An Investigation of the Factors for Adopting E-learning in Libyan Higher Education for Learning and Teaching

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This thesis is presented for the degree of Doctor of Philosophy of Murdoch University

2015
DECLARATION

I declare that this thesis is an account of my own research and contains as its main content, work which has not been previously submitted for a degree at any tertiary education institution.

________________________
Ali Mohamed Elkaseh
ABSTRACT

E-learning in higher education has changed the conventional way of learning due to the rapid development of Information and Communication Technology (ICT) over the past decades. To successfully adopt e-learning in higher education institutions, it is vital to examine and consider the factors for implementing e-learning. Recently, the Libyan government has provided some initiatives to move towards the implementation of e-learning in higher education institutions. However, there are many obstacles and challenges that need to be addressed for the implementation of an effective e-learning system in Libya. It is the purpose of this research to investigate the feasibility of adopting e-learning in Libyan higher education. The objectives of this study is to investigate the factors affecting the implementation of e-learning in Libyan higher education. In order to study the adoption of e-learning for teaching and learning in Libyan higher education, the conceptual model, namely the Technology Accepting Model (TAM), was used in this study. The research strategy used here is that of survey research and the questionnaire is the tool used for data collection. A sample size of 400 students and 400 teachers were selected from four Libyan universities. Structural Equation Modelling (SEM) was carried out to examine the predictive behaviour of the proposed factors of the research models.

The student model shows that both ‘Perceived Ease of Use’ and ‘Perceived Usefulness’ of e-learning were significantly influenced by Social Networking Media, Social Influences and Mobile Devices. In addition, the teacher model also shows that both ‘Perceived Ease of Use’ and ‘Perceived Usefulness’ of e-learning were significantly influenced by Perceived Enjoyment, Social Networking Media and Mobile Devices. Moreover, for both students and teachers, ‘Perceived Ease of Use’ and ‘Perceived Usefulness’ considerably influenced the attitude towards the utilisation of e-learning. As
such, the attitude towards using e-learning has positively influenced the intention to use it.

Finally, in both models, the results suggest that individuals who believe in the usefulness of Social Networking Media and Mobile Devices, will have more intention to use e-learning technology, when these platforms and gadgets are simple and easy to use.
ACKNOWLEDGEMENTS

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I would like to thank my lovely wife, Iman Samalus, for being very supportive and patient with me during my most difficult times. Her love, understanding and hard work enabled the family and I to make this educational journey a successful one.

I would like to thank the rest of my family here in Perth, including my dear sons - Awis, Anas, Mohamed, Elias and Eyad, as well as my beautiful daughter, Asil, for being so considerate and willing to overcome the culture shock and language challenges, just to be with their father. Special thanks also continues to my family back home in Libya, in particular, the greatest mother and father of mine, whom without their prayers and support, I would not have been able to accomplish this.
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LIST OF ABBREVIATIONS

ICT : Information and Communication Technology
TRA : Theory of Reasoned Action
TAM : Technology Acceptance Model
PU : Perceived Usefulness
PEOU : Perceived Ease of Use
AU : Attitude Towards Use
BI : Behavioural Intent to Use
SI : Social Influence
PE : Perceived Enjoyment
SNM : Social Networking Media
MD : Mobile Devices
CSF : Critical Success Factors
SEM : Structural Equation Modelling
BI : Behavioural Intention
UTAUT : Unified Theory of Acceptance and Use of Technology
SPSS : Statistical package of Social Sciences
AMOS : Analysis of Moment Structure
EFA : Exploratory Factor Analysis
AVE : Average Variance Extract
CrR : Critical Ratio
RMSEA : Root mean square error of approximation
GFI : Goodness-of-fit index
AGF : Adjusted Goodness-of-fit index
CFI : Comparative fit index
TLI : Tucker Lewis Index
MLE : Maximum Likelihood Estimation
KMO : Kaiser-Meyer-Olkin
CR  : Composite Reliability
CFA : Confirmatory Factors Analysis
LIST OF PUBLICATIONS AND CONTRIBUTIONS OF THE THESIS


CHAPTER 1: INTRODUCTION

1.1 Background

In recent decades, the rapid growth of Information and Communication Technology (ICT) has led to many changes and developments in all aspects of life, in particular the education sector. For example, the growth of ICT has allowed higher education institutions to reach a wide range of students and improved student access to higher education. Lim and Morris (2009) stated that as a result of the developments in ICT and network technologies, further innovative distribution and learning methods have appeared in order to produce meaningful learning experiences for students in academic settings. E-learning has become popular in higher education institutions in many countries. Despite the proliferation of e-learning in higher education institutions, the adoption of e-learning still faces a number of obstacles and challenges in some countries. These obstacles and challenges can be summarized as a lack of ICT infrastructure, leadership, training of instructors and learners, as well as e-learning strategy (Khashkhush, 2011). Successful e-learning implementation in a country offers learners and institutions with new opportunities of learning, that may overcome those obstacles and challenges which limit participation in a traditional classroom. Typical challenges include the cost of learning, travel and classroom facilities. According to Jebeile (2003), successful implementation of e-learning requires an investigation into the pedagogical, technological and individual factors that enhance the effective utilization of the technology. Many researchers have highlighted that investigating the factors that impact users’ acceptance and usage of e-learning, is significant for better implementation and use of e-learning (Pituch & Lee, 2006; Selim, 2007).
On the other hand, the international community is trying to overcome these challenges through the development of its citizens with the skills necessary to adapt to the development of ICT. For example, the UK 2011-12, the expenditure on ICT on higher education was about £1,0945 million (Office, 2011). In the USA, the expenditure on higher education in 2013 was $65 billion (Stauffer, 2015) and the on expenditure K-12 schools in 2015 was $4.9 billion (Hewitt & Srinivasan, 2011), while in New Zealand, the government spends more than $410 million every year on schools’ ICT infrastructure (Johnson et al., 2009). The investments on ICT infrastructure, equipment and professional development are essential to bring about the implementation of a successful e-learning strategy (Buabeng-Andoh, 2012).

The idea of using and adopting e-learning has become widely accepted across higher education in many developed countries, including the USA, UK, most European countries and Australia (Oliver, 2001; Paredes & Correa, 2010; Saowapakpongchai, 2010; Tucker & Gentry, 2009). Developing countries also appear to adopt e-learning in their higher education to improve and enhance the education experience. These countries include Pakistan, China, Bangladesh and Jordan (Al-Adwan & Smedley, 2012; Chuntao, 2010; Mahmud & Gope, 2009). However, the adoption of this technology as a tool for teaching and learning in Libyan higher education is still in its early stage, where some of the difficulties and challenges are still being addressed.

In fact, researchers found that the Critical Success Factors (CSFs) to adopt e-learning differ from one country to another due to reasons such as culture, policy, government regulation and economic environment. Lonner et al. (1980) defined culture “as the collective programming of the mind that distinguishes the members of one group or category of people from another”. Therefore, student's and teachers' perceptions of e-learning differ, depending on their backgrounds. Cultural and cultural-pedagogical
challenges in some cases have resulted in failure of educational institutions to accomplish their intended goals (Ess, 2009). Most Libyan are still quite tradition in their attitudes, customs, behaviours, communication patterns and protocols (Rhema & Miliszewska, 2010a). On the other hand, students as well as teachers are still generally unaware of the potential of e-learning in Libya.

Othman et al. (2013) mentioned that the armed conflicts in Libya in 2011 crippled the country's economy and has badly influenced its telecommunications sector. It is estimated that more than US$1 billion worth of telecom infrastructure has been destroyed, including about 20% of the country's cell sites. Rhema and Miliszewska (2012a) mentioned that Libya is facing significant challenges aftermath the 2011 armed conflict, which left the country in a dismal state and forced it to "start from scratch" in building up its infrastructure and services. One of the most important challenges facing Libya is to rebuild its educational system. Many of the higher educational institutions in the conflict areas have lost their infrastructure. These losses must be taken care of in order to revive the education system in Libya (Rhema & Miliszewska, 2012a).

All these factors may cause obstacles and challenges for e-learning implementation. As Libya has a different culture, policy, government regulation and economic environment from the rest of the world, e-learning implementation in the Libyan higher education scene could face unique challenges and obstacles. Therefore, the objective of this research is to identify the challenges and obstacles present in the Libyan higher education system.

Libya is one of the few developing countries where the usage of ICT and the use of e-learning is still in its early stages (Rhema & Miliszewska, 2010b). The process of implementing the National ICT policy, specifically the development of projects in different domains in general is still on-going (Hamdy, 2007). Although some Libyan
universities such as Tripoli University, Benghazi University and the Academy of Postgraduate Studies and Economic Research have some basic ICT infrastructure and facilities such as computers, local area network and Internet access, they still rely heavily on the traditional education method of using face-to-face interaction in and out of the classrooms between students and teachers. Besides, most learning activities are only available on campus (Rhema & Miliszewska, 2010b). Recently, the Libyan government has provided some initiatives to move towards the implementation of e-learning in higher education, but there are many challenges and obstacles that need to be resolved for the implementation of e-learning. There is an absence of skilled and experienced teachers who can bring ICT into classrooms for their teaching (Hamdy, 2007). The Libyan higher education landscape still faces many challenges to implement ICT and e-learning technology in teaching and learning. The challenges are related to cultural and linguistic factors, awareness and attitudes of students and teachers towards e-learning, a lack of efficient technological infrastructure, as well as a shortage of curriculum development for e-learning (Rhema & Miliszewska, 2010b). However, the factors to successfully implement e-learning technology in Libyan higher education have not been defined and studied. Therefore, this research will focus on examining the experience, perception and intention of teachers and students in Libya towards using e-learning. This research will also investigate and provide an understanding of the factors that have an impact on the implementation of e-learning for higher education in Libya.

1.2 Research Purpose and Aims

This research aims to investigate and understand the factors that have an impact on the implementation of e-learning in Libyan higher education. The following are the aims of this research.
1. To investigate the factors impacting the implementation of e-learning in Libyan higher education.

2. To determine the perceived usefulness of using e-learning to enhance learning and teaching in Libyan higher education.

1.3 Research Questions

1. What are the factors that could influence the implementation of e-learning in Libyan higher education?

2. Does the frequency of using social media have an impact on the perceived ease of use and the perceived usefulness of e-learning by students and teachers in Libyan higher education?

3. Does the use of mobile devices affect the perceived ease of use and perceived usefulness of e-learning for students and teachers in Libyan higher education?

1.4 Project Contribution to Scholarly Knowledge in the Field

According to Chuntao (2010), modern instructional technology has revolutionized teaching and learning in higher education. It can enhance, improve and alter the current way of teaching in higher education. For that reason, this research intends to investigate the factors that may impede the implementation of e-learning in Libyan higher education. To our knowledge, there is only one research study to date that has specifically tackled this issue by providing the challenges of implementing e-learning for higher education in Libya. That research merely discussed the challenges faced when implementing e-learning in Libyan higher education (Rhema & Miliszewska, 2010b), but has not provided a substantial framework for understanding the factors contributing to the implementation of e-learning in Libyan higher education. The study was seeking to investigate the experiences and perceptions of ICT and e-learning among
students and academics in higher education engineering programs in Libya. The data was collected from two public Libyan universities. The findings of this research study indicated that most of the participating students and instructors in Libya have good levels of skill in using ICTs, have positive attitudes towards e-learning, and are willing to engage in e-learning programmes. On other hand, the purpose of this research is to investigate the feasibility of e-learning in Libyan higher education. The study examines the factors affecting the implementation of e-learning in Libyan higher education. Technology Acceptance Model (TAM) is used as a theoretical lens to answer research questions. The data are analysed using Structural Equation Modeling (SEM) technique.

A contribution of this proposed research has been the investigation and understanding of the factors that have an impact on the implementation of e-learning. Moreover, results from this research provide a framework for further study in this domain. Investigating and analysing the factors which affect the implementation of e-learning will help the authorities involved in higher education avoid the impediments which negatively affect the adoption of e-learning in Libyan higher education.

This thesis offers fundamental information to assist in establishing a framework for the adoption of e-learning, which will provide support to the development of the higher education sector in Libya.

With regards to the personal benefits for the students and teachers in Libya, the use of e-learning in higher education might enhance their learning quality, increase their academic performance, as well as improve both teaching and learning styles. Moreover, with social networking media, perceived enjoyment, social influence, mobile devices, perceived ease of use, perceived usefulness, coupled with a positive attitude towards the use of e-learning, students and teachers can have good behavioural intentions to use this technological tool for their learning. The purpose of this thesis is to explore and
investigate these issues. The outcomes of this thesis will support the idea of utilizing e-
learning in Libyan higher education and hopefully, convince decision makers, university
administrators, academics and educators to include e-learning in their future plans.

1.5 Theoretical Framework

In order to investigate the factors for adopting e-learning in Libyan higher education for
learning and teaching, four main constructs, namely ‘Social Influence’, ‘Perceived
Enjoyment’, ‘Social Networking Media’ and ‘Mobile Devices’, need to be investigated
(Balakrishnan & Loo, 2013; Cheon et al., 2012; Huang et al., 2007; Landry et al., 2006).
The proposed framework was created based on the established theories from the Theory
of Reasoned Action (TRA) (Venkatesh & Davis, 2000) and the Technology Acceptance
Model (TAM) (Venkatesh & Davis, 2000). TAM proposes that acceptance or usage is
to determine by two factors: Perceived Usefulness (PU) and Perceived Ease of Use
(PEOU). Perceived Usefulness is defined as “the degree to which an individual believes
that using a particular system would enhance his or her productivity,” while Perceived
Ease of Use is defined as “the degree an individual believes that using a particular
system would be free of effort” (Davis, 1989). Based on empirical studies and literature
related to the adoption of Information Technology, four factors relating to attitudes and
intentions were extended to TAM. Consequently, the research model for this study
consisted of eight constructs: ‘Perceived Ease of Use’ (PEOU), ‘Perceived Usefulness’
(PU), ‘Attitude Towards Use’ (AU), ‘Behavioural Intent to Use’ (BI), ‘Social Influence’
(SI), ‘Perceived Enjoyment’ (PE), ‘Social Networking Media’ (SNM) and ‘Mobile
Devices’ (MD). The basic framework is similar to the research conducted by
(Rapeepisarn, 2012), and this thesis extended that basic framework to accommodate the
focus of this research.
1.6 Variables Used in the Study

The variables used in this study are categorised into four main groups: ‘E-learning Acceptance Factors’, ‘Technology factors’, ‘Demographic’ and ‘Pedagogy’ (Rapeepisarn, 2012). The lists and respective definitions of the variables are illustrated in Figure 1.1 and Table 1.1.

<table>
<thead>
<tr>
<th>Demographic</th>
<th>E-learning Acceptance Factors</th>
<th>Technology Factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>Perceived Ease of Use (PEOU)</td>
<td>Mobile Devices (MD)</td>
</tr>
<tr>
<td>Age</td>
<td>Perceived Usefulness (PU)</td>
<td>Social Networking Media (SNM)</td>
</tr>
<tr>
<td>University Type</td>
<td>Behavioural Intention (BI)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Perceived Enjoyment (PE)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Social Influence (SI)</td>
<td></td>
</tr>
</tbody>
</table>

**Figure 1.1: List of Variables**

**Table 1.1: Definition of Variables**

The Acceptance of E-learning

<table>
<thead>
<tr>
<th>Variables</th>
<th>Conceptual definition</th>
<th>Working definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perceived usefulness (Davis 1989)</td>
<td>The degree to which a person believes that the use of e-learning in higher education would have advantages and offer positive, expected results.</td>
<td>E-learning may improve, support and enhance the effectiveness of teaching and learning, engage students during learning and allow students to study at their own preferred pace.</td>
</tr>
<tr>
<td>Perceived ease of use (Davis 1989)</td>
<td>The degree to which a person believes that the use of e-learning would take less effort.</td>
<td>E-learning is simple and easy to learn and use in higher education.</td>
</tr>
<tr>
<td>Behavioural Intention to use (Venkatesh et al. 2003)</td>
<td>An indication of how hard people are willing to try and of how much effort they are willing to exert.</td>
<td>The degree to which teachers and students are willing to use e-learning in higher education.</td>
</tr>
<tr>
<td>Perceived Enjoyment (pikkarainen et al. 2004)</td>
<td>The degree to which a person believes that using e-learning</td>
<td>The degree of satisfaction among e-learning users.</td>
</tr>
</tbody>
</table>
would be interesting and will improve the education system.

| Social Influence (Taylor and Todd 1995a) | Social influence is equivalent to subjective norm and defined as other people’s opinions, superior and peer influences. | Positive impacts from their colleagues, family, friends and superiors regarding the use of e-learning in higher education by teachers and students. |
| Awareness and attitude (Fishbein and Ajzen, 1975) | A person's positive or negative feeling about performing the target behaviour. | The awareness of teachers and students towards using e-learning and that it can be perceived as either positive or negative. |
| English Language (Devlin 2007) | The differences among students of different linguistic and cultural backgrounds with regards to their patterns of use and the degree of comfort in using e-learning. | Language plays an essential role in utilizing the benefits of e-learning because most of the materials for e-learning are written in English. |
| Computing experience (van Braak et al., 2004) | The ability to handle varieties of computer applications for different purposes. | Categorizes the levels of computer skills required for using e-learning. |

### Technology Factors

<table>
<thead>
<tr>
<th>Variables</th>
<th>Conceptual definition</th>
<th>Working definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mobile Devices (Alsaadat, 2009)</td>
<td>Mobile learning simply means the using of mobile and handheld IT devices, such as Personal Digital Assistants (PDAs), mobile telephones, laptops and tablet PC technologies, in teaching and learning.</td>
<td>The use of portable devices like wireless laptops, cell phones, and PDAs to facilitate the teaching and learning process in physical spaces that accommodate the convenience or demands of the learner and/or allows learning to take place at a location conducive to fulfilling learning objectives.</td>
</tr>
<tr>
<td>Social Networking Media (Harris &amp; Rea, 2009)</td>
<td>Social networking technologies discriminated by several characteristics such as the ability to share and create content, collaboration and the new methods of interaction.</td>
<td>Internet-based application designed to connect people (to interact and share data) who share personal or professional interests. Examples of popular social networking softwares include Twitter, Facebook and Myspace. Here, social networking softwares are also referred to as social networking applications.</td>
</tr>
</tbody>
</table>
Demographic

<table>
<thead>
<tr>
<th>Variables</th>
<th>Conceptual definition</th>
<th>Working definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>Male or female</td>
<td>Male or female</td>
</tr>
<tr>
<td>Age</td>
<td>Age</td>
<td>Age</td>
</tr>
<tr>
<td>University Type</td>
<td>University purpose</td>
<td>Type of university that is classified into either a public or private.</td>
</tr>
</tbody>
</table>

Table 1.1 listed the independent, dependent and moderate variables. The independent variables are: Social Networking Media, Social Influence, Perceived Enjoyment and Mobile Devices. The dependent variables are: Perceived Usefulness, Perceived Ease of Use, Attitude Towards Use and Behavioural Intent to Use. The moderate variables are: Gender, University Type, Language and Computer Experience. Figure 1.2 shows the conceptual framework.

Figure 1.2: Conceptual Framework Relating Factors Influencing E-learning Implementation
1.7 Outline of Thesis

The thesis is organized in six chapters. Chapter 1 presents the general background, aims and purposes of the research. This chapter also provides the research questions and gives a description about the structure of the thesis and variables used in this thesis.

Chapter 2 reviews the background literature on e-learning. It explains what e-learning is, the different types of e-learning, the benefits of e-learning and e-learning in higher education. It also includes reviews on past research in the domain of e-learning in order to identify the theoretical models that could be used to understand and investigate the Critical Success Factors (CSFs), that can affect the successful implementation of e-learning in higher education. Moreover, this chapter reviews the effect of CSFs in different countries and also gives an overview on Libyan higher education.

Chapter 3 discusses the research framework and introduces the research model. This chapter also describes the proposed constructs and the research hypotheses.

Chapter 4 provides the research methodology used in this thesis. It presents the research design, population and sample, instrument development, data collection methods and data analysis techniques. Moreover, it describes the Structural Equation Modelling (SEM) used to determine the fit of the hypothesized model.

Chapters 5 present the results of the study. Chapter 5 presents the outcomes of the quantitative data collection and analysis. This chapter also reports the outcomes of the measurement and structural models. It also concludes by reporting the outcomes of the testing of the hypotheses.

Chapter 6 discusses the research results and the implications of this study. This chapter also discusses the limitations of the research and introduces recommendations to the Libyan higher education. Finally, the chapter reports the conclusion.
CHAPTER 2: REVIEW OF LITERATURE

2.1 Introduction

With the advancements in Information and Communication Technologies (ICT), computers have been used in education over the past decades. Much attention is paid to the use of e-learning technologies like online learning as tools for learning in the higher education sector in recent times. According to Wilson (2001), e-learning can be considered in several ways, such as networked, distance and online learning. E-learning also introduces the use of modern learning approaches by utilizing ICT in typical learning environments, to create new learning paradigms that can help to enhance the traditional methods of teaching (Ma et al., 2008).

In higher education, online learning or e-learning are normally used to create efficient and effective e-learning platforms (Laurillard, 1999). This instructional technology has changed the delivery of teaching and learning in higher education, because it provides more convenience and flexibility to learn anytime anywhere (Chuntao, 2010). Higher education institutions are adopting and using the Internet more for distributing learning materials, both externally and on campus (Mohamed Ally, 2004; Kim & Bonk, 2006). However, Surry et al. (2002) stated that in most instances where institutions plan to implement and use instructional technologies in higher education can face many obstacles that could affect the competence of a student, instructor’s ability to motivate, technology infrastructure and the satisfaction of using such technology. Even in universities where integration has been considered successful, the unintended consequences relating to technology and resistance to change between teachers, students and other employees, have made the technology integration process a challenging and difficult task. Many higher education institutions have embarked in the implementation of e-learning courses. However, they face enormous difficulty in achieving successful
strategies including the effectiveness, poor delivery, and acceptance of the e-learning courses. This is mainly due to the fact that the problem of implementing successfully e-learning courses involves multiple inter-related factors ranging from technology related issues to pedagogical considerations (Saadé, 2003).

It was reported by Chitiba (2011) that at the higher educational level, there are many driving factors and challenges which may increase or decrease the motivation to engage in e-learning. This has also provided some insights into the challenges of embedding e-learning for higher education purposes. The key driving factors underlying the adoption of e-learning, as identified by Chitiba (2011) in higher education, are the need to improve the skills of the students to meet the challenges of the Information and Knowledge society, as well as the need for flexible access to lifelong education.

While many higher educational institutions have begun to implement e-learning strategies, a number of concerns and issues have been highlighted in the literature pertaining to the availability of the technologies and users’ perspectives of these technologies, including other associated infrastructure costs (Khan et al., 2012; Wilson et al., 2000). The implementation of a huge project such as e-learning requires the understanding of its typical role in teaching and learning pedagogy. More importantly, understanding the Critical Success Factors (CSFs) will go a long way in establishing it as a preferable alternative in Libyan universities. The CSFs can be considered as those factors that must be accomplished before e-learning implementation can be regarded as being successful (Odunaike et al., 2013). Weller (2007) mentioned that e-learning environments consist of process, technology and people. These are indeed the Critical Success Factors (CSFs) that need to be considered when implementing e-learning to create a successful and conducive learning environment. Another CSF which affects a learner’s experience is the technical support provided to the faculty and students
(Concannon et al., 2005). There have been reports of students facing obstacles during their e-learning courses and this has thereafter led to adverse perceptions of the use of e-learning technology in their studies. This negative viewpoint is mainly due to the lack of resources, inadequate pedagogy in the curriculum and lack of user touch and feel in the e-learning platforms (Allen, 2003; Östlund, 2005; Rhema & Miliszewska, 2010c).

The purpose of this chapter is to review the CSFs that can affect the successful implementation of e-learning in higher education institutes, especially in the Libyan higher education system. These CSFs have been identified through the review of past literature in the domain of e-learning. In addition, this chapter also reviews some theoretical models available to be used to identify and investigate the factors influencing the acceptance of e-learning technology in Libyan higher education.

2.2 Overview of E-learning

E-learning covers areas such as computer-based learning, virtual classrooms, digital collaboration and web-based learning. It also involves the delivery of course materials via electronic tools. E-learning is an “innovative approach to education delivery via electronic forms of information that enhance the learner’s knowledge, skills, or other performance” (Sirintongthaworn et al., 2006).

Urdan et al. (2000) defined e-learning as the mechanism for content delivery through electronic media, including extranets, intranets, the Internet, audio/ video tape, satellite broadcast, interactive television (TV) and CD-ROM. E-learning uses the Internet for teaching and learning; it includes work submission, contact between and among the students and teachers, as well as content delivery (Cysewski, 2010). Gunasekaran et al. (2002) also proposed that e-learning is an Internet-enabled learning comprising of the delivery of contents in multiple formats, the management of learning experiences and a
networked-community of learners, content developers and experts. Other researchers in the e-learning domain have defined e-learning as a new technological concept that uses ICT and other computing device systems to deliver learning instruction, content and information (Selim, 2007).

2.3 Types of E-learning

E-learning can be broadly classified into two main types depending on how the learning events are scheduled and how users interact with each other. Wentling et al. (2000) mentioned that e-learning may include asynchronous or synchronous access and may be delivered geographically with different time limits (cited in Anani 2008). E-learning involves asynchronous as well as synchronous types of communication (Kirkwood & Price, 2012). The two types of e-learning are asynchronous (self-paced) versus synchronous (instructor-led) (Wagner et al., 2008).

2.3.1 Asynchronous E-learning:

In asynchronous e-learning, the communication between the students and instructors does not occur at a specific time, as the learning content or courseware is delivered at the student’s own pace. The courseware is normally available to learners all the time. The asynchronous type of e-learning refers to online learning where learners interact with each other or with their teachers, over a time gap, by using tools such as chat rooms, social networks, e-mails and bulletins (Oye & Iahad, 2012). In this type of e-learning, learners use emails, take self-paced courses, and post messages to discussion groups. This form is more popular because it is cheaper to develop, its components are reusable and it gives more support to the learners. Also, it allows students to discuss amongst themselves, as well as with the instructors via the Internet. However, as these activities are not real time, the interaction between participants is delayed (Algahtani,
It has been noted that asynchronous e-learning offers students more flexibility (Kearsley, 1995). The advantage here is that the students can learn anytime, at any place that suits them. The only disadvantage is that the student does not receive feedback instantly.

Asynchronous e-learning is ‘on-demand delivery’, which offers learners the advantages of controlling their learning pace and content. Asynchronous e-learning usually takes the form of: electronic mail and delivering of learning materials; sending and receiving assignments; getting and giving feedback; public electronic bulletin newsgroups/boards or collaborative systems for discussion; downloading materials for learning from knowledge repositories through the web; company intranets that distribute training to its staff; the use of online databanks/databases to acquire information or pursue research and interactive training/tutorials on the Internet (Hiltz & Wellman, 1997; Wulf, 1996). Most e-learning systems use asynchronous communication technologies due to the fact that it is easier to develop and implement. In addition, it is not as expensive to implement when compared to the synchronous e-learning systems (Zhang & Nunamaker, 2003).

### 2.3.2 Synchronous E-learning

Synchronous e-learning means that all instructors and students are logged on to the e-learning platform at the same time to communicate directly and virtually with one another. The instructors and students must be in the virtual classrooms at a specific time in order for the class to begin. Synchronous e-learning events include chat rooms, application sharing, live web-casts, social media and whiteboard sessions. The synchronous e-learning allows students to communicate with the instructors and amongst themselves via the Internet instantly, using tools such as videoconference, chat rooms and other similar methods. The advantage of this method is that it offers
immediate feedback (Algahtani, 2011). Leidner and Jarvenpaa (1995) stated that all students in the class will contribute in computer-mediated synchronous discussions and that they communicate with each other or the whole class, rather than on a one-to-one basis with the instructor, when comparing with the traditional classroom. Synchronous communication can be used as a complement to the traditional classroom learning as it is seen to be more sociable and interactive (Chou, 2002). It has been argued that this type of communication can enhance the e-learning environment (Dawson, 2006) and speed up the information flow within a team (Carr et al., 2004). The key educational assumption that stimulates interacting synchronously is participation. Interaction is important to the learning process (Leidner & Jarvenpaa, 1995). Taran (2006) stated that when synchronous learning is mixed with technology, it provides better interaction between the students and teachers, as well as creating an efficient platform to develop ideas, solve problems and enhance critical thinking abilities between students and teachers. Synchronous e-learning furnishes individuals with abilities to feel more associated and part of a learning society, rather than asynchronous learning. Most importantly, the interaction between students and teachers is carried out in real time (Zhang & Nunamaker, 2003).

2.3.3 E-learning in Libya

According to study conducted by Al-Badree (2007) mentioned that the implementation of e-learning system in Libyan higher education is still in its early formative years, because the deployment of ICT is not widespread in Libya. Although some Libyan higher education institutions have basic ICT infrastructure, they still heavily depend on the traditional education method of using face-to-face interactions and learning activities that are only available in the classrooms (Rhema & Miliszewska, 2010c). Libyan Open Universities provide learners the opportunity to study out of campus,
catering to the needs of learners with family commitments and work, and to learners from the reginal area of the country. However, learning experiences tend to be traditional, as the universities rely heavily on printed learning materials. This is beginning to change, as many institutions have recently introduced electronic resource repositories, and e-libraries (Rhema & Miliszewska, 2010c). In Libyan higher education institutions, the level of educational technology awareness and even the basic of computer skills is generally low among students and teachers which leads to resistance in implementing ICT for learning and teaching (Rhema & Sztendur, 2013). Rhema and Miliszewska (2010c) stated that most of students and teachers have had little experience in using a computer; and those who are familiar with computer, generally only use them as a tool for communication and entertainment through the Internet. Hence, students and teachers tend to feel unconformtable when engaging with technology for teaching and learning purposes. On the other hand, they find interacting with computers pleasant, helpful and easy, as they use online chat-rooms, and download music and films (Rhema & Miliszewska, 2010a). Recently, many Libyan younger generation, in particular higher education students have shown that they prefer using new technology and also their eagerness to utilize all technical devices through social networking media (Kenan et al., 2013). According to Thuraya Kenan et al. (2013), many Libyan higher education students are using social media tools to share knowledge, information, and discuss the issues related to their studies.

2.4 Benefits of E-learning in Higher Education

E-learning offers many opportunities and has various benefits if implemented successfully. Many studies indicated that e-learning can be useful to the institutions and individuals involved (Lou & Alshawi, 2009), as well as to the teachers and students (Committee, 2006; InfoNet, 2008; Savin-Baden, 2008). Some of these important
benefits are normally applicable for both asynchronous and synchronous e-learning. On the other hand, there are some benefits that only apply to asynchronous e-learning. The benefits are described as follows.

### 2.4.1 Benefit of Asynchronous E-learning

- **Accessibility**

  E-learning permits unlimited access and retrieval of online learning materials (Zhang & Nunamaker, 2003). It allows learners to access material and study at their own preferred pace without the stress of missing important information (Roy & Raymond, 2005). E-learning opens up new opportunities for many people who are tied up with several commitments and allows them to learn anytime anywhere (Goi & Ng, 2009), with knowledge and information available to students 24 hours a day. Learners can also review the current or past knowledge acquired, which are stored in online databanks or databases over and over again (Zhang & Nunamaker, 2003). The advent of the Internet and how it is used in education, has made physical or geographical constraints no longer a critical issue for higher education students. As such, they are now able to enrol in any course provided by any university, where e-learning opportunities are available (Goi & Ng, 2009).

- **Convenience and flexibility**

  E-learning offers much flexibility and convenience to learners. Students can take breaks during their learning periods at their own convenience. Often, e-learning does not require the use of sophisticated technological systems but rather, the simple access to the Internet that supports the multimedia is proven to be sufficient (Kerkman & Leah, 2004). Zhang and Nunamaker (2003) reported that e-learning can remove the barriers of time and travel distance, which makes it capable of reaching audiences anytime and anywhere. During distance learning courses, e-learning assists students to study their
preferred choice of course from any convenient location that is technology enabled. Kember et al. (1994) noted that most adult learners benefit from e-learning because it creates more convenience for them as it allows them to study, work and at the same time have the flexibility to manage their personal affairs. As Al-Ghonaim (2005) stated, “students can log on to their courses at any time of the day or night and have access to lectures, course materials, and class discussions”.

2.4.2 Benefits of Both Types of E-learning

- **Cost and time saving**

E-learning eliminates the need to bring teachers and students together in the same place at the same time and this leads to cost and time saving. Since e-learners do not have to travel to specific locations, therefore e-learning can result in significant cost savings on indirect expenses (Zhang & Nunamaker, 2003). Many studies have shown that e-learning can reduce the travel cost associated with training by at least 50% (Hall, 1995). Other studies have shown that if e-learning is implemented properly, these costs can be cut by at least 80% (Hemphill 1997). Diane (2000) mentioned that institutions that utilize online learning can expect an average of 50% in time savings and about 60% in cost savings, compared with traditional face-to-face learning. Using e-learning can reduce the cost of infrastructure, from the millions (in American dollars) necessary to build a campus to just thousands needed to set up a complete network infrastructure (Goi & Ng, 2009). It could therefore be established that e-learning is able to reduce the costs of learning, travel, classroom and facilities, labour, printed materials and decrease information overload (Ruiz et al., 2006; Wang et al., 2002; Welsh et al., 2003; Zhang & Nunamaker, 2003).

- **Collaborative learning environment:**
E-learning links physically separated teachers and students together to create an online collaborative learning environment (Hiltz & Benbunan-Fich, 1997). An e-learning system encourages students to ask questions that they may be shy to ask in a traditional class (Zhang & Nunamaker, 2003). It was observed by Garrison and Anderson (2003) that one of the advantages of e-learning is not only to allow learners to access huge amounts of information, but also to allow communication and interaction opportunities. They further observed that the ability of using e-learning technology to create successful learning environments encourage students and promote meaningful learning activities and outcomes. In a study using a questionnaire for cognitive functioning, Blanchette (2007) discovered that interaction within an e-learning environment is more intellectually demanding than traditional learning. The question and response was more on a higher level than face to face verbal context. This might be due to the asynchronous nature of written communication. It would appear that students have more time to reflect, to be more explicit and to able to consider the context and issues, and teachers were be able to ask higher-level written cognitive questions.

2.4.3 Benefits of E-learning in Libyan Higher education

Most of the research studies conducted recently have showed that the adoption of e-learning system in Libyan higher education can offer many benefits for the students, teachers as well as the educational institutions. The implementation of ICT and e-learning in education is a key factor in Libya’s overall development plan. In 2005, a national policy for adopting ICT and e-learning for education was launched in Libya; the policy was managed by the Ministry of Vocational Training and the Ministry of Education with the support of other parties such as the country's major telecommunication providers: the General Company of Postal and Telecommunication, and Libya Telecom and Technology. There is intention to facilitate the cooperation
between the government and the private sector to develop Libya ability to implement large-scale ICT initiatives. This policy also intended to improve ICT access, by offering stable ICT infrastructure and tools, and help to improve ICT skills on a large scale in all sectors of the country (Rhema, 2013). However, one of its key purposes was to use ICT and e-learning as tools to improve the quality of the Libyan education system through:

1) adopting modern, technology-assisted educational techniques and methods;
2) supporting the scientific community to engage in research within the general Libyan population;
3) encouraging the private sector to participate in funding higher and specialist education;
4) developing open and distance learning; and,
5) boosting the profile of Libyan higher education.

In 2012, the new Libyan government allocated about USD 3.7 billion (nearly 7% of the general budget) to the Ministry of Education for reforms in the education sector. These reforms include teacher training, improvements to IT infrastructure and technical equipment (Azeemullah, 2012). Libyan higher education could take many advantages from combining the active learning methods with suitable policy and the appropriate implementation of e-learning strategy (Elzawi et al., 2012). Both active learning and e-learning method encourage students to use numerous sources of knowledge, and persuade them to integrate and employ information efficiently. E-learning program in particular can reach previously untapped student population in rural areas, and across national borders.

Othman et al. (2013) mentioned that Libyan higher education institutions could benefit from e-learning, where learners are not only listeners in the class, but also interact with
the lecturer and discuss the knowledge offered by the subject. Othman et al. (2013) find that e-learning allows learners to reflect on the learning materials and permits them to work at their own pace, regardless of sex, race, disability or appearance.

2.5 E-learning in Higher Education

E-learning has become an essential tool for higher education institutions today to allow student-centered learning and flexible learning methods (Shopova, 2012). E-learning, together with the rapid development of ICT in higher education, has changed the way teaching and learning is conducted. This has also created new learning opportunities both on and off campus. ICT usage for teaching and learning has created a need to transform how higher education students learn by using more modern, effective and efficient alternatives such as e-learning (Selim, 2007). E-learning is continuously being adopted in higher education because it creates new and exciting opportunities for both students and educational institutions (Jaiswal, 2013). The increased integration of the Internet and other ICT has resulted in higher educational institutions moving towards a trend which changes the design of academic programs and also the course delivery methods. Advances in ICT have revolutionised higher education in many ways; for example, improving the availability of educational resources, increasing access to post-secondary instruction and facilitation of meaningful interaction between students and teachers (Tanko, 2012). Goddard and Cornford (2002) mentioned, “ICTs are taking the driving seat in shaping the way in which universities are responding to the new world calls”. Hence, e-learning offers opportunities for students, teachers and administrators (Komba, 2009; Manochehr, 2006; Purnomo & Lee, 2010). A recent trend observed in higher education is the introduction of e-learning environments to provide students with the ability to access online learning content (Qureshi et al., 2012).
With regards to accessing online learning content, Baltaci-Goktalay and Ocak (2002) discovered that many higher educational institutions respond to the increase demand of accessing learning material and recourses through the adoption of e-learning technologies as a mode of delivering learning content to students. As a result, these higher educational intuitions have even went on to create virtual universities. Subsequently, it has been reported by Mahmud and Gope (2009) that many universities and educational institutions are increasingly using e-learning technology to promote, enhance and support their modes of operations. This can be due to several factors such as the availability of the Internet, which helps e-learning eliminate or remove learning barriers and obstacles that can enhance learning, such as time, distance and other traditional teaching building infrastructure for classroom learning.

2.5.1 Mobile Devices

Mobile devices (MD) are rapidly becoming a significant technology in our daily life. Petsas et al. (2001) defined mobile devices as technologies such as smart mobile phones; laptops; tablets; and personal digital assistants (PDAs) etc; and this could also include such things as web-based system that support both internet and mobile access. MD, such as smartphones and tablet computers, provide advanced computing abilities as well as access to internet-based resources without the constraints of time or place. The functionality of these devices is continuously enhanced through the inclusion of features from established technologies such as personal digital assistants (PDA), GPS navigation, portable media players, digital cameras and eBook readers (Ally & Gardiner, 2012). This has resulted in devices that enable the provision of ubiquitous learning environments that combine real-world and digital world resources. Mobile technology has become very popular for business and social purposes. As the usage of MD increases in modern societies, an empirical understanding of the practice and social
effects has become relevant for scholars and practitioners. It is becoming one of the most important information processing devices for users these days as it is used not only to make and receive calls, but also to perform tasks that deal with information. MD allow people to be available whenever needed, wherever they may be. This has immensely changed the way in which we interact socially with one other.

The impact of mobile technology in most aspects of human life, especially in education, is obvious. The proliferation of MD and wireless technologies have reshaped University students' daily lives. Smartphones, laptops, tablets and other MD have drawn the attention of most students in developed countries. The value and quality of education has improved over the years with the advancement of technologies (Kumar, 2011). Mobile technologies offer an alternate method for delivering knowledge in different platforms (Sarwar & Soomro, 2013). According to Kumar (2011), the use of the Internet has become a part of everyday life for students and a method to search information when they need it. These days, there are more people utilising MD to search for information online, rather than via a fixed line.

The rise in use of MD such as smartphones and the availability of high speed Internet for mobile browsing are providing alternative channels to deliver course materials (Pike, 2011). MD are able to provide people with better communication and socialization anytime and anywhere (Nassuora, 2012). Mobile technologies have become affordable, effective and easy to use (Nassuora, 2012). These MD can extend the advantages of e-learning systems (Motiwalla, 2007) by providing University students with the opportunity to access learning materials and ICT, study in a collaborative environment (Nassuora, 2012) and to receive formative assessment and feedback from teachers (Crawford, 2007). This study examines the impact of the experience in using MD has on the actual acceptance of e-learning. Specifically, the purpose of this study is to examine
the hypotheses related to the use of MD and how each is correlated with the Perceived Usefulness and Perceived Ease of Use of e-learning in Libyan higher education.

2.5.2 Social Networking Media

In the past few years, the increased use of social networking media has become a global phenomenon. With the rapid development of technology utilized for communicating with others and the prevalence of the Internet, Social Networking Media (SNM) has become one of the main activities that is performed on the Internet, including services such as Facebook, MySpace, Bebo, Xanga, and Friendster (Coyle & Vaughn, 2008). SNM have been able to create a revolution in the communication fields for information and knowledge sharing (Greenhow et al., 2009). This revolution has changed the manner of how people interact and communicate with each other, including how they exchange, access and share knowledge (Redecker et al., 2009). SNM (e.g. Facebook, Linkedin or Twitter) receive a lot of attention due to the high take-up rate across the world. SNM have made communication, collaboration and interaction possible and more efficient. Consequently, they have been introduced to support educational activities (Greenhow et al., 2009). SNM is acknowledged to be a good supplementary technology for e-learning systems (Downes, 2005). In addition, SNM can be used by instructors to create e-learning experiences and more importantly, learners can use SNM in ways that can assist their learning experiences (Jonnavithula & Tretiakov, 2012). However, there are some concerns from educators and parents on the growing utilization of SNM and its impact on pedagogy, particularly between students and teachers in higher education (Kamenetz, 2011). There is also a growing awareness from teachers, students as well as scholars on the potential of using SNM applications for educational purposes, as a result of the increasing number of users of social networking applications (Eze, 2009). Recently, many universities are providing access to SNM to
be utilized as e-learning tools to assist learners to retrieve course materials, contents, as well as work together with colleagues and teachers (Al-ammery et al., 2014). There has been a different research which identified four main advantages of social media use in higher education institutions. These include improving learning motivation, enhancing relationships, developing collaborative abilities and offering personalized course materials (Rifkin et al., 2012). Social networking technologies have several advantages such as devising new methods of interaction, collaboration and the ability to share and create content (Harris & Rea, 2009). These characteristics of SNM are recognized to be important tools for reshaping the learning and educational environment. By implementing e-learning tools according to the advantages of the SNM, it can provide an interactive and collaborative learning environment (Fischer & Mandl, 2005). In Libyan higher education, the impacts of SNM and development in ICT have led to the increase academic staff awareness and improvement of teaching and learning systems and strategies (Kenan et al., 2013). Recently, many students in Libyan higher education using SNM through mobile devices to share knowledge and discuss problems related to their studies (Kenan et al., 2013). The aim of this research is to examine the hypotheses related to the use of SNM and how each is correlated with the Perceived Usefulness and Perceived Ease of Use of e-learning in Libyan higher education. The following section gives an overview on Libyan higher education.

2.6 Higher Education in Libya

After independence in 1951, the first Libyan University in the city of Benghazi was founded. It was called the College of Art and Education and is considered the centre of all Libyan universities. The Faculty of Science was established in 1957 in Tripoli. From 1962 to 1967, other educational departments such as Law, Economics & Commerce, Sciences, Engineering and Agriculture faculties were periodically established in the
Libyan cities of Tripoli and Benghazi. In 1970, the Libyan University witnessed some basic changes, with the establishment of faculties of Arabic Language and Islamic Studies, Medicine, as well as Petroleum Engineering and Mineralogy in the cities of Tripoli and Benghazi. In 1973, the Libyan University was divided in two universities - the University of Tripoli and the University of Benghazi. More universities have been created in different areas of Libya in order to cover the needs of the growing number of students seeking higher education. Since 1981, the Libyan higher education system was restructured and many universities were thus formed (Howard, 2003). Currently, there are 12 public universities with a total of 160 faculties, in addition to 16 technical faculties and 81 higher technical and vocational education institutes. Libyan universities have witnessed an increase in the number of students to more than 300,000, in addition to the 90,000 students enrolled in institutions of higher technical and vocational education.

Tertiary level studies in Libya are divided into three stages - Bachelor's degree, Master's degree and Doctorate (PhD). A Bachelor's Degree requires four to five years of university study. In particular, a Bachelor's degree in Pharmacy, Veterinary Medicine, Dentistry, Architecture and Engineering all entail five years of study; although the Bachelor's degree in Medicine and Surgery requires an additional year. After which, a Master’s degree is obtained after two to three years’ of study and is offered by the Academy of Postgraduate Studies, Tripoli University and Benghazi University. Finally, a PhD consists of three years of research following a Master’s degree, in areas such as Arabic language, Humanities and Islamic studies. Libyan universities are not yet equipped to offer Doctorates in the Science fields. Moreover, Libyan higher education institutes offer higher technical and vocational education of three to five years in the areas of Mechanical Engineering, Electrical Engineering, Finance, Industrial
Technology, Computer Studies, Social Work, Civil Aviation and Medical Technology. After three years, the Higher Technician Diploma is obtained. Alternatively, a Bachelor's Degree is obtained after four or five years.

In 1990, the Libyan government encouraged the private sector to play a vital role in the education system. Since that time, the private sector has assisted in the establishment of more than 1,000 primary and secondary schools and institutes. Moreover, more than 30 private universities offering education in all disciplines have been created. These include higher institutes to train trainers and instructors; teacher-training higher vocational institutes; polytechnic institutes, higher education institutes of Industrial, Technical and Agricultural Sciences, as well as Petroleum training and qualifying institutes. Many higher education institutes for teacher training were created in 1997. Although many scientific research centres have been created in several areas such as health, pharmacy, education and the environment, they are both educational and research centers. The Ministry of Higher Education is responsible for higher education and scientific research, while the Chancellor of the University manages the university education. Each university consists of a number of faculties which are chaired by Deans and each university manages its own budget. The undergraduate higher education system is completely financed by the Libya Government. Only students who attend private and open universities have to pay tuition fees.

During the last decade, policy makers in Libya have allowed the establishment of private institutions of higher education. The open university institution is the only institution in the public education sector that depends on some extent on tuition fees paid by students. Postgraduate studies in Libya are not free, but are subsidized by the government. A Master's degree is about two to three years in duration and cost about 3,000 Libyan dinars, or around US$2,300 at the Academy of Postgraduate Studies.
Students from Libyan universities mainly received a PhD in Arabic, Humanities and Islamic studies only because universities in Libya have not started Doctorate programs in science, engineering, and technology. After all, most academics in Libya have Master’s and Doctorate degrees from foreign countries.

Since 2011 in Libya, the armed conflicts have completely changed all aspects of life, including the educational sector. They have halted the development and deteriorated the gains built up over generations, destroyed economic developments, as well as affected advances in nutrition, housing, health, employment and education. The League for Human Rights Association has mentioned that the amount of losses suffered by the Libyan economy by the armed conflicts have reached over $575 billion (Rhema & Miliszewska, 2012b). The continual escalation of the armed conflicts in the last four years, have had serious influence on the provision and service delivery of education in Libya. The educational infrastructure has been severely damaged and schools, universities and institutes have now become a place of recruitment for soldiers and militias (Rhema & Miliszewska, 2012b).

While Libya continues to face many challenges in the areas of economic environment, structural policies, social inclusion and governance, the interim government has taken important strides to reconstruct and develop all areas of life, in particular the educational sector (Libya, 2012).

In light of the above discussion, there is a clear indication that political, cultural and economic factors of Libya are indeed very different in comparison to other countries.

2.7 Reviews of Theoretical Model

The relevant literature has shown that there are many studies using different theories to examine the determinants of e-learning effectiveness and successful adoption of e-
learning. Many models have been developed to investigate the factors influencing the acceptance of e-learning technology in institutions. Over the past two decades, several theories have been developed to study and explain the user intention or acceptance to use new technology since the mid-1980s (Min et al., 2008). The theories that are commonly used to understand the factors that influence the successful implementation of e-learning are Theory of Reasoned Action (TRA), proposed by Ajzen and Fishbein in 1980 (Ajzen & Fishbein, 1980), Technology Acceptance Model (TAM), proposed by Davis in 1989 (Davis, 1989; Davis et al., 1989) and the Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh et al., 2003b). This section reviews the theories that are commonly found in the literature.

2.7.1 Theory of Reasoned Action (TRA)

In 1975, (Fishbein & Ajzen, 1975) developed a well-supported behavioural theory called the Theory of Reasoned Action (TRA) that describes the psychological determinants of behaviour as shown in Figure. 2.1 (Ajzen & Fishbein, 1977, 1980; Fishbein & Ajzen, 1975). This theory provides a detailed framework to understand and predict human behaviour. According to TRA, the most significant determinant of an individual’s behaviour is intent. A person’s attitude towards behaviour includes: behaviour belief, evaluations of behavioural outcomes, subjective norms, normative beliefs and the motivation to comply. In TRA, the attitude is a significant determinant of a person’s intention to perform the behaviour in question and the immediate determinant of a person’s behaviour is their intention to perform that behaviour. According to TRA, the intention to perform the behaviour (BI) are determined by the individual’s attitude and subjective norm (SN) regarding the behaviour in question. Attitude is determined by the individual’s salient beliefs about the results of performing the behaviour, multiplied by the evaluation of those results. Salient beliefs can be obtained by taking
the beliefs most frequently elicited from a representative sample of the population. The SN is determined by a multiplicative function of the individual’s normative beliefs, i.e. the perceived expectation of specific referent individuals or group and those with these expectations or beliefs.

![Diagram of Theory of Reasoned Action (TRA)](image)

**Figure 2.1: Theory of Reasoned Action (TRA)**

### 2.7.2 Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM) was developed from the Theory of Reasoned Action (TRA) in order to describe an individual’s IT acceptance behaviour. The objective of TAM is to examine why users’ attitudes and beliefs influence their acceptance or rejection of IT. TAM aims to provide an explanation of the determinants for the adoption and use of IT (Davis et al., 1989). It suggests two specific attitudes: Perceived Usefulness (PU) and Perceived Ease of Use (PEOU) that determine one’s Behavioural Intention to Use a technology (Wahid, 2007). Perceived Usefulness is
defined as “the degree to which an individual believes that using a particular system would enhance his or her productivity,” while Perceived Ease of Use is defined as “the degree an individual believes that using a particular system would be free of effort” (Davis, 1989). Davis (1993) examined the theory and found that while both Perceived Ease of Use and Perceived Usefulness play a role in predicting user attitudes towards using a system, the influence of Perceived Usefulness was 50% stronger than that of Perceived Ease of Use. Perceived Usefulness and Perceived Ease of Use have been tested to describe or predict behavioural intention on various technologies such as e-banking, e-commerce, e-learning, e-library, e-tax filing, telemedicine technology, word processing, e-mail, smartcard and microcomputer (Deng et al., 2005). Many researchers have applied TAM in e-learning studies and have found that Perceived Ease of Use and Perceived Usefulness have significant effects on an individual’s Behavioural Intention to Use e-learning systems (Liu et al., 2009; Ong et al., 2004; Zhang et al., 2008). Figure 2.2 depicts the original TAM (Davis, 1989).

Figure 2.2: Original Technology Acceptance Model
2.7.3 Unified Theory of Acceptance and Use of Technology (UTAUT)

The Unified Theory of Acceptance and Use of Technology (UTAUT) model is being widely used in the field of ICT. Venkatesh et al. (2003b) examined and tested eight prominent models from IT acceptance researchers. Based on their findings, they formulated the UTAUT model from the eight models, which are the Technology Acceptance Model (TAM) (Davis, 1989), the Innovation Diffusion Theory (Rogers, 1962), Theory of Reasoned Action (TRA) (Ajzen & Fishbein, 1980), Motivational Model (Davis et al., 1992), Theory of Planned Behaviour (TPB) (Ajzen, 1991), Model of Combined TAM-TPB (Taylor & Todd, 1995), Model of PC Utilization (Thompson et al., 1991) and Social Cognitive Theory (Bandura, 1986). The most significant factors from the eight models mentioned above were chosen to present a model which can be seen as a new version of TAM (Louho et al., 2006). In comparison with the previous models, UTAUT was able to explain 70% of the technology acceptance behaviour, a considerable improvement on previous models, which routinely explained only over 40% of acceptance (Venkatesh et al., 2003b). The UTAUT model is presented in Figure 2.3. This model consists of four key factors of intention and usage, namely Performance Expectancy (PE), Effort Expectancy (EE), Social Factors (SFs), and Facilitating Conditions (FCs) (Venkatesh et al., 2003b). There are also four moderators of key relationships in the model - age, gender, experience, and voluntariness of use.
2.8 Critical Success Factors for E-learning Implementation

The use of e-learning in higher education has been studied and continues to be studied by many researchers in terms of the factors that could impact the successful implementation of e-learning in the higher education system (Lowery, 2009; Mahdizadeh et al., 2008; Ngai et al., 2007; Ong et al., 2004; Selim, 2003, 2007). These researchers used the Technology Acceptance Model (TAM) proposed by (Davis, 1993), to identify the Critical Success Factors (CSFs) that impact the e-learning implementation. In other studies, researchers modified the basic TAM to create the Unified Theory of Acceptance and Use of Technology (UTAUT) model to identify CSFs (Iahad et al., 2012; David & Rahim, 2012; Jong & Wang, 2009; Lewis et al., 2013; Marques et al., 2011; Nassuora, 2012; Ondago et al., 2012; Oye et al., 2012; Tan, 2013; Van Schaik, 2009). This section will review the CSFs which are identified from the literature using models described in the previous sections.

There are a number of CSFs for e-learning. CSFs are noted as those critical activities, that need to be considered in order to ensure its competitiveness for the organisation, department, or individual. CSFs should be controllable, measurable and few in number.

**Figure 2.3: UTAUT Model**
They can also be defined as a set of factors that can impact positively and influence the success of the e-learning implementation (Odunaike et al., 2013). Furthermore, they address the standards, sustainability, operation and mission of e-learning. It is critical that these factors are appropriately considered during the pre-implementation, on-going and post-implementation stage as otherwise, it may cause the whole process of implementation and planning to fail (Selim, 2007). There are different schools of thoughts on e-learning implementation based on CSFs. Benson Soong et al. (2001) stated that the e-learning CSFs are, perceived information technology infrastructure, technical competency of both teacher and student, e-learning mindsets of both student and instructor, human factors and level of collaboration. Lin et al. (2011) concluded that the CSFs of e-learning are: organisational factors (expertise, experience, leadership and top management support), technological support (platform support, tool support and technician support), e-learning content related factors (documentation, simplification, creativeness and template auxiliary) and general factors (trust, motivation and communication).

Masrom et al. (2008) reported that technological and institutional support factors play a key role in the use and implementation of e-learning. According to Govindasamy (2001) there are seven CSFs for successful e-learning implementation, in particular, institution, student and faculty support, teaching and learning, evaluation and assessment, course structure, as well as course development. According to the study conducted by (Volery & Lord, 2000), which involved a number of students enrolled in an e-learning management program, three CSFs were identified: teacher (attitudes towards students, teacher technical competence and classroom interaction); technology (interface design and level of interaction, ease of access and navigation) and previous use of technology from a student’s perspective. Furthermore, Leidner and Jarvenpaa (1995) conducted a
study to determine the factors which affect the efficiency of e-learning. These factors are instructor characteristics, student characteristics, and technology. Selim (2007) categorized the CSFs for e-learning into four parts: instructor characteristics (technology control, teaching style and attitude toward students), students’ characteristics (technical competency, motivation, collaboration in interaction and perception of content system), technology (internet speed, screen design and ease of access) and university support (technical support, learning material accessibility and printing, as well as computer availability). Papp (2000) categorised a number of critical factors for helping the university e-learning improvement, including intellectual property, course suitability for e-learning environment, e-learning course building and development, e-learning course content generation, e-learning course maintenance, e-learning platform and measuring the success of an e-learning course.

The reviews above have shown that basically there are four main areas of e-learning success factors (individual, technology, course and context), each individually representing a subset of challenges. Figure 2.4 shows the general research framework that summarizes the four main areas.

Figure 2.4: Research Framework
The main purpose of this study is to identify the CSFs that affect e-learning implementation in higher education. A literature review search based on some keywords like CSFs and e-learning were used to identify appropriate papers for this review. A total of 20 papers published between 2001 and 2013 were selected to be presented in this chapter after a thorough review of about 60 papers. The methodology for this review was analysing and synthesizing data using one of the common qualitative techniques, based on the most frequently cited factors in literature influencing the implementation of e-learning. Many studies have applied similar qualitative methods in e-learning studies to identify CSFs for e-learning implementation (Asiri et al., 2012; Cheawjindakarn et al., 2013; Pieterse, 2012).

Table 2.1 provides a list of the CSFs identified through their corresponding studies. It also provided the occurrences of each of the CSFs in the reviewed literature.

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After analyzing the research papers, eight factors were found to be commonly studied in the literature, so as to enable the successful implementation of e-learning. These factors were selected based on their frequency of occurrences. The factors identified are educational technology, curriculum development, teaching and learning styles, attitude, social influence, language, computing experience and demographics. Each identified CSF will be examined in more detail as follows.

### 2.8.1 Educational Technology

Technology is the backbone in the development of e-learning and it includes computers, hardware, software, networks, audio/video, the Internet, extranet, interactive TV and DVDs. The technological dimension of the e-Learning framework examines issues of technology infrastructure in e-learning environments. This includes infrastructure planning, hardware and software (Khan, 2001). E-learning technologies based on the evolution of software and hardware provided different types of applications in the

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education system for students, administrators and teachers. Thus, e-learning
technologies contain many techniques and tools that run on several new and old digital
gadgets (Sife et al., 2007). The network and the Internet are the main technologies that
can facilitate the different requirements of the e-learning process (Ezziane, 2007).
Adequate technical support is an essential part of the adoption and integration of ICT
and e-learning in higher education systems (Sife et al., 2007). Suitable infrastructure for
ICT development such as intranet, extranet, the Internet and networks are considered
one of the most difficult barriers in the implementation of e-learning in higher education
institutions, especially in developing countries (Kashorda et al., 2007). In Australia,
before e-learning became commonly available, one of the most important factors for
successful e-learning implementation in higher education was related to the availability
of technological infrastructure (Oliver, 2001). Technological barriers in implementing
the e-learning environment often happen in the areas of hardware, software and
bandwidth capacity. This suggests that the factors of educational technology have a
direct impact in the process of e-learning adoption (Vencatachellum & Munusami,
2005).

2.8.2 Curriculum Development

The curriculum is becoming more dynamic and interactive as a result of many kinds of
ICT-based learning activities, projects and software applications being developed
(UNESCO, 2005a). However, teachers face challenges in the use of ICT for curriculum
development. One of the biggest barriers for teachers is the amount of time needed to
deal with the e-learning requirements (Smith & Taversas, 2005). Many teachers are
concerned that they have inadequate knowledge and skills to develop effective and
appropriate e-learning materials, both in terms of pedagogy and technology (France &
Fletcher, 2007). Despite these challenges, pedagogy and curriculum need to be
developed and modified to enable ICT is employed efficiently and should be particularly designed to support the e-learning environmental settings. E-learning is different from traditional learning (Andersson & Grönlund, 2009); so courses must be redesigned effectively to accommodate the use of e-learning. There are many factors affecting the implementation of e-learning in this domain. Course structure and development, assessment and evaluation can be classified as the factors of curriculum development (Govindasamy, 2001).

2.8.3 Teaching and Learning Styles

Keefe (1979) stated that learning styles indicates how students perceive, interact and respond to varying learning environments. Learning styles differ from one student to another. Some students learn fast, whereas others learn at a slower pace with repetition. Moreover, some students prefer to work alone, while other students like to work in groups. ICT enables students to customize their own learning experience and thus allowing for the accommodation of different types of learning styles (Sirkemaa, 2001). While teachers cannot always accommodate each student’s need, it is necessary that several learning channels can be offered. A match between teaching and learning style shows that there is a rise in students’ satisfaction when using appropriate e-learning technology (Manochehr, 2006). Students and teachers are using the Web in different ways to improve their learning and teaching experiences. E-learning can also provide personalised materials easily (Manochehr, 2006).

2.8.4 Attitude

Attitude is defined as a person's positive or negative feeling about performing the target behaviour (Fishbein & Ajzen, 1975). It is important for students, teachers, and administrators to know all intents and purposes of the ICT facilities and services
available. Awareness goes along with attitude and “positive attitude towards ICT is widely recognized as a necessary condition for the effective implementation” (Woodrow, 1990). Rhema et al. (2013) stated that e-learning success is affected by different factors including users' attitudes towards e-learning, as well as their satisfaction of using technology during teaching/learning. Moreover, research has shown that an understanding of educators’ attitudes of the technology and its influence on their jobs helps in developing more appropriate technology training programs for teaching. This also facilitates better technology-integration with the pedagogy (Zhao & Bryant, 2006). Similarly, there are strong relationships between educators’ attitudes and their success in using technology for learning (Bataineh & Baniabdulrahman, 2006).

2.8.5 Social Influence

Venkatesh and Morris (2000) mentioned that Social Influence (SI) plays an important role in determining the acceptance and use of new technologies. According to the study conducted by Taylor and Todd (1995), they confirmed that SI was equivalent to the subjective norm and defined it as other people’s opinion, superior and peer influence. It has been shown that the SI factor is more important either before or during the initial periods that users are still inexperienced from developing attitudes (Hartwick & Barki, 1994). Chua (1980) emphasised that in subjective norms, the groups that will particularly influence the adoption are mostly close relatives of the adopter. Individuals tend to present better behaviours in using the new technology for tasks, especially if they develop positive instincts and attitudes which are influenced by others (Aizen, 1988). Subsequent research by Schepers and Wetzels (2007) discovered that there is a strong relationship between the correlation of Behavioural Intention and Subjective Norms. E-learning students tend to appreciate it more when their close relatives support them. A study conducted by Grandon et al. (2005) found that the subjective norm is an
important factor that affects students in higher education who use e-learning. TAMs have proved that the subjective norm is a SI variable which aids in decisions of performing or not performing behaviour (Ajzen, 1991). In e-learning, it is imperative to know how SI can affect users’ commitments in using the new technological system, so as to better understand and predict how these systems are used, including the Perceived Behaviour (Malhotra & Galletta, 1999).

2.8.6 English Language

Language plays an essential role in utilizing the benefits of e-learning because most of the materials for e-learning are written in the English language. Central to the cultural challenge in web-based instruction is the issue of language, where it was noted that majority of the online courses are written primarily in English (Olaniran, 2007). According to Devlin (2007), there are clear differences among students of different linguistic and cultural backgrounds with regards to their patterns of use and the degree of comfort in using the e-learning environment. Some students have difficulty in understanding their course materials and knowing how to use the functions of the e-learning if English is not their native language. Understanding of the language used for the instructions and teaching is important as students engaging in e-learning need to manage their own learning without any face-to-face contact with teachers and other students (Hatcher & Yen, 2005).

2.8.7 Computing Experience

Computer experience is defined as the ability to handle varieties of computer applications for different purposes (van Braak et al., 2004). Some students may resist using new technology, especially if they do not have any prior computing experience. These students are normally more comfortable if they learn by using traditional methods.
of teaching through regular face-to-face interaction in physical classrooms (Ishtaiwa, 2006). In addition, some teachers suffer from scarcity of training and knowledge in using technology to design online materials (Educause, 2003). Moreover, some teachers who are not experienced in computing are still skeptical about the integration of technology into their teaching (Ishtaiwa, 2006). According to Peralta and Costa (2007), instructors that have more experience with computers are more confident in their ability to use them efficiently. To conclude, Jones (2004) stated that an instructor’s competence relates directly to confidence. The confidence of an instructor is also related to the perceptions of their ability to use computers in the classroom, specifically in relation to their student’s perceived competence.

2.8.8 Demographics

There are many research studies done by examining the demographic influence on the awareness of the developers and users of e-learning in higher education in different countries (Bataineh & Baniabdellahman, 2006; Gay et al., 2006). Moreover, researchers observe the decisions made by the students, teachers and administrators about the use of ICT in higher education as impacted by demographic factors (Mehra & Mital, 2007). Perceptual variations are established across the different demographic backgrounds of the users. For instance, individual variations in terms of awareness of e-learning and Internet use are obvious. These differences appear from the variations of nationality, age and gender (Graff et al., 2004). For example, female students have lesser positive perceptions about computer and information technology than male students. Also, older learners will treat the use of computer as an extra tool in addition to other traditional teaching methods when compared to younger learners (Gay et al., 2006). A study by Schrodt (2002) showed a strong correlation between levels of learning and gender. A comparison between the male and female students in terms of the level of understanding
in classroom scenarios where no technology is used, has found that male students have a higher level of understanding and assimilation without the use of technology. On the other hand, female students who used technology in the classroom demonstrated a better level of understanding than male students. Furthermore, subsequent research has also shown that there is a strong correlation between age and level of learning. (Mungania, 2004) noted that students under the age of 45 are more likely to accept and use e-learning technology than those above 45 years of age.

2.9 Effects of CSF in Different Countries

Although a number of empirical and non-empirical studies have examined a variety of CSFs for e-learning, a range of studies have produced different sets of factors. Thus, there is no general agreement as to which set of factors is the key to success (Zhang et al., 2003). One possible reason why different factors were generated is that these studies were based on different samples and research settings, which may have placed more emphasis on some CSFs in comparison to others. This may explain why studies have reported different subsets of CSFs rather than a comprehensive set of similar factors. In addition, the CSFs are also different due to the fact that the researchers conducted their research in different countries and territories. Cultures, policies, government regulations and economic environments differ among countries; a fact that raises some issues and challenges for e-learning implementation (Huang & Palvia, 2001). As an example, according to a study conducted by Saekow and Samson (2011) on the comparison of e-learning readiness between Thailand as an example of developing country and United States of America (USA) as a developed country. The study reviews CSFs of e-learning in the USA and presents the results in comparison to Thailand’s higher education. The results indicated that the CSFs between countries can differ in many ways. Table 2.2
gives a summary of the results from the study, which was based on the comparison of e-learning readiness between Thailand and the USA.

Table 2.2: Shows a Comparison of E-learning Readiness Between Thailand and the USA

<table>
<thead>
<tr>
<th>CSF</th>
<th>Countries</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Thailand</td>
</tr>
<tr>
<td>University support</td>
<td>Lack of strong support from the top executive level in many universities.</td>
</tr>
<tr>
<td>Computing experience</td>
<td>Lack of technical skills for online courses.</td>
</tr>
<tr>
<td>Course development</td>
<td>Inconsistent financial support for developing e-learning tools.</td>
</tr>
<tr>
<td>Attitude</td>
<td>Lack of awareness of e-learning adoption.</td>
</tr>
<tr>
<td>Educational technology</td>
<td>Inconvenient e-learning software and access.</td>
</tr>
</tbody>
</table>

There is another study conducted by Alkhareng and Ghinea (2013) on the comparison of e-learning barriers between Kuwait as an example of developing country and the developed countries. A country with a highly developed economy and technological and infrastructural advancement is considered as a developed country (Schwab & Sala-i-Martin, 2011). The results reiterated that the CSFs between countries can differ in many ways. Table 2.3 gives a summary of the results, which was based on the comparison of e-learning barriers between Kuwait and developed countries.
Table 2.3: Shows a Comparison of E-learning CSFs Between Kuwait and the Developed Countries

<table>
<thead>
<tr>
<th>CSF</th>
<th>Kuwait</th>
<th>Developed countries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Educational technology</td>
<td>Important</td>
<td>Important</td>
</tr>
<tr>
<td>Attitude</td>
<td>Relevant</td>
<td>Important</td>
</tr>
<tr>
<td>Language</td>
<td>Important</td>
<td>Irrelevant</td>
</tr>
<tr>
<td>Cost</td>
<td>Irrelevant</td>
<td>Important</td>
</tr>
</tbody>
</table>

Moreover, Elango et al. (2008) found that there is statistically significant difference between Oman and UAE e-learners with regard to the factors on quality perceptions of e-learning.

The table above depicted that different countries have different education environments and policies. This analysis further enhances the importance of the identified CSFs and their impacts in implementing e-learning in different countries.

Libya is one of the developing countries with a number of factors (such as culture, policy, government regulations and economic environment) differing from the rest of the world. Therefore, the challenges and obstacles of the adoption of e-learning in Libyan higher education are unique, and as such, it is important for a more in-depth study.

2.10 Summary

This chapter has given an overview of the use of e-learning as a tool for teaching and learning in higher education. The benefits and types of e-learning are examined. From the literature review, it can be identified that some common theoretical models have been used to investigate the factors influencing the acceptance of e-learning technology.
in higher education institutions. The commonly used theories are Theory of Reasoned Action (TRA) as proposed by Fishbein and Ajen in 1991 (Ajzen & Fishbein, 1980), Technology Acceptance Model (TAM) as proposed by Davis in 1989 (Davis, 1989; Davis et al., 1989) and the Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh et al., 2003b). Furthermore, this chapter provides a review on the CSFs that could influence the successful implementation of e-learning in the higher education system. From the review, eight have been identified as important factors for implementing successful e-learning in higher education institutions. The eight are educational technology, curriculum development, teaching and learning styles, attitude, social influence, language, computing experience and demographics. These CSFs are important towards the development of an effective e-learning system and can be used as a guide for e-learning implementation in Libya as well as other countries.
CHAPTER 3: RESEARCH FRAMEWORK

3.1 Overview

Drawing on the findings of literature review presented in the previous chapter, a proposed research model and research hypotheses were developed for this study to investigate the factors that affect the adoption and use of e-learning in Libyan higher education. This chapter is divided into four main sections. The research objectives and research questions are presented in Section 3.2. Section 3.3 defines each of the main research constructs for this thesis and these definitions are based on the review presented in Chapter 2. Section 3.4 presents the development of the proposed research model and hypotheses. Finally, Section 3.5 presents a chapter summary.

3.2 Research Objectives and Questions

The research described in this thesis aims to investigate and understand the factors that have an impact on the implementation of e-learning in higher education in Libya. In order to address the research aims, three research questions were proposed. These questions are as follows:

Q1. What are the factors that could influence the implementation of e-learning in Libyan higher education?

Q2. Does the intensity of using Social Networking Media impact on the Perceived Ease of Use and the Perceived Usefulness of students’ and teachers’ using e-learning in Libyan higher education?
Q3. Does the use of Mobile Devices have an affect on the Perceived Ease of Use and Perceived Usefulness of students and teachers using e-learning in Libyan higher education?

Based on the literature review in Chapter 2, a number of Critical Success Factors (CSFs) that can affect the successful implementation of e-learning in higher education institutes were identified. Section 3.3 introduces the definitions of these main constructs. The literature evaluation also reviewed some theoretical models available to be used to identify and investigate the factors that influence the acceptance of e-learning technology in institutions in different countries. Section 3.4 provides the research model that was proposed based on these factors.

3.3 Constructs of Interest

This study assumes that the success of implementing e-learning in Libyan higher education will be influenced by a set of factors. As comprehensively discussed in Chapter 2, such factors might preclude adopting e-learning in Libyan higher education as a tool for teaching and learning. Similar issues have been observed in many higher education institutions around the world, affected by different sets of factors as discussed in Chapter 2 (Al-Adwan & Smedley, 2012; Chuntao, 2010; Mahmud & Gope, 2009). Hence, the research described in this thesis investigates the set of factors believed to most likely have an impact on students' and teachers' intentions to use e-learning in Libyan higher education: Awareness and attitude, Social Influence, Perceived Enjoyment, Computing Experience, Language, Social Networking Media, Mobile Devices and Demographic Information. Most of these factors have not been studied sufficiently in the context of the implementation of e-learning in Libya higher education. The sections below provide definitions for all the factors that are related to the context of this study.
3.3.1 Intention to use E-learning

Ajzen (1985) noticed that Behavioural Intention is an indication of the willingness of a person to perform a particular behaviour. Suh and Han (2003) described it as the level of strength of an individual’s intention to perform a particular behaviour. It is supposed to be the direct antecedent of the behaviour commonly utilized as an indicator of users’ adoption and acceptance of new systems (Carter & Bélanger, 2005; Suh & Han, 2003; Venkatesh & Davis, 2000). This study defines the intention to use e-learning as people’s willingness to accept and use e-learning as a tool for teaching and learning in Libyan higher education.

3.3.2 Perceived Ease of Use of E-learning

Davis defined ‘Perceived Ease of Use’ (PEOU) as “the degree to which a person believes that using a particular system would be free of effort” (Davis, 1989). Given that effort is a finite resource, an application perceived to be easier to use than another is more likely to be accepted by users (Davis, 1989). PEOU consists of how clear and understandable the system is, the ease of getting the system to do what is required, the mental effort needed to interact with the system and the ease of use concerning the system (Ndubisi, 2006). PEOU and PU are two variables which are affecting the Behavioural Intentions to Use a system (Doll & Torkzadeh, 1998). It was also found that the PEOU have a positive effect on the PU (Lee et al., 2011). Gong et al. (2004) defines PEOU as “the degree to which a prospective user expects the target system to be free of effort”. Based on the literature, this study thus defines PEOU with regards to e-learning, as “the degree to which students and teachers believe that using e-learning would be free of effort”.

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3.3.3 Perceived Usefulness of E-learning

Davis (1989) defined ‘Perceived Usefulness’ (PU) as “the degree to which a person believes that using a particular system would enhance his or her job performance”. Venkatesh et al. (2003a) described PU as the expected level that people believe they will obtain by utilizing a particular system. Teo (2011) and Seif et al. (2012) found direct impact between perceived usefulness (PU) and Attitude Towards use in the context acceptance e-learning and factors that affect teachers and students to use technology. Based on previous literature, this research defines PU of e-learning as “the degree to which students and teachers believe that using e-learning would enhance his or her effectiveness of teaching and learning”.

3.3.4 Attitude Towards E-learning Behaviour

‘Attitude Towards E-learning Behaviour’ is defined as an individual’s positive or negative feelings about performing the specific behaviour (Fishbein & Ajzen, 1975). Bathaei and Hosseini (2014) defines an ‘Attitude Towards Behaviour’ as a positive or negative examination to achieve that actual behaviour. There are strong relationships between educators’ attitude and their success in using technology for learning (Bataineh & Bani-Abdel-Rahman, 2006). Research has shown that the more positive attitude towards the use of new technology, provides greater intention to use (Lee et al., 2005). This research defines ‘Attitude Towards Behaviour’ as “the impression of users about acceptance and use of e-learning as a tool for teaching and learning in Libyan higher education”.
3.3.5 Perceived Enjoyment

People participate in activities that bring enjoyment and pleasure (Teo & Lim, 1997). According to (Davis et al., 1992), ‘Perceived Enjoyment’ (PE) is defined as “the extent to which the activity of using the technology is perceived to be enjoyable in its own right, apart from any performance consequences that may be anticipated”. PE is observed as an example of the self-motivated and has been discovered to influence individual acceptance significantly. Moreover, many of the research findings emphasized the importance of enjoyment (Igbaria et al., 1995; Teo & Lim, 1997; Wexler, 2001; Yi & Hwang, 2003). The results of the study conducted by Huang et al. (2007) show that PE has a significant effect on Perceived Ease of Use and can expect user intentions of utilizing e-learning. In this research, PE indicates the extent to which a user finds the interaction of e-learning intrinsically enjoyable or interesting.

3.3.6 Social Influence

‘Social Influence’ (SI) refers to the degree to which a person perceives that significant others believe he or she should use the new system. In the domain of e-learning, influences could be from friends, family members, colleagues and even a supervisor at work (Hsu & Chiu, 2004). SI has been utilized by many researchers as a significant factor in examining the behavioral intention of utilization e-learning system (Elkaseh et al., 2015; Landry et al., 2006; Park, 2009). SI is defined in the context of this research as “the beliefs of the user as to whether or not people who are important in their lives want them to use e-learning”.

3.3.7 Computing Experience

‘Computing Experience’ (CE) is a major factor to take into consideration for both students and teachers to use the e-learning program. Mauleon (2003) mentioned that
users who need to use e-learning should have an adequate amount of computer skills to take advantage of the technology. Computer experience has been indicated by many studies to have a significant effect on the behavioral intention of using e-learning system (Park, 2009). Many research studies identified correlations between positive computer experience and positive attitudes, competence and comfort with computers (Papaioannou & Charalambous, 2011; Paris, 2004) and an inverse relationship between computer experience and computer anxiety (Olatoye, 2009). Hence, it is vital to measure teachers’ and students’ perceptions about how their computer experience can assist them in accepting and using e-learning.

### 3.3.8 English Language

As mentioned in Chapter 2, English is an important language for using e-learning. English language skills are critical factors for success in learning generally in tertiary education and particularly in the e-learning environment (Elkaseh et al., 2015; Koloto et al., 2006). Rhema (2013) mentioned that the language barrier is a significant inhibiting factor in adopting e-learning in developing countries (particularly in Libya). Rhema and Miliszewska (2010) found that the level of English skills in Libya is low and this has an impact on the use of e-learning as most of the learning resources available are in English. Therefore, it is essential to measure users’ perceptions of how one’s English level could affect the use of e-learning.

### 3.3.9 Social Networking Media

According to Adamson (2012), ‘Social Networking Media’ (SNM) is a vital tool for teaching and learning and should be used extensively for this purpose. Jackson (2011) reported that the usage of SNM in education institutions can have a positive effect on students' learning outcomes. Adopting a SNM approach provides learners with valuable
resources for utilizing the Internet as a tool in order to improve their understanding (Friesen & Anderson, 2004). Several studies have reported the effects of using SNM on students and teachers in e-learning situations (Balakrishnan & Loo, 2013; Liu et al., 2009; Selwyn et al., 2008; Tan & Low, 2010). Due to the challenges with the adoption of SNM for e-learning as identified in Chapter 2, this research examines the impact of using SNM on ‘Perceived Ease of Use’ and ‘Perceived Usefulness’ of students and teachers using e-learning for teaching and learning in Libyan higher education.

### 3.3.10 Mobile Devices

May (2001) stated that Mobile Devices (MD) offer users with more freedom, as they can access information and services anytime anywhere. With the continual growth of MD in the higher education system, the technological equipment show both opportunities and obstacles to higher education institutions (Looi et al., 2010). Many research have been conducted around the world in order to portray students' intention on using MD in higher education, as well as to explore the potential of this technology to improve the learning environment (Cheon et al., 2012; Liu et al., 2010). Many Libyan higher education students prefer utilizing new technology and also their eagerness to use mobile devices through SNM to share knowledge (Kenan et al., 2013). This research examines the effect of the experience in using MD on the acceptance of e-learning. Specifically, the purpose of this study is to explore the impact of the use of MD on accepting the use of e-learning in Libyan higher education.

### 3.4 The Research Model and Hypotheses

A model was proposed to introduce a framework for this thesis and also to define the boundary of the research (see Figure 3.1). The research model for this thesis is based on preceding related literature (See Chapter Two). This model intends to offer a further
understanding of the relationships that exist among a set of factors identified as probable in playing an important role in e-learning acceptance in Libya. In order to investigate the factors that affect the use of e-learning in higher education by Libyan teachers and students, the variable “Behavioural Intention to use” is utilized as a determinant for e-learning adoption.

### 3.4.1 Determinants of Behavioural Intention to use

In this survey, Behavioural Intention to use (BI) is considered a critical dependent variable, used to show how difficult it is for people to attempt e-learning and how much effort they are willing to exert. In order to predict, determine and explain user acceptance, there is a need to understand better why users accept or reject the use of e-learning as a tool for teaching and learning. The predictability of users’ acceptance of e-learning is determined by measuring the intention to use, while the possibility to explain users’ intentions is related to their ‘Perceived Ease of Use’, ‘Perceived Usefulness’, ‘Attitude’, ‘Social Influence’ and other associated variables. Fishbein and Ajzen developed a well-supported behavioural theory called the Theory of Reasoned Action (TRA) in 1975 (Fishbein & Ajzen, 1975) which describes the psychological determinants of behaviour (Ajzen & Fishbein, 1977, 1980; Fishbein & Ajzen, 1975). According to the TRA, the intention to perform is determined by the individual’s attitude towards use (AU) and Social Influence (SI) regarding the behaviour in question.

Additionally, the Technology Acceptance Model (TAM) was developed from the TRA. It suggests two specific attitudes: Perceived Usefulness (PU) and Perceived Ease of Use (PEOU), that determine one’s Behavioural Intention to use a technology (Wahid, 2007). The survey study of Libyan students and teachers in adopting e-learning has employed variable usage in both TRA and TAM for predicting the BI. Perceived Enjoyment (PE)
is another variable that has been included. A number of studies noticed that PE significantly affects the BI to use e-learning (Pikkarainen et al., 2004).

The other two variables are Computer Experience and the English Language. These variables have a significant effect on PEOU of e-learning and many studies stated that these variables also have an important effect on e-learning adoption (Al-Ammari & Hamad, 2009; Ali & Magalhaes, 2008; Alkharang & Ghinea, 2013; Kenan et al., 2011; Kundi et al., 2010; Mahmud & Gope, 2009).

The intensity of using Social Networking Media (SNM) and Mobile Devices (MD) are the other important factors which may affect students’ and teachers’ Behavioural Intention to use e-learning. Several studies show that SNM has a direct effect on the ease of using e-learning (Mason, 2006; Selwyn, 2009; Tapscott & Williams, 2010). Moreover, a number of studies reported that the use of MD has a strong effect on the use of the e-learning system (Al-Fahad, 2009; Cavus & Uzunboylu, 2009; Clarke et al., 2008; Wang et al., 2009).

To conclude, this study focuses on the factors that impact the Behavioural Intention to use e-learning as a tool for teaching and learning in Libyan higher education. To test these factors, the TAM model was developed as shown in Figure 3.1. The research model consists of the TAM theory factors of PU, PEOU and AU, which have a direct influence on the BI towards using e-learning. In addition, external factors such as PE, SI, MD and SNM have an indirect influence on the BI by PEOU and PU.
3.4.2 Research Hypotheses

The following are the research hypotheses:

**Social networking Media**

H1a: Social Networking Media use influences students’ Perceived Usefulness of e-learning in Libyan higher education.

H1b: Social Networking Media use influences teachers’ Perceived Usefulness of e-learning in Libyan higher education.

H2a: Social Networking Media use influences students’ Perceived Ease of Use of e-learning in Libyan higher education.

H2b: Social Networking Media use influences teachers’ Perceived Ease of Use of e-learning in Libyan higher education.

![Figure 3.1: The Research Model](image-url)
**Perceived Enjoyment**

H3a: Perceived Enjoyment has a positive impact on students’ Perceived Usefulness of e-learning in Libyan higher education.

H3b: Perceived Enjoyment has a positive impact on teachers’ Perceived Usefulness of e-learning in Libyan higher education.

H4a: Perceived Enjoyment has a positive impact on students’ Perceived Ease of Use of e-learning in Libyan higher education.

H4b: Perceived Enjoyment has a positive impact on teachers’ Perceived Ease of Use of e-learning in Libyan higher education.

**Social Influence**

H5a: Social Influence has a positive impact on students’ Perceived Usefulness of e-learning in Libyan higher education.

H5b: Social influence has a positive impact on teachers’ Perceived Usefulness of e-learning in Libyan higher education.

H6a: Social influence has a positive impact on students’ Perceived Ease of Use of e-learning in Libyan higher education.

H6b: Social influence has a positive impact on teachers’ Perceived Ease of Use of e-learning in Libyan higher education.

**Mobile Devices**

H7a: Mobile Devices usage influences students’ Perceived Usefulness of e-learning in Libyan higher education.
H7b: Mobile Devices usage influences teachers’ Perceived Usefulness of e-learning in Libyan higher education.

H8a: Mobile Devices usage influences students’ Perceived Ease of Use of e-learning in Libyan higher education.

H8b: Mobile Devices usage influences teachers’ Perceived Ease of Use of e-learning in Libyan higher education.

**Perceived Ease of Use and Perceived Usefulness**

H9a: Perceived Ease of Use influences students’ Attitude Towards Behaviour of using e-learning in Libyan higher education.

H9b: Perceived Ease of Use influences teachers’ Attitude Towards Behaviour of using e-learning in Libyan higher education.

H10a: Perceived Usefulness influences students’ Attitude Towards Behaviour of using e-learning in Libyan higher education.

H10b: Perceived Usefulness influences teachers’ Attitude Towards Behaviour of using e-learning in Libyan higher education.

**Attitude Towards Behaviour**

H11a: Attitude Towards Behaviour influences students’ Behavioural Intention to Use e-learning in Libyan higher education.

H11b: Attitude Towards Behaviour influences teachers’ Behavioural Intention to Use e-learning in Libyan higher education.
3.5 Summary

This chapter provided the research model and its main constructs. The first section highlighted the research objectives and the main research questions. In the second section, the key constructs for this research were defined. Seven constructs were introduced as the factors most likely to affect directly and indirectly on the students’ and teachers’ intention to use e-learning in Libyan higher education. These factors are ‘Perceived Ease of Use’, ‘Perceived Usefulness’, ‘Perceived Enjoyment’, ‘Attitude Towards Behaviour’, ‘Social Influence’, ‘Social Networking Media’, and ‘Mobile Devices’. Moreover, there are three moderating variables namely ‘Computing Experience’, ‘Language’, and ‘Demographic Information’. The proposed research model was then introduced and explained. The last section of the chapter provided the justification of the research hypotheses related with the model. The next chapter will discuss the research methodology and data analysis techniques.
CHAPTER 4: RESEARCH METHODOLOGY

4.1 Introduction

The purpose of this research is to investigate the factors that affect e-learning implementation in Libyan higher education. This chapter presents the research methodology and research design that were used in this thesis. The chapter includes the following sections.

4.2 Research Design

A quantitative research approach was used to investigate the factors that have an impact on the implementation of e-learning in Libya. Quantitative research methodology is a widely used approach in Social Science studies, including Education and Information Systems Management (Palys, 1997). Quantitative research is done to determine effects, causes and relationships and is more theory-based (Jurs & Wiersma, 2009). In this research, quantitative research methodology is used and implemented throughout the study.

Survey research is most commonly used in non-experimental design and is considered most appropriate for theory testing. A survey research can support the external validity of the study results from a managerial perspective (Bakos & Treacy, 1986). Glatthorn and Joyner (2005) mentioned that survey research is utilized to evaluate perception, attitudes and opinions of business students. There are many types of surveys such as oral, written, online and example surveys. This study focuses on the written survey. According to Fowler (2009), a written survey can be grouped as an administered questionnaire, a mail survey or a drop-off survey. A mail survey was used in this study. After receiving the consent from each university, advertisements were displayed on the campuses. The questionnaires were emailed to the participants with the support of the university. Participants can answer the questionnaire at their convenience and return the
questionnaire by post. An envelope with a local return address and a postage stamp were provided.

4.3 Population and Sample

The population in the study consists of students and teachers from Libyan higher education. The research strategy used in this thesis was that of survey research. A self-administered questionnaire was targeted at both students and teachers.

The sample size required is calculated based on Yamane’s (1967) sample size and margin error table. The number of students in Libyan higher education is more than 300,000 (Rhema & Miliszewska, 2010c). According to Yamane’s (1967) sample size table, if the population is more than 100,000 and to achieve a confidence level of 95%, the sample size should be 400. The number of teachers in Libyan universities is 11260 (Deeb, 2006). According to Yamane’s (1967) sample table, with a population of 11260, in order to achieve the confidence level of 95%, the sample size is 385.

The sampling for the self-administered survey is described as follows:

The participants were recruited from four universities: two private and two public universities. These universities had been chosen for the following reasons:

1. These universities reflect the geographical diversity in Libya, where two of them are situated in urban areas, while the other two are located in the rural areas.

2. For public universities, the University of Tripoli and Elmergib University had been chosen because they were larger universities in the region and they had students coming from the surrounding areas, thus covering a large geographical area.

3. Private universities, Alrefak and Libyan Universities had been chosen because they are under a different funding system.
It is worth noting that the proportion of the students and teachers obtained from each university is not important, as long as the minimum sample size was achieved. The minimum limit will be obtained by a formula used by Tabachnick and Fidel. Tabachnick and Fidell (2007) provided a formula for computing the minimum sample size by taking the number of independent variables of interest into consideration. It is $N > 50 + 8m$, where $m$ is the number of independent variables. Using this rule, the minimum sample size for this study with 7 variables should be $N = 50 + 8(7) = 106$. However, Structural Equation Modeling (SEM) was conducted to test the validity of the proposed model. SEM was used to examine the relationships among the research construct. Normally, when SEM is used to deal with five factors, which is the case in this research, at least 100 cases are required (Loehlin, 1992).

### 4.4 Development of the Questionnaire

Surveying is a well-known data collection method that can generate precise findings and indications about large populations. Although there are other survey techniques such as direct measurement, observation and secondary research, for many researchers, survey by questionnaire and/or interviews is always the first choice (Oates, 2005). Many previous researchers have used the questionnaire method to study e-learning adoption and usage (Al-Harbi, 2011; Moukali, 2012; Rapeepisarn, 2012; Robinson, 2009).

#### 4.4.1 Questionnaire Design

Peterson (2000) states that the quality of the information obtained from a questionnaire is directly proportional to the quality of the questionnaire. Successful questionnaires take the respondent through the questions in such a way that one finds it easy to give accurate answers to the questions (Hague, 1993). The questionnaire for this study was carefully designed to consider the major design issues such as the order, sequence and
length of questions, wording and layout (Rea & Parker, 2012) The questionnaire started with a cover letter introducing and explaining the survey objectives to the respondents. To establish credentials and legitimacy, the cover letter of this questionnaire informed participants that this is a research project at the School of Engineering and Information Technology in Murdoch University. The participants will also be informed that all the information obtained would be subject to anonymity and confidentiality and used only for the purposes of this study. A key words definition list was also placed at the beginning of the questionnaire to help with the subject matter understanding and to reduce the chance of any possible ambiguity. The questionnaire consists of 3 parts (A - C) which are:

A- Demographic and Background Information

B- Experience with Educational Technology

C- E-learning Acceptance

Each part of the questionnaire is preceded by a brief introduction, so as to make the questionnaire flow better. The structure of the questionnaire and measurement of the constructs are discussed as follows.

Part A: Demographic and Background Information

This first part of the questionnaire was used to collect basic demographic and background information about the participants. It comprised of 6 questions for students and 7 questions for teachers: Age was measured on three category scale (18-29; 30-49; 50+). Information on academic position (for respondents who are teachers) and highest level of qualification (for respondents who are students) were requested. Other details requested include gender, university type, level of English language, using of e-learning for learning and teaching, as well as experience in teaching (for respondents who are teachers). According to Blair et al. (2013), there are three main reasons for obtaining
demographic and background data. Firstly, the research analysis may require demographic data. Secondly, demographic distributions data may be needed for comparison with census data, in order to assess the accuracy of sample representation. Thirdly, demographic data will be needed, if post stratification was chosen. In this research, demographic data is collected at the beginning of the questionnaire and it is kept short and easy, so as to encourage the respondents to proceed with the completion of the questionnaire. After all, it is always best to begin with a question that most participants will find relatively simple to answer (Blair et al., 2013).

**Part B: Experience with Educational Technology**

This part relates to the experience on using educational technology. Most questions are established on a nominal scale. The questions included in this part are: having a computer at home; way of using computer; using the Internet; types of educational technology used; mobile devices used; using mobile devices for educational purposes; activities using mobile devices, social networking media use, social networking use, as well as the using of social networking media for educational purpose. This part also includes two Likert scale questions, asking for a respondent’s opinion on using mobile learning and social media in higher education. The items for both questions are labelled from ‘strongly disagree’ to ‘strongly agree’ (see part B of the questionnaire in Appendix A).

**Part C: E-learning Acceptance**

In order to investigate the factors affecting the use of e-learning of Libyan teachers and students, the variable ‘Behavioural Intent to Use’ is used as a determinant for the adoption of e-learning in Libyan higher education. All variables were established on a five point Likert scale labelled from ‘strongly disagree’ to ‘strongly agree’. The operationalization of each variable used in this part is described below.
Behavioural Intent to Use (BI)

Behavioural Intent to use e-learning was measured using three items for students and four items for teachers (see part C of questionnaire in Appendix A). Two of these items were taken from an instrument developed by Gefen and Straub (2000) and were also used by Carter and Bélanger (2005). Another two items were taken from an instrument developed by (Davis, 1985). The wording of the items were modified for appropriate use in the e-learning domain. Corn (2007) mentioned that a Likert Scaling is a bipolar approach, measuring either negative or positive answers to a statement.

Perceived Usefulness (PU)

Perceived Usefulness (PU) is the degree in which an individual believes that e-learning would be advantageous and offer positive, expected results as a tool for teaching and learning (Davis, 1989). Venkatesh et al. (2003a) described PU as the expected level that people believe they will obtain by utilizing a particular system. PU was measured on five point Likert scale labelled from ‘strongly disagree’ to ‘strongly agree’ (see part C of questionnaire in Appendix A). All the five items were taken from an instrument developed by (Venkatesh et al., 2003b). Some modifications to the wordings were made for adaptation to the e-learning domain.

Perceived Ease of Use (PEOU)

Davis (1989) defined Perceived Ease of Use (PEOU) as “the degree to which a person believes that using a particular system would be free of effort”. That can be assessed by how easy it is to use e-learning.

Key phases utilized for assessing PEOU include: the ease in which to get a system to do what a person wants; the system would be easy to use, clear and understandable; it is easy for a user to become skillful; the system is flexible to interact with, and overall, a system that a user believes it is easy to use (Davis, 1989; Moore & Benbasat, 1991;
Thompson et al., 1991). PEOU was measured using four items on a five point Likert scale labelled from ‘strongly disagree’ to ‘strongly agree’.

**Attitude Towards Use (AU)**

Attitude is how a person feels (positive / negative) about using e-learning as a tool for teaching and learning (Davis, 1989).

Attitude Towards Use (AU) was measured using five items (see part C of questionnaire in Appendix A). These items were taken from an instrument developed by (Compeau et al., 1999; Davis, 1989; Fishbein & Ajzen, 1975; Taylor & Todd, 1995; Thompson et al., 1991). Modifications to the wordings were also made so as to adapt to the e-learning domain.

**Social Influence (SI)**

Fishbein and Ajzen (1975) defined Social Influence (SI) as “the person’s perception that most people who are important to him think he should or should not perform the behaviour in question”. SI was measured using four items (see part C of questionnaire in Appendix A). All four items were taken from an instrument developed by Hartwick and Barki (1994) and have been used by Chen and Rea (2004).

**Perceived Enjoyment (PE)**

Perceived Enjoyment (PE) is the extent to which the utilization of e-learningis perceived to be enjoyable in its own right (Pikkarainen et al., 2004). It was measured using 4 items for students and five items for teachers (see part C of questionnaire in Appendix A). Four items were taken from an instrument developed by Pikkarainen et al. (2004) and have been used by Muilenburg and Berge (2005). One additional measurement item was developed for the study. Some modifications to the wordings were made to suit the e-learning domain.
Mobile Devices (MD)

Mobile devices (MD) can be considered to still be in the emerging stage. Many research have the tendency to focus on the assessment of the efficiency of the implementation of mobile systems. Preceding studies have noted that the most important advantage of MD technology is mobility (Al-ammery et al., 2014). MD was measured using six items for both students and teachers (see part B of the questionnaire in Appendix A and B). Five items were taken from an instrument developed by (Venkatesh et al., 2003b) and have been used by Tarhini et al. (2013). One additional item was developed for the study. Some modifications in wordings were made to fit within the e-learning domain.

Social Networking Media (SNM)

According to Adamson (2012), Social Networking Media (SNM) is a vital tool for teaching and learning and should be used extensively for this purpose. Jackson (2011) reported that the usage of SNM in education institutions can have a positive effect on students' learning outcomes. It was measured using four items for both students and teachers (see part B of the questionnaire in Appendix A and B). All the items were taken from an instrument developed by (Venkatesh et al., 2003b). Some modifications in the wording were made to go well with the e-learning domain.

4.4.2 Translation from English to Arabic

For the purpose of data collection, the self-administrated questionnaire was developed in English; however, the main language in Libya is Arabic. Consequently, it was a requirement to translate the questionnaire into Arabic language in order to obtain the permission for the collection of data. The researcher carefully started the translation processes by using a method involving translation and back-translation. The researcher translated the English questionnaires to Arabic language. After that, the Arabic version of the questionnaires were given to a Libyan lecturer specializing in teaching English as
a second language to translate the questionnaires back into English. The original versions and back-translated versions of questionnaires were compared. As there were some differences between the two, a few minor revisions were made to ensure that both versions conveyed the same correct meaning. After the translation processes were completed, the Arabic versions of the survey was put on trial with a small sample group of students and teachers who studied in Australia, to ensure its comprehensibility and readability. Appendix A provides the English version of the final version of the questionnaire, while Appendix B provides the Arabic version of it.

4.5 Data collection procedure and technique

The survey was conducted in June 2013. The participants (students and teachers) were recruited from four universities: two private and two public universities from the Libyan higher education system. To gain access to these selected universities, a letter was sent to the President of each university seeking the permission to recruit participants and distribute questionnaires.

After the consent was given from each university, advertisements were displayed on campus. Students and teachers who would like to participate in the study, were requested to contact the researcher by email/ phone. Arrangements were made for the posting of the questionnaire and information letter. The letter clearly stated that the participation in the research was entirely voluntary and that the participants may withdraw their consent to participate without returning the questionnaire. In an event that a participant decides to withdraw from the research after receiving the questionnaire, all material could be destroyed by the participant, without a need for return. However, after the questionnaire had been returned, no withdrawal was possible as no identification was retained.
A total of 400 students’ questionnaires and 400 teachers’ questionnaires were distributed to the students and teachers in four universities. From the 400 questionnaires distributed to the students, 318 were returned in a form eligible for the analysis and 27 questionnaires were dismissed because they were missing data due to a lack of completeness by the participants. The overall students’ response rate for this study is 79.5%. From the 400 questionnaires distributed to the teachers, 182 were returned in a form eligible for the analysis and 7 questionnaires were dismissed because they were also missing data, as a result of a lack of completeness by the participants. The overall teachers’ response rate for this study was 45.5%.

4.6 Data Analysis Technique

This section explains the different statistical tests and analysis techniques selected to support the research. The Statistical Package for Social Sciences (SPSS) Version 21 was used in order to analyse quantitative data obtained from the questionnaire. Many research have largely accepted and used the SPSS software for data analysis technique (Zikmund et al., 2012). SPSS Version 21 was used to analyse the data for descriptive statistics such as frequencies, mean and standard deviation. SPSS was also employed to run the statistical tests including Factor Analysis and Internal Consistency Reliability. The Analysis of Moment Structure (AMOS) Version 21 was used for Structural Equation Modelling (SEM) to determine the fit of the hypothesized model and also to test the hypothesized model discussed in Chapter 3.

4.6.1 Structural Equation Modelling (SEM)

As stated above, the AMOS Version 21 was used for testing the causal relationships and examining the hypotheses research model. SEM is a collection of statistical techniques that allows a hypothesized model to be examined statistically in a simultaneous analysis of the whole system of variables, so as to determine the range in which it is reliable with
the data (Byrne, 2001). The model is considered plausible for the postulated relations between variables, if the goodness-of-fit is sufficient (Byrne, 2001). This has become an essential tool for analysis which is widely in academic research (Hair, 1995). Two key characteristics of SEM are firstly, a simultaneous assessment of multiple and interrelated dependence relationships; secondly, the ability to show latent concepts in these relationships and correct for measurement errors in the assessment process (Hair, Tatham, et al., 2006). The main objective of SEM is to clarify the pattern of a series of unobserved or latent constructs, individually by using one or more observed variables (Hair, 1995).

A two-stage model building approach which has been recommended by many authors, Anderson and Gerbing (1988) and Mulaik et al. (1989) in particular, was conducted to analyse the data in this research. First, the measurement model is tested to confirm the validity and reliability of the constructs. Next, once the measurement model has been completed adequately, the structural model is estimated. By using this technique, the reliability and validity are usually ensured (Hair, 2006). The estimation of the measurement model and structural model was conducted using Maximum Likelihood Estimation (MLE).

4.6.2 Measurement Model Development

Before the development of the measurement model, the unidimensionality and internal consistency assessment of the items of each factor were conducted. Unidimensionality has been described as “an assumption underlying the calculation of reliability and is demonstrated when the indicators of a construct have an acceptable fit on a single-factor (one dimensional) model” (Hair et al., 1995). Exploratory Factor Analysis (EFA) was conducted to offer evidence of unidimensionality of the items of each measurement, while the internal consistency testing was conducted by Cronbach’s Alpha coefficient.
According to Hair et al. (1995), Cronbach’s Alpha score of at least 0.7 can be considered as acceptable for internal consistency. The purpose of the measurement model was to determine the reliability and validity of a set of items in each latent construct. The construct validity was examined by investigating the convergent and discriminant validity. The convergent validity is achieved when each measurement item relates strongly with its intended construct (Gefen & Straub, 2005). The convergent validity was measured utilizing composite reliability and Average Variance Extracted (AVE) (Fornell & Larcker, 1981b). In this research, composite reliability and AVE were conducted to determine the convergent validity. Composite reliability is a more popular measure of reliability and it is used for the item loading estimated within the model. It is commonly utilized in SEM. It can be calculated as:

\[
\text{Composite reliability} = \frac{\left(\sum_{i=1}^{n} \lambda_i^2\right)^{1/2}}{\left(\sum_{i=1}^{n} \lambda_i^2\right)^{1/2} + \left(\sum_{i=1}^{n} \delta_i\right)^{1/2}}
\]

Where \(\lambda_i\) is the standardized factor loading for the indicators on the observed variable, \(\delta_i\) is the measurement error for each indicator. A commonly used value for Composite Reliability should be at least 0.7 (Hair, Tatham, et al., 2006).

The AVE is the overall amount of variance in the indicators accounted by the observed variable. The AVE should be 0.5 or higher, to be considered acceptable (Hair, Tatham, et al., 2006). It can be calculated as:

\[
\text{Average Variance Extracted} = \frac{\left(\sum_{i=1}^{n} \lambda_i^2\right)}{\left(\sum_{i=1}^{n} \lambda_i^2\right)^{1/2} \left(\sum_{i=1}^{n} \delta_i\right)^{1/2}}
\]

Where \(\lambda_i\) is the standardized factor loading for the indicators on the observed variable, \(\delta_i\) is the measurement error for each indicator.
The discriminant validity measures the difference between a construct and its indicators from another construct and its indicators (Bagozzi, 1992). It is also used to measure the extent to which a construct is really different from other constructs (Hair Jr, 2006). Fornell and Larcker (1981a) states that the correlations among items in any two constructs should be less than the square root of the AVE shared by items within a construct.

For acceptable discriminant validity, each indicator highly measures its intended constructs (Garson, 2009). Additionally, the AVE shared between a construct and its measure should be higher than the AVE shared by the constructs in the model (Gefen & Straub, 2005).

### 4.6.3 Structural Model Evaluation

AMOS Version 21 was employed to evaluate the Goodness-of-fit of the structure model, so as to examine the significance of hypothesized paths in the research model and to examine the variance ($R^2$) explained by each dependent variable. The study evaluated the following six goodness-of-fit indices: $\chi^2$-square test, the Goodness-of-fit Index (GFI), the Adjusted Goodness-of-fit Index (AGFI), the Comparative Fit Index (CFI), the Tuker-Lewis Index (TLI) and the Root Mean Square Error of Approximation (RMSEA). For a good fit of the model, the TLI, GFI and CFI should be greater than or equal to 9.0 and $\chi^2$-square should be less than 3 (Bagozzi et al., 1991; Tatham & Black, 1998). Moreover, the AGFI should be greater than 0.8 and the RMSEA should be less than 0.08 (Hair et al., 1995). Table 4.1 shows a summary of the Goodness-of-fit Indices and reliability measures implemented in this study.
Table 4.1: Summary of Guidelines for Model fit

<table>
<thead>
<tr>
<th>Model fit measures</th>
<th>Guidelines for fit</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Goodness-of-fit measures</strong></td>
<td></td>
</tr>
<tr>
<td>▪ Root mean square error of approximation (RMSEA)</td>
<td>&lt; 0.05 indicates a good model fit</td>
</tr>
<tr>
<td></td>
<td>0.05 – 0.08 indicates a fair fit</td>
</tr>
<tr>
<td>▪ Goodness-of-fit index (GFI)</td>
<td>near to 0.90</td>
</tr>
<tr>
<td>▪ Adjusted Goodness-of-fit index(AGFI)</td>
<td>&gt; 0.80</td>
</tr>
<tr>
<td>▪ Comparative fit index (CFI)</td>
<td>≥ 0.90</td>
</tr>
<tr>
<td>▪ Tucker Lewis Index (TLI)</td>
<td>≥ 0.90</td>
</tr>
<tr>
<td>▪ Chi sq/ df</td>
<td>&lt; 3 indicates a good fit</td>
</tr>
<tr>
<td><strong>Reliability measures</strong></td>
<td></td>
</tr>
<tr>
<td>▪ Cronbach’s alpha coefficient</td>
<td>≥ 0.70</td>
</tr>
<tr>
<td>▪ Composite reliability</td>
<td>≥ 0.70</td>
</tr>
<tr>
<td>▪ Average variance extracted</td>
<td>≥ 0.50</td>
</tr>
</tbody>
</table>

4.6.4 Moderating Effects Analysis

The analytic strategy of (Singh, 1995) was utilized to assess the existence of the moderating effect on the structural model by utilizing a subgroup analysis. First, an “unconstrained” simultaneous multi-group assessment of path coefficient was implemented, where path coefficients were allowed to vary across the cross-group dataset. Next, a “fully constrained” model was estimated with the target path coefficient, restricted to be equal for simultaneous multi-group estimation. The Goodness-of-fit statistical values for the “unconstrained” and “fully constrained” models, which are dependent on a ($x^2$) square difference test, are compared. This is then used to test the hypotheses.
4.7 Summary

This chapter described the research methodology and methods utilized in this study. The research was carried out by utilizing quantitative methods. The quantitative method was conducted through a questionnaire which described the reasons for the above mentioned choices, offers details about the participants and how they were selected. The chapter also described how the questionnaire was designed and the data analysis methods that were used. AMOS Version 21 was used for testing the causal relationships and examining the hypotheses research model. A two-stage model building approach was conducted to analyse the data in this research. First, the measurement model was tested to substantiate the validity and reliability of the constructs. After which, the structural model was estimated via hypotheses testing. The estimation of the measurement and structural model was conducted using MLE. The analytical strategy of Singh (1995) was utilized to test the existence of the moderating effect on the structural model by using a subgroup analysis. The results of the quantitative testing of the research model will be presented in the next chapter.
CHAPTER 5: DATA ANALYSIS AND RESULTS

5.1 Introduction

This chapter presents the results of the quantitative data analysis that was conducted, as reported in Chapter 4. The self-administered questionnaire was designed to collect the quantitative data required to investigate and understand the factors that have an impact on students’ and teachers’ behavioural intention to implement e-learning as a tool for teaching and learning in Libyan higher education. Section 5.2 discusses the missing data. Section 5.3 presents descriptive information about the participants and their intention of using e-learning for teaching and learning. The normality of data is discussed in Section 5.4. Section 5.5 discusses the measurement model and testing while Section 5.6 discusses the structural model and testing. The results of the hypothesis testing are presented in Section 5.7. In Section 5.8, the effects of the moderator variables and findings of the hypotheses are presented.

5.2 Missing Data

Missing data occurs when a participant fails to answer one or more questions in the questionnaire (Hair et al., 2010). The process of sorting the collected data indicated that from 345 student responses, there were 27 uncompleted responses. From 189 collected responses from teachers, there were 7 uncompleted responses. These 34 incomplete responses have 60% missing data, where the participants failed to answer more than half of the questions in the questionnaire. According to Hair et al. (2010), if one participant fails to answer 50% of the questions in the questionnaire, then the participant’s responses should be deleted from the collected data. Hence, the 27 uncompleted students’ responses and 7 uncompleted teachers’ responses were deleted.
5.3 Descriptive Statistics

This section provides some basic information about the demographics and background of the participants and their intention to use e-learning. Participants were recruited from four Libyan universities: two private and two public. As mentioned earlier in Chapter 4, two sets of 400 questionnaires were distributed to students and teachers. Overall, 318 (79.5%) and 182 (45.5%) of the questionnaires from students and teachers were returned respectively.

5.3.1 Demographic

Demographic information of the participants was categorised as follows: age, gender, university type, years of teaching (for teachers) and using e-learning as a learning tool.

Table 5.1: Summary of the Characteristics of the Respondents in terms of Age, Gender, University Type, Year of Teaching, and E-learning use as a Learning Tool

<table>
<thead>
<tr>
<th></th>
<th>Student</th>
<th>Teacher</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frequency</td>
<td>(%)</td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18-29 years</td>
<td>299</td>
<td>94.3%</td>
</tr>
<tr>
<td>30-49 years</td>
<td>17</td>
<td>5.3%</td>
</tr>
<tr>
<td>50+</td>
<td>1</td>
<td>0.3%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>317</td>
<td></td>
</tr>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>114</td>
<td>35.8%</td>
</tr>
<tr>
<td>Female</td>
<td>204</td>
<td>64.2%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>318</td>
<td></td>
</tr>
<tr>
<td><strong>University Type</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Private</td>
<td>82</td>
<td>25.8%</td>
</tr>
<tr>
<td>Public</td>
<td>236</td>
<td>74.2%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>318</td>
<td></td>
</tr>
<tr>
<td><strong>Years of teaching</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0-5 years</td>
<td>89</td>
<td></td>
</tr>
<tr>
<td>6-10 years</td>
<td>38</td>
<td></td>
</tr>
<tr>
<td>+10 years</td>
<td>35</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>182</td>
<td></td>
</tr>
<tr>
<td><strong>Use E-learning as Learning Tool</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>144</td>
<td>45.3%</td>
</tr>
<tr>
<td>No</td>
<td>172</td>
<td>54.1%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>316</td>
<td></td>
</tr>
</tbody>
</table>

1 One respondent did not answer.
2 Two respondents did not answer.
As illustrated in Table 5.1, the largest category of students who participated in the questionnaire is those between 18-29 years of age (94.3%), followed by those in the 30 to 49 age range (5.3%). There is only one respondent who is 50 or over in age. As for the age groups of the teachers who responded, 26.9% are aged between 18-29 years, while 48.4% and 24.7% are between 30-49 years and 50 or over respectively.

Regarding the genders of the participant, female students are higher in frequency than male students at percentages of 64.2 and 35.8 respectively, while the male teachers are higher in frequency as compared to the male students (62.1% and 37.9% respectively).

In terms of the university type, both public students and teachers are higher in frequency (74.2% and 85.7%) than private students and teachers (25.8% and 14.3%).

Regarding the years of teaching, teachers who have taught from 0-5 years ranked the highest at 48.9%, while teachers who have taught between 6-10 years and over 10 years ranked lower with percentages of 20.9 and 30.2 respectively.

When asked about the use of e-learning as a tool for teaching and learning, both students and teachers who have never used e-learning exceeded those who have, with percentages of 54.1, compared to 45.3 and 50.5 as compared to 49.5 respectively.

5.3.2 Experience with Educational Technology

This section relates to the experience and behaviour in using e-learning. E-learning acceptance and usage behaviour are divided into computer, mobile devices and social networking media as shown in Tables 5.2 and 5.3.
Table 5.2: Shows Computer and Mobile Devices use

<table>
<thead>
<tr>
<th>Do you have computer at home?</th>
<th>Students</th>
<th>Teachers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>284</td>
<td>175</td>
</tr>
<tr>
<td>No</td>
<td>33</td>
<td>7</td>
</tr>
<tr>
<td>Total¹</td>
<td>317</td>
<td>182</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Using the Internet</th>
<th>Students</th>
<th>Teachers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never</td>
<td>15</td>
<td>1</td>
</tr>
<tr>
<td>Once a month</td>
<td>34</td>
<td>22</td>
</tr>
<tr>
<td>Once a week</td>
<td>48</td>
<td>46</td>
</tr>
<tr>
<td>Once a day</td>
<td>79</td>
<td>36</td>
</tr>
<tr>
<td>More than once a day</td>
<td>142</td>
<td>77</td>
</tr>
<tr>
<td>Total</td>
<td>318</td>
<td>182</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Educational computer use</th>
<th>Students</th>
<th>Teachers</th>
</tr>
</thead>
<tbody>
<tr>
<td>E-learning</td>
<td>51</td>
<td>30</td>
</tr>
<tr>
<td>Computer assisted instruction</td>
<td>97</td>
<td>70</td>
</tr>
<tr>
<td>WWW</td>
<td>234</td>
<td>136</td>
</tr>
<tr>
<td>Others</td>
<td>40</td>
<td>15</td>
</tr>
<tr>
<td>Total</td>
<td>422</td>
<td>215</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mobile devices used</th>
<th>Students</th>
<th>Teachers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hand phone</td>
<td>184</td>
<td>119</td>
</tr>
<tr>
<td>Smart phone</td>
<td>112</td>
<td>38</td>
</tr>
<tr>
<td>Laptop</td>
<td>183</td>
<td>132</td>
</tr>
<tr>
<td>personal digital assistant (PDA)</td>
<td>7</td>
<td>4</td>
</tr>
<tr>
<td>iPod</td>
<td>39</td>
<td>19</td>
</tr>
<tr>
<td>Mp3/Mp4</td>
<td>15</td>
<td>14</td>
</tr>
<tr>
<td>Other</td>
<td>7</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>547</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Activates usage with mobile devices</th>
<th>Students</th>
<th>Teachers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Making calls</td>
<td>185</td>
<td>134</td>
</tr>
<tr>
<td>Sending/reading SMS</td>
<td>110</td>
<td>90</td>
</tr>
<tr>
<td>Downloading (pic, music, video)</td>
<td>111</td>
<td>50</td>
</tr>
<tr>
<td>Surfing the net</td>
<td>183</td>
<td>111</td>
</tr>
<tr>
<td>Email</td>
<td>107</td>
<td>85</td>
</tr>
<tr>
<td>Note taking</td>
<td>57</td>
<td>31</td>
</tr>
<tr>
<td>Total</td>
<td>753</td>
<td>501</td>
</tr>
</tbody>
</table>

¹ One respondent did not answer.
²,³,⁴ Participants can answer more than one item.

Table 5.2 illustrates the background styles of participants’ computer and mobile devices usage. Responses indicated that most students and teachers have a computer at home with percentages of 89.6 and 96.2 respectively. Regarding the usage of the Internet, most students and teachers use the Internet more than once a day with percentages of 44.7 and 42.3 respectively. Only 4.7% of students have never used the Internet, while 0.3% of teachers have also never used the Internet. The responses further indicated that
24.8% of students use the Internet once a day. Likewise, 19.8% of teachers use the Internet once a day.

Regarding the types of educational technology used, both students and teachers use the World Wide Web (WWW) the most with percentages of 74.3 and 76.0 respectively. On the other hand, both students and teachers use e-learning the least with percentages of 16.2 and 16.8 respectively. The rest is Computer Assisted Instruction (CAI) in which students’ and teachers’ usage were 30.5% and 39.1% respectively.

In terms of the type of mobile devices usage, responses indicated that the most popular device for students is the handphone with a percentage of 58.2%. On the other hand, the most popular device for teachers is the laptop with a percentage of 72.5%. As for students, the second most popular device is the laptop with a percentage of 57.9, followed by a smartphone at 35.4% and the iPod at 12.3%. Teachers use the handphone, smartphone and iPod with percentages of 65.4%, 20.9% and 10.4% respectively.

As for the activities use with the mobile devices, both students and teachers used the mobile devices for calls most often, with percentages of 74.9% and 58.7%. Likewise, both students and teachers do not often use mobile devices for taking of notes, with percentages of 17.3% and 18.1% respectively. The responses indicated that 62.0% of students use mobile devices for Internet browsing, whereas 58.1% of teachers use mobile devices for Internet browsing. The responses also indicated that 50.3% of the students use mobile devices for sending and receiving messages, while only 34.9% of teachers use mobile devices for the same purpose. Finally, only 47.5% of the students and 34.0% of the teachers use mobile devices for checking of emails.
Table 5.3: Shows Social Networking Media use

<table>
<thead>
<tr>
<th>Do you use Social Networking Media?</th>
<th>Student</th>
<th>Teacher</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frequency</td>
<td>(%)</td>
</tr>
<tr>
<td>Yes</td>
<td>293</td>
<td>92.1</td>
</tr>
<tr>
<td>No</td>
<td>25</td>
<td>7.9</td>
</tr>
<tr>
<td>Total</td>
<td>318</td>
<td>100.0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>How often do you use Social Networking Media?</th>
<th>Student</th>
<th>Teacher</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never</td>
<td>24</td>
<td>7.5</td>
</tr>
<tr>
<td>Once a month</td>
<td>16</td>
<td>5.0</td>
</tr>
<tr>
<td>Once a week</td>
<td>26</td>
<td>8.2</td>
</tr>
<tr>
<td>Once a day</td>
<td>115</td>
<td>36.2</td>
</tr>
<tr>
<td>More than once a day</td>
<td>137</td>
<td>43.1</td>
</tr>
<tr>
<td>Total</td>
<td>318</td>
<td>100.0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>What Social Networking Media do you use?</th>
<th>Student</th>
<th>Teacher</th>
</tr>
</thead>
<tbody>
<tr>
<td>Facebook</td>
<td>253</td>
<td>79.6</td>
</tr>
<tr>
<td>Twitter</td>
<td>24</td>
<td>7.5</td>
</tr>
<tr>
<td>Blackboard</td>
<td>4</td>
<td>1.3</td>
</tr>
<tr>
<td>Other</td>
<td>13</td>
<td>4.1</td>
</tr>
<tr>
<td>No selection</td>
<td>23</td>
<td>7.2</td>
</tr>
<tr>
<td>Total¹</td>
<td>317</td>
<td>99.7</td>
</tr>
</tbody>
</table>

¹One respondent did not answer.

Table 5.3 compares the Social Networking Media (SNM) usage between students and teachers. Regarding the use of SNM, responses indicated that most students and teachers use SNM with percentages of 92.1 and 83.5 respectively.

In terms of how often the social network is used, responses indicated that 43.1% of students use SNM more than once a day, while 39% of teachers use SNM more than once a day. The responses also indicated that 36.2% of students use SNM once a day, whereas 33.5% of teachers use SNM once a day. Only 15.9 % of the teachers and 7.5% of the students do not use the SNM at all.

Regarding the question on what type of social networking platform is used, the responses indicated that both students and teachers use Facebook the most with percentages of 79.6 and 64.3 respectively. Only 7.2% of the students have no selection and 15.2 % of the teachers also have no selection. The responses indicated that 7.5 % of students use Twitter, while 9.9% of the teachers use Twitter.
5.3.3 Summary Information on the Research Constructs

The research constructs include Perceived Usefulness (PU), Perceived Ease of Use (PEOU), Perceived Enjoyment (PE), Social Influence, Social Networking Media (SNM), Mobile Devices (MD), Attitude Towards the Use (AU), and Behaviour Intent to Use (BI). Table 5.4 offers a summary on these constructs. The responses to the indicators utilized to measure each construct was averaged for each participant. Also, descriptive statistical information about these summary measures for the key research constructs is offered to provide a sense of the spread. All constructs in both models showed a wide range of values. The table clearly presents that most of the students and teachers perceived e-learning in Libyan higher education to be very useful to them (mean of 4.12 out of 5 and mean of 4.02 out of 5 respectively). It was also evident that most students and teachers perceived the ease of use e-learning as easy to use (mean of 3.86 out of 5 and mean of 3.83 out of 5 respectively). With regards to e-learning awareness, the data indicated that there was a wide range of levels of awareness for both students and teachers (mean of 4.12 out of 5 and mean of 4.19 out of 5 respectively). Similarly, there was a wide range of levels of PE, SI, SNM and MD. Lastly, the table presents that a substantial number of students and teachers were not sure about their future intentions. However, there was a tendency towards the accepting of e-learning for students and teachers (mean of 4.22 out of 5 and mean of 3.98 out of 5 respectively).
Table 5.4: Constructs Summary Information

<table>
<thead>
<tr>
<th>Construct</th>
<th>Student</th>
<th>Teacher</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>Min</td>
</tr>
<tr>
<td>Perceived Usefulness</td>
<td>4.12</td>
<td>1</td>
</tr>
<tr>
<td>Perceived Ease Of Use</td>
<td>3.86</td>
<td>1</td>
</tr>
<tr>
<td>Social Influence</td>
<td>3.63</td>
<td>1</td>
</tr>
<tr>
<td>Social Networking Media</td>
<td>3.90</td>
<td>1</td>
</tr>
<tr>
<td>Mobile Devices</td>
<td>3.98</td>
<td>1</td>
</tr>
<tr>
<td>Perceived Enjoyment</td>
<td>3.56</td>
<td>1</td>
</tr>
<tr>
<td>Attitude Towards the Use</td>
<td>4.12</td>
<td>1</td>
</tr>
<tr>
<td>Behaviour Intent to Use</td>
<td>4.22</td>
<td>1</td>
</tr>
</tbody>
</table>

5.4 Normality

According to Hair et al. (2010), normality refers to the “degree to which the distribution of the sample data corresponds to a normal distribution”. The data can be assessed for normality statistically by obtaining skewness and kurtosis. Skewness is the measure of the symmetry of the data distribution (Tabachnick & Fidell, 2007), while kurtosis is the measure of the peak or flatness of a distribution (Hair et al., 2010). A distribution is regarded to be normal when the values of skewness and kurtosis are equal to zero. However, there are no formal cut-off points on the level of skewness and kurtosis to indicate when variables are no longer regarded as normal (Curran et al., 1996). In addition, the skewness and kurtosis for each variable were calculated using SPSS.
Tables 5.5 and 5.6 show the mean, the standard deviation, skewness and kurtosis for the variables in both models. As seen in Tables 5.5 and 5.6, no variables had skewness greater than 3.00 and no variables had kurtosis greater than 10.00, as recommended by (Kline, 2011). The results showed that all variables can be considered normally distributed. Hence, the maximum likelihood estimation can be utilized in examining the structural model in this study (Hair et al., 1998).

Table 5.5: Mean, Standard Deviation, Skewness and Kurtosis for the items used in student’s model

<table>
<thead>
<tr>
<th>Variables</th>
<th>Mean</th>
<th>SD</th>
<th>Skewness</th>
<th>Kurtosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social Networking Media</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SM1</td>
<td>3.67</td>
<td>1.080</td>
<td>-0.966</td>
<td>0.504</td>
</tr>
<tr>
<td>SM2</td>
<td>3.99</td>
<td>0.888</td>
<td>-1.036</td>
<td>1.368</td>
</tr>
<tr>
<td>SM3</td>
<td>4.03</td>
<td>0.861</td>
<td>-1.250</td>
<td>2.449</td>
</tr>
<tr>
<td>SM4</td>
<td>3.94</td>
<td>0.996</td>
<td>-1.163</td>
<td>1.394</td>
</tr>
<tr>
<td>Perceived Ease of Use</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EASE1</td>
<td>3.80</td>
<td>0.927</td>
<td>-0.910</td>
<td>1.057</td>
</tr>
<tr>
<td>EASE2</td>
<td>3.90</td>
<td>0.851</td>
<td>-0.913</td>
<td>1.241</td>
</tr>
<tr>
<td>EASE3</td>
<td>3.85</td>
<td>0.879</td>
<td>-0.571</td>
<td>0.275</td>
</tr>
<tr>
<td>EASE3</td>
<td>3.91</td>
<td>0.847</td>
<td>-0.614</td>
<td>0.403</td>
</tr>
<tr>
<td>Social Influence</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S1</td>
<td>3.80</td>
<td>1.072</td>
<td>-1.072</td>
<td>0.948</td>
</tr>
<tr>
<td>S2</td>
<td>3.51</td>
<td>1.103</td>
<td>-0.693</td>
<td>-0.143</td>
</tr>
<tr>
<td>S3</td>
<td>3.58</td>
<td>1.064</td>
<td>-0.800</td>
<td>0.208</td>
</tr>
<tr>
<td>S4</td>
<td>3.97</td>
<td>0.886</td>
<td>-1.013</td>
<td>1.329</td>
</tr>
<tr>
<td>Intention to Use</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>INT1</td>
<td>4.20</td>
<td>0.808</td>
<td>-1.248</td>
<td>2.577</td>
</tr>
<tr>
<td>INT2</td>
<td>4.30</td>
<td>0.762</td>
<td>-0.943</td>
<td>0.785</td>
</tr>
<tr>
<td>INT3</td>
<td>4.17</td>
<td>0.831</td>
<td>-0.891</td>
<td>0.852</td>
</tr>
<tr>
<td>Perceived Enjoyment</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Enj1</td>
<td>3.45</td>
<td>1.229</td>
<td>-0.399</td>
<td>-0.961</td>
</tr>
<tr>
<td>Enj2</td>
<td>3.46</td>
<td>1.247</td>
<td>-0.459</td>
<td>-0.955</td>
</tr>
<tr>
<td>Enj3</td>
<td>3.77</td>
<td>1.151</td>
<td>-0.686</td>
<td>-0.527</td>
</tr>
<tr>
<td>Variables</td>
<td>Mean</td>
<td>SD</td>
<td>Skewness</td>
<td>Kurtosis</td>
</tr>
<tr>
<td>---------------------------------</td>
<td>------</td>
<td>------</td>
<td>----------</td>
<td>----------</td>
</tr>
<tr>
<td>Social Networking Media</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SM1</td>
<td>3.53</td>
<td>1.070</td>
<td>-0.921</td>
<td>0.022</td>
</tr>
<tr>
<td>SM2</td>
<td>3.87</td>
<td>1.000</td>
<td>-1.175</td>
<td>1.036</td>
</tr>
<tr>
<td>SM3</td>
<td>3.97</td>
<td>0.901</td>
<td>-1.276</td>
<td>1.911</td>
</tr>
<tr>
<td>SM4</td>
<td>3.85</td>
<td>0.951</td>
<td>-1.051</td>
<td>1.035</td>
</tr>
<tr>
<td>Perceived Ease of Use</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EASE1</td>
<td>3.86</td>
<td>0.917</td>
<td>-1.189</td>
<td>1.366</td>
</tr>
<tr>
<td>EASE2</td>
<td>3.87</td>
<td>0.917</td>
<td>-1.269</td>
<td>1.737</td>
</tr>
<tr>
<td>EASE3</td>
<td>3.83</td>
<td>0.939</td>
<td>-1.270</td>
<td>1.589</td>
</tr>
</tbody>
</table>

Table 5.6: Mean, Standard Deviation, Skewness and Kurtosis for the items used in teacher’s model
<table>
<thead>
<tr>
<th></th>
<th>EASE4</th>
<th>3.81</th>
<th>0.947</th>
<th>-1.106</th>
<th>0.896</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social Influence</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S1</td>
<td>3.63</td>
<td>1.392</td>
<td>-0.724</td>
<td>-0.913</td>
<td></td>
</tr>
<tr>
<td>S2</td>
<td>2.48</td>
<td>1.106</td>
<td>0.477</td>
<td>-0.559</td>
<td></td>
</tr>
<tr>
<td>S3</td>
<td>3.67</td>
<td>1.334</td>
<td>-0.802</td>
<td>-0.664</td>
<td></td>
</tr>
<tr>
<td>S4</td>
<td>3.79</td>
<td>1.306</td>
<td>-0.950</td>
<td>-0.358</td>
<td></td>
</tr>
<tr>
<td>Intention to Use</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>INT1</td>
<td>4.0</td>
<td>1.189</td>
<td>-1.275</td>
<td>0.695</td>
<td></td>
</tr>
<tr>
<td>INT2</td>
<td>1.92</td>
<td>1.043</td>
<td>1.159</td>
<td>0.653</td>
<td></td>
</tr>
<tr>
<td>INT3</td>
<td>3.96</td>
<td>1.058</td>
<td>-1.506</td>
<td>2.012</td>
<td></td>
</tr>
<tr>
<td>INT4</td>
<td>3.98</td>
<td>1.064</td>
<td>-1.497</td>
<td>1.989</td>
<td></td>
</tr>
<tr>
<td>Perceived Enjoyment</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Enj1</td>
<td>3.94</td>
<td>1.042</td>
<td>-0.946</td>
<td>0.180</td>
<td></td>
</tr>
<tr>
<td>Enj2</td>
<td>4.04</td>
<td>0.891</td>
<td>-0.940</td>
<td>0.606</td>
<td></td>
</tr>
<tr>
<td>Enj3</td>
<td>2.45</td>
<td>1.00</td>
<td>0.406</td>
<td>-0.430</td>
<td></td>
</tr>
<tr>
<td>Enj4</td>
<td>3.85</td>
<td>1.022</td>
<td>-1.269</td>
<td>1.476</td>
<td></td>
</tr>
<tr>
<td>Enj5</td>
<td>4.07</td>
<td>0.938</td>
<td>-1.351</td>
<td>2.032</td>
<td></td>
</tr>
<tr>
<td>Mobile Devices</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M1</td>
<td>3.66</td>
<td>1.026</td>
<td>-0.748</td>
<td>0.136</td>
<td></td>
</tr>
<tr>
<td>M2</td>
<td>4.18</td>
<td>0.935</td>
<td>-1.505</td>
<td>2.332</td>
<td></td>
</tr>
<tr>
<td>M3</td>
<td>4.05</td>
<td>0.942</td>
<td>-1.584</td>
<td>2.883</td>
<td></td>
</tr>
<tr>
<td>M4</td>
<td>4.21</td>
<td>0.923</td>
<td>-1.495</td>
<td>2.222</td>
<td></td>
</tr>
<tr>
<td>M5</td>
<td>4.15</td>
<td>0.872</td>
<td>-1.315</td>
<td>2.185</td>
<td></td>
</tr>
<tr>
<td>M6</td>
<td>4.13</td>
<td>1.005</td>
<td>-1.556</td>
<td>2.278</td>
<td></td>
</tr>
<tr>
<td>Perceived Usefulness</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>USEF1</td>
<td>4.20</td>
<td>0.857</td>
<td>-1.778</td>
<td>4.356</td>
<td></td>
</tr>
<tr>
<td>USEF2</td>
<td>4.18</td>
<td>0.699</td>
<td>-1.041</td>
<td>2.176</td>
<td></td>
</tr>
<tr>
<td>USEF3</td>
<td>4.02</td>
<td>0.957</td>
<td>-1.457</td>
<td>2.208</td>
<td></td>
</tr>
<tr>
<td>USEF4</td>
<td>4.19</td>
<td>0.766</td>
<td>-1.609</td>
<td>4.651</td>
<td></td>
</tr>
<tr>
<td>USEF5</td>
<td>3.87</td>
<td>0.946</td>
<td>-1.405</td>
<td>2.203</td>
<td></td>
</tr>
<tr>
<td>Attitude Towards Use</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ATT1</td>
<td>3.86</td>
<td>0.899</td>
<td>-1.052</td>
<td>1.722</td>
<td></td>
</tr>
<tr>
<td>ATT2</td>
<td>4.25</td>
<td>0.594</td>
<td>-0.616</td>
<td>1.983</td>
<td></td>
</tr>
<tr>
<td>ATT3</td>
<td>4.14</td>
<td>0.594</td>
<td>-0.616</td>
<td>1.983</td>
<td></td>
</tr>
</tbody>
</table>
5.5  The Measurement Model

This section shows the measurement model for each latent variable in the model. The unidimensionality and internal consistency assessment of the items of each factor were conducted. The source and number of items in each measurement are elaborated in Section 4.4.1. The measurement models were then measured based on the convergent and discriminant validity. A detailed explanation of these were provided in Section 4.6.1 and this section demonstrates how it was achieved.

5.5.1 Exploratory Factor Analysis (EFA)

An Exploratory Factor Analysis (EFA) using maximum likelihood with Pormax rotation was conducted to examine the unidimensionality of the items in each measurement instrument using SPSS 21 for the student and teacher models (Song, 2010). The findings of EFA showed that some items had cross loading in both instruments. As a result, the items were dropped to validate and estimate the instruments. After the items were deleted, the result of EFA showed that the factor analysis was suitable for all multi-item measurement instruments due to the correlation coefficients between the items in all instruments being more than 0.3. Similarly, the inter-correlation between the variables is significant and there was no correlation more than 0.80. The Bartlett’s Test of Sphericity was statistically significant ($p = 0.000$), which determined adequate correlation among the variables. The Kaiser-Meyer-Olkin (KMO) evaluation of sampling adequacy were 0.843 and 0.879, showing the suitability of the data for EFA. The KMO and Bartlett’s Test results are shown in Tables 5.7 and 5.8.
Table 5.7: KMO and Bartlett's Test for Student Model

| Kaiser-Meyer-Olkin Measure of Sampling Adequacy. | .843 |
| Bartlett's Test of Sphericity | Approx. Chi-Square | 3583.231 |
| | Df | 325 |
| | Sig. | .000 |

Table 5.8: KMO and Bartlett's Test Teacher Model

| Kaiser-Meyer-Olkin Measure of Sampling Adequacy. | .879 |
| Bartlett's Test of Sphericity | Approx. Chi-Square | 2638.348 |
| | Df | 276 |
| | Sig. | .000 |

The following sections show the items which were deleted from each construct.

**Perceived Usefulness**

For both students and teachers, only three of the five items measuring the Perceived Usefulness loaded sufficiently on the construct. The other items USEF1 and USEF2 for students, and USEF1 and USEF4 for teachers were dropped, as they did not meet the criteria.

**Social Influence**

Three out of four items were used to measure Social Influence for both students and teachers. One item was dropped, S4 for students and S2 for teachers, as they did not meet the criteria.

**Perceived Ease of Use**

Four items were used to measure Perceived Ease of Use for students and teachers. One item for teachers, EASE2, was dropped, as it did not meet the criteria. The other items were considered good indicators of Perceived Ease of Use.
**Perceived Enjoyment**

Four items were used to measure Perceived Enjoyment for students and five items were used to measure Perceived Enjoyment for teachers. One item for students (Enj4) and two items for teachers (Enj2, Enj3) were dropped, as they did not meet the criteria.

**Attitude Towards Use**

For both students and teachers, only three items of the five items measuring Attitude Towards Use loaded sufficiently on the construct. The items ATT1 and ATT2 for students, ATT1 and ATT4 for teachers were dropped, as they did not meet the criteria.

**Mobile devices**

For both students and teachers, only three of the six items measuring the Mobile Devices loaded sufficiently on the construct. The other items M4, M5 and M6 for students and M1, M2 and M5 for teachers were dropped, as they did not meet the criteria.

**Social Networking Media**

For students, all four items measuring Social Networking Media loaded sufficiently on the construct, while one item, SM2, for teachers was dropped as it did not meet the criteria. The rest of the items met the criteria.

**Behavioural Intention**

Three items were used to measure Behavioural Intention to use e-learning for students and four items were used to measure Behavioural Intention to use e-learning for teachers. All items loaded sufficiently on the construct, except one item for teachers (INT2). This was dropped as it did not meet the criteria.

Tables 5.9 and 5.10 below show the test results on unidimensionality and reliability. The results showed unidimensionality was achieved for all items in the respective measurements. The Cronbach’s Alpha coefficient was conducted to test the internal
consistency. The criteria suggested by Hair (1995) was used to determine the suitability of the reliability coefficients obtained for each measurement. Cronbach’s Alpha should be at least 0.7. Tables 5.9 and 5.10 show the Cronbach’s Alpha values for each construct in the models. All values were more than 0.7 and subsequently meet the requirements. Convergent and discriminant validities were also conducted for all constructs.

Convergent validity was evaluated using Composite Reliability (CR) and Average Variance Extracted (AVE). Tables 5.9 and 5.10 below present that all values of CR were greater than 0.7 and all values of AVE were more than or equal 0.5. Tables 5.9 and 5.10 show the values of the convergent validity. All constructs show good convergent validity, therefore all requirements were met.

**Table 5.9: Construct Reliability for Students**

<table>
<thead>
<tr>
<th>Factor</th>
<th>Item</th>
<th>Factor Loading</th>
<th>CR</th>
<th>AVE</th>
<th>Cronbach’s alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social Networking Media</td>
<td>SM1</td>
<td>0.897</td>
<td>0.847</td>
<td>0.650</td>
<td>0.829</td>
</tr>
<tr>
<td></td>
<td>SM2</td>
<td>0.734</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>SM3</td>
<td>0.668</td>
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<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SM4</td>
<td>0.633</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perceived Ease of Use</td>
<td>EASE1</td>
<td>0.675</td>
<td>0.819</td>
<td>0.533</td>
<td>0.828</td>
</tr>
<tr>
<td></td>
<td>EASE2</td>
<td>0.831</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>EASE3</td>
<td>0.659</td>
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<td></td>
<td>EASE4</td>
<td>0.745</td>
<td></td>
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</tr>
<tr>
<td>Social Influence</td>
<td>S1</td>
<td>0.737</td>
<td>0.848</td>
<td>0.651</td>
<td>0.846</td>
</tr>
<tr>
<td></td>
<td>S2</td>
<td>0.851</td>
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<tr>
<td></td>
<td>S3</td>
<td>0.827</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Behavioural Intention</td>
<td>INT1</td>
<td>0.778</td>
<td>0.831</td>
<td>0.623</td>
<td>0.832</td>
</tr>
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<td>Factor</td>
<td>Item</td>
<td>Factor Loading</td>
<td>CR</td>
<td>AVE</td>
<td>Cronbach’s alpha</td>
</tr>
<tr>
<td>-----------------------------</td>
<td>-------</td>
<td>----------------</td>
<td>------</td>
<td>-------</td>
<td>------------------</td>
</tr>
<tr>
<td>Behavioural Intention</td>
<td>INT1</td>
<td>0.848</td>
<td>0.726</td>
<td>0.888</td>
<td>0.904</td>
</tr>
<tr>
<td></td>
<td>INT3</td>
<td>0.897</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>INT4</td>
<td>0.809</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perceived Ease of Use</td>
<td>EASE1</td>
<td>0.820</td>
<td>0.886</td>
<td>0.722</td>
<td>0.891</td>
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<td></td>
<td>EASE3</td>
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<td></td>
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<tr>
<td></td>
<td>EASE4</td>
<td>0.892</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mobile Devices</td>
<td>M3</td>
<td>0.742</td>
<td>0.827</td>
<td>0.616</td>
<td>0.856</td>
</tr>
<tr>
<td></td>
<td>M4</td>
<td>0.752</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>M6</td>
<td>0.857</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: CR = Composite Reliability; AVE = Average Variance Extracted
<table>
<thead>
<tr>
<th>Social media</th>
<th>SM1</th>
<th>0.721</th>
<th>0.824</th>
<th>0.610</th>
<th>0.836</th>
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</thead>
<tbody>
<tr>
<td>SM3</td>
<td></td>
<td>0.817</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SM4</td>
<td></td>
<td>0.802</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Perceived Enjoyment</td>
<td>Enj1</td>
<td>0.674</td>
<td>0.818</td>
<td>0.598</td>
<td>0.811</td>
</tr>
<tr>
<td></td>
<td>Enj4</td>
<td>0.781</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Enj5</td>
<td>0.856</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social Influence</td>
<td>S1</td>
<td>0.766</td>
<td>0.642</td>
<td>0.843</td>
<td>0.840</td>
</tr>
<tr>
<td></td>
<td>S3</td>
<td>0.824</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>S4</td>
<td>0.814</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attitude</td>
<td>ATT2</td>
<td>0.657</td>
<td>0.750</td>
<td>0.507</td>
<td>0.840</td>
</tr>
<tr>
<td></td>
<td>ATT3</td>
<td>0.862</td>
<td></td>
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<tr>
<td></td>
<td>ATT5</td>
<td>0.590</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perceived Usefulness</td>
<td>USEF2</td>
<td>0.621</td>
<td>0.797</td>
<td>0.571</td>
<td>0.812</td>
</tr>
<tr>
<td></td>
<td>USEF3</td>
<td>0.847</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>USEF5</td>
<td>0.782</td>
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<td></td>
</tr>
</tbody>
</table>

Note: CR= Composite Reliability; AVE= Average Variance Extracted

Discriminant validity as mentioned earlier, is presented when each item relates weakly with all constructs, except for the one it is theoretically correlated with. Discriminant validity is achieved if an item relates more highly with the variable that it is intended to assess rather than with other variables (Garson, 2009). Tables 5.11 and 5.12 show the implied correlation between the variables in the models. The results supported the discriminant validity of the measurement models.

**Table 5.11: Correlation Between the Variables in the Model of Students**

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1.000</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>.356</td>
<td>1.000</td>
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<td></td>
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<tr>
<td>3</td>
<td>.197</td>
<td>.203</td>
<td>1.000</td>
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<td></td>
<td></td>
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<td></td>
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<tr>
<td>4</td>
<td>.256</td>
<td>.452</td>
<td>.113</td>
<td>1.000</td>
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<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 5.12: Correlation Between the Variables in the Model of Teachers

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>.485</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
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<td>.472</td>
<td>1.000</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>.506</td>
<td>.488</td>
<td>.495</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>.485</td>
<td>.392</td>
<td>.428</td>
<td>.317</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>-.045</td>
<td>.088</td>
<td>.16</td>
<td>.008</td>
<td>-.015</td>
<td>1.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>.576</td>
<td>.412</td>
<td>.482</td>
<td>.442</td>
<td>.347</td>
<td>-.074</td>
<td>1.000</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>.567</td>
<td>.535</td>
<td>.582</td>
<td>.592</td>
<td>.382</td>
<td>-.003</td>
<td>.569</td>
<td>1.000</td>
</tr>
</tbody>
</table>

Note: 1= Behavioural Intention; 2= Ease of Use; 3= mobile Devices; 4= Social Media; 5= Enjoyment; 6= Social Influence; 7= Attitude; 8= Usefulness;

5.5.2 Confirmatory Factor Analysis (CFA)

Confirmatory Factors Analysis (CFA) assists researchers to test how well the theoretical pattern represents the actual data (Hair, 2010). CFA was used to test the adequacy of the measurement model using AOMS Version 21. Figures 5.1 and 5.2 illustrate the initial measurement models of the present study. The adequacy of the measurement models was evaluated on the criteria of goodness-of-fit, reliability, convergent validity and discriminant validity for both models.

The Goodness-of-fit

To investigate the goodness-of-fit of the proposed measurement models, six indices were used, namely $x^2$-square test, the goodness-of-fit index (GFI), the adjusted goodness-of-fit index (AGFI), the comparative fit index (CFI), the Tucker-lewis Index (TLI) and the root mean square error of approximation (RMSEA). A detailed
explanation of the model fit is given in Section 4.6.3. Tables 5.13 and 5.14 show goodness-of-fit indices in the initial measurement models.

Figure 5.1: Initial Measurement Model for Student
Figure 5.2: Initial Measurements Model for Teacher

From the above, in the Initial measurement model for students (Figure 5.1), one item, namely S2 was deleted, whereas in the Initial measurement model for teachers (Figure 5.2), no items were deleted.
Table 5.13: Results of the Student’s Initial Measurement Model Goodness-of-fit

<table>
<thead>
<tr>
<th>Model Fit Indices</th>
<th>Criteria</th>
<th>Values</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\chi^2$/df</td>
<td>$&lt; 3.0$</td>
<td>1.563</td>
<td>(Chin &amp; Todd, 1995)</td>
</tr>
<tr>
<td>Goodness-of-fit index (GFI)</td>
<td>Near to 0.90</td>
<td>0.915</td>
<td>(Schumacker &amp; Lomax, 2010)</td>
</tr>
<tr>
<td>Tucker-Lewis Index (TLI)</td>
<td>$\geq 0.90$</td>
<td>0.946</td>
<td>(Schumacker &amp; Lomax, 2010)</td>
</tr>
<tr>
<td>Comparative Fit Index (CFI)</td>
<td>$\geq 0.90$</td>
<td>0.955</td>
<td>(Tatham &amp; Black, 1998)</td>
</tr>
<tr>
<td>Adjusted Goodness-of-fit Index (AGFI)</td>
<td>$&gt; 0.80$</td>
<td>0.888</td>
<td>(Hair et al., 1995)</td>
</tr>
<tr>
<td>Root Mean Square Error of Approximation (RMSEA)</td>
<td>$&lt;0.08$</td>
<td>0.042</td>
<td>(Hair et al., 1995)</td>
</tr>
</tbody>
</table>

From the above, Figures 5.1 and 5.2, as well as Tables 5.13 and 5.14 indicate the proposed modified measurement models and the values. According to Tables 5.13 and 5.14, in the modified measurement model, all six indices are good fits.

Validity and Reliability of Measurement Model

Hair (2010) mentioned that to confirm the validity of the proposed measurement model, its construct validity should be examined.

Construct Validity

Construct validity can be defined as “the extent to which a measure assesses the constructs that it intended or supposed to measure” (Cramer & Howitt, 2004). The
constructs’ validity of the developed model was examined by investigating convergent and discriminant validity.

**Convergent Validity**

Convergent validity was measured utilizing Composite Reliability (CR) and Average Variance Extracted (AVE) (Fornell & Larcker, 1981b). A commonly used value for CR should be at least 0.7, whereas the AVE should be 0.5 or higher, to be considered acceptable (Hair, Tatham, et al., 2006). All factor loadings should be significant and greater than 0.5 (Fornell & Larcker, 1981b). According to Tables 5.15 and 5.16, the loading value of each factor is greater than or equal to 0.5 and also reaches the significance level of $p < 0.001$. Tables 5.15 and 5.16 show Factor Loading, Composite Reliability (CR), Average Variance Extracted (AVE), and items of proposed modified measurement models. As Tables 5.15 and 5.16 show, the modified measurement models met the convergent validity.

**Table 5.15: Criteria for Convergent Validity for Students**

<table>
<thead>
<tr>
<th>Factor</th>
<th>Item</th>
<th>Factor Loading</th>
<th>CR</th>
<th>AVE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social Networking Media</td>
<td>SM1</td>
<td>0.81</td>
<td>0.833</td>
<td>0.557</td>
</tr>
<tr>
<td></td>
<td>SM2</td>
<td>0.80</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SM3</td>
<td>0.69</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SM4</td>
<td>0.68</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perceived Ease of Use</td>
<td>EASE1</td>
<td>0.73</td>
<td>0.829</td>
<td>0.549</td>
</tr>
<tr>
<td></td>
<td>EASE2</td>
<td>0.75</td>
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</tr>
<tr>
<td></td>
<td>EASE3</td>
<td>0.73</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>EASE4</td>
<td>0.74</td>
<td></td>
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</tr>
<tr>
<td>Social Influence</td>
<td>S1</td>
<td>0.79</td>
<td>0.760</td>
<td>0.613</td>
</tr>
<tr>
<td></td>
<td>S3</td>
<td>0.78</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Factor</td>
<td>Item</td>
<td>Factor Loading</td>
<td>CR</td>
<td>AVE</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>------</td>
<td>----------------</td>
<td>-------</td>
<td>------</td>
</tr>
<tr>
<td>Behavioural Intention</td>
<td>INT1</td>
<td>0.86</td>
<td>0.907</td>
<td>0.765</td>
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<tr>
<td></td>
<td>INT3</td>
<td>0.93</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>INT4</td>
<td>0.83</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perceived Ease of Use</td>
<td>EASE1</td>
<td>0.80</td>
<td>0.891</td>
<td>0.732</td>
</tr>
<tr>
<td></td>
<td>EASE3</td>
<td>0.86</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>EASE4</td>
<td>0.90</td>
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<tr>
<td>Mobile Devices</td>
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<td>0.83</td>
<td>0.877</td>
<td>0.707</td>
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<tr>
<td></td>
<td>M4</td>
<td>0.71</td>
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<tr>
<td></td>
<td>M6</td>
<td>0.96</td>
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</tr>
</tbody>
</table>

Note: CR= Composite Reliability; AVE= Average Variance Extracted

Table 5.16: Criteria for Convergent Validity for teachers
### Discriminant Validity

Discriminant validity is evaluated by considering the correlation between the constructs. Fornell and Larcker (1981b) suggested that for discriminant validity to be satisfactory, the square root of the AVE from a construct should be higher than the correlation shared among the construct and other constructs in the model. Tables 5.17 and 5.18 show that all of the constructs were different from each other. The diagonal shows the square root of AVE values of each construct and these values were higher than the other correlation values between the constructs.

<table>
<thead>
<tr>
<th>Construct</th>
<th>Measure</th>
<th>CR</th>
<th>AVE</th>
<th>AVE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social media</td>
<td>SM1</td>
<td>0.76</td>
<td>0.840</td>
<td>0.637</td>
</tr>
<tr>
<td></td>
<td>SM3</td>
<td>0.81</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SM4</td>
<td>0.83</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perceived Enjoyment</td>
<td>Enj1</td>
<td>0.58</td>
<td>0.812</td>
<td>0.599</td>
</tr>
<tr>
<td></td>
<td>Enj4</td>
<td>0.94</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Enj5</td>
<td>0.76</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social Influence</td>
<td>S1</td>
<td>0.76</td>
<td>0.841</td>
<td>0.639</td>
</tr>
<tr>
<td></td>
<td>S3</td>
<td>0.83</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>S4</td>
<td>0.80</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attitude</td>
<td>ATT2</td>
<td>0.76</td>
<td>0.877</td>
<td>0.704</td>
</tr>
<tr>
<td></td>
<td>ATT3</td>
<td>0.86</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>ATT5</td>
<td>0.89</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perceived Usefulness</td>
<td>USEF2</td>
<td>0.66</td>
<td>0.822</td>
<td>0.609</td>
</tr>
<tr>
<td></td>
<td>USEF3</td>
<td>0.87</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>USEF5</td>
<td>0.79</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note: CR= Composite Reliability; AVE= Average Variance Extracted*
### Table 5.17: Discriminant Validity for Students Measurement Model

<table>
<thead>
<tr>
<th>Constructs</th>
<th>Mobile</th>
<th>Media</th>
<th>Ease</th>
<th>Influence</th>
<th>Intention</th>
<th>Usefulness</th>
<th>Enjoyment</th>
<th>Attitude</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mobile</td>
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<td>Media</td>
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</tr>
<tr>
<td>Ease</td>
<td>0.440</td>
<td>0.391</td>
<td>0.741</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Influence</td>
<td>0.123</td>
<td>0.237</td>
<td>0.223</td>
<td>0.783</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Intention</td>
<td>0.422</td>
<td>0.287</td>
<td>0.480</td>
<td>0.170</td>
<td>0.794</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Usefulness</td>
<td>0.466</td>
<td>0.485</td>
<td>0.493</td>
<td>0.334</td>
<td>0.363</td>
<td>0.733</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Enjoyment</td>
<td>0.266</td>
<td>0.093</td>
<td>0.325</td>
<td>-0.054</td>
<td>0.201</td>
<td>0.194</td>
<td>0.789</td>
<td></td>
</tr>
<tr>
<td>Attitude</td>
<td>0.502</td>
<td>0.481</td>
<td>0.507</td>
<td>0.282</td>
<td>0.474</td>
<td>0.556</td>
<td>0.212</td>
<td>0.723</td>
</tr>
</tbody>
</table>

Note: Diagonals represent the square roots of AVE and the other Matrix entries are the factors’ correlations.

### Table 5.18: Discriminant Validity for Teachers Measurement Model

<table>
<thead>
<tr>
<th>Constructs</th>
<th>Mobile</th>
<th>Intention</th>
<th>Ease</th>
<th>Usefulness</th>
<th>Attitude</th>
<th>Media</th>
<th>Influence</th>
<th>Enjoyment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mobile</td>
<td>0.841</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intention</td>
<td>0.518</td>
<td>0.875</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ease</td>
<td>0.514</td>
<td>0.521</td>
<td>0.856</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Usefulness</td>
<td>0.594</td>
<td>0.586</td>
<td>0.552</td>
<td>0.780</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attitude</td>
<td>0.521</td>
<td>0.652</td>
<td>0.476</td>
<td>0.650</td>
<td>0.839</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Media</td>
<td>0.524</td>
<td>0.536</td>
<td>0.538</td>
<td>0.631</td>
<td>0.514</td>
<td>0.798</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Influence</td>
<td>0.023</td>
<td>-0.016</td>
<td>0.083</td>
<td>-0.008</td>
<td>-0.060</td>
<td>0.024</td>
<td>0.799</td>
<td></td>
</tr>
<tr>
<td>Enjoyment</td>
<td>0.502</td>
<td>0.573</td>
<td>0.448</td>
<td>0.488</td>
<td>0.428</td>
<td>0.407</td>
<td>-0.050</td>
<td>0.774</td>
</tr>
</tbody>
</table>

Note: Diagonals represent the square roots of AVE and the other Matrix entries are the factors’ correlations.
5.6 The Structural Model

The structural model was evaluated after the assessment of the measurement model. The hypothesized model quality was evaluated based on three criteria, which are overall goodness-of-fit, the statistical significance of the estimated path coefficients and the ability of the model to explain the variance in the dependent variables. These three criteria were examined in this study as described in the first three parts of this section.

5.6.1 The Goodness-of-fit

The goodness-of-fit assessment indicated an acceptable fit of the model. A detailed explanation of the model fit was given in Section 4.6.3. The $\chi^2$-square for the student and teacher models were 1.689 and 1.418 respectively, which were less than 3; the GFI was 0.905 for the student model and 0.874 for the teacher model, which was close to 0.90; AGFI was 0.880 for the student model and 0.837 for the teacher model, which were both greater than 0.8; CFI for the student model was 0.943 and for the teacher model, it was 0.961, which is greater than 0.9; TLI were 0.934 and 0.954, which is higher than 0.9 and finally, RMSEA was 0.047 and 0.048, which were both less than 0.08. These data are all within the commonly accepted thresholds suggested in the relevant literature. Furthermore, the fit indices indicate that the models have a good fit to the data (see Tables 5.19 and 5.20).

Table 5.19: Results of the Student’s Structural Model Goodness-of-fit

<table>
<thead>
<tr>
<th>Model Fit Indices</th>
<th>Criteria</th>
<th>Values</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\chi^2$/df</td>
<td>$&lt; 3.0$</td>
<td>1.689</td>
<td>(Chin &amp; Todd, 1995)</td>
</tr>
<tr>
<td>Goodness-of-fit index (GFI)</td>
<td>$\geq 0.90$</td>
<td>0.905</td>
<td>(Tatham &amp; Black, 1998)</td>
</tr>
<tr>
<td>Tucker-Lewis Index (TLI)</td>
<td>$\geq 0.90$</td>
<td>0.934</td>
<td>(Schumacker &amp; Lomax, 2010)</td>
</tr>
<tr>
<td>Comparative Fit Index (CFI)</td>
<td>$\geq 0.90$</td>
<td>0.943</td>
<td>(Tatham &amp; Black, 1998)</td>
</tr>
<tr>
<td>Adjusted Goodness-of-fit Index (AGFI)</td>
<td>$&gt; 0.80$</td>
<td>0.880</td>
<td>(Hair et al., 1995)</td>
</tr>
<tr>
<td>Root Mean Square Error of Approximation</td>
<td>$&lt;0.08$</td>
<td>0.047</td>
<td>(Hair et al., 1995)</td>
</tr>
</tbody>
</table>
Table 5.20: Results of the Teacher’s Structural Model Goodness-of-fit

<table>
<thead>
<tr>
<th>Model Fit Indices</th>
<th>Criteria</th>
<th>Values</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\chi^2$/df</td>
<td>&lt; 3.0</td>
<td>1.418</td>
<td>(Chin &amp; Todd, 1995)</td>
</tr>
<tr>
<td>Goodness-of-fit index (GFI)</td>
<td>Near to 0.90</td>
<td>0.874</td>
<td>(Schumacker &amp; Lomax, 2010)</td>
</tr>
<tr>
<td>Tuker-Lewis Index (TLI)</td>
<td>&gt;=0.90</td>
<td>0.954</td>
<td>(Schumacker &amp; Lomax, 2010)</td>
</tr>
<tr>
<td>Comparative Fit Index (CFI)</td>
<td>&gt;=0.90</td>
<td>0.961</td>
<td>(Tatham &amp; Black, 1998)</td>
</tr>
<tr>
<td>Adjusted Goodness-of-fit Index (AGFI)</td>
<td>&gt;0.80</td>
<td>0.837</td>
<td>(Hair et al., 1995)</td>
</tr>
<tr>
<td>Root Mean Square Error of Approximation (RMSEA)</td>
<td>&lt;0.08</td>
<td>0.048</td>
<td>(Hair et al., 1995)</td>
</tr>
</tbody>
</table>

5.6.2 Analysis of Path Coefficients

Estimation of the path coefficients indicate the strengths of the relationships between the dependent and independent variables. The path coefficients in the SEM model represent standardized regression coefficients. In Amos, the Critical Ratio (CrR) can be utilized to determine the significance of estimated parameters. For both models, all estimates were within the acceptable range (i.e. no correlations greater than one and no negative covariance). Byrne (2001) said that based on a level of 0.05, the CrR needs to be greater than ± 1.96, to accept the hypothesis that the estimate equals to 0.0. When the CrR (or t-value) is greater than 1.96 for an estimate (regression weight), then the parameter coefficient value is statistically significant at the 0.05 level (Hair, Black, et al., 2006). CrR was obtained by dividing the regression weight estimate by the estimate of its standard error (S.E). In both models, based on the level of 0.05, all except three of the CrRs were greater than 1.96, which indicates the significance of the estimated coefficients.

Tables 5.21 and 5.22 show the standardized path coefficients (β), standard error, p-value, critical ratio (CrR) and hypotheses results for the students’ and teachers’ models.
Table 5.21: Shows Standardized Path Coefficients (β), Standard Error, P-value, Critical Ratio (CrR) and Hypotheses Result for Student’s Model

<table>
<thead>
<tr>
<th>Path</th>
<th>β</th>
<th>S.E</th>
<th>P</th>
<th>CrR</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1a: Social Media → PU</td>
<td>.323</td>
<td>.063</td>
<td>***</td>
<td>4.446</td>
<td>Supported</td>
</tr>
<tr>
<td>H2a: Social Media → PEOU</td>
<td>.237</td>
<td>.067</td>
<td>***</td>
<td>3.408</td>
<td>Supported</td>
</tr>
<tr>
<td>H3a: Perceived Enjoyment → PU</td>
<td>.098</td>
<td>.038</td>
<td>.111</td>
<td>1.595</td>
<td>Not Supported</td>
</tr>
<tr>
<td>H4a: Perceived Enjoyment → PEOU</td>
<td>.237</td>
<td>.043</td>
<td>***</td>
<td>3.767</td>
<td>Supported</td>
</tr>
<tr>
<td>H5a: Social Influence → PU</td>
<td>.239</td>
<td>.050</td>
<td>***</td>
<td>3.533</td>
<td>Supported</td>
</tr>
<tr>
<td>H6a: Social Influence → PEOU</td>
<td>.168</td>
<td>.054</td>
<td>.010</td>
<td>2.589</td>
<td>Supported</td>
</tr>
<tr>
<td>H7a: Mobile devices → PU</td>
<td>.328</td>
<td>.068</td>
<td>***</td>
<td>4.289</td>
<td>Supported</td>
</tr>
<tr>
<td>H8a: Mobile devices → PEOU</td>
<td>.295</td>
<td>.078</td>
<td>***</td>
<td>3.948</td>
<td>Supported</td>
</tr>
<tr>
<td>H9a: PEOU → Attitude</td>
<td>.368</td>
<td>.054</td>
<td>***</td>
<td>5.196</td>
<td>Supported</td>
</tr>
<tr>
<td>H10a: PU → Attitude</td>
<td>.452</td>
<td>.065</td>
<td>***</td>
<td>5.920</td>
<td>Supported</td>
</tr>
<tr>
<td>H11a: Attitude → Intention</td>
<td>.523</td>
<td>.105</td>
<td>***</td>
<td>7.500</td>
<td>Supported</td>
</tr>
</tbody>
</table>

Notes: *p<0.05, **p<0.01, ***p<0.001

Table 5.22: Shows Standardized Path Coefficients (β), Standard Error, P-value, Critical Ratio (CrR) and Hypotheses Result for Teacher’s Model

<table>
<thead>
<tr>
<th>Path</th>
<th>β</th>
<th>S.E</th>
<th>P</th>
<th>CrR</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1b: Social Media → PU</td>
<td>.414***</td>
<td>.059</td>
<td>***</td>
<td>4.452</td>
<td>Supported</td>
</tr>
<tr>
<td>H2b: Social Media → PEOU</td>
<td>.343***</td>
<td>.092</td>
<td>***</td>
<td>3.775</td>
<td>Supported</td>
</tr>
<tr>
<td>H3b: Perceived Enjoyment → PU</td>
<td>.194*</td>
<td>.053</td>
<td>.015</td>
<td>2.433</td>
<td>Supported</td>
</tr>
<tr>
<td>H4b: Perceived Enjoyment → PEOU</td>
<td>.201*</td>
<td>.087</td>
<td>.015</td>
<td>2.429</td>
<td>Supported</td>
</tr>
<tr>
<td>H5b: Social Influence → PU</td>
<td>-.024</td>
<td>.028</td>
<td>.710</td>
<td>-3.372</td>
<td>Not Supported</td>
</tr>
<tr>
<td>H6b: Social Influence → PEOU</td>
<td>.076</td>
<td>.046</td>
<td>.273</td>
<td>1.095</td>
<td>Not Supported</td>
</tr>
<tr>
<td>H7b: Mobile devices → PU</td>
<td>.305***</td>
<td>.063</td>
<td>***</td>
<td>3.440</td>
<td>Supported</td>
</tr>
<tr>
<td>H8b: Mobile devices → PEOU</td>
<td>.236**</td>
<td>.100</td>
<td>.008</td>
<td>2.665</td>
<td>Supported</td>
</tr>
<tr>
<td>H9b: PEOU → Attitude</td>
<td>.233**</td>
<td>.062</td>
<td>.003</td>
<td>3.011</td>
<td>Supported</td>
</tr>
<tr>
<td>H10b: PU → Attitude</td>
<td>.629***</td>
<td>.127</td>
<td>***</td>
<td>6.344</td>
<td>Supported</td>
</tr>
<tr>
<td>H11b: Attitude → Intention</td>
<td>.723***</td>
<td>.146</td>
<td>***</td>
<td>8.562</td>
<td>Supported</td>
</tr>
</tbody>
</table>

Notes: *p<0.05, **p<0.01, ***p<0.001

5.6.3 Variance Explained

The third estimation process was to determine whether the models have the ability to explain the variance in the dependent variables, which are measured by using the squared multiple correlation $R^2$. The $R^2$ value represents the amount of variance in the dependent variable that is explained by independent variables. In model 1, Social
Networking Media, Perceived Enjoyment, Social influence, and Mobile Devices explained 44% of the variance in Perceived Usefulness. In addition, Social Networking Media, Perceived Enjoyment, Social Influence and Mobile Devices explained 36% of the variance in Perceived Ease of Use. Perceived Usefulness and Perceived Ease of Use explained 47% of Attitude Towards the Behaviour. The model explained 27% of the variability in the Intention to Use e-learning. Figure 5.3 presents the multiple squares correlation $R^2$ for each dependent variable in the students’ model.

In model 2, 56% of the Perceived usefulness of e-learning was explained by Social Networking Media, Perceived Enjoyment, Social Influence and Mobile Devices. In addition, 41% of the Perceived Ease of Use of e-learning was explained by Social Networking Media, Perceived Enjoyment, Social Influence and Mobile Devices. Perceived Usefulness and Perceived Ease of Use explained 59% of the attitude towards the behaviour. The model explained 52% of the variability in the intention to use e-learning. Figure 5.4 presents the multiple squares correlation $R^2$ for each dependent variable in the teachers’ model.
Figure 5.3: Structural Model Results of Students
*p < 0.05; **p < 0.01; ***p < 0.001

Figure 5.4: Structural Model Results of Teachers
*p < 0.05; **p < 0.01; ***p < 0.001
5.7 Hypotheses Testing

The results from the Structural Equation Modelling presented in Tables 5.21 and 5.22 indicate that all of the hypothesized relationships between independent and dependent variables were supported, except one relationship in model 1 and two relationships in model 2.

In model 1 for example, the hypothesized path between Perceived Usefulness and Social Networking Media with CrR value 4.446 (>1.96) was statistically significant (p <= 0.001). Similarly, the paths between Perceived Usefulness and Social Influence; Perceived Usefulness and Mobile Devices; Perceived Ease of Use and Social Networking Media; Perceived Ease of Use and Perceived Enjoyment; Perceived Ease of Use and Social Influence; Perceived Ease of Use and Mobile Devices; Attitude Towards Behaviour and Perceived Usefulness; Attitude Towards Behaviour and Perceived Ease of Use; Behaviour Intention and Attitude Towards Behaviour were statistically significant at p <= 0.05. The hypothesized path between Perceived Usefulness and Perceived Enjoyment indicated that its t-value did not exceed the cut-off point required for statistical significance. Therefore, this path was not supported.

Furthermore, Perceived Usefulness to e-learning was predicted by Social Networking Media (β = 0.323, p < 0.001), Perceived Enjoyment (β = 0.098, p < 0.01), Social Influence (β = 0.239, p < 0.001) and Mobile Devices (β = 0.328, p < 0.001). Therefore, hypotheses H1a, H5a, H7a were supported and hypotheses H3a was rejected. Perceived Ease of Use was predicted by Social Networking Media (β = 0.237, p < 0.001), Perceived Enjoyment (β = 0.237, p < 0.01), Social Influence (β = 0.168, p < 0.05) and Mobile Devices (β = 0.295, p < 0.001). As result, hypotheses H2a, H4a, H6a, and H8a were supported.
Attitude Towards Behaviour was predicted by Perceived Ease of Use (β = .368, p < 0.001) and Perceived Usefulness (β = .452, p < 0.001). Therefore, hypotheses H9a, and H10a were supported. Attitude Towards Behaviour significantly (β = .523, p < 0.001) affects Behavioural Intention to Use. Consequently, hypothesis H11a was supported.

In general, Social Networking Media, Perceived Enjoyment, Social Influence, and Mobile Devices had only an indirect effect on e-learning intention through Attitude Towards Behaviour (0.171, 0.069, 0.107 and 0.194 respectively). Table 5.23 shows the total, direct and indirect effects of the observed variables on the latent variables. Cohen (1977) said that the total effects more than 0.8 can be said to be a large effect, whereas those in the 0.2 to 0.5 range can be said to be small.

In model 2, for example, the hypothesized path between Perceived Usefulness and Social Networking Media with CrR value 4.452 (>1.96) was statistically significant (p <= 0.001). Similarly, the paths between Perceived Usefulness and Perceived Enjoyment; Perceived Usefulness and Mobile Devices; Perceived Ease of Use and Social Networking Media; Perceived Ease of Use and Perceived Enjoyment; Perceived Ease of Use and Mobile Devices; Attitude Towards Behaviour and Perceived Usefulness; Attitude Towards Behaviour and Perceived Ease of Use; Behaviour Intention and Attitude Towards Behaviour were statistically significant at p <= 0.05.

The hypothesized paths between Perceived Usefulness and Social Influence; Perceived Ease of Use and Social Influence indicate that its t-value did not exceed the cut-off point required for statistical significance. Therefore, these paths were not supported.

Furthermore, Perceived Usefulness to e-learning was predicted by Social Networking Media (β = 0 .414, p < 0.001), Perceived Enjoyment (β = 0 .194, p < 0.01), Social Influence (β = -0.024, p < 0.001) and Mobile Devices (β = 0.305, p < 0.001). Therefore, hypotheses H1b, H3b, H7b were supported and hypotheses H5b was rejected. Perceived
Ease of Use was predicted by Social Media (β = 0.343, p < 0.001), Perceived Enjoyment (β = 0.201, p < 0.05), Social Influence (β = 0.076, p < 0.05) and Mobile Devices (β = 0.236, p < 0.001). As result, hypotheses H2b, H4b, H8b were supported and H6b was rejected.

Attitude Towards Behaviour was predicted by Perceived Ease of Use (β = 0.233, p < 0.01) and Perceived Usefulness (β = 0.629, p < 0.001). Therefore, hypotheses H9b, and H10b were supported. Attitude Towards Behaviour significantly (β = 0.723, p < 0.001) affects Behavioural Intention to Use. Consequently, hypothesis H11b was supported.

In general, Social Networking Media, Perceived Enjoyment, Social Influence and Mobile Devices only had an indirect effect on e-learning intention through Attitude Towards Behaviour (0.277, 0.143, 0.001 and 0.244 respectively). Table 5.24 shows the total, direct, and indirect effects of the observed variables on the latent variable.

**Table 5.23: Shows the Standardized Causal Effects for the Student’s Structural Model**

<table>
<thead>
<tr>
<th>Endogenous variables</th>
<th>Determinants</th>
<th>Direct</th>
<th>Indirect</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perceived Usefulness</td>
<td>Mobile Devices</td>
<td>.293***</td>
<td>-</td>
<td>.293</td>
</tr>
<tr>
<td></td>
<td>Enjoyment</td>
<td>.061</td>
<td>-</td>
<td>.061</td>
</tr>
<tr>
<td></td>
<td>Social Influence</td>
<td>.178***</td>
<td>-</td>
<td>.178</td>
</tr>
<tr>
<td></td>
<td>Social Media</td>
<td>.279***</td>
<td>-</td>
<td>.279</td>
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<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Perceived Ease to Use</td>
<td>Mobile Devices</td>
<td>.291***</td>
<td>-</td>
<td>.291</td>
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<tr>
<td></td>
<td>Enjoyment</td>
<td>.162***</td>
<td>-</td>
<td>.162</td>
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<tr>
<td></td>
<td>Social Influence</td>
<td>.139*</td>
<td>-</td>
<td>.139</td>
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<tr>
<td></td>
<td>Social Media</td>
<td>.227***</td>
<td>-</td>
<td>.227</td>
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<td></td>
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<tr>
<td>Attitude</td>
<td>Usefulness</td>
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<td>Ease to Use</td>
<td>.281***</td>
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<td>.281</td>
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<td></td>
<td>Mobile Devices</td>
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<td>.194</td>
<td>.194</td>
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<td>Enjoyment</td>
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<td>Social Influence</td>
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<td>Usefulness</td>
<td>Ease to Use</td>
<td>Enjoyment</td>
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</table>

**Table 5.24: Shows the Standardized Causal Effects for the Teacher’s Structural Model**

<table>
<thead>
<tr>
<th>Standardized causal effect</th>
<th>Endogenous variables</th>
<th>Determinants</th>
<th>Direct</th>
<th>Indirect</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perceived Usefulness</td>
<td>Mobile Devices</td>
<td>.217***</td>
<td>-</td>
<td>-</td>
<td>.217</td>
</tr>
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<td></td>
<td>Enjoyment</td>
<td>.129*</td>
<td>-</td>
<td>-</td>
<td>.129</td>
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<tr>
<td></td>
<td>Social Influence</td>
<td>-.010</td>
<td>-</td>
<td>-</td>
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<td>Social Media</td>
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<td>-</td>
<td>-</td>
<td>.264</td>
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<tr>
<td>Perceived Ease to Use</td>
<td>Mobile Devices</td>
<td>.266**</td>
<td>-</td>
<td>-</td>
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<td></td>
<td>Enjoyment</td>
<td>.211*</td>
<td>-</td>
<td>-</td>
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<tr>
<td></td>
<td>Social Influence</td>
<td>.051</td>
<td>-</td>
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<td></td>
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<td>.346***</td>
<td>-</td>
<td>-</td>
<td>.346</td>
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<td>Usefulness</td>
<td>.703***</td>
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<td>.244</td>
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<td></td>
<td>Ease to Use</td>
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<td>-</td>
<td>.143</td>
<td>.281</td>
</tr>
<tr>
<td></td>
<td>Mobile Devices</td>
<td>-</td>
<td>.244</td>
<td>.244</td>
<td>.244</td>
</tr>
<tr>
<td></td>
<td>Enjoyment</td>
<td>-</td>
<td>.143</td>
<td>.143</td>
<td>.143</td>
</tr>
<tr>
<td></td>
<td>Social Influence</td>
<td>-</td>
<td>.001</td>
<td>.001</td>
<td>.001</td>
</tr>
<tr>
<td></td>
<td>Social Media</td>
<td>-</td>
<td>.277</td>
<td>.277</td>
<td>.277</td>
</tr>
<tr>
<td>Intention</td>
<td>Attitude</td>
<td>.805***</td>
<td>-</td>
<td>.281</td>
<td>.805</td>
</tr>
<tr>
<td></td>
<td>Mobile Devices</td>
<td>-</td>
<td>.281</td>
<td>.281</td>
<td>.281</td>
</tr>
<tr>
<td></td>
<td>Enjoyment</td>
<td>-</td>
<td>.179</td>
<td>.179</td>
<td>.179</td>
</tr>
<tr>
<td></td>
<td>Social Influence</td>
<td>-</td>
<td>.002</td>
<td>.002</td>
<td>.002</td>
</tr>
<tr>
<td></td>
<td>Social Media</td>
<td>-</td>
<td>.347</td>
<td>.347</td>
<td>.347</td>
</tr>
<tr>
<td></td>
<td>Ease to Use</td>
<td>-</td>
<td>.235</td>
<td>.235</td>
<td>.235</td>
</tr>
</tbody>
</table>
The results for the hypotheses associated with the models are described below.

H1a: Social Networking Media use influences students’ Perceived Usefulness of e-learning in Libyan higher education.

Social Networking Media use demonstrated a positive effect on students’ Perceived Usefulness of e-learning in Libyan higher education. Therefore, this hypothesis was supported.

H1b: Social Networking Media use influences teachers’ Perceived Usefulness of e-learning in Libyan higher education.

Social networking Media use demonstrated a positive effect on teachers’ Perceived Usefulness e-learning in Libyan higher education. Therefore, this hypothesis was supported.

H2a: Social Networking Media use influences students’ Perceived Ease of Use of e-learning in Libyan higher education.

Social networking Media use demonstrated a positive effect on students’ Perceived Ease of Use of e-learning in Libyan higher education. Therefore, this hypothesis was supported.

H2b: Social Networking Media use influences teachers’ Perceived Ease of Use of e-learning in Libyan higher education.

Social networking Media use demonstrated a positive effect on teachers’ Perceived Ease of Use of e-learning in Libyan higher education. Therefore, this hypothesis was supported.
H3a: Perceived Enjoyment has a positive impact on students’ perceived Usefulness of e-learning in Libyan higher education.

Perceived Enjoyment did not demonstrate a positive impact on students’ Perceived Usefulness of e-learning in Libyan higher education. This hypothesis was not supported.

H3b: Perceived Enjoyment has a positive impact on teachers’ Perceived Usefulness of e-learning in Libyan higher education.

Perceived Enjoyment demonstrated a positive impact on teachers’ Perceived Usefulness of e-learning in Libyan higher education. Therefore, this hypothesis was supported.

H4a: Perceived Enjoyment has a positive impact on students’ Perceived Ease of Use of e-learning in Libyan higher education.

Perceived Enjoyment demonstrated a positive impact on students’ Perceived Ease of Use of e-learning in Libyan higher education. Therefore, this hypothesis was supported.

H4b: Perceived Enjoyment has a positive impact on teachers’ Perceived Ease of Use of e-learning in Libyan higher education.

Perceived Enjoyment demonstrated a positive impact on teachers’ Perceived Ease of Use of e-learning in Libyan higher education. Therefore, this hypothesis was supported.

H5a: Social Influence has a positive impact on students’ Perceived Usefulness of e-learning in Libyan higher education.

Social Influence demonstrated a positive influence on students’ level of Perceived Usefulness of e-learning in Libyan higher education. Therefore, this hypothesis was supported.
H5b: Social Influence has a positive impact on teachers’ Perceived Usefulness of e-learning in Libyan higher education.

Social Influence did not demonstrate a positive influence on teachers’ level of Perceived Usefulness e-learning in Libyan higher education. Therefore, this hypothesis was not supported.

H6a: Social Influence has a positive impact on students’ Perceived Ease of Use of e-learning in Libyan higher education.

Social Influence demonstrated a positive influence on students’ level of Perceived Ease of Use of e-learning in Libyan higher education. Therefore, this hypothesis was supported.

H6b: Social Influence has a positive impact on teachers’ Perceived Ease of Use of e-learning in Libyan higher education.

Social Influence did not demonstrate a positive influence on teachers’ level of Perceived Ease of Use e-learning in Libyan higher education. Therefore, this hypothesis was not supported.

H7a: Mobile Devices usage influences students’ Perceived Usefulness of e-learning in Libyan higher education.

Mobile Devices usage demonstrated a positive influence on students’ level of Perceived Usefulness e-learning in Libyan higher education. Therefore, this hypothesis was supported.

H7b: Mobile Devices usage influences teachers’ Perceived Usefulness of e-learning in Libyan higher education.
Mobile Devices use demonstrated a positive influence on teachers’ level of Perceived Usefulness e-learning in Libyan higher education. Therefore, this hypothesis was supported.

H8a: Mobile Devices usage influences students’ Perceived Ease of Use of e-learning in Libyan higher education.

Mobile Device usage demonstrated a positive influence on students’ level of Perceived Ease of Use e-learning in Libyan higher education. Therefore, this hypothesis was supported.

H8b: Mobile Devices usage teachers’ influences Perceived Ease of Use of e-learning in Libyan higher education.

Mobile Device usage demonstrated a positive influence on teachers’ level of Perceived Ease of Use e-learning in Libyan higher education. Therefore, this hypothesis was supported.

H9a: Perceived Ease of Use influences students’ Attitude Towards Behaviour of e-learning in Libyan higher education.

Perceived Ease of Use demonstrated a positive effect on students’ Attitude Towards Behaviour of e-learning in Libyan higher education Therefore, this hypothesis was supported.

H9b: Perceived Ease of Use influences teachers’ Attitude Towards Behaviour of e-learning in Libyan higher education.

Perceived Ease of Use demonstrated a positive effect on teachers’ Attitude towards Behaviour of e-learning in Libyan higher education Therefore, this hypothesis was supported.
H10a: Perceived Usefulness influences students’ Attitude Towards Behaviour of e-learning in Libyan higher education.

Perceived Usefulness demonstrated a positive effect on students’ Attitude Towards Behaviour of an e-learning in Libyan higher education. Therefore, this hypothesis was supported.

H10b: Perceived Usefulness has influences teachers’ Attitude Towards Behaviour of an e-learning in Libyan higher education.

Perceived Usefulness demonstrated a positive effect on teachers’ Attitude Towards Behaviour of an e-learning in Libyan higher education. Therefore, this hypothesis was supported.

H11a: Attitude Towards Behaviour influences students’ Behavioural Intention to Use e-learning in Libyan higher education.

Attitude Towards Behaviour demonstrated a positive effect on students’ Behavioural Intention to Use e-learning in Libyan higher education. Therefore, this hypothesis was supported.

H11b: Attitude Towards Behaviour influences teachers’ Behavioural Intention to Use e-learning in Libyan higher education.

Attitude Towards Behaviour demonstrated a positive effect on teachers’ Behavioural Intention to Use e-learning in Libyan higher education. Therefore, this hypothesis was supported.
5.8 Moderating Effects of Students and Teachers Characteristics

The multi-group analysis for the moderating effects of gender, language, university type and computer experience is shown in Tables 5.25 – 5.31. The chi-square difference test was utilized to examine the hypotheses.

5.8.1 Gender Moderating

Table 5.25: Gender Moderating Effects for Students’ Model

<table>
<thead>
<tr>
<th>Hypotheses</th>
<th>Male Group</th>
<th>Female Group</th>
<th>Subgroup comparison (Unconstrant) $\chi^2$ (516)=789.352</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Standardized C.R Coefficient</td>
<td>Standardized C.R Coefficient</td>
<td>$\chi^2$ (544)</td>
<td>$\chi^2$ difference</td>
</tr>
<tr>
<td>H1a</td>
<td>.292***</td>
<td>.296***</td>
<td>3.589</td>
<td>789.354</td>
</tr>
<tr>
<td>H2a</td>
<td>.088</td>
<td>.354***</td>
<td>3.620</td>
<td>793.427</td>
</tr>
<tr>
<td>H3a</td>
<td>.0281**</td>
<td>.135 **</td>
<td>2.645</td>
<td>790.992</td>
</tr>
<tr>
<td>H4a</td>
<td>.165</td>
<td>.103</td>
<td>1.789</td>
<td>789.485</td>
</tr>
<tr>
<td>H5a</td>
<td>-.010</td>
<td>.086</td>
<td>1.874</td>
<td>790.936</td>
</tr>
<tr>
<td>H6a</td>
<td>.176**</td>
<td>.144 *</td>
<td>2.572</td>
<td>789.578</td>
</tr>
<tr>
<td>H7a</td>
<td>.430**</td>
<td>.223**</td>
<td>3.169</td>
<td>791.041</td>
</tr>
<tr>
<td>H8a</td>
<td>.472**</td>
<td>.201*</td>
<td>2.450</td>
<td>791.812</td>
</tr>
<tr>
<td>H9a</td>
<td>.518***</td>
<td>.103</td>
<td>1.789</td>
<td>799.399</td>
</tr>
<tr>
<td>H10a</td>
<td>.211*</td>
<td>.573***</td>
<td>5.577</td>
<td>796.117</td>
</tr>
<tr>
<td>H11a</td>
<td>.881***</td>
<td>.737***</td>
<td>5.503</td>
<td>789.829</td>
</tr>
</tbody>
</table>

It can be seen from table 5.25 that the students’ gender did not moderate all the paths in the model except for the following hypotheses:
H2a: Gender moderates the influence of Social Network Media on students’ Perceived Ease of Use on using e-learning in Libyan higher education.

H9a: Gender moderates the influence of Perceived Ease of Use on students’ Attitude Towards Behaviour on using e-learning in Libyan higher education.

H10a: Gender moderates the influence of Perceived Usefulness on students’ Attitude Towards Behaviour on using e-learning in Libyan higher education.

### Table 5.26: Gender Moderating Effects for Teacher Model

<table>
<thead>
<tr>
<th>Hypotheses</th>
<th>Male Group</th>
<th>Female Group</th>
<th>Subgroup comparison (Unconstrant) $x^2(464) = 637.513$</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Standardized C.R Coefficient</td>
<td>Standardized C.R Coefficient</td>
<td>$x^2$ difference</td>
<td></td>
</tr>
<tr>
<td>H1b</td>
<td>.340***</td>
<td>.097</td>
<td>.683</td>
<td>635.222</td>
</tr>
<tr>
<td>H2b</td>
<td>.301**</td>
<td>.938*</td>
<td>2.519</td>
<td>640.668</td>
</tr>
<tr>
<td>H3b</td>
<td>.090</td>
<td>.247*</td>
<td>2.196</td>
<td>639.021</td>
</tr>
<tr>
<td>H4b</td>
<td>.101</td>
<td>.544*</td>
<td>2.499</td>
<td>640.738</td>
</tr>
<tr>
<td>H5b</td>
<td>.49</td>
<td>-.043</td>
<td>-1.135</td>
<td>640.352</td>
</tr>
<tr>
<td>H6b</td>
<td>.077</td>
<td>.046</td>
<td>.622</td>
<td>637.614</td>
</tr>
<tr>
<td>H7b</td>
<td>.300***</td>
<td>.158</td>
<td>1.170</td>
<td>638.084</td>
</tr>
<tr>
<td>H8b</td>
<td>.556***</td>
<td>-.738*</td>
<td>-2.150</td>
<td>651.145</td>
</tr>
<tr>
<td>H9b</td>
<td>.303***</td>
<td>.003</td>
<td>.040</td>
<td>642.675</td>
</tr>
<tr>
<td>H10b</td>
<td>.784*</td>
<td>.786***</td>
<td>3.666</td>
<td>637.513</td>
</tr>
<tr>
<td>H11b</td>
<td>.882***</td>
<td>.684***</td>
<td>4.255</td>
<td>637.541</td>
</tr>
</tbody>
</table>
Table 5.26 shows that the teachers’ gender did not affect all the paths of the model except for the following hypotheses:

H2b: Gender moderates the influence of Social Network Media on teachers’ Perceived Ease of Use on using e-learning in Libyan higher education.

H4b: Gender moderates the influence of Perceived Enjoyment on teachers’ Perceived Ease of Use on using e-learning in Libyan higher education.

H8b: Gender moderates the influence of Mobile Devices on teachers’ Perceived Ease of Use on using e-learning in Libyan higher education.

H9b: Gender moderates the influence of Perceived Ease of Use on teachers’ Attitude Towards Behaviour on using e-learning in Libyan higher education.

5.8.2 Language Moderating

Table 5.27: Language Moderating Effects for Student Model

<table>
<thead>
<tr>
<th>Hypotheses</th>
<th>High language level Group</th>
<th>Low language level Group</th>
<th>Subgroup comparsion (Unconstrant)</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Standardized C.R Coefficient</td>
<td>Standardized C.R Coefficient</td>
<td>$x^2$ (516)=759.555</td>
<td></td>
</tr>
<tr>
<td>H1a</td>
<td>.275***</td>
<td>.335***</td>
<td>3.348</td>
<td>3.407</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>759.773</td>
<td>0.218</td>
</tr>
<tr>
<td>H2a</td>
<td>.274 **</td>
<td>.190*</td>
<td>3.066</td>
<td>2.059</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>759.97</td>
<td>0.415</td>
</tr>
<tr>
<td>H3a</td>
<td>.109</td>
<td>.010</td>
<td>1.949</td>
<td>.218</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>761.344</td>
<td>1.789</td>
</tr>
<tr>
<td>H4a</td>
<td>.158*</td>
<td>.146**</td>
<td>2.526</td>
<td>2.862</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>760</td>
<td>0.023</td>
</tr>
<tr>
<td>H5a</td>
<td>.238***</td>
<td>.092</td>
<td>3.641</td>
<td>1.112</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>761.33</td>
<td>1.775</td>
</tr>
</tbody>
</table>
Table 5.2 shows that the language did not moderate all the paths in the student model except for the following hypotheses:

H6a: Language moderates the influence of Social Influence on students’ Perceived Ease of Use on using e-learning in Libyan higher education.

H8a: Language moderates the influence of Mobile Devices use on students’ Perceived Ease of Use on using e-learning in Libyan higher education.

H9a: Language moderates the influence of Perceived Ease of Use on students’ Attitude Towards Behaviour on using e-learning in Libyan higher education.

H10a: Language moderates the influence of Perceived Usefulness on students’ Attitude Towards Behaviour on using e-learning in Libyan higher education.

H11a: Language moderates the influence of Attitude Towards Behaviour on students’ Behaviour intention on using e-learning in Libyan higher education.
Table 5.28: Language Moderating Effects for Teacher Model

<table>
<thead>
<tr>
<th>Hypotheses</th>
<th>High language level Group</th>
<th>Low language level Group</th>
<th>Subgroup comparison (Unconstrain) $\chi^2(464)=669.917$</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Standardized C.R Coefficient</td>
<td>Standardized C.R Coefficient</td>
<td>$\chi^2(491)$</td>
<td>$\chi^2$ difference</td>
</tr>
<tr>
<td>H1b</td>
<td>.267*** 4.321</td>
<td>.226* 1.986</td>
<td>670.003</td>
<td>0.086  H=L</td>
</tr>
<tr>
<td>H2b</td>
<td>.286** 2.819</td>
<td>.344 * 2.075</td>
<td>670.004</td>
<td>0.087  H=L</td>
</tr>
<tr>
<td>H3b</td>
<td>.174** 2.723</td>
<td>-.011 -.137</td>
<td>672.929</td>
<td>3.012  H&gt;L</td>
</tr>
<tr>
<td>H4b</td>
<td>.279** 2.352</td>
<td>.250* 2.136</td>
<td>669.948</td>
<td>0.031  H=L</td>
</tr>
<tr>
<td>H5b</td>
<td>.010 .380</td>
<td>-.115 -1.614</td>
<td>672.735</td>
<td>2.818  H&gt;L</td>
</tr>
<tr>
<td>H6b</td>
<td>.028 .545</td>
<td>.167 1.642</td>
<td>671.412</td>
<td>1.495  H=L</td>
</tr>
<tr>
<td>H7b</td>
<td>.109 1.888</td>
<td>.545*** 3.416</td>
<td>678.26</td>
<td>8.343  H&lt;L</td>
</tr>
<tr>
<td>H8b</td>
<td>.323** 2.779</td>
<td>.146 .799</td>
<td>670.521</td>
<td>0.604  H=L</td>
</tr>
<tr>
<td>H9b</td>
<td>.207* 2.424</td>
<td>.155 1.828</td>
<td>670.06</td>
<td>0.143  H=L</td>
</tr>
<tr>
<td>H10b</td>
<td>.349 *** 4.663</td>
<td>.613 *** 4.200</td>
<td>672.483</td>
<td>2.566  H=L</td>
</tr>
<tr>
<td>H11b</td>
<td>.361*** 7.572</td>
<td>.602*** 4.351</td>
<td>670.034</td>
<td>0.117  H=L</td>
</tr>
</tbody>
</table>

Table 5.28 shows that the language did not moderate all the paths in the teachers’ model except for the following hypotheses:

H3b: Language moderates the influence of Perceived Enjoyment on teachers’ Perceived Usefulness on using E-learning in Libyan higher education.

H5b: Language moderates the influence of Social Influence on teachers’ Perceived Usefulness on using e-learning in Libyan higher education.
H7b: Language moderates the influence of Mobile Devices use on students’ Perceived Usefulness on using e-learning in Libyan higher education.

5.8.3 Computer Experience Moderating

Table 5.29: Computer Experience Moderating Effects for Student Model

<table>
<thead>
<tr>
<th>Hypotheses</th>
<th>High computer experience Group</th>
<th>Low computer experience Group</th>
<th>Subgroup comparison (Unconstrained) $\chi^2 (516)=916.211$</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Standardized C.R Coefficient</td>
<td>Standardized C.R Coefficient</td>
<td>$\chi^2 (544)$</td>
<td>$\chi^2$ difference</td>
</tr>
<tr>
<td>H1a</td>
<td>.345***</td>
<td>.139</td>
<td>1.075</td>
<td>917.91</td>
</tr>
<tr>
<td>H2a</td>
<td>.234**</td>
<td>.149</td>
<td>1.851</td>
<td>916.701</td>
</tr>
<tr>
<td>H3a</td>
<td>.074</td>
<td>-.051</td>
<td>-.602</td>
<td>917.857</td>
</tr>
<tr>
<td>H4a</td>
<td>.198***</td>
<td>.031</td>
<td>.693</td>
<td>921.559</td>
</tr>
<tr>
<td>H5a</td>
<td>.172***</td>
<td>.219</td>
<td>1.435</td>
<td>918.247</td>
</tr>
<tr>
<td>H6a</td>
<td>.123*</td>
<td>-.003</td>
<td>-.063</td>
<td>917.71</td>
</tr>
<tr>
<td>H7a</td>
<td>.254**</td>
<td>.410**</td>
<td>2.795</td>
<td>916.923</td>
</tr>
<tr>
<td>H8a</td>
<td>.378***</td>
<td>.087</td>
<td>1.253</td>
<td>920.588</td>
</tr>
<tr>
<td>H9a</td>
<td>.283***</td>
<td>.310</td>
<td>1.716</td>
<td>916.244</td>
</tr>
<tr>
<td>H10a</td>
<td>.393***</td>
<td>.227**</td>
<td>2.711</td>
<td>917.322</td>
</tr>
<tr>
<td>H11a</td>
<td>.751 ***</td>
<td>.715</td>
<td>7.172</td>
<td>917.889</td>
</tr>
</tbody>
</table>

Table 5.29 shows that most of paths did not moderate by Computer Experience except the following two paths:
H4a: Computer experience moderates the influence of Perceived Enjoyment on students’ Perceived Ease of Use on using e-learning in Libyan higher education.

H8a: Computer experience moderates the influence of mobile devices use on students’ Perceived Ease of Use on using e-learning in Libyan higher education.

Table 5.30: Computer Experience Moderating Effects for Teacher Model

<table>
<thead>
<tr>
<th>Hypotheses</th>
<th>High computer experience Group</th>
<th>Low computer experience Group</th>
<th>Subgroup comparsion (Unconstrant) $x^2$ (406)=602.402</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Standardized C.R Coefficient</td>
<td>Standardized C.R Coefficient</td>
<td>$x^2$ (491) $x^2$ difference</td>
<td></td>
</tr>
<tr>
<td>H1b</td>
<td>.236** 3.069</td>
<td>.191* 2.133</td>
<td>602.54 0.138 H=L</td>
<td></td>
</tr>
<tr>
<td>H2b</td>
<td>.224* 1.787</td>
<td>.538*** 3.935</td>
<td>605.22 2.818 H&lt;L</td>
<td></td>
</tr>
<tr>
<td>H3b</td>
<td>.226** 2.736</td>
<td>-.066 -.834</td>
<td>608.772 6.37 H&gt;L</td>
<td></td>
</tr>
<tr>
<td>H4b</td>
<td>.309* 2.195</td>
<td>.190 1.661</td>
<td>602.838 0.436 H=L</td>
<td></td>
</tr>
<tr>
<td>H5b</td>
<td>-.004 -.112</td>
<td>-.060 -1.384</td>
<td>603.453 1.051 H=L</td>
<td></td>
</tr>
<tr>
<td>H6b</td>
<td>-.033 -.528</td>
<td>.192* 2.831</td>
<td>608.237 5.835 H&lt;L</td>
<td></td>
</tr>
<tr>
<td>H7b</td>
<td>.088 1.499</td>
<td>.559*** 3.754</td>
<td>613.051 10.649 H&lt;L</td>
<td></td>
</tr>
<tr>
<td>H8b</td>
<td>.206 1.899</td>
<td>.258 1.456</td>
<td>602.467 0.065 H=L</td>
<td></td>
</tr>
<tr>
<td>H9b</td>
<td>.119 1.445</td>
<td>.265** 2.648</td>
<td>603.502 1.1 H=L</td>
<td></td>
</tr>
<tr>
<td>H10b</td>
<td>.946*** 4.705</td>
<td>.676** 3.830</td>
<td>603.389 0.987 H=L</td>
<td></td>
</tr>
<tr>
<td>H11b</td>
<td>.729 *** 5.968</td>
<td>.449 *** 6.264</td>
<td>602.409 0.007 H=L</td>
<td></td>
</tr>
</tbody>
</table>

Table 5.30 shows that Computer Experience did not moderate all the paths in the teachers’ model except for the following hypotheses:
H2b: Computer experience moderates the influence of Social Networking Media on teachers’ Perceived Ease of Use of using e-learning in Libyan higher education.

H3b: Computer experience moderates the influence of Perceived Enjoyment on teachers’ Perceived usefulness of using e-learning in Libyan higher education.

H6b: Computer experience moderates the influence of Social Influence use on students’ Perceived Ease of Use on using e-learning in Libyan higher education.

H7b: Computer experience moderates the influence of Mobile Devices use on students’ Perceived Usefulness on using e-learning in Libyan higher education.

5.8.4 University Type

Table 5.31: University Type Moderating Effects for Student’s Model

<table>
<thead>
<tr>
<th>Hypotheses</th>
<th>Public Uni</th>
<th>Private Uni</th>
<th>Subgroup comparison</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Standardized C.R Coefficient</td>
<td>Standardized C.R Coefficient</td>
<td>Constraint $x^2$ ($544$)</td>
</tr>
<tr>
<td>H1a</td>
<td>.306***</td>
<td>.165</td>
<td>1.709</td>
</tr>
<tr>
<td>H2a</td>
<td>.257**</td>
<td>3.124</td>
<td>.034</td>
</tr>
<tr>
<td>H3a</td>
<td>.091*</td>
<td>2.294</td>
<td>.039</td>
</tr>
<tr>
<td>H4a</td>
<td>.096*</td>
<td>2.147</td>
<td>.544***</td>
</tr>
<tr>
<td>H5a</td>
<td>.155 **</td>
<td>2.742</td>
<td>.215*</td>
</tr>
<tr>
<td>H6a</td>
<td>.138*</td>
<td>2.206</td>
<td>.149</td>
</tr>
<tr>
<td>H7a</td>
<td>.336***</td>
<td>4.137</td>
<td>.167</td>
</tr>
</tbody>
</table>
Table 5.3 shows that the University type did not moderate all the paths in the students model except the following two paths:

H2a: University type moderates the influence of Social Networking Media on students’ Perceived Ease of Use on using e-learning in Libyan higher education.

H4a: University type moderates the influence of Perceived Enjoyment on students’ Perceived Ease of Use on using e-learning in Libyan higher education.

Table 5.32: University Type Moderating Effects for Teacher Model

<table>
<thead>
<tr>
<th>Hypotheses</th>
<th>Public Uni</th>
<th>Private Uni</th>
<th>Subgroup comparsion</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Standardized C.R Coefficient</td>
<td>Standardized C.R Coefficient</td>
<td>Constraint $x^2$ (491)</td>
<td>$x^2$ difference</td>
</tr>
<tr>
<td>H1b</td>
<td>.279*** 4.352</td>
<td>.121 .714</td>
<td>749.806 0.561</td>
<td>Pu=Pr</td>
</tr>
<tr>
<td>H2b</td>
<td>.381** 2.885</td>
<td>.847* 2.554</td>
<td>768.29 19.045</td>
<td>Pu&gt;Pr</td>
</tr>
<tr>
<td>H3b</td>
<td>.114* 2.072</td>
<td>-.024 -.421</td>
<td>752.83 3.585</td>
<td>Pu&gt;Pr</td>
</tr>
<tr>
<td>H4b</td>
<td>.231* 2.499</td>
<td>.003 .159</td>
<td>752.634 3.389</td>
<td>Pu&gt;Pr</td>
</tr>
<tr>
<td>H5b</td>
<td>-.014 -.467</td>
<td>-.005 -.071</td>
<td>764.144 14.899</td>
<td>Pu&lt;Pr</td>
</tr>
</tbody>
</table>
Table 5.32 shows that the University type did not moderate all the paths in the teacher model except for the following hypothesis:

**H2b**: University type moderates the influence of Social Networking Media on teachers’ Perceived Ease of Use on using e-learning in Libyan higher education.

**H3b**: University type moderates the influence of Perceived Enjoyment on students’ Perceived Usefulness on using e-learning in Libyan higher education.

**H4b**: University type moderates the influence of Perceived Enjoyment on students’ Perceived Ease of Use on using e-learning in Libyan higher education.

**H5b**: University type moderates the influence of Social Influence on students’ Perceived Usefulness on using e-learning in Libyan higher education.

**H8b**: University type moderates the influence of Mobile Devices use on teachers’ Perceived Ease of Use on using e-learning in Libyan higher education.

**H9b**: University type moderates the influence of Perceived Ease of Use on teachers’ Attitude Towards Behaviour on using e-learning in Libyan higher education.

### 5.9 Summary

This chapter presented the results of the data analysis undertaken to test the proposed models. The descriptive characteristics of the teachers and students and their use of
educational technology at the time of the survey were presented. The fit of the models was determined using SEM. The unidimensionality and reliability of the measurements were determined. In both models, the results of the factor analysis shown that unidimensionality was achieved for all items in each measurement instrument. The reliability and validity of the measurement models were tested before the structural model was evaluated. The results on the convergent validity and discriminant validity of the measurement models were considered satisfactory and suitable for the testing of the structural model. The chapter then presented the evaluation of the structural model based on the criteria established in Chapter 4 and the results of the tests of the hypotheses were reported. This testing included the ability of the model to explain variance in the dependent variables and significance of path coefficients. Finally, the effects of the moderator variables and findings of the hypotheses were also presented. The results presented in this chapter are further discussed in Chapter 6.
CHAPTER 6: DISCUSSIONS AND CONCLUSIONS

6.1 Introduction

This chapter discusses the research results as reported in the thesis. Section 6.2 discusses the theoretical research model and the role of each construct in affecting the intention to accept and use e-learning in Libyan higher education. Section 6.3 discusses the progress towards answering the research questions. Then, Section 6.4 shows some limitations of the research, while Section 6.5 discusses the implication of the research. Finally, Section 6.6 discusses the recommendation for future research.

6.2 Model Discussion

This study focuses on the adoption of e-learning in Libyan higher education for learning and teaching. The aims of this study are to investigate the factors that affect Libyan teachers and students in their acceptance and use of e-learning in higher education. In this study, three research questions were formulated and 11 subsequent hypotheses were generated.

Based on empirical studies and literature relating to the adoption of Information Technology, four factors relating the attitudes and intentions were extended to the TAM. Therefore, the research model for this study consisted of eight constructs: (1) Perceived Usefulness, (2) Perceived Ease of Use, (3) Perceived Enjoyment, (4) Social Influence, (5) Social Networking Media, (6) Mobile Devices, (7) Attitude and (8) Intention to Use.

Figures 6.1 and 6.2 below show the paths for the student and teacher model as found in this study.
The student model shows that both Perceived Ease of Use and Perceived Usefulness of e-learning were significantly influenced by Social Networking Media, Social Influence and Mobile Devices. Moreover, Perceived Ease of Use and Perceived Usefulness significantly influenced the Attitude Towards Use. In turn, the Attitude towards use significantly influenced the intention to use e-learning. The results therefore suggest that when individuals feel that Social Networking Media and Mobile Devices are useful, they will have more intention to use the e-learning technology in Libyan universities.

Figure 6.1: The Final Student Model Showing Supported Relationships

The student model explained 27% of the total variance in the students’ intended adoption behaviour. This is consistent with earlier TAM related studies such as Ndubisi (2004), in which their model explained 24% of the variability in the e-learning adoption intention. Similarly, Purnomo and Lee (2013) model explained 19% of the variability of the intention to use e-learning.

The teacher model shows that both Perceived Ease of Use and Perceived Usefulness of e-learning were significantly influenced by Perceived Enjoyment, Social Networking
Media and Mobile Devices. Furthermore, Perceived Ease of Use and Perceived Usefulness significantly influenced the Attitude Towards Use. In turn, the Attitude Towards Use significantly influenced the intention to use e-learning.

![Diagram](image)

**Figure 6.2: The Final Teacher Model Showing Supported Relationships**

The teacher model explained 52% of the total variance in the teachers’ behaviour intention to use. This is consistent with earlier TAM related studies such as Bere (2013) in which their model explained 58% of the variability in the intention to use mobile learning. Similarly, Chang et al. (2012) explained 55% of the variability of the intention to use mobile technology.

### 6.2.1 Role of Social Networking Media

According to Adamson (2012), Social Networking Media (SNM) is a vital tool for teaching and learning and should therefore be used extensively for this purpose. Jackson (2011) reported that the usage of SNM in education institutions could have a positive effect on students' learning outcomes. This research is to examine the hypotheses related to the use of SNM and examine how each is correlated with the Perceived Usefulness
and Perceived Ease of Use of e-learning in Libyan higher education. The importance of this study is that Perceived Ease of Use and Perceived Usefulness of SNM are considered the key factors in assessing students’ and teachers’ Behavioural Intention of accepting and using e-learning in Libyan higher education. The result of this research shows that the use of SNM plays an important role in the adoption of e-learning in Libyan higher education. As hypothesized, SNM significantly affects both the Perceived Ease of Use and Perceived Usefulness for both students and teachers in Libya. Hence, when the SNM is simple and easy to use, an individual who feels that social media is more useful will have a greater intention to use e-learning technology for learning in Libya. Dwivedi et al. (2011) identified Perceived Ease of Use and Perceived Usefulness as the key factors for adoption of e-learning. This study found that students and teachers who more readily used SNM in their everyday lives, tend to have more positive perceptions of e-learning. Moreover, the study finds a stronger relationship between SNM ease of use and acceptance of e-learning. This research concurs with the research by Martin (2012) which stated that students and teachers who frequently and/ or heavily use the SNM have a high chance of accepting e-learning technology in their teaching and learning. In conclusion, the high rate of the use of SNM have a positive impact on students and teachers in terms of the perceived ease of use of e-learning technology in Libyan higher education.

6.2.2 Role of Perceived Enjoyment

Perceived Enjoyment (PE) refers to the extent to which the activity of using the technology is perceived to be enjoyable in its own right (Davis et al., 1992). The results from this thesis show that PE significantly affects students’ Perceived Ease of Use of e-learning in Libyan higher education. This finding is supported and is accordance with (Al-ammary et al., 2014) and (Shyu & Huang, 2011). They also found that PE had a
significant impact on the ease of use of e-learning. However, this study found that PE has no effect on students’ Perceived Usefulness of e-learning. One possible explanation is that majority of students were female. As shown in the demographic profile Section 5.3.1 Chapter 5, 64.2% of students were female. Venkatesh and Morris (2000) stated that men are more driven by instrumental factors (such as Perceived Usefulness) than women.

As for the teachers, the results of the thesis presented that PE significantly affects teachers’ Perceived Usefulness and Perceived Ease of Use of e-learning. This result is consistent with the results of a past study by (Balog & Pribeanu, 2010; Shyu & Huang, 2011), that PE influences both Perceived Usefulness and Perceived Ease of Use of the e-learning system.

On the other hand, the results show that PE has a significantly strong influence on the Perceived Ease of Use for both students and teachers, which indirectly provides a support for investigating students’ and teachers’ intention to accept and use e-learning. If students and teachers believe that e-learning is enjoyable and interesting for teaching and learning, it will become very easy for them to accept and adopt it in their learning process (Huang et al., 2007).

6.2.3 Role of Social Influence

Social Influence (SI) is defined as the individual's perception that majority of people who are important to him think he should/should not perform behaviour in question. The results of this study present that SI plays an important role in the students’ Behavioural Intention to Use e-learning but has no important role in teachers’ Behavioural Intention to Use e-learning. This implies that friends, colleagues, families or supervisors have an effect on students, with regards to the intent to use e-learning, but these same groups of people have no effect on the teachers. As hypothesized in the
students’ model, SI significantly affects students’ Perceived Usefulness and Perceived Ease of Use of e-learning. This result is consistent with the results of a past study by (Choi & Chung, 2012; Farahat, 2012; Watjatrakul, 2013), specifically that SI influences both Perceived Usefulness and Perceived Ease of Use of the e-learning system.

As hypothesized in the teachers’ model 2, SI did not affect either Perceived Ease of Use or Perceived Usefulness. This result is consistent with a number of previous research studies (Mathieson, 1991). Davis (1989) found that SI had no significant affect on intentions over and above Perceived Usefulness and Perceived Ease of Use. One possible explanation for this finding is that majority of the teachers were male. As presented in the demographic profile Section 5.3.1 Chapter 5, 62.1% of the teachers were male. Venkatesh and Morris (2000) pointed out that SI has a smaller effect on men as compared to women.

### 6.2.4 Role of Mobile Devices

As proposed in the models, Mobile Devices (MD) usage by students and teachers influenced both Perceived Usefulness of E-learning and Perceived Ease of Use of E-learning. MD usage also indirectly influenced the attitude to use E-learning via Perceived Usefulness and Perceived Ease of Use. Hence, when the MD are simple and easy to use, individuals who feel that MD are useful will have more intention to use e-learning technology for learning in Libya.

Earlier research has shown that past experiences with a specific technology is a vital determinant for the future adoption of technology (Ajzen & Fishbein, 1980; Kidwell & Jewell, 2008; Saadé & Kira, 2009). The study highlighted that students’ and teachers’ experiences with MD will influence their perception of its ease of use and usefulness of e-learning. This result is consistent with the results of a past study by (Mac Callum & Jeffrey, 2014). The high frequency of use of MD enables students and teachers to accept
and use e-learning. The familiarity of mobile device technology will assist and support the extension and experimentation of e-learning use in other areas such as teaching and learning. Conversely, students and teachers who do not use MD often or have a low level of skill with this technology will be less likely to experiment or deviate from their existing usage. Therefore, it will be less likely for them to see e-learning as easy to use or useful for teaching and learning. Lefoe et al. (2009) found that students and teachers, who became more familiar with their MD, will be more accepting of the e-learning system.

6.2.5 Role of Perceived Ease of Use

As in the models, Perceived Ease of Use (PEOU) by students and teachers influenced their attitude towards the use of e-learning. Prior studies have presented that one of the main obstacles to user acceptance of a new system, is the shortage of user friendliness features in the system (Moon & Kim, 2001). In interacting and dealing with a new educational technology such as e-learning, if the students and teachers perceive e-learning as complex and difficult, they might be deterred from utilizing such a system (Pituch & Lee, 2006). They may think that the effort involved in utilizing e-learning outweighs the benefits of implementing it. Ultimately, students and teachers may become unwilling to adopt the system, thus defeating the objective of introducing it. The ease of use of the features for e-learning applications can maximise its adoption and use. Hence, efforts should be in place to support students' and teachers' perception of the ease of use of the e-learning system. When adopting an e-learning system, its ease of use should be a priority advantage (Qui et al., 2003). This research found that PEOU for both students and teachers had a positive affect on students’ and teachers’ attitude towards e-learning. These findings were consistent with previous research that studied the relationship between Attitude and PEOU (Chang et al., 2005; Shih, 2004).
6.2.6 Role of Perceived Usefulness

The results of this study supported the proposed relationship between the Perceived Usefulness (PU) of e-learning and students and teachers’ Attitude Toward e-learning. This implies that students and teachers tend to use e-learning to the extent that they believe it will enhance the learning and teaching process. This finding is consistent with TAM and is also consistent with previous studies that examined the relationship between Attitude and PU (Chang et al., 2005; Ha et al., 2007; Shih, 2004).

6.2.7 Role of Attitude Towards Use

The results of this study present that students’ and teachers’ Attitude Towards Use (AU) influenced their Behavioural Intent to Use e-learning. This implies that the students and teachers have a positive attitude about using e-learning as a tool for learning and teaching. This finding is consistent with previous studies that studied the relationship between Behavioural Intention to use and AU (Chang et al., 2005; Lam et al., 2007; Rapeepisarn, 2012).

6.3 Answering the Research Questions

Chapters 1 and 3 have provided the research questions of this thesis. The purpose of this section is to provide a detailed description and explain the process towards answering the research questions, in order to achieve the objectives of the study.

The main objective of the study described in this thesis is to investigate the factors that affect the implementation of e-learning in Libyan higher education, such as Social Networking Media, Perceived Enjoyment, Social Influence and Mobile Devices. It also considers which learning and teaching styles have the most impact on Behavioural Intention to use e-learning in Libyan higher education. The requirements of these objectives have implicitly been met via the answering of the four research questions.
The first question of the thesis is:

Q1: What are the factors that could influence the implementation of e-learning in Libyan higher education?

The factors investigated were Social Networking Media (SNM), Perceived Enjoyment (PE), Social Influence (SI) and Mobile Devices (MD).

Regarding the students, it was found that SNM, PE, SI and MD all influenced the students’ intention to accept and use e-learning in Libyan higher education. In addition, SNM, SI and MD influenced the intention through both Perceived Usefulness and Perceived Ease of Use of E-learning, whereas PE had its influence only through Perceived Ease of Use of E-learning.

Regarding the teachers, it was found that SNM, PE, and MD all influenced the teachers’ intention to accept and use e-learning in Libyan higher education, whereas SNM, PE and MD influenced the intention through both Perceived Usefulness and Perceived Ease of Use of E-learning.

However, the study found that SI had no influence on the intention to use e-learning. This implies that colleagues, friends and one’s supervisor at work had no influence on a teacher’s intention to use e-learning.

The second research question of the thesis is:

Q2: Does the intensity of using Social Media affect the Perceived Ease of Use and the Perceived Usefulness of teachers’ and students’ using e-learning in Libyan higher education?

The results of this thesis show clearly that Social Networking Media (SNM) significantly affects both the Perceived Ease of Use and Perceived Usefulness for both students and teachers. SNM also indirectly affected the Attitude to Use e-learning via Perceived Usefulness and Perceived Ease of Use. Thus, students and teachers who
frequently and/or heavily use the SNM in their everyday lives, have a higher intention to use e-learning in Libyan higher education.

**The third research question of the thesis is:**

Q3: Does the use of Mobile Devices have an effect on the Perceived Ease of Use and Perceived Usefulness of students’ and teachers’ using e-learning in Libyan higher education?

The additional factor investigated was Mobile Devices (MD). It was found that MD usage by students and teachers influenced both Perceived Usefulness of e-learning and Perceived Ease of Use of e-learning. The usage of MD also indirectly affected the attitude to use e-learning via Perceived Usefulness and Perceived Ease of Use. Thus, students and teachers who find MD simple and easy to use, coupled with students and teachers who feel that MD are useful, will have more intention to use e-learning in Libyan higher education.

### 6.4 The research limitations

There were some limitations on this study which should be considered. The first is that the majority of the student participants were female (64.2%), while the majority of teacher participants were male (62.1%). This probably led to some influences in the research results. This study found that Perceived Enjoyment has no effect on students’ Perceived Usefulness of e-learning. One possible explanation is that the majority of students participants were female. Venkatesh and Morris (2000) stated that men are more driven by instrumental factors such as Perceived Usefulness than women. Moreover, Social Influence had no effect on teachers’ Perceived Ease of Use or Perceived Usefulness. One possible explanation for this finding is that majority of the teachers were male. Venkatesh and Morris (2000) pointed out that Social Influence affects men less than women. Hence, this suggests for future work to take into
consideration more male students and more female teachers, so as to make comparisons with the findings of this thesis.

The second is that in this study, no account was taken of prior knowledge or expertise in using e-learning. In particular, 54.1% of student participants and 50.5% of teacher participants have never used e-learning as a tool for teaching and learning before. Half of the students and teachers who participate in this study had no perception and experience with regards to e-learning. It would be interesting to test and examine the model when the students and teachers have some experience of e-learning.

### 6.5 The research implications

The findings of this study have important implications for decision makers in the area of e-learning in Libyan higher education. The findings could provide some motivation for the decision makers in Libyan higher education to take note of the critical success factors in this thesis.

The implications will focus on the results of the investigation of the factors, which affect Libyan teachers and students in their acceptance and use of e-learning.

The results indicated that Perceived Enjoyment significantly affects students’ Perceived Ease of Use but has no effect on students’ Perceived Usefulness of e-learning in Libyan higher education. Moreover, this study shows that Perceived Enjoyment significantly affects teachers' Perceived Ease of Use and Perceived Usefulness of e-learning in Libyan higher education.

The study has highlighted that the use of Social Networking Media and Mobile Devices significantly influences both Perceived Ease of Use and Perceived Usefulness for both students and teachers in the Libyan higher education system. This implies that the use of Social Networking Media and Mobile Devices play an important role in the adoption of e-learning in Libyan higher education.
This study explored whether a direct relationship exists between Social Influence and Perceived Usefulness and Perceived Ease of Use of e-learning. The findings of this study highlighted that Social Influence significantly affects students' Perceived Usefulness and Perceived Ease of use of e-learning whereas Social Influence had no significant effect on teachers’ Perceived Usefulness and Perceived Ease of Use of e-learning in Libyan higher education.

In this study, the impact of teaching and learning styles on Behavioural Intention to Use e-learning in Libyan higher education has also been studied and the results are presented in Appendix C.

6.6 Suggestions for Future Research

This section suggests a related area of research where further investigations may be valuable. Based on the results of this study, a few suggestions are provided by the researcher for future research:

Firstly, there may be a need to search for additional variables that will improve the predictability of determining and understanding the factors that affect students’ and teachers’ acceptance of e-learning in Libyan higher education. Future researchers can investigate the usability evaluation of Learning Management Systems (LMSs) in Libyan universities. LMSs provide an integrated platform for educational materials, distribution and management of learning as well as accessibility by users including students, teachers and content makers particularly for e-learning. E-learning systems can benefit from usability research to evaluate the ease of use of the LMS and the satisfaction between its handlers (Thuseethan & Kuhanesan, 2014). Students’ perceptions and attitudes toward the LMS, including the design of the interface, the communication capabilities of the learning system and media support, need to be examined since technological advances offer rich learning possibilities, which may affect the learners’
adoption behaviours (Tselios et al., 2011). Therefore, a deep understanding of such issues is required in order to offer a clear understanding of how LMS affects learners’ acceptance of e-learning. Moreover, future researches can also investigate resistance to change of teachers and administrators to accept and use e-learning in Libyan higher education. Hultman (2003) defined resistance as “A state of mind reflecting unwillingness or un-receptiveness to change in the ways people think or behave”. The resistance of teachers and administrators to change in using technology in higher education can be one of the most pressing challenges for decision-makers in academia (Berge & Muilenburg, 2001; Moerschell, 2009). Meanwhile, teachers choose what technology they want to use in the classroom, their acceptance plays a very essential role in the successful implementation of the technology (Aaron et al., 2004). According to Markus (1983), clarification of resistance to change is essential because resistance help individuals’ use of IT, and impact the IT implementation in organizations. Therefore, it is vital to understand the nature of individuals’ resistance to change (Klaus et al., 2007).

Secondly, this study was mainly a quantitative approach by means of a survey questionnaire, being the key instrument, to collect the data. It is suggested that qualitative research be carried out in the future to offer more detailed information that can enrich the results of the current research. Not only will the qualitative method be able to highlight the issues that may not be addressed through quantitative based survey studies, it will also help to shed light on any unexpected results from the main quantitative study - such as interviewing some of the teachers and students will be worthwhile. This will allow better understanding as to why some of the learning and teaching styles have higher impact over others. Moreover, this research also found that Social Influence had no significant effects on Perceived Usefulness and Perceived Ease
of Use. Further research would benefit from conducting interviews with Libyan teachers to determine the effect of Social Influence on Perceived Ease of Use and Perceived Usefulness in the Libyan higher education system.

Finally, this study focused only on teachers and students from the Libyan University. It would be interesting to conduct further studies with university administrators to see if their students and teachers have the same perceptions and attitudes toward e-learning adoption. Additionally, further studies can include other types of universities, such as open universities and higher education institutes, to see if there are any differences between the perceptions and attitudes of people in private, public and open universities, as well as higher education institutes, with regards towards e-learning adoption.

6.7 Conclusion

The main purpose of this study was to investigate the factors that affect students’ and teachers adoption of e-learning over traditional learning in Libyan higher education. The study developed and examined a theoretical model to meet the research objectives and answer its research questions. The models were tested using quantitative data analysis. The quantitative analysis was conducted and ten of the 11 proposed hypothesis in students model were supported and nine of the 11 proposed hypothesis in teachers model were supported in this study.

The study answered the research questions as initially planned. The student model shows that both Perceived Ease of Use and Perceived Usefulness of e-learning were significantly influenced by Social Networking Media, Social Influence and Mobile Devices. Moreover, Perceived Ease of Use and Perceived Usefulness significantly influenced the Attitude Towards Use. In turn, the Attitude Towards Use significantly influenced the intention to use e-learning.
The teacher model shows that both Perceived Ease of Use and Perceived Usefulness of e-learning was significantly influenced by Perceived Enjoyment, Social Networking Media and Mobile Devices. Furthermore, Perceived Ease of Use and Perceived Usefulness significantly influenced the Attitude Towards Use. In turn, the Attitude Towards Use significantly influenced the intention to use e-learning.”

The study has made a contribution to scholarly knowledge by providing a more comprehensive model of e-learning use and adoption in Libya. In particular, it has explained the role of external factors such as PE, SI, MD, and SNM in influencing intentions to use e-learning implementation.
Appendix A: English Version of the Questionnaire

QUESTIONNAIRES

Student Questionnaire

Dear student:

I am a PHD student at Murdoch University, under the supervision of Dr Kevin Wong. Libya has been implementing a plan to establish e-learning in higher education. This questionnaire is designed to investigate the factors for adopting e-learning in Libyan higher education.

You are invited to participate in this questionnaire which should take approximately 30 minutes to complete. Completion of the questionnaire is entirely voluntary and you can decide not to participate at any time simply by not completing and submitting the questionnaire. However, please note that once you have completed and submitted this questionnaire, you have agreed and given your full consent to participate. All information given in the questionnaire is confidential, and no names or other information that might identify you will be disclosed.

This questionnaire consists of four parts:

Part A: Demographic Information
Part B: Computing Experience
Part C: E-learning Acceptance
Part D: Learning Styles

To help you understand the terms used in this questionnaire, please read the explanation below:

<table>
<thead>
<tr>
<th>Term</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Web Site</td>
<td>It is a collection of related Word Wide Web (WWW) files.</td>
</tr>
<tr>
<td>E-learning</td>
<td>Is the use of the telecommunication system to deliver information for education and training.</td>
</tr>
<tr>
<td>Learning styles</td>
<td>Characteristic of processing information, feeling and behaving in learning for an individual.</td>
</tr>
<tr>
<td>Teaching styles</td>
<td>Manners or methods of teaching based on individual teacher’s beliefs, which includes good teaching personal preference, abilities and the norms of a particular discipline.</td>
</tr>
<tr>
<td>Mobile learning</td>
<td>Is the use of portable devices like wireless laptops, cell phones and PDAs to facilitate the teaching and learning process in physical spaces that accommodate the convenience or demands of the learner and/or allows learning to take place at a location conducive to fulfilling learning objectives.</td>
</tr>
</tbody>
</table>
Social Network Application | Internet-based application designed to connect people who share personal or professional interests to interact and share data. Examples of popular social networking software include Twitter, Facebook, Myspace. Social networking software is also referred to as Social Networking Applications.

The results of this project will advance the understanding about the factors for adopting e-learning in Libyan higher education. If you have any questions about this project, please feel free to contact me, Ali Elkaseh (Libya Mobile: + 21892 581307, Australia Mobile: +61 423941794, alielkaseh@hotmail.com, alielkasah@yahoo.com), or my supervisors (Dr Kevin Wong, k.wong @murdoch.edu.au, + 61 8 9360 6100). Alternatively, you can contact Murdoch University’s Human Research Ethics Committee (ethics@murdoch.edu.au, + 61 8 9360 6677).

**Part A. Demographic and Background Information**

This portion of the questionnaire collects some basic demographic and background information about you. Please select and tick √ only one answer for each of the following questions.

1. How old are you?  
   - 18-25  
   - 30-49  
   - 50+

2. What is your gender?  
   - Female  
   - Male

3. What is your university type?  
   - Private  
   - Public

4. What is the highest academic qualification you have received?  
   - High school  
   - Bachelor  
   - Master  
   - Doctoral

5. What is your English language proficiency?  
   - Poor  
   - Average  
   - Good  
   - V .good  
   - Excellent

6. Have you ever used e-learning for learning?  
   - Yes  
   - No
Part B. Experience with Educational Technology

This portion relates to your experience and behaviour in using e-learning. Please tick √ only one answer (unless specify) for each of the following questions and fill in the blank provided.

B1. Do you have a computer at home?
   ☐ Yes   ☐ No

B2. Which statement best describes your level of experience of using computer?
   ☐ None   ☐ Beginner   ☐ Intermediate   ☐ Advanced

B3. In what way do you use computer at home or at university? (tick √ all appropriate answers)
   ☐ Word processing   ☐ Drill-and-practice   ☐ Internet
   ☐ Electronic mail   ☐ Games   ☐ Others, please specify: --------------

B4. Indicate how often do you use the internet?
   ☐ Never   ☐ Once a month
   ☐ Once a week   ☐ Once a day   ☐ More than once a day

B5. What types of educational technology have you ever used or applied in your learning?
   ☐ E-learning   ☐ Computer assisted instruction
   ☐ Word Wide Web   ☐ Others, please specify: --------------

B6. Which of the following mobile device(s) are you currently using?
   ☐ Hand phone   ☐ Smart phone (mobile phone with operating system, processor and/or Wifi)
   ☐ laptop   ☐ PDA (personal digital assistant)
   ☐ Netbook/notebook   ☐ MP3 player / MP4 player
   ☐ Ipod   ☐ Others, please specify: --------------

B7. Have you used your mobile device(s) for learning or educational purposes?
   ☐ Yes   ☐ No

B8. Have you used mobile devices that are connected wirelessly to the Internet outside of class in the process of completing a research paper assignment?
   ☐ Yes   ☐ No
B9. Which of the following activities do you usually use with your mobile device(s)?

- [ ] making calls
- [ ] sending / reading SMS
- [ ] downloading / capturing video or image
- [ ] downloading / listening music
- [ ] surfing net
- [ ] email Access
- [ ] not taking
- [ ] others, please specify: __________

Please answer the following questions which relates to how you think you will be using m-learning in higher education. Please select and tick **only one answer** for each of the following questions.

**Note:** 1= Strongly Disagree, 2=Disagree, 3=Neutral, 4=Agree, 5=Strongly Agree.

<table>
<thead>
<tr>
<th>Item</th>
<th>M-learning</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>B10.</td>
<td>I would probably find m-learning easy to use.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>B11.</td>
<td>Using m-learning would probably help me perform my studies at any place.</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>B12.</td>
<td>M-learning would help increase access to learning and education.</td>
<td></td>
<td></td>
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<tr>
<td>B13.</td>
<td>I am likely to use m-learning if the university provides good technical support.</td>
<td></td>
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<tr>
<td>B14.</td>
<td>All students should be given the option to carry out some class learning activities through mobile learning using a laptop with wireless internet connection, smartphone, or handphone.</td>
<td></td>
<td></td>
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<tr>
<td>B15.</td>
<td>M-learning would increase teachable moments between students and teachers (interactive).</td>
<td></td>
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</tbody>
</table>

B16. Do you currently use a Social Networking Application software for educational use in your learning?

- [ ] Yes
- [ ] No

B17. Indicate how often you use the Social Networking Sites?

- [ ] Never
- [ ] Once a month
- [ ] Once a week
- [ ] Once a day
- [ ] More than once a day

B18. What Social Networking Sites do you use in your education?

- [ ] Facebook
- [ ] Twitter
- [ ] Blackboard
- [ ] Other (please specify)

19. Have you used an online social networking website for educational purpose in the past?
Please answer the following questions which relates to how you think you will be using Social Networking Application in higher education. Please select and tick \(\sqrt{\text{only one answer}}\) for each of the following questions.

Note: 1= Strongly Disagree, 2=Disagree, 3=Neutral, 4=Agree, 5=Strongly Agree.

<table>
<thead>
<tr>
<th>Item</th>
<th>Social Networking Application</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>B20.</td>
<td>Using Social Networking Application would probably increase learning and education experience.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>B21.</td>
<td>Using Social Networking Application would probably improve students’ group discussions.</td>
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<tr>
<td>B22.</td>
<td>Using Social Networking Application would increase interaction and communication between students and teachers in and out the classes</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>B23.</td>
<td>Using Social Networking Application could increase the quality of learning.</td>
<td></td>
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</tbody>
</table>

**Part C. E-learning Acceptance**

C(a). This portion relates to how useful you think by using E-learning in Libyan higher education will enhance your knowledge and learning performance. Please select and tick \(\sqrt{\text{only one answer}}\) for each of the following questions.

Note: 1= Strongly Disagree, 2=Disagree, 3=Neutral, 4=Agree, 5=Strongly Agree.

<table>
<thead>
<tr>
<th>Item</th>
<th>Usefulness</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1.</td>
<td>Using e-learning would probably enhance my learning experience.</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>C2.</td>
<td>Using e-learning would probably help me to accomplish tasks more quickly.</td>
<td></td>
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<tr>
<td>C3.</td>
<td>Using e-learning would probably increase the effectiveness of my learning.</td>
<td></td>
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<tr>
<td>C4.</td>
<td>Using e-learning would probably to encourage me to learn more.</td>
<td></td>
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<tr>
<td>C5.</td>
<td>Using e-learning would probably improve my academic performance.</td>
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</tbody>
</table>

C(b). This portion relates to whether you think e-learning is easy to use. Please select and tick \(\sqrt{\text{only one answer}}\) for each of the following questions.

Note: 1= Strongly Disagree, 2=Disagree, 3=Neutral, 4=Agree, 5=Strongly Agree.

<table>
<thead>
<tr>
<th>Item</th>
<th>Easy to use</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>C6.</td>
<td>I would probably find e-learning easy to use.</td>
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<tr>
<td>C7.</td>
<td>It would probably be easy for me to learn how to use e-learning technology.</td>
<td></td>
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</tbody>
</table>
C8. I would probably find interaction with e-learning to be clear and understandable.  

<table>
<thead>
<tr>
<th>Item</th>
<th>Attitude</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>C10.</td>
<td>I think I am confident using e-learning.</td>
<td></td>
<td></td>
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<tr>
<td>C11.</td>
<td>I think the use of e-learning in higher education is useful.</td>
<td></td>
<td></td>
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<tr>
<td>C12.</td>
<td>I would be willing to use e-learning even if the benefits would come in the future.</td>
<td></td>
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<tr>
<td>C13.</td>
<td>Using e-learning will improve interaction with other students.</td>
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<tr>
<td>C14.</td>
<td>E-learning increases students’ access to education.</td>
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</tbody>
</table>

C(c). This portion relates to your positive or negative feelings toward the use of e-learning. Please select and tick **only one answer** for each of the following questions.

Note: 1= Strongly Disagree, 2=Disagree, 3=Neutral, 4=Agree, 5=Strongly Agree.

<table>
<thead>
<tr>
<th>Item</th>
<th>Attitude</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>C15.</td>
<td>I would likely use e-learning if my teacher recommends it.</td>
<td></td>
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<tr>
<td>C16.</td>
<td>E-learning would be appealing to me if the majority of my friends are using it.</td>
<td></td>
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<tr>
<td>C17.</td>
<td>I would like to use e-learning if my classmates supported it.</td>
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<tr>
<td>C18.</td>
<td>People I know think that using the e-learning is a good idea.</td>
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</tbody>
</table>

C(d). This portion relates to others’ opinions of the use of e-learning. Please select and tick **only one answer** for each of the following questions.

Note: 1= Strongly Disagree, 2=Disagree, 3=Neutral, 4=Agree, 5=Strongly Agree.

<table>
<thead>
<tr>
<th>Item</th>
<th>Others’ opinions which affect you</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>C19.</td>
<td>I enjoy learning online significantly less than face-to-face learning.</td>
<td></td>
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</tr>
<tr>
<td>C20.</td>
<td>While I have never taken an online class, I predict I would enjoy learning online significantly less than face-to-face.</td>
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<tr>
<td>C21.</td>
<td>While I have never taken an online class, I predict I would not see much difference in my enjoyment between online and face-to-face learning.</td>
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</tbody>
</table>

C(e). This portion relates to how likely you think you will be using e-learning in higher education. Please select and tick **only one answer** for each of the following questions.

Note: 1= Strongly Disagree, 2=Disagree, 3=Neutral, 4=Agree, 5=Strongly Agree.

<table>
<thead>
<tr>
<th>Item</th>
<th>Enjoyment</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
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<td>C19.</td>
<td>I enjoy learning online significantly less than face-to-face learning.</td>
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</tbody>
</table>
C22. I intend to use e-learning in my academic life. □ □ □ □ □

C(f). This portion relates to how willing you are to try and plan to use e-learning. Please select and tick \textbf{only one answer} for each of the following questions.

\textbf{Note:} 1= Strongly Disagree, 2=Disagree, 3=Neutral, 4=Agree, 5=Strongly Agree.

\begin{center}
\begin{tabular}{|l|p{12cm}|c|c|c|c|c|}
\hline
\textbf{Item} & \textbf{Intention to use} & 1 & 2 & 3 & 4 & 5 \\
\hline
C23. & Whenever possible, I intend to use e-learning in my future learning. & & & & & \\
C24. & I definitely do not think I will use e-learning in my future learning. & & & & & \\
C25. & I would recommend that others use e-learning. & & & & & \\
\hline
\end{tabular}
\end{center}

\textbf{PART D. Learning Styles}

D(a). This portion relates to your learning style. Choose the answer which best explains your preference and circle the letter(s) A, B, C, or D. \textbf{Please circle more than one} if a single answer does not match your perception. Leave blank to any question that does not apply to you.

D1. You are helping someone who wants to go to the airport, town centre or railway station. You would:

A. Go with her to show her the way.
B. Tell her the directions.
C. Write down the direction (without a map).
D. Draw her a map.

D2. You are not sure whether a word should spell ‘dependent’ or ‘dependant’. You would:

A. See the words in your mind and choose by the way they look.
B. Think about how each word sounds and choose one.
C. Find it in a dictionary.
D. Write both words on a paper and choose one.

D3. You are planning a holiday for a group. You want some feedback from them about the plan. You would:

A. Describe some of the highlights.
B. Use a map or website to show them the places.
C. Give them a copy of the printed itinerary.
D. Phone, text or email them.

D4. You are going to cook something as a special treat for your family. You would:

A. Cook something you know without the need for instructions the cookbook for ideas.
B. Ask friends for suggestions.
C. Look at the pictures through the cookbook for ideas.
D. Use a cookbook where you know there is a good recipe.

D5. A group of tourists want to learn about tourist site in your area. You would.
A. Talk about, or arrange a talk for them about parks or wildlife reserves.
B. Ask friends for suggestions.
C. Take them to a park or wildlife reserve and walk them.
D. Give them a book or pamphlets about the parks or wildlife reserve.

D6. You are about to purchase a digital camera or mobile phone. Other than price, what would most influence your decision?

A. Trying or testing it.
B. Reading the details about its features.
C. It is a modern design and looks good.
D. The salesperson telling me about its features.

D7. Remember a time when you learned how to do something new (try to avoid choosing a physical skill), eg. An application like PowerPoint, you learned best by:

A. Watching a demonstration.
B. Listening to somebody explaining it and asking questions.
C. Diagrams and charts - visual clues.
D. Written instructions - eg. a manual or textbook.

D8. You have a problem with your knee. You would prefer that the doctor:

A. Give you a web address or something to read about it.
B. Used a plastic model of a knee to show what was wrong.
C. Described what was wrong.
D. Showed you a diagram of what was wrong.

D9. You want to learn a new program, skill or game on a computer. You would:

A. Read the written instructions that came with the program.
B. Talk with people who know about the program.
C. Use the control or keyboard.
D. Follow the diagrams in the book that came with it.

D10. I like websites that have:

A. Things I can click on, shift or try.
B. Interesting design and visual features.
C. Interesting written descriptions, lists, and explanations.
D. Audio channels where I can hear music, radio programmes or interviews.

D11. Other than price, what would most influence your decision to buy a new non-fiction book?

A. The way it looks is appealing.
B. Quickly reading parts of it.
C. A friend talks about it and recommends it.
D. It has real-life stories, experiences and examples.

D12. You are using a book, CD or website to learn how to take photos with your new digital camera. You would like to have:

A. A chance to ask questions and talk about the camera and its features.
B. Clear written instructions with lists and bullet points about what to do.
C. Diagrams showing the camera and what each part does.
D. Many examples of good and poor photos and how to improve them.

D13. Do you prefer a teacher or a presenter who uses:

A. Demonstrations, models or practical sessions.
B. Question and answer, talk, group discussion, or guest speakers.
C. Handouts, books, or readings.
D. Diagrams, charts or graphs.

D14. You have finished a competition or test and would like some feedback. You would like to have feedback:

A. Using examples from what you have done.
B. Using a written description of your results.
C. From somebody who talks it through with you.
D. Using graphs showing what you had achieved.

D15. You are going to choose food at a restaurant or café. You would:

A. Choose something that you have had there before.
B. Listen to the waiter or ask friends to recommend choices.
C. Choose from the descriptions in the menu.
D. Look at what others are eating or look at pictures of each dish.

D16. You have to make an important speech at a special occasion. You would:

A. Make diagrams or get graphs to help explain things.
B. Write a few key words and practice saying your speech over and over.
C. Write out your speech and learn from reading it over several times.
D. Gather many examples and stories to make the talk real and practical.

D(b). This portion relates what type of learner you are. Below is a list of 24 questions. If your answer to the question is YES, tick √ in the check box YES. If your answer is DEFINITELY YES (because that question describes one of your main characteristics), tick √ in the check box DEFINITELY (instead of YES). If your answer is NO or if you are not sure, tick √ in the check box NO.

<table>
<thead>
<tr>
<th>D17</th>
<th>Do you find it easy to meet new people and make new friends?</th>
</tr>
</thead>
<tbody>
<tr>
<td>D18</td>
<td>Are you cautious and thoughtful?</td>
</tr>
<tr>
<td>D19</td>
<td>Do you get bored easily?</td>
</tr>
<tr>
<td>D20</td>
<td>Are you a practical, “hands on” kind of person?</td>
</tr>
<tr>
<td>D21</td>
<td>Do you like to try things out for yourself?</td>
</tr>
<tr>
<td>D22</td>
<td>Do friends consider you to be a good listener?</td>
</tr>
<tr>
<td>D23</td>
<td>Do you have clear ideas about the best way to do things?</td>
</tr>
<tr>
<td>D24</td>
<td>Do you enjoy being the centre of attention?</td>
</tr>
<tr>
<td>D25</td>
<td>Are you a bit of a daydreamer?</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>NO</th>
<th>YES</th>
<th>DEFINITELY</th>
</tr>
</thead>
<tbody>
<tr>
<td>D17</td>
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<td>D18</td>
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<td>D25</td>
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<tr>
<td>D26.</td>
<td>Do you keep a list of things to do?</td>
<td>☐ NO</td>
<td>☐ YES</td>
</tr>
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<tr>
<td>D27.</td>
<td>Do you like to experiment to find the best way to do things?</td>
<td>☐ NO</td>
<td>☐ YES</td>
</tr>
<tr>
<td>D28.</td>
<td>Do you prefer to think things out logically?</td>
<td>☐ NO</td>
<td>☐ YES</td>
</tr>
<tr>
<td>D29.</td>
<td>Do you like to concentrate on one thing at a time?</td>
<td>☐ NO</td>
<td>☐ YES</td>
</tr>
<tr>
<td>D30.</td>
<td>Do people sometimes think of you as shy and quiet?</td>
<td>☐ NO</td>
<td>☐ YES</td>
</tr>
<tr>
<td>D31.</td>
<td>Are you a bit of a perfectionist?</td>
<td>☐ NO</td>
<td>☐ YES</td>
</tr>
<tr>
<td>D32.</td>
<td>Are you enthusiastic about life?</td>
<td>☐ NO</td>
<td>☐ YES</td>
</tr>
<tr>
<td>D33.</td>
<td>Would you rather “get on with the job” than keep talking about it?</td>
<td>☐ NO</td>
<td>☐ YES</td>
</tr>
<tr>
<td>D34.</td>
<td>Do you often notice things that other people miss?</td>
<td>☐ NO</td>
<td>☐ YES</td>
</tr>
<tr>
<td>D35.</td>
<td>Do you act first then think about the consequences later?</td>
<td>☐ NO</td>
<td>☐ YES</td>
</tr>
<tr>
<td>D36.</td>
<td>Do you like to have everything in its “proper place”?</td>
<td>☐ NO</td>
<td>☐ YES</td>
</tr>
<tr>
<td>D37.</td>
<td>Do you ask lots of questions?</td>
<td>☐ NO</td>
<td>☐ YES</td>
</tr>
<tr>
<td>D38.</td>
<td>Do you like to think things through before getting involved?</td>
<td>☐ NO</td>
<td>☐ YES</td>
</tr>
<tr>
<td>D39.</td>
<td>Do you enjoy trying out new things?</td>
<td>☐ NO</td>
<td>☐ YES</td>
</tr>
<tr>
<td>D40.</td>
<td>Do you like the challenge of having a problem to solve?</td>
<td>☐ NO</td>
<td>☐ YES</td>
</tr>
</tbody>
</table>

D41. If you would like to make any other comments about the use of e-learning in higher education,

Please use the space below and continue overleaf if necessary.

__________________________________________________________________________________________
__________________________________________________________________________________________
__________________________________________________________________________________________
__________________________________________________________________________________________
__________________________________________________________________________________________
__________________________________________________________________________________________
__________________________________________________________________________________________
__________________________________________________________________________________________
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__________________________________________________________________________________________
__________________________________________________________________________________________
__________________________________________________________________________________________
__________________________________________________________________________________________
__________________________________________________________________________________________
__________________________________________________________________________________________

Thank you for your participation and your contribution to this survey is greatly appreciated.
If you would like to receive a copy of the publication from this research, you can contact me at the given email address below.

alielkasah@yahooo.com
QUESTIONNAIRES

Teacher Questionnaire

Dear teacher:

I am a PHD student at Murdoch University, under the supervision of Dr. Kevin Wong. Libya has been implementing a plan to establish e-learning in higher education. This questionnaire is designed to investigate the factors for adopting e-learning in Libyan higher education.

You are invited to participate in this questionnaire which should take approximately 30 minutes to complete. Completion of the questionnaire is entirely voluntary and you can decide not to participate at any time simply by not completing and submitting the questionnaire. All information given during the questionnaire is confidential, and no names or other information that might identify you will be obtained.

This questionnaire consists of four parts:

Part A: Demographic Information
Part B: Computing Experience
Part C: E-learning Acceptance
Part D: Teaching Styles

To help you understand the terms are used in this questionnaire, please read the explanation below:

<table>
<thead>
<tr>
<th>Term</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Web Site</td>
<td>It is a collection of related Word Wide Web (WWW) files.</td>
</tr>
<tr>
<td>E-learning</td>
<td>Is the use of telecommunication system to deliver information for education and training.</td>
</tr>
<tr>
<td>Learning styles</td>
<td>Characteristic of processing information, feeling and behaving in learning for an individual.</td>
</tr>
<tr>
<td>Teaching styles</td>
<td>Manners or methods of teaching based on individual teacher’s beliefs, which includes good teaching personal preference, abilities and the norms of a particular discipline.</td>
</tr>
<tr>
<td>Mobile learning</td>
<td>Is the use of portable devices like wireless laptops, cell phones and PDAs to facilitate the teaching and learning process in physical spaces that accommodate the convenience or demands of the learner and/or allows learning to take place at a location conducive to fulfilling learning objectives.</td>
</tr>
<tr>
<td>Social Network Application</td>
<td>Internet-based application designed to connect people who share personal or professional interests to interact and share data. Examples of popular social networking software include Twitter, Facebook, Myspace. Social networking Software is</td>
</tr>
</tbody>
</table>
The results of this project will advance the understanding about the factors for adopting e-learning in Libya higher education. If you have any questions about this project, please feel free to contact me, Ali Elkaseh (Libya Mobile: +21892 5813077, Australia Mobile: +61 423941794, alielkaseh@hotmail.com, alielkasah@yahoo.com), or my supervisors (Dr Kevin Wong, k.wong @murdoch.edu.au, +61 8 9360 6100). Alternatively, you can contact Murdoch University’s Human Research Ethics Committee (ethics@murdoch.edu.au, +61893606677).

**Part A. Demographic and Background Information**

This portion of the questionnaire collects some basic demographic and background information about you. Please select and tick √ only one answer for each of the following questions.

1. How old are you?
   
   - [ ] 18-25
   - [ ] 30-49
   - [ ] 50+

2. What gender are you?
   
   - [ ] Female
   - [ ] Male

3. Total number of years of teaching experience: 

4. What is your university type?
   
   - [ ] Private
   - [ ] Public

5. What is your academic position?
   
   - [ ] Assistant lecture
   - [ ] Lecturer
   - [ ] Assistant Professor
   - [ ] Associate Professor
   - [ ] Professor

6. What is your English language proficiency?
   
   - [ ] Poor
   - [ ] Average
   - [ ] Good
   - [ ] V.good
   - [ ] Excellent

7. Have you ever used e-learning for teaching?
   
   - [ ] Yes
   - [ ] No
### Part B. Experience on Educational Technology

This portion relates to your experience and behaviour in using e-learning. Please tick **only one answer** (unless specify) for each of the following questions and fill in the blank provided.

B1. Do you have a computer at home?

- [ ] Yes
- [ ] No

B2. Which of the following best describes your level of experience of using computer?

- [ ] None
- [ ] Beginner
- [ ] Intermediate
- [ ] Advanced

B3. In what way do you use computer at home or at university? (tick √ all appropriate answers)

- [ ] Word processing
- [ ] Drill-and-practice
- [ ] Internet
- [ ] Electronic mail
- [ ] Games
- [ ] Others, please specify: 

B4. Indicate how often you use the internet?

- [ ] Never
- [ ] Once a month
- [ ] Once a week
- [ ] Once a day
- [ ] More than once a day

B5. What types of educational technology have you ever used or applied in your teaching?

- [ ] E-learning
- [ ] Computer assisted instruction
- [ ] Word Wide Web
- [ ] Others, please specify: 

B6. Which of the following mobile device(s) are you currently using?

- [ ] Hand phone
- [ ] Smart phone
- [ ] Laptop
- [ ] PDA
- [ ] Netbook
- [ ] MP3 player
- [ ] Ipod
- [ ] Others, please specify: 

B7. Have you used your mobile device(s) for teaching or educational purposes?

- [ ] Yes
- [ ] No

B8. Have you used mobile device(s) that is connected wirelessly to the Internet outside of class?

- [ ] Yes
- [ ] No

B9. Which of the following activities do you usually use with your mobile device(s)?
making calls  sending / reading SMS  downloading / capturing video or image
downloading / listening music  surfing net  email
not taking  others, please specify: ------------

Please answer the following questions which relates to how you think you will be using m-learning in higher education. Please select and tick **only one answer** for each of the following questions.

**Note : 1= Strongly Disagree, 2=Disagree, 3=Neutral, 4=Agree, 5=Strongly Agree.**

<table>
<thead>
<tr>
<th>Item</th>
<th>M-learning</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>B10.</td>
<td>I would likely find m-learning easy to use.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B11.</td>
<td>Using m-learning would likely help me perform my teaching at any place.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B12.</td>
<td>M-learning would help increase access to learning and education.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B13.</td>
<td>I am likely to use m-learning if the university provides good technical support.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B14.</td>
<td>All students and teachers should be given the option to carry out some class learning activities through mobile learning using a laptop with wireless internet connection, smartphone, or hand phone.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B15.</td>
<td>M-learning would increase teachable moments between students and teachers (interactive).</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

B16. Do you currently use Social Networking Application software for your teaching?

- [ ] Yes
- [ ] No

B17. Indicate how often you use the Social Networking Application?

- [ ] Never
- [ ] Once a month
- [ ] Once a week
- [ ] Once a day
- [ ] More than once a day

B18. What Social Networking Application do you use in your education?

- [ ] Facebook
- [ ] Twitter
- [ ] Blackboard
- [ ] Other (please specify)

B19. Have you used an online Social Networking Application for educational purpose in the past?

- [ ] Yes
- [ ] No
Please answer the following questions which relates to how you think you will be using Social Networking Application websites in higher education. Please select and tick \textit{only one answer} for each of the following questions.

\textbf{Note} : 1= Strongly Disagree, 2=Disagree, 3=Neutral, 4=Agree, 5=Strongly Agree.

<table>
<thead>
<tr>
<th>Item</th>
<th>Social Networking Application</th>
</tr>
</thead>
<tbody>
<tr>
<td>B21.</td>
<td>Using Social Networking Application would likely improve students’ group discussions.</td>
</tr>
<tr>
<td>B22.</td>
<td>Using Social Networking Application would increase interaction and communication between students and teachers in and out the classes.</td>
</tr>
<tr>
<td>B23.</td>
<td>Social Networking Application would increase communication and learning between class mates.</td>
</tr>
</tbody>
</table>

\textbf{Part C. E-learning Acceptance}

\textbf{C(a).} This portion relates to how useful you think using e-learning in Libyan higher education will enhance your knowledge and teaching performance. Please select and tick \textit{only one answer} for each of the following questions.

\textbf{Note} : 1= Strongly Disagree, 2=Disagree, 3=Neutral, 4=Agree, 5=Strongly Agree.

<table>
<thead>
<tr>
<th>Item</th>
<th>Usefulness</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1.</td>
<td>Using e-learning as a tool for teaching in classroom improve /will improve my teaching.</td>
</tr>
<tr>
<td>C2.</td>
<td>Using e-learning enhances /will enhance the effectiveness of my teaching.</td>
</tr>
<tr>
<td>C3.</td>
<td>Using e-learning engage/ will engage my students during their learning.</td>
</tr>
<tr>
<td>C4.</td>
<td>Using e-learning would likely improve students’ group discussions.</td>
</tr>
<tr>
<td>C5.</td>
<td>Using e-learning would improve my students’ attention</td>
</tr>
</tbody>
</table>

\textbf{C(b).} This portion relates to whether you think using e-learning is easy. Please select and tick \textit{only one answer} for each of the following questions.

\textbf{Note} : 1= Strongly Disagree, 2=Disagree, 3=Neutral, 4=Agree, 5=Strongly Agree.

<table>
<thead>
<tr>
<th>Item</th>
<th>Easy to use</th>
</tr>
</thead>
<tbody>
<tr>
<td>C6.</td>
<td>I would likely find e-learning easy to use.</td>
</tr>
<tr>
<td>C7.</td>
<td>It would likely be easy for me to become skilful when using e-learning.</td>
</tr>
<tr>
<td>C8.</td>
<td>I would likely find interaction with e-learning to be clear and understandable.</td>
</tr>
</tbody>
</table>
C9. I would likely find e-learning flexible to interact with.

<table>
<thead>
<tr>
<th>Item</th>
<th>Attitude</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>C10.</td>
<td>I think I have / may have self-confidence in using e-learning.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C11.</td>
<td>I think the use of e-learning in higher education is useful.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C12.</td>
<td>I would be willing to use e-learning for teaching even if the benefits would come in the future.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C13.</td>
<td>Using e-learning will improve interaction with students.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C14.</td>
<td>E-learning increases students' access to education.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

C(c). This portion relates to your positive or negative feelings toward the use of e-learning. Please select and tick √ only one answer for each of the following questions.

Note: 1= Strongly Disagree, 2=Disagree, 3=Neutral, 4=Agree, 5=Strongly Agree.

<table>
<thead>
<tr>
<th>Item</th>
<th>Others’ opinions which affect you</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>C15.</td>
<td>I would likely use e-learning if my university recommends it.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C16.</td>
<td>In general, my university has supported the use of e-learning.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C17.</td>
<td>E-learning would be very appealing to me if the majority of my colleagues used it.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C19.</td>
<td>People I know think that using the e-learning is a good idea.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

C(d). This portion relates to others’ opinions of the use of e-learning. Please select and tick √ only one answer for each of the following questions.

Note: 1= Strongly Disagree, 2=Disagree, 3=Neutral, 4=Agree, 5=Strongly Agree.

<table>
<thead>
<tr>
<th>Item</th>
<th>Enjoyment</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>C20.</td>
<td>I enjoy teaching online significantly less than face-to-face.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C21.</td>
<td>I enjoy teaching online significantly more than face-to-face.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C22.</td>
<td>While I have never taught an online class, I predict I would not see much difference in motivation between online and face-to-face learning.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C23.</td>
<td>I intend to use e-learning in my academic life.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
C(f). This portion relates to how willing you are to try and plan to use e-learning. Please select and tick √ only one answer for each of the following questions.

Note: 1= Strongly Disagree, 2=Disagree, 3=Neutral, 4=Agree, 5=Strongly Agree.

<table>
<thead>
<tr>
<th>Item</th>
<th>Intention to use</th>
</tr>
</thead>
<tbody>
<tr>
<td>C25.</td>
<td>Whenever possible, I intend to use e-learning in my future teaching.</td>
</tr>
<tr>
<td>C26.</td>
<td>I definitely do not think I will use e-learning in my future teaching.</td>
</tr>
<tr>
<td>C27.</td>
<td>I would recommend that others use e-learning.</td>
</tr>
<tr>
<td>C28.</td>
<td>I intend to use e-learning frequently.</td>
</tr>
</tbody>
</table>

Part D. Teaching Styles

D(a). This portion relates to your preferred teaching styles. Please select and tick √ only one answer for each of the following questions.

Note: 1= Strongly Disagree, 2=Disagree, 3=Neutral, 4=Agree, 5=Strongly Agree.

<table>
<thead>
<tr>
<th>Item</th>
<th>Teaching style</th>
</tr>
</thead>
<tbody>
<tr>
<td>D1.</td>
<td>Facts, concepts, and principles are the most important things that students should acquire.</td>
</tr>
<tr>
<td>D2.</td>
<td>I set high standards for students in the class.</td>
</tr>
<tr>
<td>D3.</td>
<td>What I say and do models appropriate ways for students to think about issues in the content.</td>
</tr>
<tr>
<td>D4.</td>
<td>My teaching goals and methods address a variety of students learning styles.</td>
</tr>
<tr>
<td>D5.</td>
<td>Students typically work on course projects alone with little supervision from me.</td>
</tr>
<tr>
<td>D6.</td>
<td>Sharing my knowledge and expertise with students is very important to me.</td>
</tr>
<tr>
<td>D7.</td>
<td>I give students negative feedback when their performance is unsatisfactory.</td>
</tr>
<tr>
<td>D8.</td>
<td>Students are encouraged to emulate the example I provide.</td>
</tr>
<tr>
<td>D9.</td>
<td>I spend time consulting with students on how to improve their work on individual and/or group projects.</td>
</tr>
<tr>
<td>D10.</td>
<td>Activities in the class encourage students to develop their own ideas.</td>
</tr>
<tr>
<td>D11.</td>
<td>What I have to say about a topic is important for students to acquire a broader perspective on the issues in that area.</td>
</tr>
<tr>
<td>D12.</td>
<td>Students would describe my standards and expectations as somewhat strict and rigid.</td>
</tr>
<tr>
<td>D13.</td>
<td>I typically show students how and what to do in order to master course content.</td>
</tr>
<tr>
<td>D14.</td>
<td>Small group discussions are employed to help students develop their ability to think critically.</td>
</tr>
<tr>
<td>D15.</td>
<td>Students design one or more self-directed learning experiences.</td>
</tr>
<tr>
<td>D16.</td>
<td>I want students to leave this course well prepared for future work in this area.</td>
</tr>
<tr>
<td>D17.</td>
<td>It is my responsibility to define what students must learn and how they should learn it.</td>
</tr>
<tr>
<td>D18.</td>
<td>Examples from my personal experiences often are used to illustrate points about the material.</td>
</tr>
<tr>
<td>D19.</td>
<td>I guide students’ work on our course projects by asking questions, exploring options, and suggesting alternative ways to do things.</td>
</tr>
<tr>
<td>D20.</td>
<td>Developing the ability of students to think and work independently is an important goal.</td>
</tr>
<tr>
<td>D21.</td>
<td>Lecturing is a significant part of how I teach each of the class sessions.</td>
</tr>
<tr>
<td>D22.</td>
<td>I provide very clear guidelines for how I want tasks completed in this course.</td>
</tr>
<tr>
<td>D23.</td>
<td>I often show students how they can use various principles and concepts.</td>
</tr>
<tr>
<td>D24.</td>
<td>Course activities encourage students to take initiative and responsibility for their learning.</td>
</tr>
<tr>
<td>D25.</td>
<td>Students take responsibility for teaching part of the class sessions.</td>
</tr>
<tr>
<td>D26.</td>
<td>My expertise is typically used to resolve disagreements about content issues.</td>
</tr>
<tr>
<td>D27.</td>
<td>This course has very specific goals and objectives that I want to accomplish.</td>
</tr>
<tr>
<td>D28.</td>
<td>Students receive frequent verbal and/or written comments on their performance.</td>
</tr>
<tr>
<td>D29.</td>
<td>I solicit student advice about how and what to teach in this course.</td>
</tr>
<tr>
<td>D30.</td>
<td>Students set their own pace for completing independent and/or group projects.</td>
</tr>
<tr>
<td>D31.</td>
<td>Students might describe me as a “storehouse of knowledge” who dispenses the fact, principles, and concepts they need.</td>
</tr>
<tr>
<td>D32.</td>
<td>My expectations for what I want students to do in this class are clearly defined in the syllabus.</td>
</tr>
<tr>
<td>D33.</td>
<td>Eventually, many students begin to think like me about course content.</td>
</tr>
<tr>
<td>D34.</td>
<td>Students can make choice among activities in order to complete course requirements.</td>
</tr>
<tr>
<td>D35.</td>
<td>My approach to teaching is similar to a manager of a work group who delegates tasks and responsibility to subordinates.</td>
</tr>
<tr>
<td>D36.</td>
<td>There is more material in this course than I have time available to cover it.</td>
</tr>
<tr>
<td>D37.</td>
<td>My standards and expectations help students develop the discipline the need to learn.</td>
</tr>
<tr>
<td>D38.</td>
<td>Students might describe me as a “coach” who works closely with someone to correct problems in how they think and behave.</td>
</tr>
<tr>
<td>D39.</td>
<td>I give students a lot of personal support and encouragement to do well in this course.</td>
</tr>
<tr>
<td>D40.</td>
<td>I assume the role of a recourse person who is available to</td>
</tr>
</tbody>
</table>
To all students whenever they need help.

D41. If you would like to make any other comments about the use of e-learning in higher education,

Please use the space below and continue overleaf if necessary.

Thank you for your participation and your contribution to this survey is greatly appreciated.

If you would like to revive a copy of the publication from this research, you can contact me at the given email address below.

alielkasah@yahoo.com
Appendix B: Arabic Version of the Questionnaire

بسم الله الرحمن الرحيم

دراسة العوامل المؤثرة في اعتماد التعليم الإلكتروني في التعليم العالي الليبي

استبيان الطلاب

عزيزي المشاركون بالاستبيان

هذا الاستبيان جزء من مطالب الدكتوراه في مجالي تقنيات المعلومات من جامعة مردوخ وبإشراف كل من الدكتور كيفن ونولسن ودكتور لين بوفن. تسعى ليبيا إلى اعتماد التعليم الإلكتروني في التعليم العالي الليبي. ولذلك، تأتي هذه الدراسة في إطار دراسة العوامل المؤثرة في اعتماد التعليم الإلكتروني في التعليم العالي الليبي.

نأمل التكريم بالمشاركة في هذه الدراسة من خلال تعنيف الاستبيان المرفق والذي نأمل أن تشمل الإجابة عليه أكثر من 30 دقيقة. علماً بأن المشاركة في هذا الاستبيان هي عمل اختياري بحث. ونراجعك لتأكيد الإجابة على هذا الاستبيان فإنه ليس تحت الرقابة المطلقة في التوقف عن إكمال الحالة ملء ذلك. مع ملاحظة أنه بمجرد استكمال الاستبيان وتسليمك للباحث، فإن هذا يعبر عن موافقتك الكاملة على المشاركة. نود الإشارة هنا أن الاستبيان قد حصل على موافقة لجنة الأخلاق في البحث العلمي بجامعة مردوخ ولن يتم وضع أي بيانات شخصية تدل على المشارك ففي أي جزء من الاستبيان.

نهاية المتراقبة كما كان لها حق بحث الأبحاث بحثهم عليها.

الاستبيان ينقسم إلى أربعة أجزاء وهي:

الجزء الأول: البيانات démographique، والالأولية.

الجزء الثاني: الخبرة في استخدام الحاسوب.

الجزء الثالث: قبول التعليم الإلكتروني.

الجزء الرابع: أساليب التعلم.

توضيح المصطلحات المستخدمة في الاستبيان:

<table>
<thead>
<tr>
<th>المصطلح</th>
<th>الملفة</th>
</tr>
</thead>
<tbody>
<tr>
<td>الموقع الإلكتروني</td>
<td>(Web Site)</td>
</tr>
<tr>
<td>التعليم الإلكتروني</td>
<td>(E-learning)</td>
</tr>
<tr>
<td>أساليب التعلم</td>
<td>(Teaching styles)</td>
</tr>
<tr>
<td>أساليب التعلم</td>
<td>(Teaching styles)</td>
</tr>
<tr>
<td>التعلم المتنقل</td>
<td>(M-learning)</td>
</tr>
<tr>
<td>مواقع التواصل الاجتماعي</td>
<td>(Social Network Application)</td>
</tr>
</tbody>
</table>

مراجعات وتعليقات:

هذه المصطلحات تشير إلى النتائج التي تحققها الأهداف التعليمية والمواقف الحياتية في التعليم الإلكتروني. هي عبارة عن تطبيقات تكنولوجيا مستندة إلى الإنترنت تتيح التفاعل بين الناس، وتسهم بمسائل الحياة الإلكترونية وتبادلها بسهولة.

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وتوفير للمستخدمين إمكانيات العثور على آخرين يشتركون في نفس المصالم. 

هذا البحث سوف يقدم دراسة كاملة حول العوامل المؤثرة في اعتماد التعليم الإلكتروني في التعليم العالي الليبي. في حالة وجود أي استفسار أو ملاحظة على هذا الاستبيان فننصحكم بالاتصال مع الباحث (ليبيا 0925831077 أو استراليا 423941794) بالمشتركة كيف وقّع (k.wong@murdoch.edu.au, +61893606677). وكبدل ذلك يمكنك الاتصال بلجنة أخلاق الباحث العلمي في جامعة مردوخ على (+61 893606677). شاكرين لكم مقدماً تعاونكم وحسن استجابتكم.

الباحث/ على محمد الكاسح

الجزء الأول: البيانات الديموغرافية والأولية

هذا الجزء من الاستبيان جمع البيانات الديموغرافية والأولية عن المشارك/المشاركة. من فضلك اختر اجابة واحدة فقط لكل الاستبانى توضع علامة (✓) في المربع المناسب.

1. إلى أي الفئات العمرية التالية تنتمي؟
   - 0-18  ✓  
   - 19-30  ✓  
   - 31-40  
   - 41-50  
   - 51-60  
   - 61-70  
   - 71-80  
   - 81-90  

2. ما جنسك؟
   - ذكر  ✓  
   - أنثى  

3. ما هو نوع الجامعة التي تدرس بها؟
   - عامة  ✓  
   - خاصة  

4. ما هو أعلى مؤهل أكاديمي تحصلت عليه؟
   - شهادة ثانوية  
   - بكالوريوس  
   - ماجستير  
   - دكتوراه  
   - ليس لديهم  

5. ما هو مستوى خبرتك في مجال استخدام الالكتروني لغرض التعلم؟
   - لا يوجد  
   - مبتدئ  
   - متوسط  
   - متقدم  

6. هل سبق لك استخدام التعليم الإلكتروني لغرض التعليم؟
   - نعم  ✓  
   - لا  

الجزء الثاني: الخبرة في مجال التكنولوجيا التعليمية

هذا الجزء من الاستبيان يتعلق بمعرفة تجربتك في استخدام التكنولوجيا التعليمية. من فضلك اختر اجابة واحدة فقط لكل الاستبانى توضع علامة (✓) في المربع المناسب.

1. هل لديك جهاز حاسب آلية في البيت؟
   - نعم  ✓  
   - لا  

2. ما هو مستوى خبرتك في مجال استخدام الحاسب الآلي؟
   - ليس لديهم  
   - مبتدئ  
   - متوسط  
   - متقدم  

3. ما أوجه استخدامك للحاسب الآلي؟ (يمكن اختيار أكثر من إجابة)
   - البريد الإلكتروني  ✓  
   - البرامج المعالجة النصوصية  
   - ألعاب  
   - الإنترنت  
   - لا يوجد  

4. عدد مرات استخدام الإنترنت:
   - مرة في اليوم  
   - مرة في الأسبوع  
   - مرة في الشهر  
   - أكثر من مرة في اليوم  

5. ما نوع التكنولوجيا التعليمية التي سبق أن استخدمتها في تعليمك؟ (يمكن اختيار أكثر من إجابة)
   - لا يوجد  

6. ما هي نوع التكنولوجيا التعليمية التي سبق أن استخدمتها في تعليمك؟ (يمكن اختيار أكثر من إجابة)
   - لا يوجد  

7. ما هي نوع التكنولوجيا التعليمية التي سبق أن استخدمتها في تعليمك؟ (يمكن اختيار أكثر من إجابة)

8. ما هي نوع التكنولوجيا التعليمية التي سبق أن استخدمتها في تعليمك؟ (يمكن اختيار أكثر من إجابة)

9. ما هي نوع التكنولوجيا التعليمية التي سبق أن استخدمتها في تعليمك؟ (يمكن اختيار أكثر من إجابة)

10. ما هي نوع التكنولوجيا التعليمية التي سبق أن استخدمتها في تعليمك؟ (يمكن اختيار أكثر من إجابة)

11. ما هي نوع التكنولوجيا التعليمية التي سبق أن استخدمتها في تعليمك؟ (يمكن اختيار أكثر من إجابة)
1. أي أنواع الأجهزة المحمولة التي تستعملها حالياً؟
(يمكن اختيار أكثر من إجابة)
- هاتف تقليدي
- الهاتف الذكي
- حاسب محمول
- mp3/mp4
- لود
- المساعد الرقمي الشخصي
- أو ما أخرى:

2. هل تستخدم الأجهزة المحمولة في الأغراض التعليمية؟

3. أي أنواع الأجهزة المحمولة المرتبطة بالإنترنت لاستخدامها خارج الفصل لغرض استكمال وقفة?

4. أي من الأنشطة التالية في العادة تستعملها مع الأجهزة المحمولة؟
- تتبع برامج (صور، فيديو، موسيقى)
- البريد الإلكتروني
- أحد ملاحة:

5. هل تستخدم مواقع التواصل الاجتماعي في الأغراض التعليمية؟

6. عدد مرات استخدامك لمواقع التواصل الاجتماعي في الأغراض التعليمية؟
- لا يوجد
- مرة في الشهر
- مرة في اليوم
- أكثر من مرة في اليوم

7. ما هي البرامج التواصل الاجتماعي التي تستعملها في الأغراض التعليمية؟
- فيسبوك
- تويتر
- بلاكباورد

8. هل سبق استخدام جهاز كمبيوتر محمول متصلاً بالإنترنت في الأغراض التعليمية؟

9. هل يوجد عدد مرات استخدامك لمواقع التواصل الاجتماعي في الأغراض التعليمية؟

10. ما هي البرامج التواصل الاجتماعي التي تستعملها في الأغراض التعليمية؟
- فيسبوك
- تويتر
- بلاكباورد

11. هل تستخدم مواقع التواصل الاجتماعي في الأغراض التعليمية حالياً؟

12. عدد مرات استخدامك لمواقع التواصل الاجتماعي في الأغراض التعليمية؟

13. ما هي البرامج التواصل الاجتماعي التي تستعملها في الأغراض التعليمية؟
- فيسبوك
- تويتر
- بلاكباورد

14. هل تستخدم مواقع التواصل الاجتماعي في الأغراض التعليمية حالياً؟

15. ما هي البرامج التواصل الاجتماعي التي تستعملها في الأغراض التعليمية؟
- فيسبوك
- تويتر
- بلاكباورد

16. هل تستخدم مواقع التواصل الاجتماعي في الأغراض التعليمية حالياً؟

17. عدد مرات استخدامك لمواقع التواصل الاجتماعي في الأغراض التعليمية؟

18. ما هي البرامج التواصل الاجتماعي التي تستعملها في الأغراض التعليمية؟
- فيسبوك
- تويتر
- بلاكباورد

19. هل تستخدم مواقع التواصل الاجتماعي في الأغراض التعليمية حالياً؟

20. عدد مرات استخدامك لمواقع التواصل الاجتماعي في الأغراض التعليمية؟

21. ما هي البرامج التواصل الاجتماعي التي تستعملها في الأغراض التعليمية؟
- فيسبوك
- تويتر
- بلاكباورد

22. هل تستخدم مواقع التواصل الاجتماعي في الأغراض التعليمية حالياً؟

23. عدد مرات استخدامك لمواقع التواصل الاجتماعي في الأغراض التعليمية؟

24. ما هي البرامج التواصل الاجتماعي التي تستعملها في الأغراض التعليمية؟
- فيسبوك
- تويتر
- بلاكباورد

25. هل تستخدم مواقع التواصل الاجتماعي في الأغراض التعليمية حالياً؟

26. عدد مرات استخدامك لمواقع التواصل الاجتماعي في الأغراض التعليمية؟

27. ما هي البرامج التواصل الاجتماعي التي تستعملها في الأغراض التعليمية؟
- فيسبوك
- تويتر
- بلاكباورد

28. هل تستخدم مواقع التواصل الاجتماعي في الأغراض التعليمية حالياً؟

29. عدد مرات استخدامك لمواقع التواصل الاجتماعي في الأغراض التعليمية؟

30. ما هي البرامج التواصل الاجتماعي التي تستعملها في الأغراض التعليمية؟
- فيسبوك
- تويتر
- بلاكباورد

31. هل تستخدم مواقع التواصل الاجتماعي في الأغراض التعليمية حالياً؟

32. عدد مرات استخدامك لمواقع التواصل الاجتماعي في الأغراض التعليمية؟

33. ما هي البرامج التواصل الاجتماعي التي تستعملها في الأغراض التعليمية؟
- فيسبوك
- تويتر
- بلاكباورد

34. هل تستخدم مواقع التواصل الاجتماعي في الأغراض التعليمية حالياً؟

35. عدد مرات استخدامك لمواقع التواصل الاجتماعي في الأغراض التعليمية؟

36. ما هي البرامج التواصل الاجتماعي التي تستعملها في الأغراض التعليمية؟
- فيسبوك
- تويتر
- بلاكباورد

37. هل تستخدم مواقع التواصل الاجتماعي في الأغراض التعليمية حالياً؟

38. عدد مرات استخدامك لمواقع التواصل الاجتماعي في الأغراض التعليمية؟

39. ما هي البرامج التواصل الاجتماعي التي تستعملها في الأغراض التعليمية؟
- فيسبوك
- تويتر
- بلاكباورد

40. هل تستخدم مواقع التواصل الاجتماعي في الأغراض التعليمية حالياً؟

41. عدد مرات استخدامك لمواقع التواصل الاجتماعي في الأغراض التعليمية؟

42. ما هي البرامج التواصل الاجتماعي التي تستعملها في الأغراض التعليمية؟
- فيسبوك
- تويتر
- بلاكباورد

43. هل تستخدم مواقع التواصل الاجتماعي في الأغراض التعليمية حالياً؟

44. عدد مرات استخدامك لمواقع التواصل الاجتماعي في الأغراض التعليمية؟

45. ما هي البرامج التواصل الاجتماعي التي تستعملها في الأغراض التعليمية؟
- فيسبوك
- تويتر
- بلاكباورد

46. هل تستخدم مواقع التواصل الاجتماعي في الأغراض التعليمية حالياً؟

47. عدد مرات استخدامك لمواقع التواصل الاجتماعي في الأغراض التعليمية؟

48. ما هي البرامج التواصل الاجتماعي التي تستعملها في الأغراض التعليمية؟
- فيسبوك
- تويتر
- بلاكباورد

49. هل تستخدم مواقع التواصل الاجتماعي في الأغراض التعليمية حالياً؟

50. عدد مرات استخدامك لمواقع التواصل الاجتماعي في الأغراض التعليمية؟

51. ما هي البرامج التواصل الاجتماعي التي تستعملها في الأغراض التعليمية؟
- فيسبوك
- تويتر
- بلاكباورد

52. هل تستخدم مواقع التواصل الاجتماعي في الأغراض التعليمية حالياً؟

53. عدد مرات استخدامك لمواقع التواصل الاجتماعي في الأغراض التعليمية؟

54. ما هي البرامج التواصل الاجتماعي التي تستعملها في الأغراض التعليمية؟
- فيسبوك
- تويتر
- بلاكباورد

55. هل تستخدم مواقع التواصل الاجتماعي في الأغراض التعليمية حالياً؟

56. عدد مرات استخدامك لمواقع التواصل الاجتماعي في الأغراض التعليمية؟

57. ما هي البرامج التواصل الاجتماعي التي تستعملها في الأغراض التعليمية؟
- فيسبوك
- تويتر
- بلاكباورد

58. هل تستخدم مواقع التواصل الاجتماعي في الأغراض التعليمية حالياً؟

59. عدد مرات استخدامك لمواقع التواصل الاجتماعي في الأغراض التعليمية؟

60. ما هي البرامج التواصل الاجتماعي التي تستعملها في الأغراض التعليمية؟
- فيسبوك
- تويتر
- بلاكباورد
فائدة استخدام مواقع التواصل الاجتماعي

العـبـــــارة          الرقم
استخدام التواصل الاجتماعي سوف يزيد من العملية التعليمية 26
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استخدام مواقع التواصل الاجتماعي سوف يزيد من جودة التعليم 29

الجزء الثالث: قبل التعليم الإلكتروني
ا. هذا الجزء من الاستبيان يتعلق بمعرفة وجهة نظرك في مدى فائدة استخدام التعليم الإلكتروني في التعليم العالي.
من فضلك اختر إجابة واحدة فقط لكل الاستمع التالية بوضع علامة (7) في المربع المناسب.

 lạnhحة: 1=لا أوافق بشدة  2=لا أوافق  3=محايد  4=أوافق  5=أوافق بشدة

قياس استخدام التعليم الإلكتروني

العـبـــــارة          الرقم
استخدام التعليم الإلكتروني سوف يزيد من تجربتي التعليمية 30
سوف يكون من السهل أن أتعلم استخدام التعليم الإلكتروني 31
سوف أجد التعامل مع التعليم الإلكتروني مفهوم وواضح 32
سوف أجد مرونة في استخدام التعليم الإلكتروني 33

ج. هذا الجزء من الاستبيان يتعلق بمعرفة وجهة نظرك في مدى سهولة استخدام التعليم الإلكتروني في التعليم العالي.
من فضلك اختر إجابة واحدة فقط لكل الاستمع التالية بوضع علامة (7) في المربع المناسب.

ملاحظة: 1=لا أوافق بشدة  2=لا أوافق  3=محايد  4=أوافق  5=أوافق بشدة

قياس سهولة الاستخدام

العـبـــــارة          الرقم
سوف أجد استخدام التعليم الإلكتروني سهل 35
سوف يكون من السهل أن أتعلم استخدام التعليم الإلكتروني 36
سوف أجد التعامل مع التعليم الإلكتروني مفهوم وواضح 37
سوف أجد مرونة في استخدام التعليم الإلكتروني 38

د. هذا الجزء من الاستبيان يتعلق بمعرفة تأثير رأي الآخرين حول استخدام التعليم الإلكتروني في التعليم العالي.
من فضلك اختر إجابة واحدة فقط لكل الاستمع التالية بوضع علامة (7) في المربع المناسب.

ملاحظة: 1=لا أوافق بشدة  2=لا أوافق  3=محايد  4=أوافق  5=أوافق بشدة

قياس موقفك من استخدام التعليم الإلكتروني

العـبـــــارة          الرقم
اعتقد أنه لدي الثقة في النفس عند استخدام التعليم الإلكتروني 39
اعتقد أن استخدام التعليم الإلكتروني في التعليم العالي مفيد 40
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استخدام التعليم الإلكتروني سوف يحسن من التواصل بين الطلاب الآخرين 42

التفصيل عن استخدام التعليم الإلكتروني

العـبـــــارة          الرقم
اعتقد أنه لدي الثقة في النفس عند استخدام التعليم الإلكتروني 39
اعتقد أن استخدام التعليم الإلكتروني في التعليم العالي مفيد 40
اعتقد أن استخدام التعليم الإلكتروني حتى ولو كانت الفوائد سوف تأتي مستقبلا 41
استخدام التعليم الإلكتروني سوف يحسن من التواصل بين الطلاب الآخرين 42

من فضلك اختر إجابة واحدة فقط لكل الاستمع التالية بوضع علامة (7) في المربع المناسب

165
هذا الجزء من الاستبيان يتعلق بمعرفة مدى استمتعتك باستخدام التعليم الإلكتروني في التعليم العالي. من فضلك اختر الإجابة واحدة فقط لكل الأسئلة التالية بوضع علامة (✓) في المربع المناسب.

ملاحظة: 1=لا أوافق بشدة  2=لا أوافق  3=محايد  4=أوافق  5=أوافق بشدة

**العبارة**

**الرقم**

1. سوف استعمل التعليم الإلكتروني إذا صحتي بذلك استاذي.

2. سوف استخدم التعليم الإلكتروني إذا رأيت أن معظم أصدقائي يستخدمونه.

3. أشخاص أعترف بهم يعتقدون أن استخدام التعليم الإلكتروني فكرة جيدة.

4. أستاذي نصحني.

5. أستاذ ذي.

6. إذا كنت غير متأكد من أن هجاءك للكلمة "مضطرب" أو "مضظرب" يمكنك أن تخيل الكلمة في عقلك وتختار حسب الشكل الذي تراها.

7. إذا كنت غير متأكد من أن هجاءك للكلمة "مضطرب" أو "مضظرب" يمكنك أن تبحث عنها في القاموس.

8. تكتب الكلمات على ورقة وتختار واحدة.

9. نسبتي استمتعائي بالتعلم عن طريق التعليم الإلكتروني أقل من التعليم وجه لوجه.

10. مع أنني لم استخدم التعليم الإلكتروني في التعليم فلنتي اتوقع أن استمتعائي بالتعليم الإلكتروني سيكون أقل من التعليم وجه لوجه.

11. مع أنني لم استخدم التعليم الإلكتروني في التعليم فلنتي اتوقع أنه لا فرق بين التعليم الإلكتروني والتعليم وجه لوجه.

12. إذا عازم على استخدام التعليم الإلكتروني في دراستي.

13. أنا عازم على استخدام التعليم الإلكتروني كلما مكن ذلك في المستقبل.

14. إذا لم استخدم التعليم الإلكتروني كل ما مكن ذلك في المستقبل.

15. سوف أصح الآخرين باستخدام التعليم الإلكتروني.

16. أفضل مواقع الانترنت التى تحتوي على أشياء يمكن الضغط عليها لعمل.

17. قنوات سمعية تحتوى على تسجيلات سمعية.

18. معلومات وكتاتبات ومقاطع ومقاطع مكتوبة.

19. تصاميم شفافة ومرونة كرسومات وألوان وغيرها.

20. إذا كنت غير متأكد من أن هجاءك للكلمة "مضطرب" أو "مضظرب" يمكنك أن تختبر الكلمة في عللك وتجرب حسب الشكل الذي تراها.

21. تفكر في كل كلمة بصوت مسموع وتختار واحدة.

22. تبحث عنها في القاموس.

23. تكتب الكلمات على ورقة وتختار واحدة.

**العبارة**

**الرقم**

1. نية استخدام التعليم الإلكتروني

2. إذا كنت غير متأكد من أن هجاءك للكلمة "مضطرب" أو "مضظرب" يمكنك أن تختبر الكلمة في عللك وتجرب حسب الشكل الذي تراها.

3. تفكر في كل كلمة بصوت مسموع وتختار واحدة.

4. تبحث عنها في القاموس.

5. تكتب الكلمات على ورقة وتختار واحدة.

6. إذا كنت غير متأكد من أن هجاءك للكلمة "مضطرب" أو "مضظرب" يمكنك أن تختبر الكلمة في عللك وتجرب حسب الشكل الذي تراها.

7. تفكر في كل كلمة بصوت مسموع وتختار واحدة.

8. تبحث عنها في القاموس.

9. تكتب الكلمات على ورقة وتختار واحدة.
إذا أردت أن تخطط لمناسبة مفاجئة لصديقك فانك تدعو أصدقائك وتدعهم يستمتعوا فقط تعر القافلة وتدعهم يستمتعوا

• تتخيل ما سيحدث في المناسية
• تكتب قائمة بما ستفعل وما سوف تشكحيه للمناسبة
• تتحدث عن المناسبة هاتفيا مع الآخرين أو تراسلهم
• تكتب قائمة بما ستفعل وما سوف تشتريه للمناسبة
• تقوم بشيء لينبأ أن المناسبة نجحت
• تتحدث مع أصدقائك عن ما ستعمله للاحتفال
• تبحث عن فكرة ما في الكتب أو المجالات
• تستخدم كتاب فن الطبخ وتعليمات التحضير

تم اختيارك كقائد أو مرشد في رحلة مع مجموعة من أصدقائك يمكنك أن تصف الأنشطة التي سوف تكون في الرحلة.
• تستعمل خريطة أو صورة لتريهم الأماكن.
• تبدأ بالتدريب على الأنشطة التي ستكون في الرحلة.
• تعرض عليهم قائمة عن الأنشطة البرنامج
• تكتب عن القصة أو المسرحية
• ترسم تخطيطي لشئ ما حدث في القصة أو المسرحية
• تقرأ جزء أو خطبة من القصة أو المسرحية
• تكتب تعليقات عن الأمر، سواء كانت كلام للفل، كلام للجهاز، أو كلام للبرنامج.

أنت بصدد أن تشتري ألة تصوير رقمية أو هاتف نقال بغض النظر عن السعر، ما الذي يؤثر على قرارك.
• تجربة الجهاز واختياره.
• قراءة تفصيل عن مواصفاته.
• كون الجهاز ذو تصميم حديث وظهور جديد.
• البائع أو غيره عن مواصفاته.

تذكر مرة تعلمت فيها شيء جديدا، حاول عدم تذكر مهارات جسدية كركوب الدراجة مثلا، فانت تعلمت أفضل بواسطة:
• لا مشاهدة ما يقوم به أولا.
• الاستماع إلى شرح شخص ما حول الموضوع وتوجيه الأسئلة له.
• قراءة بحثية ومساعدات متنية عن الموضوع.
• قراءة التعليمات المكتوبة.

بعد قراءة قصة أو مسرحية طلب منك أن تعمل مشروع عنها فيمكنك أن تكتب عن القصة أو المسرحية.
• تقوم بمثل مشهد عن القصة أو المسرحية.
• تقوم برسم تخطيطي لما حدث في القصة أو المسرحية.
• تقرأ جزء أو خلاصة من القصة أو المسرحية.

أنت بصدد تجميع جهاز حاسوب جديد فانك تفضل أن:
• تقرأ كتاب التعليمات المرافق بالجهاز.
• تتصال أو ترسل رسالة صغرى أو رسالة كهرونية لصديق تلأل عن طريق التجميع.
• تتبع الرسومات التوضيحية التي توضح كيفية عمل ذلك.
• تتمي تعمل توصيف منزلي بالجهاز، فما الذي تفضل أن:
• تذهب مع الالزمن المخصص.
• ترسل خريطة أو مخطط على قطعة ورقية أو ترسل المخطط عن طريق البريد الإلكتروني.
• تكتب الموصف على شكل قائمة أو نظرة.
• تخيرهم بالوصيف للفقد.

لديك مشكلة في ركوبك فانت تفضل الطبيب الذي:
• يعطيك رسالة عن المشكلة.
• يعطيك مقال أو نشرة تشرح لك المشكلة.
يتحدث اليك يصف لك المشكلة مباشرة.

12. برنامج تلفزيوني سوف يعرض قريبا فان أكثر شي يثير عليك مشاهدته هو.
   - أن تسمع أصدقائك يتحدثون عنه
   - أن تقرأ ما قاله الآخرون عنه في الإنترنت أو المجلات أو الصحف
   - أن تشاهد مقطع منه
   - أن يكون شبيه بالأشياء التي تفضلك
   - أن يكون على الإنترنت أو في المجلات أو الصحف

13. برنامج تلفزيوني سوف يعرض قريبا فان أكتر شي يؤثر عليك لمشاهدته هو
   - أن تسمع أصدقائك يتحدثون عنه
   - أن تقرأ ما قاله الآخرون عنه فى الإنترنت أو المجلات أو الصحف
   - أن تشاهد مقطع منه
   - أن يكون شبيه بالأشياء التى تفضلها
   - أن يكون على الإنترنت أو في المجلات أو الصحف

14. أنت تتعلم كيف تلتقط صور بواسطة الة التصوير الرقمية أو جهاز الهاتف النقال فانك تفضل.
   - مثال للصور الجيدة والصور الرديئة وكيفية تحسينها.
   - معلومات تصنيفية مكتوبة بوضوح مع قائمة بالказывает.
   - فرصة لطرح سوال واكتساب خبرة تمكينية للتصوير.
   - تسجيل بعض التعليقات حول بعض المناقشات أو الاختبارات التي قمت بها فانك تفضل أن تكون التعليقات:
     - تستخدم أمثلة عملية توضيح ما قمت به
     - تستخدم الوصف الكتابى أو جدول للنتائج

15. تعلم بعض القواعد حول بعض المناقشات أو الاختبارات التي قمت بها فانك تفضل أن تكون القواعد:
   - تتعلم كيف تلتقط صور بواسطة الة التصوير الرقمية أو جهاز الهاتف النقال.
   - تستخدم أمثلة عملية توضيح ما قمت به
   - تستخدم الوصف الكتابى أو جدول للنتائج
   - تتعلم بعض التقنيات حول بعض المناقشات أو الاختبارات التي قمت بها فانك تفضل أن تكون التعليمات:
   - تعلم بعض القواعد حول بعض المناقشات أو الاختبارات التي قمت بها فانك تفضل أن تكون القواعد.

16. أنت تعلم كيف تلتقط صور بواسطة الة التصوير الرقمية أو جهاز الهاتف النقال فانك تفضل.
   - مثال للصور الجيدة والصور الرديئة وكيفية تحسينها.
   - معلومات تصنيفية مكتوبة بوضوح مع قائمة بالкажет.
   - فرصة لطرح سوال والتحدث عن مميزات الة التصوير.
   - تسجيل بعض التعليقات حول بعض المناقشات أو الاختبارات التي قمت بها فانك تفضل أن تكون التعليقات:
     - تستخدم أمثلة عملية توضيح ما قمت به
     - تستخدم الوصف الكتابى أو جدول للنتائج

الظروف.

ه. هذا الجزء من الاستبيان لمعرفة من أي نوع من أنواع المتعلمين تتبع. فما يلى 24 سؤال اختير الإجابة المناسبة من
الخيارات الثلاثة وذلك بوضع علامة (3). ملاحظة: أختر "مطلقا " في حالة أن السؤال يصف أحد صفاتك الرئيسية.

17. هل تجد أن من السهل التعرف وتكوين صدقات جديدة
    - نعم
    - مطلقا
    - لا

18. هل تجد أن من السهل التعرف وتكوين صدقات جديدة
    - نعم
    - مطلقا
    - لا

19. هل تجد أن من السهل التعرف وتكوين صدقات جديدة
    - نعم
    - مطلقا
    - لا

20. هل تجد أن من السهل التعرف وتكوين صدقات جديدة
    - نعم
    - مطلقا
    - لا

21. هل تجد أن من السهل التعرف وتكوين صدقات جديدة
    - نعم
    - مطلقا
    - لا

22. هل تجد أن من السهل التعرف وتكوين صدقات جديدة
    - نعم
    - مطلقا
    - لا

23. هل تجد أن من السهل التعرف وتكوين صدقات جديدة
    - نعم
    - مطلقا
    - لا

24. هل تجد أن من السهل التعرف وتكوين صدقات جديدة
    - نعم
    - مطلقا
    - لا

25. هل تجد أن من السهل التعرف وتكوين صدقات جديدة
    - نعم
    - مطلقا
    - لا

26. هل تجد أن من السهل التعرف وتكوين صدقات جديدة
    - نعم
    - مطلقا
    - لا

27. هل تجد أن من السهل التعرف وتكوين صدقات جديدة
    - نعم
    - مطلقا
    - لا

28. هل تجد أن من السهل التعرف وتكوين صدقات جديدة
    - نعم
    - مطلقا
    - لا

29. هل تجد أن من السهل التعرف وتكوين صدقات جديدة
    - نعم
    - مطلقا
    - لا

30. هل تجد أن من السهل التعرف وتكوين صدقات جديدة
    - نعم
    - مطلقا
    - لا

31. هل تجد أن من السهل التعرف وتكوين صدقات جديدة
    - نعم
    - مطلقا
    - لا

32. هل تجد أن من السهل التعرف وتكوين صدقات جديدة
    - نعم
    - مطلقا
    - لا

33. هل تجد أن من السهل التعرف وتكوين صدقات جديدة
    - نعم
    - مطلقا
    - لا
هل غالبا تلاحظ الأشياء التي يغفل عنها الآخرين   

هل تصرف أولا ثم تفكّر في العواقب   

هل تحب أن يكون كل شيء في المكان المناسب   

هل أنت كثير الاستثناء   

هل تحب التفكير في الأمور قبل عملها   

هل تستمتع بتجربة أشياء جديدة   

هل تحب تحدى حل المشاكل   

عزیزی المشارك إذا رغبت في إضافة مزيد من الأراء أو الاقتراحات لهذا الاستبيان فإنه يرجى ذكرها في الفراغ أدناه:  

……………………………………………………………………………………………
……………………………………………………………………………………………
……………………………………………………………………………………………
……………………………………………………………………………………………

هل ترغب في الحصول على تقرير بنتائج هذا الاستبيان؟   

نعم (يرجى الاتصال بالباحث من خلال البريد الالكتروني    

لا

شكرًا على مشاركتك وتعاونك لتعبئة هذا الاستبيان
بسم الله الرحمن الرحيم
دراسة العوامل المؤثرة في اعتماد التعليم الإلكتروني في التعليم العالي الليبي

استبيان أعضاء هيئة التدريس

عزى المشارك بالاستبيان

هذا الاستبيان جزء من منطقتين تعلم شهادة الدكتوراه في مجال تقنية المعلومات من جامعة مردوخ ويشمل كل من الدكتور/ كيفن ونق، والدكتور/ لنس فونق. تسعى ليبيا إلى اعتماد التعليم الإلكتروني في التعليم العالي. لذلك، تأتي هذه الدراسة في إطار دراسة العوامل المؤثرة في اعتماد التعليم الإلكتروني في التعليم العالي الليبي.

نأمل التكرم بالمشاركة في هذه الدراسة من خلال تعبير الاستبيان المرفق والذي نأمل أن تحققه الجدية عليه أكثر من 30 دقيقة. على أن المشاركة في هذا الاستبيان هي عمل اختياري، حيث ندعو إلى إكمال الأجابة على هذا الاستبيان في حالة استمتعت فيه، مما يثبت الحاجة ملحًا. مع ملاحظة أنه بمجرد استكمال الاستبيان وتسليمك للباحث، فإن هذا الاستبيان قد حصل على موافقة لجنة أخلاقيات البحث العلمي في جامعة مردوخ، ولم يتم وضع أي بيانات شخصية تدل على المشارك في أي جزء من أجزاء الاستبيان، كما ضمن أن جملة هذه الدراسة، بما فيها النتائج سوف يحترم سرية كاملة، وأن يحترم واحد من الباحث ومشرفيه الإطلاع عليها.

الاستبيان يتضمن إلى أربع أجزاء، وهي:
1. الجزء الأول: البيانات الديموغرافية والأولية.
2. الجزء الثاني: الخبرة في استخدام الحاسوب.
3. الجزء الثالث: قبول التعليم الإلكتروني.
4. الجزء الرابع: أساليب التعلم.

وصف المصطلحات المستخدمة في الاستبيان:

<table>
<thead>
<tr>
<th>المصطلح</th>
<th>الوصف</th>
</tr>
</thead>
<tbody>
<tr>
<td>الموقع الإلكتروني</td>
<td>(Web Site) مجموعة من الصفحات الإلكترونية على الشبكة العالمية &quot;الإنترنت&quot;.</td>
</tr>
<tr>
<td>التعليم الإلكتروني</td>
<td>(E-learning) استخدام تقنيات الاتصالات المنطقية واللاسلكية لتوصيل المعلومات في التعليم والتدريس.</td>
</tr>
<tr>
<td>أساليب التعلم</td>
<td>(Learning styles) الطرق التي يستخدمها الفرد لمعالجة المعلومات التي يتلقاها وكيفية استخدامها في التعامل مع المعلومات الحياتية التي يواجهها.</td>
</tr>
<tr>
<td>أساليب التعليم</td>
<td>(Teaching styles) الطرق التي توظيفها المعلم والمهارات التربوية التي تقدم لطالب وتعبر عنه لتحقيق أهداف الدرس.</td>
</tr>
<tr>
<td>التعليم المتغير</td>
<td>(M-learning) هو التعليم الذي يتم استخدامه المعروف طريقة المحمولة الصغيرة وتتمثل في الهواتف الذكية، المساعدات الرقمية المحمولة، أجهزة الكمبيوتر المحمول.</td>
</tr>
<tr>
<td>مواقع التواصل الاجتماعي</td>
<td>(Social Network Application) هي مجموعة من تطبيقات تكنولوجية مستدامة إلى الإنترنت تتيح التواصل بين الناس، وتسمح بتلك البيانات الإلكترونية تبادلها بسهولة، وتوفير للمستخدمين إمكانية التفاعل على آخرين يشاركون في نفس المواصلات.</td>
</tr>
</tbody>
</table>
هذا البحث سوف يقدم دراسة كاملة حول العوامل المؤثرة في اعتماد التعليم الإلكتروني في التعليم العالي الليبي.

في حالة وجود أي استفسار أو ملاحظة على هذا الاستبيان فانه يمكنك الاتصال بالباحث على أحد العناوين التالية (ليبيا 0703185044، أو استراليا 61 423941794، بالإضافة كيفن وون 618936061000 و k_wong@murdoch.edu.au). وكبديل لذلك يمكنك الاتصال بلجنة أخلاقية البحث العلمي في جامعة مردوخ على (+174681606644، ethics@murdoch.edu.au).

شكراً لكم مقدما تعاونكم وحسن استجابكم.

الباحث/ على محمد الكاسح

<table>
<thead>
<tr>
<th>الجزء الأول: البيانات الديموغرافية والأولية</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>هذا الجزء من الاستبيان يجمع البيانات الديموغرافية والأولية عن المشارك/المشاركة. من فضلك اختيار إجابة واحدة فقط لكل الأسئلة التالية بوضع علامة (✓) في المربع المناسب.</td>
<td></td>
</tr>
<tr>
<td>إلى أي من الفئات العمرية التالية تنتمي؟</td>
<td></td>
</tr>
<tr>
<td>1. 29-18</td>
<td>✓</td>
</tr>
<tr>
<td>2. ما الجنس؟</td>
<td></td>
</tr>
<tr>
<td>ذكر</td>
<td>✓</td>
</tr>
<tr>
<td>3. كم عدد سنوات الخبرة التي أمضيتها في التدريس الجامعي؟</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>✓</td>
</tr>
<tr>
<td>4. ما هو الجامعات التي تدرس بها؟</td>
<td></td>
</tr>
<tr>
<td>عامة</td>
<td>✓</td>
</tr>
<tr>
<td>5. ما هي درجة العلمية؟</td>
<td></td>
</tr>
<tr>
<td>مساعد محاضر</td>
<td>✓</td>
</tr>
<tr>
<td>6. ما هو مستوى إتقانك اللغة الإنجليزية؟</td>
<td></td>
</tr>
<tr>
<td>لا يوجد</td>
<td>✓</td>
</tr>
<tr>
<td>7. هل سبق لك استخدام التعليم الالكتروني في الأغراض التعليمية؟</td>
<td></td>
</tr>
<tr>
<td>نعم</td>
<td>✓</td>
</tr>
</tbody>
</table>

| الجزء الثاني: الخبرة في مجال التقنية التعليمية |   |
| هذه الأسئلة تتعلق بذكريك في استخدام التقنية التعليمية. من فضلك اختر إجابة واحدة فقط لكل الأسئلة التالية بوضع علامة (✓) في المربع المناسب و إذا كانت الإجابة غير موجودة أكمل الفراغ الموجود. |   |
| هل لديك جهاز حاسب آل في البيت؟ |   |
| نعم | ✓ | لا |   |
| ما هو مستوى خبرتك في مجال استخدام الحاسب الآلي؟ |   |
| لا يوجد | ✓ | مبتدئ | متوسط | متقدم |   |
10. ما أوجه استخدامك للحاسب الآلي؟ (يمكن اختيار أكثر من إجابة)
- البرامج التعليمية
- البرامج التطبيقية
- البريد الإلكتروني
- الإنترنت
- الألعاب
- ملاحظات:

11. حدد عدد مرات استخدامك للإنترنت؟
- لا يوجد
- مرة في الاسبوع
- مرة في الشهر
- أكثر من مرة في اليوم

12. ما هي نوع التكنولوجيا التعليمية التي سبق أن استخدمتها في التدريس؟ (يمكن اختيار أكثر من إجابة)
- التعليم الإلكتروني
- الإنترنت
- البرامج التطبيقية
- ملاحظات:

13. أي أنواع الأجهزة المحمولة التي تستعملها حالياً؟
- هاتف نقال
- الهاتف الذكي
- المساعد الرقمي الشخصي
- mp3/mp4
- iPod
- أخرى:

14. هل سبق لك استخدام الأجهزة المحمولة في الأغراض التعليمية؟
- نعم
- لا

15. هل سبق لك استخدام الأجهزة المحمولة المرتبطة بالإنترنت لاسلكيا خارج الفصل؟
- نعم
- لا

16. أي من الإنشطة التالية في العادة تستخدمها مع الأجهزة المحمولة؟
- تلقي رسائل النص الصغير
- توزيع برامج (صور، فيديو، موسيقى)
- تحصيل ملاحظات
- إرسال/استقبال الرسائل القصيرة
- تصفح الإنترنت
- البريد الإلكتروني

17. هل تستخدم مواقع التواصل الاجتماعي في الأغراض التعليمية حالياً؟
- نعم
- لا

18. حدد عدد مرات استخدامك لمواقع التواصل الاجتماعي في الأغراض التعليمية؟
- لا يوجد
- مرة في الاسبوع
- مرة في الشهر
- أكثر من مرة في اليوم

19. ما أنواع الأجهزة المحمولة التي تستعملها حالياً؟
- هاتف نقال
- الهاتف الذكي
- المساعد الرقمي الشخصي
- mp3/mp4
- iPod
- أخرى:

20. هل سيقلك استخدام الأجهزة المحمولة المرتبطة بالإنترنت لاسلكيا خارج الفصل؟
- نعم
- لا

21. هل تستخدم مواقع التواصل الاجتماعي في الأغراض التعليمية حالياً؟
- نعم
- لا

22. حدد عدد مرات استخدامك لمواقع التواصل الاجتماعي في الأغراض التعليمية؟
- لا يوجد
- مرة في الاسبوع
- مرة في الشهر
- أكثر من مرة في اليوم

23. هل تستخدم مواقع التواصل الاجتماعي في الأغراض التعليمية حالياً؟
- نعم
- لا

24. حدد عدد مرات استخدامك لمواقع التواصل الاجتماعي في الأغراض التعليمية؟
- لا يوجد
- مرة في الاسبوع
- مرة في الشهر
- أكثر من مرة في اليوم

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ما هي برامج التواصل الاجتماعي التي تستخدمها في الأغراض التعليمية؟

فيسبوك □
تويتر □
بلاكبورد □
أخرى :□

هل سبق أن استخدمت مواقع التواصل الاجتماعي في الأغراض التعليمية في الماضي؟

نعم □
لا □

هذا الجزء من الاستبيان يتعلق بمعرفة وجهة نظرك في مدى فائدة استخدام مواقع التواصل الاجتماعي في التعليم العالي. من فضلك اختر اجابة واحدة فقط لكل الاستبانة التالية بوضع علامة (✓) في المربع المناسب.

ملاحظة: 1 = لا أوفق بشدة
       2 = لا أوفق
       3 = محايد
       4 = أوفق
       5 = أوفق بشدة

الجزء الثالث:

أ. هذا الجزء من الاستبيان يتعلق بمعرفة وجهة نظرك في مدى فائدة استخدام التعليم الإلكتروني في التعليم العالي.

ب. هذا الجزء من الاستبيان يتعلق بمعرفة وجهة نظرك في مدى سهولة استخدام التعليم الإلكتروني في التعليم العالي. من فضلك اختر اجابة واحدة فقط لكل الاستبانة التالية بوضع علامة (✓) في المربع المناسب.

ملاحظة: 1 = لا أوفق بشدة
       2 = لا أوفق
       3 = محايد
       4 = أوفق
       5 = أوفق بشدة

<table>
<thead>
<tr>
<th>المعلمة</th>
<th>رقم</th>
<th>5</th>
<th>4</th>
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<tr>
<td>استخدام مواقع التواصل الاجتماعي سوف يزيد من تطوير العملية التعليمية</td>
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<tr>
<td>استخدام التواصل الاجتماعي سوف يطور النقاش بين المجموعات الطلابية</td>
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<td>استخدام مواقع التواصل الاجتماعي سوف يزيد التفاعل والاتصال بين الطلاب والمعليمين</td>
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<td>استخدام مواقع التواصل الاجتماعي سوف يزيد من جودة التعليم</td>
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<th>4</th>
<th>3</th>
<th>2</th>
<th>1</th>
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<tbody>
<tr>
<td>استخدام التعليم الإلكتروني يحسن ويطور من عملي الأكاديمي</td>
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<td>استخدام التعليم الإلكتروني يعزز من فعالية وتطبيقية الأكاديمية</td>
<td>32</td>
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<tr>
<td>استخدام التعليم الإلكتروني يقوي مشكلة الطلاب أثناء الدراسة</td>
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<tr>
<td>استخدام التعليم الإلكتروني يمكن أن يزيد من انتباه الطلاب</td>
<td>34</td>
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</tr>
<tr>
<td>استخدام التعليم الإلكتروني يمكن أن يزيد من تفاعل الطلاب</td>
<td>35</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>المعلمة</th>
<th>رقم</th>
<th>5</th>
<th>4</th>
<th>3</th>
<th>2</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>سوف أجد استخدام التعليم الإلكتروني سهل</td>
<td>36</td>
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<td></td>
</tr>
<tr>
<td>سوف أجد التعليم الإلكتروني معقداً وأصعب</td>
<td>37</td>
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<tr>
<td>سوف أجد التعليم الإلكتروني مفهوم وواضح</td>
<td>38</td>
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<td></td>
</tr>
<tr>
<td>سوف أجد مرونة في استخدام التعليم الإلكتروني</td>
<td>39</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
174
ج. هذا الجزء من الاستبيان يتعلق بمعرفة موقفك من استخدام التعليم الإلكتروني في التعليم العالي. من فضلك اخترك بوجه واحد فقط لكل الاستماعات التالية بوضع علامة (٥) في المربع المناسب.

ملاحظة: 1 = لا أوفق بشدة  2 = لا أوفق  3 =محايد  4 = أوفق  5 =أوفق بشدة

**سؤال 1: موقفك من استخدام التعليم الإلكتروني**

<table>
<thead>
<tr>
<th>العدد</th>
<th>الرمز</th>
<th>نص الأسئلة</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>5</td>
<td>أعتقد أنه لدي / سيكون لدي ثقة في النفس عند استخدام التعليم الإلكتروني</td>
</tr>
<tr>
<td>2</td>
<td>4</td>
<td>أعتقد أن استخدام التعليم الإلكتروني في التعليم العالي مفيد</td>
</tr>
<tr>
<td>3</td>
<td>3</td>
<td>أنا أرغب في استخدام التعليم الإلكتروني حتى ولو كانت القواعد سوف تأتي</td>
</tr>
<tr>
<td>4</td>
<td>2</td>
<td>استخدام التعليم الإلكتروني من شأنه أن يحسن التفاعل بين الطلاب</td>
</tr>
<tr>
<td>5</td>
<td>1</td>
<td>التعليم الإلكتروني من شأنه زيادة فرص وصول الطلاب</td>
</tr>
</tbody>
</table>

من فضلك اختر إجابة واحدة فقط لكل الاستماعات التالية بوضع علامة (٥) في المربع المناسب.

ملاحظة: 1 = لا أوفق بشدة  2 = لا أوفق  3 =محايد  4 = أوفق  5 =أوفق بشدة

**سؤال 2: تأثير رأي الآخرين على استخدام التعليم الإلكتروني**

<table>
<thead>
<tr>
<th>العدد</th>
<th>الرمز</th>
<th>نص الأسئلة</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>5</td>
<td>سوف استعمل التعليم الإلكتروني إذا نصحتني إدارة الجامعة بذلك</td>
</tr>
<tr>
<td>2</td>
<td>4</td>
<td>بشكل عام، تدعم استخدم التعليم الإلكتروني</td>
</tr>
<tr>
<td>3</td>
<td>3</td>
<td>التعلم الإلكتروني سيكون مزعجًا لدى في حالة استخدمه أغلب زملائي</td>
</tr>
<tr>
<td>4</td>
<td>2</td>
<td>أشخاص أعرفهم يعتقدون أن استخدام التعليم الإلكتروني فكرة جيدة</td>
</tr>
<tr>
<td>5</td>
<td>1</td>
<td>أشياء أعرفهم يعتقدون أن استخدام التعليم الإلكتروني فكرة جيدة</td>
</tr>
</tbody>
</table>

ه. هذا الجزء من الاستبيان يتعلق بمعرفة مدى استمتاعك باستخدام التعليم الإلكتروني في التعليم العالي. من فضلك اختر إجابة واحدة فقط لكل الاستماعات التالية بوضع علامة (٥) في المربع المناسب.

ملاحظة: 1 = لا أوفق بشدة  2 = لا أوفق  3 =محايد  4 = أوفق  5 =أوفق بشدة

**سؤال 3: استمتاعك باستخدام التعليم الإلكتروني**

<table>
<thead>
<tr>
<th>العدد</th>
<th>الرمز</th>
<th>نص الأسئلة</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>5</td>
<td>نسبة استمتاعي بالتدريس عن طريق التعليم الإلكتروني أقل من التعليم وجه</td>
</tr>
<tr>
<td>2</td>
<td>4</td>
<td>نسبة استمتاعي بالتدريس عن طريق التعليم الإلكتروني أكثر من التعليم وجه</td>
</tr>
<tr>
<td>3</td>
<td>3</td>
<td>مع أنني لم استخدم التعليم الإلكتروني في التدريس فإنني أتوقع أن لايفرق بين</td>
</tr>
<tr>
<td>4</td>
<td>2</td>
<td>أعزس على استخدام التعليم الإلكتروني في حياتي الأكاديمية</td>
</tr>
<tr>
<td>5</td>
<td>1</td>
<td>أنا استمتع باستخدام التعليم الإلكتروني</td>
</tr>
</tbody>
</table>

و. هذا الجزء من الاستبيان يتعلق بمعرفة الدعم الذي تقدمه الجامعة في ما يخص استخدام التعليم الإلكتروني في التعليم العالي. من فضلك اختر إجابة واحدة فقط لكل الاستماعات التالية بوضع علامة (٥) في المربع المناسب.

ملاحظة: 1 = لا أوفق بشدة  2 = لا أوفق  3 =محايد  4 = أوفق  5 =أوفق بشدة

**سؤال 4: الدعم الذي تقدمه الجامعة في استخدام التعليم الإلكتروني**

<table>
<thead>
<tr>
<th>العدد</th>
<th>الرمز</th>
<th>نص الأسئلة</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>5</td>
<td>نسبة استمتاعي بالتدريس عن طريق التعليم الإلكتروني أقل من التعليم وجه</td>
</tr>
<tr>
<td>2</td>
<td>4</td>
<td>نسبة استمتاعي بالتدريس عن طريق التعليم الإلكتروني أكثر من التعليم وجه</td>
</tr>
<tr>
<td>3</td>
<td>3</td>
<td>مع أنني لم استخدم التعليم الإلكتروني في التدريس فإنني أتوقع أن لايفرق بين</td>
</tr>
<tr>
<td>4</td>
<td>2</td>
<td>أعزس على استخدام التعليم الإلكتروني في حياتي الأكاديمية</td>
</tr>
<tr>
<td>5</td>
<td>1</td>
<td>أنا استمتع باستخدام التعليم الإلكتروني</td>
</tr>
</tbody>
</table>

ف. هذا الجزء من الاستبيان يتعلق بمعرفة نظرك المستقبل في استخدام التعليم الإلكتروني في التعليم العالي. من فضلك اختر إجابة واحدة فقط لكل الاستماعات التالية بوضع علامة (٥) في المربع المناسب.

ملاحظة: 1 = لا أوفق بشدة  2 = لا أوفق  3 =محايد  4 = أوفق  5 =أوفق بشدة

**سؤال 5: نظرك المستقبل في استخدام التعليم الإلكتروني**

<table>
<thead>
<tr>
<th>العدد</th>
<th>الرمز</th>
<th>نص الأسئلة</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>5</td>
<td>نسبه استمتاعي بالتدريس عن طريق التعليم الإلكتروني أقل من التعليم وجه</td>
</tr>
<tr>
<td>2</td>
<td>4</td>
<td>نسبة استمتاعي بالتدريس عن طريق التعليم الإلكتروني أكثر من التعليم وجه</td>
</tr>
<tr>
<td>3</td>
<td>3</td>
<td>مع أنني لم استخدم التعليم الإلكتروني في التدريس فإنني أتوقع أنه لايفرق بين</td>
</tr>
<tr>
<td>4</td>
<td>2</td>
<td>أعزس على استخدام التعليم الإلكتروني في حياتي الأكاديمية</td>
</tr>
<tr>
<td>5</td>
<td>1</td>
<td>أنا استمتع باستخدام التعليم الإلكتروني</td>
</tr>
</tbody>
</table>

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أنا عازم على استخدام التعليم الإلكتروني كلما أمكن ذلك في المستقبل.

لا أعتقد أنني سأستخدم التعليم الإلكتروني في التدريس مستقبلا.

سوف أضع الآخرين باستخدام التعليم الإلكتروني.

أنا عازم في الأغلب على استخدام التعليم الإلكتروني.

الجزء الرابع: أساليب التدريس

هذا الجزء يتعامل بمعرفة طريقةك المفضلة في التدريس. من فضلك اختيار إجابة واحدة فقط بوضع علامة (✓) في المرفق المناسب. ملاحظة: 1=لا أوفق بشدة 2=لا أوفق 3=محايد 4=أوفق 5=أوفق بشدة

| الرقم | الحقيقة، المفاهيم، والمبادئ هي أهم الأشياء التي يجب على الطلاب اكتسابها من الدراسة | انظر معايير علمية عالية للطلاب داخل الفصل | ذلك أقوله واقف، يمثل طرق مناسبة للتفكير حول مواضيع في المنهج | هذة الطريقك في التدريس تراعى التنوع في أساليب تعليم الطلاب. | في المواد التي يها مشاريع، تلبية الطلاب يقومون بالعمل لوحدهم مع قليل من الاشراط. | لا أستطيع أن أ罘ط الطالب. ولهذا يبدأ بمعنى من الأشراط مني. | مشاركة الطلاب العلمي وخبرتي، على أن تكون رشيداً عندما يكون غير حاضر عن أداة التعليم. | اقطع الطلاب على محاكاة الأسئلة التي أعلنتها أثناء التدريس. | افتح وقت الشعور مع الطلاب عن كيفية تعديل أدائهم على المستوى الفردي أو الجماعي. | تشجيع الطلاب على أساس فكر منظوره، على أي طرق تفهمهم في التدريس. | أ yaptها الطلاب رد فعل سلبي عندما أكون غير سعيد عن أداءهم التعليمي. | مجموعات النقاش الصغيرة توظف لتساعد الطلاب في تطوير قدراتهم في التفكير الدقيق. | الطلاب يصممون أو أكثر من التجارب التعليمية الموجهة ذاتية (Self-directed). | أرغب بإبقاء الطلاب المغادرين لهذا الفصل في المجال. | مسؤوليتين تحديد ما يجب أن يتعلموه الطلاب وكيف ينبغي لهم أن يتعلموه ذلك. | مسؤوليتين تحديد ما يجب أن يتعلموه الطلاب وكيف ينبغي لهم أن يتعلموه ذلك. | أغلب الشؤون استخدام طرق مختلفة مفاهيم ومبادئ. | الطلاب يصفونني بمخزن المعرفة الذي يوزع المعرفة والمبادئ والمفاهيم.

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التق馈 ا لما أرغب فى الطلبة أن يقوموا به في هذا الفصل موضوع جيدا في متطلبات المدة.  

مؤخرًا، العديد من الطلاب بدأوا في التفكير مثلى في محتوى المادة. يمكن للطالب الاختيار من بين النشاطات لإتمام متطلبات المادة. يشبه مدير مجموعة عمل يفوض المهام والمسؤوليات للتابعين.

ويوجد هناك العديد من المواضيع في المادة الدراسية لا تستطيع تغطيتها نظراً لضيق الوقت.

معايرتي وتوقعاتي تساعدهم في تطوير الطرق التي يحتاجونها للتعلم. الطلاب قد يصفوننى "بالمدرب الذي يعمل عن قرب مع الآخرين لتصحيح المشاكل من حيث كيفية تفكيرهم وسلوكهم. أنا أعطي الطلاب الكثير من الدعم والتشجيع على الاجتهاد في المادة الدراسية. افترض أن دور الأستاذ كالخبير، الذي يكون متواجد للطلاب عندما يحتاجونه

عزيزي المشارك إذا رغبت في إضافة مزيد من الأراء أو الاقتراحات لهذا الاستبيان يرجى ذكرها في الفراغ أدناه:

 Helm ترغب في الحصول على تقرير بنتائج هذا الاستبيان؟  
نعم (يرجى الاتصال بالباحث من خلال البريد الإلكتروني alielkasah@yahoo.com) □ 
لا □

شكراً على مشاركتك وتعاونك في تعبيئة هذا الاستبيان
Appendix C: Teaching and Learning Styles

AC.1 Introduction
This Appendix identifies the dominant teaching and learning styles in Libyan higher education. This chapter also investigates which teaching and learning styles have a higher intention to use e-learning as a tool for teaching and learning in Libya. The chapter is divided into five main sections. Section AC.2 reviews the literature about teaching and learning styles. The research objectives are presented in Section AC.3. Section AC.4 provides the background on how the perceived learning styles, preferred learning styles and preferred teaching styles were classified. The research methodology is presented in Section AC.5. Section AC.6 presents the results of the study. The summary of the chapter is presented in Section AC.7.

AC.2 Literature Review
Factors involving individual differences have appeared as a main mediator in many models to predict the behaviours of students in e-learning systems. According to Lin, Lu, et al. (2013), most previous research have indicated that typical factors that are related to individual differences, including gender, age, experience and education significantly determine the system implementation. Lin, Lu, et al. (2013) mentioned that teaching and learning styles are significant factors to affect students’ and teachers’ behavioural intention to use the e-learning systems. According to Umran-Khan and Iyer (2009), the predominant learning style of students and teaching style of teachers are considered as mediators affecting the relation between determinants of e-learning acceptance and intention to use the technology. Furthermore, Lin, Liu, et al. (2013) also believed that students from different learning environments tend to have different ideas about teachers and these teachers’ respective perceived teaching styles usually affect the students’ learning behaviour, particularly when using e-learning systems. There has
been evidence that teaching styles can aid the interpretation of the influences of teachers on students’ achievements (Aitkin & Zuzovsky, 1994; Ebmeier & Good, 1979). Likewise, teaching styles can also help to interpret attitudes towards the subjects. Teaching behaviour and styles can make a significant difference to the learning of students (Centra & Potter, 1980; McDaniel, 1981; Wentzel, 2002).

A number of research have been conducted to explore and predict user behaviour of an e-learning system (Selim, 2003; Sun et al., 2008; Teo et al., 2008). These research have also reviewed the main factors that affect the use of e-learning technology in education (Moses et al., 2008; Yee et al., 2009). Therefore, it was suggested that there are relationships between learning and teaching styles and the use of e-learning as a tool for teaching and learning. However, no such research has been conducted in Libya to determine the relationship between teaching and learning styles and the behavioural intention to use. This chapter therefore, aims to fill this gap.

**AC.3 Research Objectives**

The aim of this empirical study is to identify which teaching and learning styles have a higher possibility of using e-learning as a tool for teaching and learning in Libyan higher education. Both teaching and learning styles, as well as behavioural intention to use are measured through a questionnaire in this research. The specific objective of this research is to identify the effect of different teaching and learning styles in respective behavioural intention to use e-learning in Libyan higher education.

The Perceived Learning Style is referred to a person’s characteristics in the ways of gathering, organizing and thinking about information (Ahmed, 2012). Moreover, it is a student’s way to interpret and understand what he sees and observes. It can be classified into visual, aural, reading/ writing and kinaesthetic (VARK). One of the most common and widely used instruments measuring learner-perceived information is the VARK.
learning styles (Fleming & Mills, 1992). Preferred learning styles are the behaviours and attitudes which determine a person’s preferred method of learning. This can be classified into four types of learners: Activist, Pragmatist, Reflectors and Theorist (Honey & Mumford, 1986).

The following three hypotheses were tested so as to achieve the purpose and objectives of this research.

H1: Students with different Perceived Learning Styles have different Behavioural Intentions to Use e-learning in Libyan higher education.

H2: Students with different Preferred Learning Styles have different Behavioural Intentions to Use e-learning in Libyan higher education.

H3: Teachers with different Preferred Teaching Styles have different Behavioural Intentions to Use e-learning in Libyan higher education.

**AC.4 Background**

Section AC.4.1 and AC.4.2 show the detailed descriptions of how the Perceived Learning Styles, Preferred Learning Styles and Preferred Teaching Styles were classified.

**AC.4.1 Learning Styles**

A learning style is the method that an individual prefers to receive information from the surrounding and is assumed to be the best way of learning by the individual. Reed and Oughton (1997) mentioned that learning styles refer to how people prefer to represent and organize information. Grasha (1996) described a learning style as simply a person's preferred method of learning. Price (2004) offered another definition, “learning style is often used as a metaphor for considering the range of individual differences in learning. The term ‘learning style’ when used in this way, is considered to include a range of constructs describing the variations in the manner in which individuals learn”.

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In the past decades, many models of learning styles have been introduced to allow learners to be categorised according to different learning types. The importance of identifying the learning style is that it could be used to provide the learner with suitable content that may lead to learning enhancement. Moran (1991) reported that there are at least 21 various models of learning styles which makes it difficult to provide a definite single definition. Furthermore, Fleming and Mills (1992) stated that more than 30 learning style models have been developed in the last three decades. Some of the most well-known and widely used theoretical models of learning styles are the Myers-Brigss Type Indicator (Myers et al., 1998), Kolb learning styles Theory (Kolb, 2005), Felder and Silverman models (Felder & Silverman, 1988), VARK (Fleming & Mills, 1992), as well as Honey and Mumford (Honey & Mumford, 1986).

In this research, the VARK model is selected to evaluate the Perceived Learning Styles because it provides the most concise tool and comes with many relevant questions that are suitable for this research. The model also contains a small number of questions that can be completed in a short time frame. Another reason why the VARK is selected is because it can clearly map the type of learning materials used. VARK, as illustrated in Table AC.1, is divided into visual, auditory, verbal (read/ write) and kinesthetic learning.

<table>
<thead>
<tr>
<th>Learning styles</th>
<th>Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Visual</td>
<td>Prefers information depicted in maps, diagrams and watch presentations involving pictures and visual media.</td>
</tr>
<tr>
<td>Aural/Auditory</td>
<td>Prefers information that is &quot;heard or spoken&quot;, learns best from lectures, tapes, group discussion, email and radio.</td>
</tr>
<tr>
<td>Verbal (read/ write)</td>
<td>Prefers information displayed as words. Favours modes such as reports, essays, PowerPoint, the Internet. Learns best by reading and taking notes.</td>
</tr>
<tr>
<td>Kinesthetic</td>
<td>Prefers experience and practice either through personal experience, practical applications or simulation.</td>
</tr>
</tbody>
</table>
With respect to Preferred Learning Style, some people prefer to learn by reading and making reflections on how it could be utilized to their own situations, while others prefer learning by trying the ideas out and also by reviewing their experience before proceeding to the next step. Kolb (1984) identified four stages of learning styles that are more specific for individual learning approaches. Based on Kolb’s theories, Honey and Mumford (1986) advanced the Learning Styles Questionnaire (LSQ) and proposed four basic learning styles which are Activist, Reflector, Theorist and Pragmatist. Characteristics of Honey and Mumford’s (Honey & Mumford, 1986) learning styles are illustrated in Table AC.2.

**Table AC.2: Honey and Mumford Learning Styles**

<table>
<thead>
<tr>
<th>Learning styles</th>
<th>Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Activists</td>
<td>Involve themselves fully and without bias in new experiences, enjoy new challenges and solutions, enjoy here and now, have an open-minded approach to learning, enthusiastic about anything new, days are filled with activities.</td>
</tr>
<tr>
<td>Reflectors</td>
<td>Careful, methodical, thoughtful, good at listening, stand back and ponder about experiences, collect data and take the time to work towards an appropriate conclusion.</td>
</tr>
<tr>
<td>Theorists</td>
<td>Think in a logical manner, objectively and rationally, observe and make theories. They need models, concepts and facts in order to engage in the learning process.</td>
</tr>
<tr>
<td>Pragmatists</td>
<td>Keen on trying out new ideas, theories and techniques into practice, search for new ideas and experimental, act quickly and confidently on ideas, go straight to the point.</td>
</tr>
</tbody>
</table>

**AC.4.2 Teaching Style**

Since 1930, teaching styles have been emphasized in the education sector and educational psychology and scholars have continually introduced theoretical discussions and classifications of teaching styles from different perspectives. Reinsmith (1994)
mentioned that the teaching style is the teacher's presence, as well as the quality and nature of encounter between teachers and students. According to Crossroads (2006), teaching styles can also differ from teacher to teacher because they are strongly impacted by the teacher’s personal qualities, educational philosophy, philosophy in life and attitude. Gregorc (1979) stated that teaching styles are made up of personal teaching behaviours and the specific medium which was used to receive and transmit.

Teaching styles are determined by the teaching preferences, assessment of learning tools, delivery of instruction and an enhancement of a student’s individual learning needs (Grasha, 1996; Hunt, 1971). Grasha (1996) believed that teaching styles are considered special patterns of needs, behaviours and beliefs that teachers show in the classroom. Grasha also mentioned that teaching styles are multi-dimensional and influence how teachers introduce information, manage classroom tasks, interact with students, supervise coursework, mentor students and socialize with students in the field.

In this research, teaching styles refer to the five distinct teaching styles of Grasha’s teaching style model (1996), which are Expert Teaching, Formal Authority Teaching, Personal Model Teaching, Facilitator Teaching and Delegator Teaching. The Grasha-Richman Teaching Style model is illustrated in Table AC.3.
Table AC.3: Grasha-Riechmann Teaching Style

<table>
<thead>
<tr>
<th>Style</th>
<th>Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Expert</td>
<td>Possesses knowledge and expertise that learners need, guides, focuses on facts and work to ensure all students are well-prepared.</td>
</tr>
<tr>
<td>Formal Authority</td>
<td>Responsible for providing and controlling the flow of curriculum, supervises learners closely with a critical eye towards standard practices and procedures, as well as concerned with providing positive or negative feedback.</td>
</tr>
<tr>
<td>Personal Model</td>
<td>Demonstrates and models what is expected, believes in teaching by personal examples, showd students how to do things, wants students to observe and emulate approach.</td>
</tr>
<tr>
<td>Facilitator</td>
<td>Facilitates and focuses on activities, asks questions, explores options, encourages student-responsibility, independence and initiative.</td>
</tr>
<tr>
<td>Delegator</td>
<td>Puts much control for learning on an individual or group and allows learners to explore and design their learning projects.</td>
</tr>
</tbody>
</table>

AC.5 Methodology

AC.5.1 Research Design

A quantitative research approach was used to investigate the factors that have an impact on the implementation of e-learning in Libya. Quantitative research methodology is a widely used approach in Social Science studies, including Education and Information Systems Management (Palys, 1997). Quantitative research is done to determine effects, causes and relationships and is more theory-based (Jurs & Wiersma, 2009). In this research, quantitative research methodology is used and implemented throughout the study detailed in Chapter 4.2.

AC.5.2 Population and Sample

The population in this study consists of students and teachers from the Libyan higher education system. The self-administered survey was targeted at random students and teachers. Participants were recruited from four universities: two private and two public universities. More details can be found in Chapter 4.2.
**AC.6 Results of the study**

The results of this study concentrate on the impact of teaching and learning styles on behavioural intention to use e-learning in Libyan higher education. In order to answer the research question, “Which are the learning and teaching styles that have the most impact on behavioural intention to use e-learning?”, the following hypotheses were tested.

H1: Students with different Perceived Learning Styles have different behavioural intentions to use e-learning in Libyan higher education.

H2: Students with different Learning Styles have different behavioural intentions to use e-learning in Libyan higher education.

H3: Teachers with different Teaching Styles have different behavioural intentions to use e-learning in Libyan higher education.

**AC.6.1 Testing of H1**

One-way ANOVA is utilised to test Hypothesis 1. Table AC.4 shows the descriptive statistics of the four learning styles: the Mean (M), Standard Deviation (SD), Minimum (Min) and Maximum (Max). It can be seen that most of the students in Libya have a Perceived Kinesthetic style of learning (34.3%), followed by Read/Write (30.8%), Auditory (18.9%) and Visual (16.0%).

<table>
<thead>
<tr>
<th>Learning styles</th>
<th>Frequency</th>
<th>(%)</th>
<th>M</th>
<th>SD</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Visual</td>
<td>51</td>
<td>16.0</td>
<td>10.9020</td>
<td>1.60318</td>
<td>7.00</td>
<td>15.00</td>
</tr>
<tr>
<td>Auditory</td>
<td>60</td>
<td>18.9</td>
<td>10.7000</td>
<td>1.42971</td>
<td>8.00</td>
<td>15.00</td>
</tr>
<tr>
<td>Read/Write</td>
<td>98</td>
<td>30.8</td>
<td>10.4592</td>
<td>2.24834</td>
<td>4.00</td>
<td>15.00</td>
</tr>
<tr>
<td>Kinesthetic</td>
<td>109</td>
<td>34.3</td>
<td>10.0367</td>
<td>1.75292</td>
<td>3.00</td>
<td>15.00</td>
</tr>
</tbody>
</table>
One-way ANOVA was also conducted to determine the existence of possible differences between the mean among the four groups of Perceived Learning Styles. The results of the analysis are presented in Table AC.5, where the data show an $F (3, 314) = 3.193$, $P<.05$. Based on the analysis of the results (sig. was less than 0.05), there was statistical significant difference between the four types of Perceived Learning Styles towards the behavioural intent to use e-learning in Libyan higher education. This test result confirm to validate hypothesis H1 - Students with different Perceived Learning Styles have different behavioural intentions to use e-learning in Libyan higher education. This study concluded that there are significant differences among the four learning styles towards the Behaviour intention to use e-learning in Libyan higher education.

<table>
<thead>
<tr>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>32.678</td>
<td>1071.300</td>
<td>1103.978</td>
<td></td>
</tr>
<tr>
<td>Within Group</td>
<td></td>
<td>3</td>
<td>314</td>
<td>3.193</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>317</td>
<td>317</td>
<td></td>
</tr>
</tbody>
</table>

To test which Perceived Learning Styles between the four affect Behavioral Intention, the Post Hoc Test can be used. The Post Hoc can present the mean difference between each pair among the four Perceived Learning Styles as shown in Table AC.6.

| Table AC.6: The Significant Mean Difference in the Comparisons of Perceived Learning Styles |
|---------------------------------|-----------------|-----------------|-----------------|-----------------|
| Visual                         | Auditory        | Read/Write      | Kinesthetic     |
| Visual                         | 0.20196         | 0.44278         | 0.86526*        |
| Auditory                       | -0.02196        | 0.24082         | 0.66330*        |
| Read/Write                     | -0.44278        | -0.24082        | 0.42249         |
| Kinesthetic                    | -0.86526*       | -0.66330*       | -0.42249        |

* The mean difference is significant at the 0.05 level
The table above shows the significant mean difference comparisons of Perceived Learning Styles by using Fisher’s Least Significant Difference (LSD) method. The results show that there are two pairs with a statistical significant difference at -0.86526, and -0.66330. The first pair is Kinaesthetic and Visual, and second pair is Kinaesthetic and Auditory. Hence, the more impactful pairs are Kinaesthetic and Visual (-0.86526), followed by Kinaesthetic and Auditory (-0.66330).

**AC.6.2 Testing of H2**

One-way ANOVA is utilised to test Hypothesis 2. Table AC.7 shows descriptive statistics of the four learning styles: Mean (M), Standard Deviation (SD), Minimum (Min) and Maximum (Max). It can be seen that most students are Pragmatist (39.9%), followed by Theorist (23%), then Reflector (20.1%) and finally, Activist (17%).

<table>
<thead>
<tr>
<th>Learning styles</th>
<th>Frequency</th>
<th>(%)</th>
<th>M</th>
<th>SD</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Activist</td>
<td>54</td>
<td>17.0</td>
<td>10.6852</td>
<td>1.68034</td>
<td>7.00</td>
<td>15.00</td>
</tr>
<tr>
<td>Reflector</td>
<td>64</td>
<td>20.1</td>
<td>10.3906</td>
<td>2.15006</td>
<td>4.00</td>
<td>15.00</td>
</tr>
<tr>
<td>Theorist</td>
<td>73</td>
<td>23.0</td>
<td>10.5479</td>
<td>1.98635</td>
<td>4.00</td>
<td>15.00</td>
</tr>
<tr>
<td>Pragmatist</td>
<td>127</td>
<td>39.9</td>
<td>10.2756</td>
<td>1.71676</td>
<td>3.00</td>
<td>15.00</td>
</tr>
</tbody>
</table>

One-way ANOVA was also conducted to determine the existence of possible differences between the mean among the four groups of learning styles. The results of the analysis are presented in Table AC.8 where the data show an F (3, 314) = .731, P<.05. Based on the analysis of the results (sig. was more than 0.05), there was no significant statistical difference between the four types of learning styles towards the behavioural intent to use. This test result failed to validate hypothesis H2 - Students with different Preferred Learning Styles have different Behavioural Intentions to Use e-learning in Libyan higher education. This study concluded that there are no significant
differences among the four learning styles towards the Behaviour intention to use e-learning in Libyan higher education.

**Table AC.8: One-way ANOVA Hypothesis 2**

<table>
<thead>
<tr>
<th></th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>7.659</td>
<td>3</td>
<td>2.553</td>
<td>.731</td>
<td>.534</td>
</tr>
<tr>
<td>Within Group</td>
<td>1096.319</td>
<td>314</td>
<td>3.491</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>1103.978</td>
<td>317</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**AC.6.3 Testing of H3**

One-way ANOVA is utilised to test Hypothesis 3. Table AC.9 shows the descriptive statistics of the five teaching styles: Mean (M), Standard Deviation (SD), Minimum (Min) and Maximum (Max). It can be seen that most of the teachers are Experts (40.7%), whereas the minority are Delegators (4.9%). The remaining teaching styles are Facilitator, Formal and Personal with the percentages of 36.8, 8.8 and 8.8 respectively.

**Table AC.9: Descriptive Statistics for Preferred Teaching Styles**

<table>
<thead>
<tr>
<th>Teaching styles</th>
<th>Frequency</th>
<th>(%)</th>
<th>M</th>
<th>SD</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Expert</td>
<td>74</td>
<td>40.7</td>
<td>10.2568</td>
<td>1.44356</td>
<td>7.00</td>
<td>15.00</td>
</tr>
<tr>
<td>Formal</td>
<td>16</td>
<td>8.8</td>
<td>9.8750</td>
<td>1.20416</td>
<td>7.00</td>
<td>12.00</td>
</tr>
<tr>
<td>Personal</td>
<td>16</td>
<td>8.8</td>
<td>10.2500</td>
<td>1.98326</td>
<td>7.00</td>
<td>14.00</td>
</tr>
<tr>
<td>Facilitator</td>
<td>67</td>
<td>36.8</td>
<td>10.0448</td>
<td>1.59955</td>
<td>3.00</td>
<td>15.00</td>
</tr>
<tr>
<td>Delegator</td>
<td>9</td>
<td>4.9</td>
<td>9.5556</td>
<td>3.00463</td>
<td>3.00</td>
<td>13.00</td>
</tr>
</tbody>
</table>

One-way ANOVA was also applied to determine whether there are significant differences between the mean among the five groups of teaching styles. The results of the analysis displayed in Table AC.10, show an F (4, 177) = .545, P<.05. Based on the analysis of the results (sig. was more than 0.05), there was no statistical significant difference between the five types of teaching styles towards the BI. This test result failed to validate hypothesis H3 - Teachers with different Preferred Teaching Styles.
have different Behavioural intentions to Use e-learning in Libyan higher education. This study concluded that there are no significant differences among the five teaching styles towards the behaviour intention to use e-learning in Libyan higher education.

Table AC.10: One-way ANOVA Hypothesis 3

<table>
<thead>
<tr>
<th></th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>5.843</td>
<td>4</td>
<td>1.461</td>
<td>.545</td>
<td>.703</td>
</tr>
<tr>
<td>Within Group</td>
<td>473.960</td>
<td>177</td>
<td>2.678</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>479.802</td>
<td>181</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

AC.7 Conclusion and Discussion

This chapter has presented the study of the impact of teaching and learning styles on behavioural intention to use e-learning in Libyan higher education. Based on the study outcomes, ANOVA was conduct to test H1 - Students with different Perceived Learning Styles have different Behavioural Intentions to Use e-learning in Libyan higher education. The hypothesis test shows that H1 is accepted. This implies that there is a significant difference between these four types of Perceived Learning Styles towards the Behavioural Intention to Use e-learning in Libyan higher education. The Post Hoc Test was used to test which Perceived Learning Style between the four had an impact on BI. The results present that there are tow pairs of Perceived Learning Styles that have a statistical significant difference. The pairs showing more of an impact are Kinaesthetic and Visual (-0.86526) followed by Kinaesthetic and Auditory (-0.66330).

Based on the findings, ANOVA was also conducted to test H2 - Students with different Preferred Learning Styles have different Behavioural Intentions to Use e-learning in Libyan higher education. The hypothesis test shows that H2 was rejected. This study highlighted that there are no significant differences among the four learning styles towards the behaviour intention to use e-learning. This result is consistent with results of past studies by (Doherty & Maddux, 2002; Martin, 2004; Rapeepisarn et al., 2008),
even though the samples are from different countries. Similarly, with the ANOVA test, the result of testing of H3 also showed that there is no significant differences in Preferred Teaching Styles which affect the Behavioural Intention to Use e-learning. This result is also consistent with past studies by (Rapeepisarn, 2012; Umran-Khan & Iyer, 2009). On the other hand, learning and teaching styles are considered to play a similar role for the acceptance of e-learning by the students and teachers in Libyan higher education. In other words, all students and teachers regardless of their preferred teaching and learning styles, had a similar behavioural intention to use e-learning in Libyan higher education. This implies that students and teachers, irrespective of their learning and teaching styles, are willing to adopt e-learning and thus, this will have a higher impact on the success of implementing e-learning in Libyan higher education.
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