are paying an important role for e-learning adoption in terms of academics and administration. Similarly, Daneshgar *et al.*, (2008) pointed out organizational structure is important and play a role for e-learning adoption among individuals.

Conole (2004) noted that more research must be dedicated to mapping current structures, skills and roles towards the new structure on e-learning adoption. Adult workers in organizations are continuously being encouraged to utilize new technology such as e-learning. Furthermore, organizational culture, structure and administrative system support workers to be innovative (Table 2.9).

Table 2.9 Previous Studies on Organizational Factors in E-Learning

Author and year	Country	Factors	Study Objectives	Sample	Findings
Hung <i>et al.</i> , 2009	Taiwan	Managerial Organizational Technological	Medical errors cause a significant number of deaths. Providing training to medical staff can improve the quality of medical care.	Senior executives and managers in hospitals	These three factors are significant influences on the decision to adopt e-learning.
Waight & Stewart, 2005	Texas, USA	Leadership Learning culture Technology infrastructure Finance	To illustrate how the interdependence among four championing factors, five antecedents, and four moderators affect companies' efforts in valuing the adult learner in e-learning.	Adult learner	Leadership, learning culture and technology factors were significantly associated with e-learning adoption.
Czerniewicz & Brown, 2009	Cape Town, South Africa	Policy Organizational culture	To investigate the relationship between policy (conceptualized as goals, values and resources), organizational culture and e-learning use.	Student	The policy and organizational culture are significant influences on e-learning adoption.
McPherson & Nunes, 2006	Sheffield UK	Organizational setting Technological Curriculum design Educational systems design E-learning course delivery	To report on a research project that identified organizational critical success factors (CSFs) for e-learning implementation in higher education (HE). These CSFs can be used as a theoretical foundation upon which to base decision making and strategic thinking about e-learning.	Interviews with practitioners, administrators and academics	Revealed 66 CSFs divided into four clusters: leadership, structure and culture design technological and delivery are significant influences on the adoption decision

Newton & Ellis, 2005	Australia	Dynamic integration to respond to change contributes to priorities of the organizational context drivers for change alignment with organizational culture to improve relevance relevant to needs of the learner's context	To identifies factors influencing the implementation of e-learning within the Australian Army training context	Australian army	the organizational context drivers for change alignment with organizational culture are significant impact on decision to adopt e-learning
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Table 2.9 shows some previous studies that are related e-learning adoption. The sample of those studies included adult learners, students and managers. On the other hand, the e-learning adoption among adult workers has been neglected area in the realm of e-learning. Current study attempts to provide a good starting point for research which links the organizational and technological to any e-learning adoption.

Numerous authors argued that the findings of e-learning can differ among organizations as well as across different countries (Haung *et al.*, 2009; Ho & Kuo 2010). Every organization has different organizational culture toward it (Ginsberg & Venkatraman, 1992; Iacovou *et al.*, 1995; Crook & Kumar, 1998). Generally, limited studies have been conducted to examine e-learning adoption among adult workers in organization (Johnson & Aragon, 2003; Waight & Stewart, 2005; McPherson & Nunes, 2006; Wang *et al.*, 2007; Daneshgar1 *et al.*, 2008).

On the other hand, previous studies on e-learning adoption had focused on technological, design and delivery issues. A few studies have discussed institutional and

organizational factors that are influence on e-learning adoption (McPherson & Nunes, 2006; Daneshgarl *et al.*, 2008). Hence, this research will be used the role of organizational top management support, culture and structure deserves further investigation especially in the context of e-learning adoption among adult workers.

2.11 Personal Attributes

Previous studies on e-learning adoption had focused on technology that contribute to successful e-learning adoption (e.g. Roffe, 2002; Wang & Liu, 2003). Participants' personal attributes and their interest for enrolment e-learning process was neglected in literature (e.g. Wools *et al.*, 2002; Bose, 2003; Gonc, 2006; Nadelko, 2008; Learning Online, 2008).

Wools *et al.*, (2002) and Lee *et al.*, (2007) argued that participants' adopting of e-learning depends on multiple interdependent factors other than the technology factors are associated. Participants' personal characteristics have been found influence adoption of e-learning. Johannes *et al.*, (2007) and Nadelko (2008) highlighted that personal characteristics of e-learning practitioners are useful for deciding with adult learners to enroll in e-learning system.

Several authors highlighted the need to investigate the motivational factors that drive adult learners to enroll in distance learning program (Holmberg, 1995; Johannes *et al.*, 2007; Cercone, 2008; Abdullah *et al.*, 2008a; Abdullah *et al.*, 2008b; Nadelko, 2008). Due to the nature of e-learning (e.g. physical distance among participants and educator),

participant need to independently direct their learning. Adult workers are motivated for different reasons to enroll in e-learning programs, previous theories related to self directed learning could be applied in this context.

Self-directed learners are those who take their own responsibility for learning. Adult students are motivated to adopt e-learning because of their busy work schedules. Self-directed learning is effective for instructors to when they teach adult learners in distance learning environment (Cercone, 2008). Moreover, majority of distance education learners are adults between the age of 25 and 50. Therefore, better understanding of adult personal attributes will be significant to understand of distance learning environment in general (Moore & Kearsley, 1996).

Past studies have been conducted to investigate adults' motivation to participate in education (e.g. Houle, 1961; Sheffield, 1964; Morstain & Smart, 1974; Boshier & Riddell, 1978; Peterson, 1981; Romaniuk & Romanuik, 1982; Furst & Steel, 1986; O'Conner, 1987; Brady & Fowler, 1988; Adair & Mowseian, 1993; Bynum & Seaman, 1993; Knapper & Cropley, 2000). These researches have shown that the educational motivations among adults varied from learner to learner.

Houle's work (1961) was the basis for other researchers to conduct studies about learning motivation. In his study, Houle interviewed 22 adult learners to obtain a comprehensible image about why they would like to continue learning. As a result, Houle classified these adult learners into three subgroups. These are the goal-oriented, the activity-oriented, and the learning-oriented. Sheffield (1964) carried out a study by

adopting Houle's model. He has listed fifty-eight reasons why adults enrol in education and categorized these reasons into five main groups. These are learning orientation, desire-activity orientation, personal goal orientation, societal goal orientation and need-activity orientation.

More recently, Boshier (1971) developed Education Participation Scale (EPS) which become one of the most used scales by researchers. By adopting Boshier's (1971) Education Participation Scale (EPS), Morstain and Smart (1974) carried out a study aimed to classify the purposes of adult participation in education. Their study had identified six factors out of fourteen factors of the original EPS. Furthermore, their study also investigated gender and age differences in terms of motivation to participation in learning between adult learners. Men were more rationale by external anticipations than women, and women scored slightly higher on the cognitive desire than men did. Younger adults seem to score slightly higher on social motivation.

Boshier and Collins (1983) have developed a model contains of six factors to determine adult learners' motivation to participant in learning. This model found adults' participation for lifelong education are due to the need for social contact, social stimulation, professional advancement, community service, external expectations, and cognitive interest.

According to Boshier and Collins (1983) social contact involves the desire among participants to raise better relations with other citizens or peers. In other words, this factor is associated to social status and the need for search or for certain status. The

improvement in social status can be accomplished through group activities that are accepted by others. On the other hand, social stimulation is related to the desire among participants to get relief from boring situations and to avoid the confusion of daily life. It also involves timed escape from other heavy responsibilities. The significance of this factor is derived from using adult education as a path to avoid boredom or confusion. Professional advancement involves participants' desire to gain higher salary from their careers, professional progression, search about better working atmosphere and to obtain respect from their counter parts to counterparts. In other words, the main goal of this factor is job-oriented.

Moreover, community service includes the intention among participants to develop valuable stuff, to prepare for social works, and to develop their abilities in conducting social works. While, external expectations involve the participants' expose in learning such activities that are in lines with the adoption of someone's instructions or the recommendations of certain authority, for instance manager, friends, community workers, religious head or counselor (Boshier & Collins, 1983). Finally, cognitive interest relates to the participation intention to obtain a specified knowledge due to their lack of understanding of some issues in that particular realm. They might be exposed to learn certain knowledge for their own good or to obtain personal job out of learning procedures (Boshier & Collins, 1983).

Based on Boshier and Collins (1983) and Knapper and Cropley (2000) have categorized adult learners' motivation as follows: firstly, willingness to accomplish practical objectives get a new job or advance in a current career, secondly, willingness to

accomplish personal satisfaction and other inner-directed personal objectives, thirdly, desire to obtain knowledge, fourthly, consisting of the desire to learn for its own goods, fifthly, willingness to accomplish formal pedagogical objectives like degrees and certification, sixthly, willingness to socialize with others or to escape from everyday routine, and willingness to accomplish societal objective.

Knapper and Cropley (2000) have noted the prerequisite behavioral for idealized lifelong learning which is similar to the categorization approach of Peterson (1979). According to Knapper and Cropley (2000), the significant particularities that are needed to meet the learners' learning objectives are adult learners are aware of the relationship between learning and real life, their aware of the need for lifelong learning, their motivated to carry on process of livelong learning, their possess a self-concept favourable to lifelong learning and the skills necessary for lifelong learning. E-learning will continue to grow in significant for adult learners. Nevertheless, personal attributes and motivation drives adults to participate in education (Abdullah et al., 2008a; Nedelko 2008).

In the present study, Boshier and Collins (1983) model will be used due to the fact that Boshier's EPS has been applied in numerous studies and has subsequently been established as a standard scale for measuring motivation to participate in education. Therefore, social contact, social stimulation, professional advancement, external expectations and cognitive interest will be used in this study and will incorporate in the conceptual framework. A number of studies (Dixon, 1986; Dorn, 1987; Poltechar, 1987; Valentine & Darkenwald, 1990) have been conducted and support the use of Boshier's EPS to assess the needs of adults in educational settings (Truell & Turner, 1997; Dirx,

2000). The Boshier's EPS pretends the participation of adults' lifelong education in the form of e-learning is due to the need for social contact, social stimulation, professional advancement, community service, external expectations, and cognitive interest. In this context, community service variable is taken out because the programs provided by this research are education based instead of community based.

2.12 Institutional Forces

The institutional theory focuses on the pursuit of legitimacy in the eyes of important societal stakeholders and accentuates the significance of the institutional environment as attitudes and behaviors of social actors (Grewal & Dharwadkar 2002). The theory indicates that in modern societies, social actors are typified as systems of rationally ordered rules and behaviors (Weber, 1946; Teo, Wei, & Benbasa, 2003). Therefore, there are general social conceptions of appropriate structures, beliefs, attitudes and behaviors. Early studies in the institutional theory identified three mechanisms by which institutional changes occur that promote similarities in structures and processes. As introduced by DiMaggio and Powell and Scott, these mechanisms for isomorphism are coercive, normative and mimetic (DiMaggio & Powell, 1983; Scott, 2001). These three mechanisms move from the conscious to the unconscious, from the legally enforced to the taken for granted (Hoffman, 1997).

Coercive pressures are defined as both formal and informal pressures exerted on social actors to adopt the same attitudes, behaviors and practices, because they feel pressured to do so by more powerful actors (DiMaggio & Powell, 1983). The previous

empirical evidence suggests that, at the organizational level, coercive pressures may stem from a variety of sources, like regulatory agencies, suppliers, customers, parent corporations and other key constituents (Teo, Wei, & Benbasa, 2003). In general, there are two types of coercive pressures, which are agencies (Harcourt, Lam, & Harcourt, 2005). Competitive pressures arise from the threat of losing competitive advantage.

Early studies have cited the influence of coercive isomorphism pressures on innovation acceptance. For example, Zhu et al. indicated that the regulatory environment plays an important role in e-business diffusion (Zhu, Kraemer, Xu, & Dedrick, 2004). Wang and Cheung (2004) found that coercive pressure was positively related to travel agencies' adoption of e-business. At the individual level, it seems unlikely that there are coercive pressures from regulatory agencies and other key constituents identified at the organizational level. However, at the individual level, e-learning individuals may still face coercive pressures from other sources, like management commitment and support. For example, employees may perceive coercive pressures to use e-learning for on-the-job training when their manager has already been using e-learning.

Normative pressures, associated with the professionalization of fields and disciplines, occur when social actors voluntarily, but unconsciously, replicate other actors' same beliefs, attitudes, behaviors and practices. The institutional theory proposes that social actors are more likely to copy a certain action if that action has been taken by a large number of other actors. Social actors are then been forced to adopt certain behavior due to their expectation for legitimacy and not necessarily for suitability (Flanagin, 2000).

However, this copying or imitation is not coerced by any powerful actors, nor is it conscious. Instead, attitudes, behaviors and practices demonstrated for a long time by most actors in the same social context become so legitimized as the 'right' way things are done that individuals often come to believe that these practices and behaviors indicate the 'only' way to do things (Harcourt, Lam, & Harcourt, 2005; Johnson, Dowd, & Ridgeway, 2006). The normative pressures may guide social actors who have not adopted the innovation to experience discord and hence discomfort when peers whose approval they value have adopted the innovation (DiMaggio & Powell, 1983; Van Den Bulte & Lilien, 2001).

Several studies have demonstrated this imitation in the past. For example, Krassa and Granovetter suggested that decisions to undertake in a particular behavior depended on the considerable number of similar others in the environment which had already done likewise (Krassa, 1988; Granovetter, 1978). In the context of e-learning, normative pressures indicate that individuals will be more likely to adopt e-learning if they perceive that a considerable number of other individuals in their workplace had already adopted e-learning, as individuals may be afraid that they will be loneliness and lack of competitiveness if they do not adopt e-learning. In many cases, individuals may be afraid that they will be deemed 'old fashioned' if they do not follow the current trend. These phenomena have been described before as Bandwagon theories (Abrahamson & Rosenkopf, 1993) and theories of fads (Abrahamson, 1991).

Mimetic pressures force social actors to seek examples of established behaviors and practices to follow through voluntarily and consciously copying the same behaviors and practices of other high-status and successful actors (DiMaggio & Powell, 1983), due to the belief that action taken by successful actors will be more likely to get positive outcomes. In addition, through imitating, actors can reproduce with a minimal effort on search costs and experimentation costs, and avoid risks inherent from being the first-movers (Teo, Wei, & Benbasa, 2003). In the e-learning context, individuals may selectively imitate the attitudes and behaviors that have been adopted by higher status individuals. Individuals may believe that they may get promoted to the higher position by mimicking what their supervisors or high-ranking managers are doing, i.e. benchmark learning. It indicates that individuals will be more likely to adopt e-learning if they perceive high status people have already adopted e-learning.

In summaries, several models have been proposed in the literature to understand e-learning acceptance in which social environmental factors are not primarily addressed (Jan et al., 2012). According to Jan et al., (2012) other studies could be applied a richer set of variables, including not only social factors but also individual factors, as predictors to provide better explanatory power for e-learning behaviors. Therefore, coercive, normative and mimetic pressures will be used in this study and will incorporate in the conceptual framework for measuring e-learning adoption among adult workers.

2.13 The outcome of E-Learning on Adult worker

As this study is focus on adult workers, the literature has indicated two perspectives to examine the outcomes of e-learning adoption in terms of academic study and job performance. Bloom's taxonomy was used to examine adult workers' academic study as well as DeLone and McLean's model was used to evaluate the outcome of working adults' job performance.

2.13.1 The outcome of E-Learning on Adult worker's Academic Study

Numerous models have been developed in order to explain the process of learning such as Bloom's taxonomy namely education objective which can also be as surrogate for e-learning performance evaluation. Lenning (1977) has revised more than eighty models to explain learning outcomes that for 1918 to 1977. Among these models, Bloom taxonomy is considered as the best taxonomies among these models, and the most comprehensive models as well.

The taxonomy of educational objectives developed by Bloom (1956) in order to use it as a general system for classifying learning outcomes. The learning outcomes have categorized into three domains of behavior namely cognitive, affective and psychomotor (Bloom, Englehart, Furst, Hill & Krathwohl 1956).

The cognitive domain has received more attention due to its applicability in postsecondary and secondary education (Chyung, 2003). Bloom *et al.*, (1956) divided

cognitive domain into six categories of learning and organized them on the basis of hierarchy (Baker, 2003; Anderson & Krathwohl, 2001). The six categories in the cognitive domain namely knowledge, comprehension, application, analysis, synthesis and evaluation

Knowledge, which focuses on memorization, recognition, and recall of information; comprehension, which focuses on organization of ideas, interpretation of information, and translation; application, which focuses on problem solving, use of particulars, and principles; analysis, which focuses on finding the underlying organization, and the division of a whole into components; synthesis, which focuses on a combination of ideas to form something new, creating something unique whether verbal or physical; and evaluation, which is the highest level in the taxonomy and focuses on making judgments about issues, resolving disparities or disagreements (Bloom *et al.*, 1956).

The category entails more intricate thinking than the one preceding it and integrates the previous levels of thought to advance to higher levels. Affective domain described as the way for individuals to deal with things emotionally such as feelings, values, appreciations, motivations and attitudes (Anderson & Krathwohl, 2001; Krathwohl *et al.*, 1964). Psychomotor domain is the area of physical movement, coordination and use of motor skills.

Some of the studies have been conducted to evaluate the e-learning performance evaluation by Bloom's taxonomy (e.g. Chiu *et al.*, 2008; Halawi *et al.*, 2009; Alonso *et*

al., 2009; Fu *et al.*, 2009; Ho & Kuo, 2010). A study conducted by Halawi *et al.*, (2009) the objectives of the study were to evaluate e-learning outcomes on the basis of Bloom's taxonomy and to investigate individual, instructional and technological factors that influence on e-learning. The results show that Bloom's taxonomy is significantly related to e-learning. Furthermore, the finding of his study is in line with the outcomes in previous studies which have unraveled this Bloom's taxonomy (Vidakovic *et al.*, 2003; Kartha, 2006; Suanpang & Petocz, 2006).

Moreover, Kartha (2006); Suanpang and Petocz (2006); Vidakovic *et al.*, (2003) carried out a study the Bloom's taxonomy has an important influence on e-learning. Furthermore, from the perspective of Bloom's taxonomy education objective, e-learning is an effective learning tool. In addition, Bloom's taxonomy provides an empirical measurement to account for the different between traditional learning and online learning. In the same line, Halawi *et al.*, (2009) highlighted that the Bloom's taxonomy has been utilized to assess the influence of e-learning and is widely accepted.

In addition, numerous of researchers have also used Bloom's taxonomy an evaluation tool to assess student's performance in traditional courses in return for online learning (e.g. Wong & Wong, 1998; Boyd & Murphrey, 2002; Vidakovic, Bevis & Alexander, 2003; Chyung, 2003). The findings indicate that traditional courses in return for online learning have a positive direct influence on Bloom's taxonomy of learning outcome.

Wikramanayake (2003) emphasized that the importance of identifying learning objects, assessment methods and training to apply the learning outcomes are some of the changes in the teaching process. These changes should be considered as a strategy to implement e-learning systems. The learning process is activity based and focuses on group and individual work with presentations and discussions. E-learning environment together with tutorial and practical classes facilitates the learning process (Wikramanayake, 2003).

To conclude, a previous research done locally by Halawi *et al.*, (2009) has established the Bloom's taxonomy of this model. The study quantifies learning outcomes based on the categories proposed by Bloom *et al.*, (1956). This is significant because Bloom's taxonomy provides an empirical measurement to account for differences between online learning and traditional learning. Therefore, this study presents contributes to the literature by evaluating the usefulness of Bloom's taxonomy in e-learning among adult workers in terms of their study. For the purpose of this study, e-learning outcome was measured on the basis of the purposes contained in Bloom's taxonomy learning objective. The next section will discuss the impact of e-learning in terms of job performance.

2.13.2 The Impact of E-Learning on Adult worker's Job Performance

The system impact or net benefit was proposed by DeLone and McLean in (2003) to examine the outcome of any type of Information System evaluation. DeLone and McLean (1992) argued to move in the opposite direction and group all the impact measures into a single impact or benefit category called “net benefits”. Previous studies assume that the system impact or net benefit is suitable of any educational environment. System impact or net benefit (NB) implies how the system can benefit a single user, a group of users, an organization or an entire industry. It is associated with users' job performance, as well as change in work activity and improved productivity. Thus, individual Net Benefits can be assessed using job effects, efficiency, effectiveness, decision quality, and error reduction (DeLone and McLean, 2003, Lee-Post, 2009). In assessing learning management system (LMS), net benefits capture the balance of positive and negative impacts on the behavior of users, which includes system developers, administrator, instructor and student, or the entire distance learning stakeholders.

Some of the studies have been conducted to evaluate the e-learning performance evaluation DeLone and McLean's model (e.g. Gable, *et al.*, 2003; Gable, Sedera, & Chan, 2003; Gable, *et al.*, 2008; Liu *et al.*, 2012). A study conducted by Alkhalaf *et al.*, (2012) the objectives of the study were to examine an e-learning system outcome on higher education institutions in KSA: attitudes and perceptions of faculty members. The findings indicated that the positive academics' attitudes towards e-learning systems in

higher education, helping faculty members to improve their job performance, and educational organizations to provide better and new products and services to users.

A study done by Almarashdeh et al., (2010) examines the success of learning management system among distance learners in Malaysian universities. The study used a set of questionnaire which was adapted from the literatures to examine three groups of dimensions, system design (system quality, service quality, information quality, usefulness and ease of use), system usage (system use, behavioral intention to use and user satisfaction) and system outcome (net benefit). The findings show that system design has a significant influence on user satisfaction and intention to use of the LMS which directly affect the use of the system. Consequently user satisfaction and system used show strong impact to the net benefit.

Ho and Kuo (2010) recommended direction for future studies to investigate the impact of the adult workers on organizational factors. Studies that have been conducted with the aim of identifying the antecedence factors associated with e-learning adoption has been limited in general especially in the context of adult worker adoption in the developing countries (Dirani & Yoon, 2009). For example, a study by Dirani and Yoon (2009) investigate the factors that affect Open Distance Learning (ODL) quality in the Arab Open University in Jordan (AOUD). The study used a qualitative approach, which included semi-structured interviews with the program director, two instructors, and three students. The findings revealed that three significant conclusions can be drawn from the study about e-learning in the Arab region: (1) the existence of adverse conditions, (2) the

presence of strong instructional practices, and (3) the need to improve administrative support.

Few studies have dealt with e-learning adoption in the perceptive of job performance. The job performance play an important role in adoption of innovation and have been examined by Völlink, Meertens & Midden, (2002); Al-Gahtani, (2003); Lee, (2004); Martins, Steil & Todesco, (2004); Hayati & Jowkar, (2008). These studies indicated that the findings of job performance can differ among countries to another (Al-Gahtani, 2003; Lee, 2004; Martins, Steil & Todesco, 2004; Hayati & Jowkar, 2008). In summary, job performance or net benefits are playing an important role to adopt any new technology (Rogers, 1995; Vahs & Burmester, 2002). Job performance of e-learning adoption among adult workers will be used in this study.

2.14 Recognizing Key Gap in the Literature Review

The research conceptual framework will developed based on the research questions. Furthermore, the framework of this study derived from four major theories developed by various researchers, namely Roger's (1995) diffusion of innovation, Boshier's (1985) education participation scale, DiMaggio & Powell, (1983); Scott, (2001) institutional forces, Bloom's (1956) taxonomy of educational objectives and DeLone and McLean's (1992) model to examine the impact of e-learning on adult workers' job and technologies success. The mean gap in the literature, there are limited studies attempt to combine the four factors in a single framework, limited studies attempt to measure e-learning adoption

on two perspective as well as few research works have examined the outcome of e-learning adoption.

In this study, Roger's theory is aimed to examine diffusion of innovation and adoption of new technology based on innovation attributes. These are relative advantage, compatibility and complexity which were incorporated in the model. These attributes of innovation can be described between 49% and 87% of the rate of the adoption of innovations (Rogers, 1995).

As e-learning system is a special type of IS, DeLone & McLean IS success model is one of the most widely cited for examining system successfully adoption (Wang et al., 2007). Numerous authors recommend integrating DoI with other theories such as D&M to cope with rapid changes in IS/IT, improve specificity and explanatory power and one theoretical model for evaluating e-learning adoption successfully is not sufficient (Carter & Belanger, 2005; Liu et al., 2009). Therefore, this study proposes an integrated conceptual framework for evaluating e-learning adoption successfully by applying the concepts of both Roger's diffusion of innovation and DeLone & McLean update IS success model (D&M). The service quality, system quality and information quality were incorporated in the model.

Beside technological factors, organizational factors are other factors which have been identified in the literature that contributes to IT adoption in general and to e-learning adoption among adult workers. These organizational factors include: top management

support, organization culture and organization structure were also incorporated in the model.

Personal attributes are other factors that aimed to obtain a better understanding of adult adoption of e-learning in general. In this study, the personal factors consisting of five factors namely social contact, social stimulation, professional advancement, external expectations and cognitive interest were incorporated in the model. Personal attributes can understand of the motivation which drives adults to commit to, higher education and complete through e-learning is a very significant requirement for the delivery and the design of adult programs for educational institutions (Abdullah *et al.*, 2008a; Nadelko 2008). The participants' personal factors in their interest in enrolment in e-learning process have been neglected in the literature of this field (Andersson, 2009).

Moreover, several models have been proposed in the literature to understand e-learning adoption context in which social environmental factors are not primarily addressed. This study aims to improve understanding of what social forces influence employee's attitude and intention of e-learning adoption within an adult workers context. Drawing upon the institutional theory, this study identifies three social environmental factors including coercive, normative and mimetic pressures that also drive the e-learning adoption context. A study done by Jan *et al.*, (2012) recommended direction for future studies could be integrate social factors with individual factors due to predictors to provide better explanatory power for e-learning adoption among adult workers.

In addition, as this study is focus on adult workers, the literature has indicated two perspectives to examine the impact of e-learning adoption in terms of study and job. Bloom's taxonomy was used to examine adult workers' study as well as DeLone and McLean's model was used to evaluate the impact of working adults' job. The study has sought to develop a model to describe the e-learning applications adoption among adult workers in terms of types of e-learning applications adoption and the extent of their usage.

In general, limited researches have been conducted in the field of e-learning adoption among adult workers. The limited researchers mainly attempt to identify the technological factors (e.g. Mohd et al., 2011; Samah et al., 2011; Aggorowati, Iriawan & Gautama, 2012), or technological and organizational factors that influence e-learning adoption (Macpherson *et al.*, 2005; Nwabufo et al, 2012). Furthermore, the approach of examining e-learning adoption in previous studies has to basically relied on two contexts which are "adopt or not adopt e-learning". These studies were focused just in one perspective to examine the e-learning adoption (e.g. Hung *et al.*, 2009; Duan *et al.*, 2010). Limited studies investigated e-learning and subsequent impacts on performance in terms of study and work (Halawi *et al.*, 2009; Chen 2010).

Previous studies conducted on e-learning have focused on students, while few research works have examined the e-learning adoption among adult workers who are working fulltime and study part time. Few studies on e-learning adoption from the adult workers' perspective have been conducted. However, the review showed that limited

attempt to combine the four factors (e.g. technological, organizational, social environmental factors, personal factors and impact of e-learning) in a single framework.

2.15 Proposed Research Framework

To sum up, the current study investigates a model for describing adult workers' adoption of e-learning as well as its impact. The model of this study is shown in Figure 2.14. The model consists of three segments. The one in the middle aims to determine the current level of e-learning adoption among adult workers. The second (the left side of the model) represents the relationships between technology, organization, institutional forces and personal factors that are perceived to influence e-learning adoption. The third segment (the right side of the model) represents the relationships between e-learning adoption and e-learning impacts on adult workers.

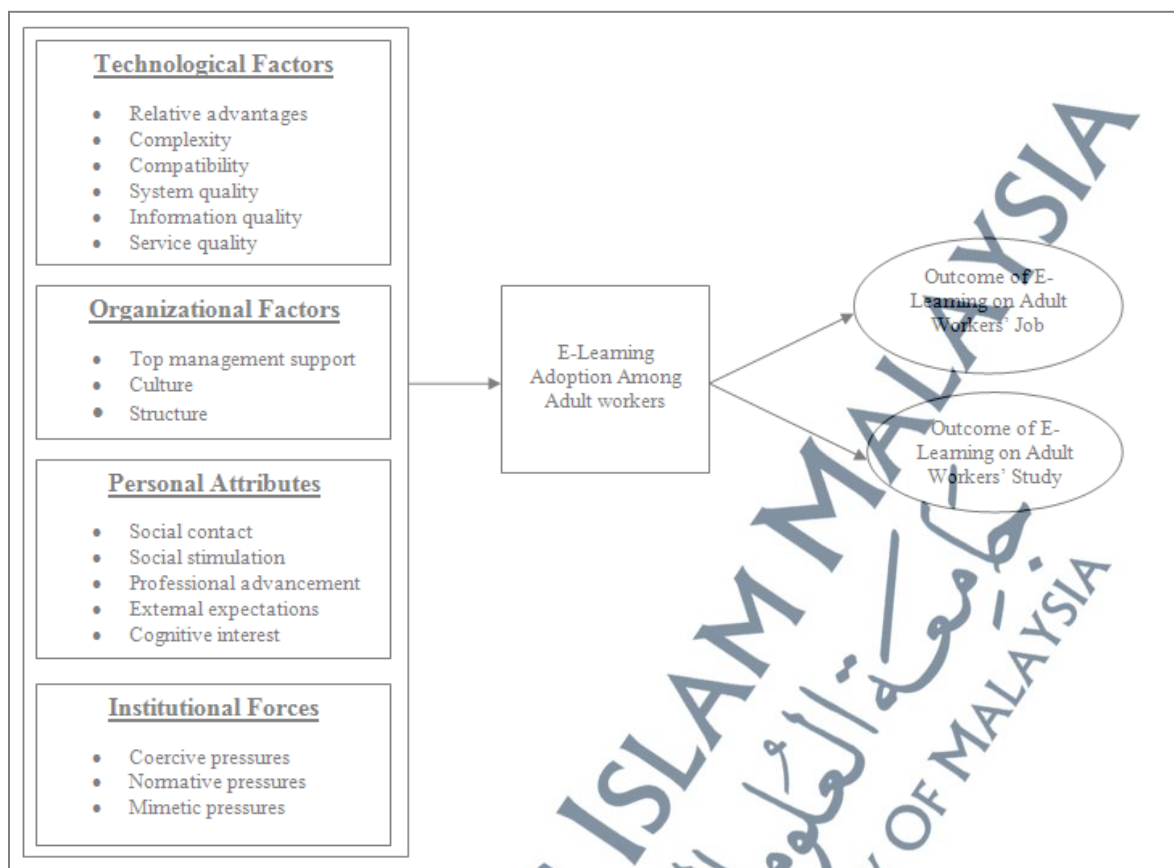


Figure 2.14 Conceptual Framework for Adoption and Implementation of E-Learning among Adult Workers

2.16 Summary

This chapter has discussed the basis for the development the research framework for this study. The research framework is built on theories that have been validated and useful in explaining adoption of innovations. Moreover, the current research draws on the DOI (Rogers, 2003). This model is one part of the well-known Rogers' DOI framework (2003). Rogers (2003) postulated that the perceived characteristics of an innovation have an effect on its adoption. Rogers (2003) argued that these characteristics can provide an explanation on the rate of innovation adoption.

This chapter also reviewed the literature on the adoption of e-learning. The review showed the importance of various factors influencing e-learning adoption among adult workers. These factors are categorized into technological, organizational, institutional forces, personal as well as impact on e-learning adoption. However, the review showed that limited attempt to combine the four factors in a single framework. Furthermore, it was found that little studies that attempt to examine the adoption of e-learning among the Jordanian students in general and adult workers in particular have been conducted. The next chapter will describe in detail the research framework and methodology adopted in this research.