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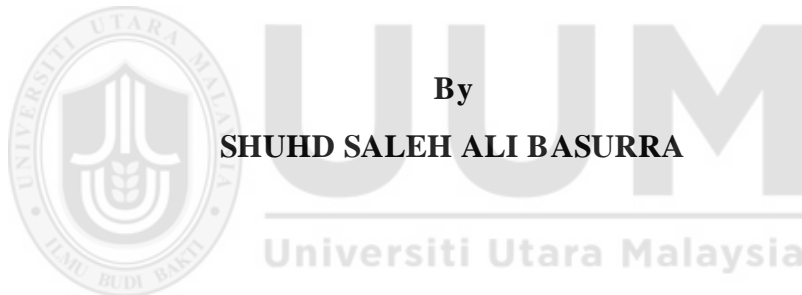


**FACTORS INFLUENCING STUDENTS' INTENTION TO USE MOBILE
LEARNING: A STUDY AT YEMEN HIGHER EDUCATION
INSTITUTIONS**



**MASTER OF SCIENCE (MANAGEMENT)
UNIVERSITI UTARA MALAYSIA
April 2021**

**FACTORS INFLUENCING STUDENTS' INTENTION TO USE MOBILE
LEARNING: A STUDY AT YEMEN HIGHER EDUCATION INSTITUTIONS**



**Thesis Submitted to
Othman Yeop Abdullah Graduate School of Business,
Universiti Utara Malaysia,
In Fulfilment of the Requirement for the Master of Science (Management)**

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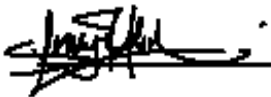
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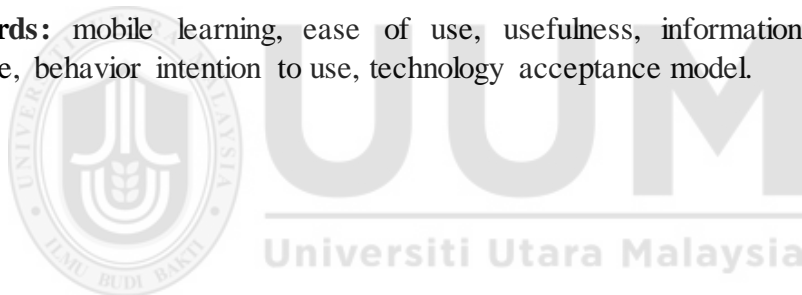


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ABSTRACT

Mobile learning (M-learning) is a novel e-learning through mobile technologies. As a result, education for teachers and learners becomes unlimited by time and place. M-learning services makes Yemeni higher education more accessible, but for successful acceptance, students must understand the technology. M-learning implementation in Yemeni higher education institutions are facing two issues namely: the disparity concerning the perceptions of technology between students and the university, and inadequate knowledge and inclusion of students' acceptance during technology investment decision. The acceptance and use of m-learning services among students in Yemeni higher education is thus examined in this study, and an acceptance model of students of m-learning in higher education environment is proposed based on Extended Technology Acceptance Model (TAM2). Students' acceptance of behavior intention to use m-learning and its impact on usage behavior is investigated in higher education environment. Factors such Perceived Ease of Use, Perceived Usefulness, Information Quality and Social Influence have shown a great impact on the Behavior Intention to use Mobile Learning services. This research employed SPSS analysis techniques to test the measurement and structural models with a sample of 381 students.

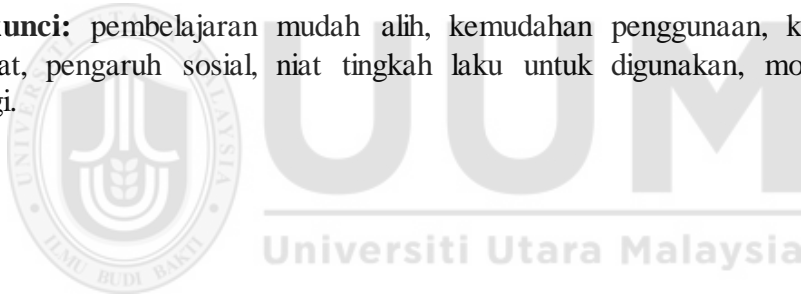
Keywords: mobile learning, ease of use, usefulness, information quality, social influence, behavior intention to use, technology acceptance model.



ABSTRAK

Pembelajaran bergerak (M-pembelajaran) adalah e-pembelajaran yang baru melalui teknologi mudah alih. Hasilnya, pendidikan bagi guru dan pelajar tidak lagi dikekang oleh masa dan tempat. Perkhidmatan m-learning menjadikan pendidikan tinggi Yaman lebih mudah diakses, namun bagi penerimaan yang berjaya, pelajar harus memahami teknologinya. Pelaksanaan m-pembelajaran di institusi pendidikan tinggi Yaman sedang menghadapi dua isu iaitu: perbezaan berkenaan persepsi teknologi antara pelajar dan universiti, dan kurangnya pengetahuan dan kurang mengambil kira penerimaan pelajar ketika mengambil keputusan pelaburan teknologi. Oleh itu, penerimaan dan penggunaan perkhidmatan m-learning di kalangan pelajar pendidikan tinggi Yaman diselidik dalam kajian ini, dan satu model penerimaan pelajar m-pembelajaran di persekitaran pendidikan tinggi dicadangkan. Penerimaan pelajar terhadap niat tingkah laku untuk menggunakan m-pembelajaran dan impaknya terhadap tingkah laku penggunaan dikaji dalam persekitaran pendidikan tinggi. Keadaan tahap kesedaran pelajar mengenai perkhidmatan m-pembelajaran pada masa kini digambarkan dalam kajian ini. Penyelidikan ini menggunakan teknik analisis SPSS untuk menguji model pengukuran dan struktur dengan sampel 381 pelajar.

Kata kunci: pembelajaran mudah alih, kemudahan penggunaan, kegunaan, kualiti maklumat, pengaruh sosial, niat tingkah laku untuk digunakan, model penerimaan teknologi.



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LIST OF ABBREVIATIONS

M-learning	Mobile Learning
E-learning	Electronic Learning
TAM	Technology Acceptance Model
PU	Perceived Usefulness
BI	Behavioral Intention to Use
PEOU	Perceived Ease of Use
IQ	Information Quality
SI	Social influence



CHAPTER ONE: INTRODUCTION

1.1 Introduction to the Study

This study seeks to analyze the connection of the variables of; ease of use, usefulness, information quality, and social influence to the behavioral intention to use the Mobile Learning system between students of the University of Aden, Yemen. In chapter one the subjects that will be discussed are, the study background, problem statement, research objectives, research questions, and scope and limitation of the study. In addition to mobile learning or M-Learning has been appropriately delineated. Further on, this study will deliberate the significance of the study, also the contribution that this study will have in the education field. After that, the researcher will present the definition of key terms to give an idea to the reader about the meaning of each term in this study.

1.2 Background of Study

The clear impact which ICTs affect daily life is observed clearly in all countries. However, the developing and least developing countries still lack behind this effect. Yemen consider one of these least developing countries. Based on the statistics Yemeni Internet users now are around 7,903,772 from a total population of 29,825,964 and this represents the percentage of 26.5 % (IWS, 2020). This considering a noticeable increase for Internet users in the Yemen country especially compared to just 1.8% users in 2010.

Sana'a is the Capital of Yemen then comes Aden is the second city of the Republic of Yemen. The number of citizens in Aden reaches 980,455 (world population review, 2020). In 1970, the first University was founded in Aden, and this was Aden University.

In that year, the University started with four Faculties, Faculty of Agriculture Science, education, Medicine, and economic. From that year until 1999 there were a number of Faculties which was founded and increase the number of Faculties which was only four to be fifteen.

The system of Education which the University of Aden has is limited in regard to accessing all Information and communication technologies tools and this is normal for such developing countries where the level of poverty is high. Therefore, this shortage of resources to ICTs may lead the University students to face difficulties to reach to new technology and methods which might help them in their education journey. Using such technology of Mobile Learning between university students can easy solve many issues that relate to the process of education like accessing resource of learning and real-time communication (Kruger, 2010). Also, reduce the cost of operation, easy and fast user communication, and interaction efficiency all these benefits are considered when having technologies of information and communication to support the learning environment. (Sife et al., 2007; Kattoua et al., 2016).

Mobile Learning definition or M-Learning varies from community to community, but in essence, this concept is a subdivision of, educational technology, E-Learning and distance education which generally relates to learning through Contexts and education through using mobile devices. The idea of mobile learning technology has been explained in various ways, and the concept itself has various terms, such as M-Learning, personalized learning, U-Learning, learning while mobile, ubiquitous learning, at anywhere and at any time learning, and handheld learning. (Mehdipour & Zerehkafi, 2013; Merza, 2018).

The Mobile learning concept has been defined as a learning type that can happen potentially at any location and at any period of time by using or utilizing any portable devices (Behera, 2013; Hamidi and Chavoshi, 2018). According to Kim et al. (2013), such a learning mode provides the user with a learning experience that is more personalized. Mobile devices as the main feature of m-learning allow the user to access learning applications in numerous contexts during their collaboration with their mates or with other users (Kaliisa and Picard, 2017). Also, the rapid development of technology is gradually transforming m-learning from an asynchronous method of learning to connect students with teachers and for content delivery. In view of that, asynchronous learning allows the learner to acquire information without having to interact with their instructor as can be exemplified in the activity of reading and understanding an online article using a mobile device. Contrariwise, synchronous learning allows the learner to involve in two-way interaction with the instructor actively, as can be exemplified in the participation in online webinar whereby partakers could post questions or comments via tools of video conferencing or a smartphone.

Neither time nor space could restrict m-learning, and for this reason, Goundar (2011) and Al-Absi et al. (2020) indicated that this method of learning enables the communication between teacher and student using various learning tools run with mobile gadgets. Mobile devices can be utilized in a multitude of ways such as email sending and receiving, voice and video calls, picture taking and sharing, video games, and social networking, just to name a few. According to Mockus et al. (2011), three common qualities generally found in handheld device function were utility, communication, and fun.

There is a huge demand and need for mobility in educational and work environments. To satisfy these needs, the technology of mobile has become very popular as more people travel and collaborate widely across boundaries. “Mobile learning, an offshoot of e-learning is being heavily touted as the next movement that may revolutionize not only workplace learning but also classroom learning” (Adesope et al., 2007; Kaliisa and Picard, 2017).

Mobile learning adoption between the students in Yemeni Universities might increase interactive collaborative learning between students. To attract students with new learning ideas we should use these kinds of tools as innovative methods. Mobile learning ease of use may help each one to have access to many learning methods free of charge. The social media group, access free, blogs and sharing media all are features which have a positive effect with all student’s university when they use these kinds of new technology for learning.

When adopting mobile learning between students of Aden University, this will be a great move to provide benefits for students and to let them controlling and customizing their learning skills and provide themselves with many kinds of opportunities. However, no one can guarantee if this new method going to be accepted by users of Aden University or not? Therefore, this research study is planning to clarify the factors which may affect students’ usage of mobile learning if this method has been adopted between students in Aden University.

The main aim of the research study to Examining and identifying the factors that influenced the student’s intention when using mobile learning. Technology acceptance model TAM theory is proposed to identify and examine, among other factors, the ease

of use and usefulness by students which affect their intention as the predictors of the usage behaviors in the mobile learning environment.

1.3 Problem Statement

Among the subjects of interest among researchers in this domain is the success or failure of mobile learning, and as mentioned in Embi and Nordin (2013), the majority of these researchers were examining the subject post-trial. In view of that, Mtebe and Raisamo (2014) proposed examining the elements affecting the students' acceptance, for instance, factors of acceptance, requirements and limitations, Before implementing the m-learning. This way, the money and time used in the system implementation are well spent and may succeed whereby acceptance of students can be achieved. Embi and Nordin (2013) further mentioned the value of such investigation in helping the Universities to align their strategic planning to meet the requirements and needs of students. For learning services, Williams (2009) and Alzaza and Yaakub (2011) viewed mobile learning as a prominent alternative platform as it is vital to have awareness of the impacting factors of acceptance toward mobile learning systems between learners in higher education institutions. Moreover, the widespread use of mobile technologies allows today's students and teachers to work and study independently of place and time. (Tuparova et al., 2017). In this regard, among the major factors of m-learning success is the readiness and cognitive engagement of the learner in m-learning activities (Liu & Han, 2010; Al-Absi, et al., 2020).

For the situation of Yemen, the political conflict has impeded the development of e-learning infrastructure. As such, universities in this country have not been able to regularly carry out classes, while students have to resort into using personal devices

(e.g., mobile phones, tablets, and PCs). Hence, in providing support to the learning environment, the application of mobile learning would be a very helpful idea to students of universities (Tuparova, 2017).

At present time, mobile learning system-related devices for example smartphones and portable tablets are more widespread and are within the means of users. This has allowed wireless technology to improve learning considerably and furnish students with digital content. Mobile technology is attractive and valuable to students and they use it regularly in their everyday dealings. West (2013) relevantly stated that young people indefinitely want to utilize mobile devices so that education could be more engaging to them. The author further indicated that mobile devices could be personalized to suit the specific needs of the user.

For universities, the recognition of the factors linked to mobile learning acceptance will allow them to appropriately implement this method of learning is to improve the delivery of services to their students. In view of that, some past studies (e.g., Alzaza & Yaakub, 2011; Hilmi et al., 2012; Pimpaka, 2013; Mac Callum & Lynn, 2013; Iyamu & Mtshali, 2013; Tuparova et al., 2017) noted that the incorporation of such factors will increase education and learning process and students will be more loyal towards their institutions. Still, as Al-matari et al. (2013) had pointed out, factors that may impact the intention of students need to be anticipated. Also, the university needs to understand how these factors could stimulate the usage of m-learning among students. This way, the university could appropriately invest in the developments of mobile service and content. Still, failure in accepting new technology will impede students from gaining information. As mentioned by some (e.g., Liu & Han, 2010; Ariffin, & Dyson, 2012; Pimpaka, 2013; AlQudah and Kamsuriah, 2014; Din et al., 2014), Participation of

students in the learning process using mobile and adoption of any new information system appears to be impeded by factors of PEO, PU, IQ, and SI. Thus, factors that are perceived as crucial in the adoption of learning using mobile as viewed in university students need to be investigated.

Hence, in m-learning implementation among Universities, 2 issues were found to make it prominent. “A disparity in terms of the perceptions of technology between students and the university was the first issue, while lack of knowledge and integration of students’ acceptance when deciding on technology investment was the second issue” (Alrasheedi & Capretz, 2015). These factors need to be examined. Limitations and related requirements need to be examined as well. All of these have been found to affect the acceptance of m-learning among students in higher learning institutions. Hence, such scrutiny becomes the study aim. Therefore, the study going to suggest a new model to examine the acceptance of mobile learning usage.

1.4 Research Questions

As stated in the problem statement, this research leads to four research questions:

1. Is there any relationship between perceived ease of use and behavioral intention to use mobile learning?
2. Is there any relationship between perceived usefulness and behavioral intention to use mobile learning?
3. Is there any relationship between information quality and behavioral intention to use mobile learning?
4. Is there any relationship between social influence and behavioral intention to use mobile learning?

1.5 Research Objectives

The aim of this study research is to achieve the following objectives:

1. To examine the relationship between perceived ease of use and behavioral intention to use mobile learning
2. To examine the relationship between perceived usefulness and behavioral intention to use mobile learning
3. To examine the relationship between information quality and behavioral intention to use mobile learning
4. To examine the relationship between social influence and behavioral intention to use mobile learning.

1.6 Scope and Limitation of the Study

This research study will obtain data from students of the University of Aden (Aden campus) and a single theoretical background namely TAM “technology acceptance model” is used to underpin this study. The use of the restricted sample, namely a sample from only one higher education institution may limit the generalizability of the findings. This becomes a limitation of the study. The use of single theoretical background limits this study as well because reliability and validity of the study factors may be difficult to achieve. As such, future related studies should include a background that is more theoretical in order that other factors that could have influence students’ intention when using mobile learning between university students could be investigated as well.

1.7 Significance of Study

1.7.1 Theoretical Contribution

Mobile phone usage is very popular with everyone nowadays, and it's used for many reasons and the primary reason is communication. People's lives have become increasingly reliant on mobile devices. As continuously developing and expanding technology, the technology of mobile is becoming more primary in the sector of education, particularly in higher education. Particularly, educational establishments are heavily using this technology of mobile learning as the main alternative for delivering education services to students. Therefore this research study will add to the theory, the methodology and the practical application of the technology of mobile learning at the University of Aden, Yemen, particularly in higher education.

Accordingly, several aspects have been found crucial in improving the learning process of students. These aspects include perceived ease of use, perceived usefulness, information quality, and social influence. Considering those findings, the purpose of executing this research study is to assure the administrators of Aden University of the importance of understanding the aspects that impact m-learning use. As such, an assessment tool will be constructed in this study and it is hoped that this tool will ease the university administrators in executing the process of m-learning that will stimulate m-learning adoption among students.

1.7.2 Practical Contribution

This study is of value to higher education setting as it scrutinizes the link between acceptance of students and the effects of m-learning use, and such link could result in students who are independent learners. In other words, with m-learning, students will become active clients of teaching. Further, the learning nature of students will change as the occurrence of learning will not be restricted by time or place. Also, the university could utilize the information concerning the factors influencing acceptance of students of m-learning provided by this study as valuable guidance in encouraging students to use m-learning.

Equally, Limitations and requirements to adopt the M-learning by students are addressed in this research study, and it will positively add to the domain of m-learning in terms of theory. This will allow the establishment of meaningful m-learning services that are not only effective but also meaningful for institutions of higher education. In view of that, this research attempts to enrich the available proposed solutions which could raise the acceptance of university students toward the m-learning in the Yemeni higher learning institution, in this context, the University of Aden. The study outcome will solidify the prevailing substantiation on information systems and the success of the implementation of m-learning service, by presenting vital information for the application. Hence, universities could be more informed and equipped in their creation and accomplishment of complete acceptance of m-learning. Not only that, the needed attitude for technology and their relationship can be fostered and achieved as well, focusing on use, usage, satisfaction, and the m-learning benefits.

1.8 Key Terms Definition

The definitions of each concept involved in the present study are presented as follows:

a) Mobile Learning

The M-learning definition is a learning type that may occur at any time or place with the utilization of handy device (Kukulaska & Shield, 2008; Behera, 2013; Basak et al., 2018)

b) Ease of Use

Ease of Use definition can be described as the degree to which an individual believes that using a specific information system is easy to use and free of effort (Davis et al., 1989).

c) Usefulness

Usefulness definition is the degree to which an individual believes that using a particular system would enhance his or her job performance (Davis et al., 1989).

d) Information Quality

Information quality is a concept relating to the level to which users would view that the information is pertinent, well-timed, precise, and thorough (Lee et al., 2002; Cidral et al., 2018)

e) Social Influence

SI relates the person's degree of confidence when his/her other significant are certain that he or she should use the technology (Al-Gahtani et al., 2007; Briz-Ponce et al., 2017)

f) Behavior Intention

Behavior Intention entails the vigor of the intention of a person in carrying out certain behavior (Venkatesh et al., 2003).



CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

Here, the researcher highlight the meaning of electronic learning systems and mobile learning within the context of higher education institutions. It also discusses the needs for m-learning acceptance, particularly between students. Further, the theories, hypotheses, and models associated with mobile learning acceptance are discussed.

2.2 Electronic Learning

As highlighted in past relevant studies including Gururajan (2002) Collis and Wende (2002), Wakahiu and Kangethe (2014), and Aldholay et al. (2018) distance learning in higher education becomes more feasible through electronic learning and it can become a component of higher education learning modes. Distance learning is thus available in many institutions and it is either offered separately or as a component of blended learning (Matheos et al., 2005; Azizan, 2010). Blended learning which comprises a combination of conventional teaching-learning and e-learning can cater to both traditional and non-traditional students, and utilizing this learning mode, the learning process of students is not bounded by time or place (Mortera-Gutierrez, 2006; Tuparova et al., 2017).

Several definitions have been proposed to illustrate the concept of e-learning. In their study, Trifonova and Ronchetti (2003) and Basak et al., (2018) described e-learning as a learning approach that is conveyed through technology or one that is improved by technology. Also, (Ghareb & Mohammed, 2016) stated that E-learning is an extraordinary apparatus, which has added to the circulation of learning materials and procedures through the web.

The authors further explained that in the approach, learners and instructors are not attending physically and the learning and teaching process is mediated by the technology, while hybrid learning within the conventional learning is carried out with services for example Course syllabus, online learning resources, and assessments.

In Mahanta and Ahmed (2012), e-learning was viewed as a learning method associated with learning that relies on online technology. This type of learning is supported by media and digital electronic instruments (Soliman, 2014; Basak et al., 2018). In other words, e-learning occurs online. In terms of blended learning, it has been perceived as an outcome of a blend of traditional and online learning, focusing on the improvement of the learning experience (Collis & Moonen, 2002; Meylani et al., 2015).

2.3 Mobile Learning

Mobile Learning definition or M-Learning varies from community to community, but in essence, this concept is a subdivision of, educational technology, E-Learning and distance education which generally relates to learning through Contexts and education through using mobile devices. The idea of mobile learning technology has been explained in various ways, and the concept itself has various terms, such as M-Learning, personalized learning, U-Learning, learning while mobile, ubiquitous learning, at anywhere and at any time learning, and handheld learning. (Mehdipour & Zerehkafi, 2013).

In 1977, Kay and Goldberg published “Personal Dynamic Media,” An electronic was conceptualized by Kay and Goldberg, the Dynabook is a gadget that was the size of a note pad that could be utilized by a student to perform numerous tasks, it had sufficient capacity to outrace a man’s sight and hearing, enough ability to store for later recovery

a great many reciprocals of reference materials, plans, records letters, activities, drawings, melodic scores, sonnets, waveforms, dynamic reproductions, and whatever else you might want to recall and change. Modern cell phones with Internet access have outperformed Kay and Goldberg's, (1977) proposed vision of learning. They anticipated reminder as a function, and also an ability to alteration with the goal that cell phones would not only to store information but additionally permit students to change content. The present mobile devices can give more intelligence than simply changing substance as the modern tools are more inclined towards the interactive aspect of things and equipped with internet connectivity which makes it easy for the user to gain information, which full filing Kay and Goldberg's prediction from 44 years prior.

What dubbed as the m-learning system is a sort of learning which was seen as an end product of co-assessment of the information technology of mobile learning Technology and fields of e-learning, leading to increase in Content of e-learning system freely of a particular area, usage of services made alignment and dynamically with others. M-learning could utilize to help customary learning (Wang, 2004; Ahmed & Ghareb, 2017) same as distance education (Mutlu, M.E and others, Barbara et al., 2005; Korucu et al, 2011). As mentioned by Mutlu, M.E, and others, mobile phones, tablet PCs, laptops, pocket PCs, MP3 players, versatile media players, and PDAs exist inside mobile informatics gadgets. According to Georgiev, T and others express that mobile education system is a piece of electronic learning, mobile learning system ought to give learning with no actual need for network connectivity at all places, in correspondence innovations of GPRS, GSM, Bluetooth, WAP, IEEE 802.11 are utilized by cell phones. M-learning is a distance education model which is intended to help with educating, with the help of its compactness, access and ease. On account of m-learning, there seemed a

schooling model which can be advantageous for the education process without consideration of time and place.

Within the context of education, mobile learning consists of the use of wireless and mobile technologies and these elements assist in broadening the access to learning materials whereby handheld devices like mobile phones or (PDAs) the personal digital assistants are used in the formation of a mobile community (Singh & Bakar, 2007; Baran, 2014). As a knowledge transfer mode that happens with the use of the mobile device, Nomadic (2004), Bryan (2004), Conejar and Kim (2014) and Hamidi and Chavoshi (2018) perceived mobile learning is a method that allows the existence of nomadic learners. In addition, M-learning can exist as a wireless online virtual community connected by a campus server.

As such, only by use of personal handhelds, m-learning let users to share their experiences and information both synchronously and asynchronously within a joint environment (Farooq et al., 2002; Al-matari & Iahad,2013; Tuparova et al., 2017). It is in fact the next e-learning mode, made possible by way of mobile technologies. Somehow, considering the capabilities and limitations of e-learning and m-learning, Lavoie (2007) and Fotouh et al. (2011) indicated that each differs from the other, significantly, but several studies (e.g., Quinn, 2000; McLean, 2003; Barker et al., 2005; Rekkedal & Dye, 2007) have examined such issues and noted significant similarities between both, as these studies found that with novel basis and more refined technologies, both may be representative of each other.

Notably, mobile learning is now a useful and practical solution as it allows students to participate in interactive and collaborative learning activities. As such, m-learning can

be regarded as an effective method in Involving learners in learning-related activities in countless locations, and this will improve Communication learning and collaborative learning in the classroom while also facilitating group projects work (Barker et al., 2005; El-Hussein & Cronje, 2010; Kaliisa and Picard, 2017).

Neither time nor space could restrict m-learning, and for this reason, Goundar (2011) indicated that this method of learning enables the communication between teacher and student using various learning tools run with mobile gadgets. Mobile devices can be utilized in a multitude of ways such as email sending and receiving, voice and video calls, picture taking and sharing, video games, and social networking, just to name a few. According to Mockus et al. (2011), three common qualities generally found in handheld device function were utility, communication and fun.

2.3.1 Definition and Concepts of Mobile Learning

M-learning has various definitions (Paliwal & Sharma, 2009), and the following Table 2.1 presents some of them alongside their corresponding authors.

Table 2.1
M-Learning Definitions

Author	Definition
Quinn (2000)	“M-learning functions as the intersection of mobile computing and e-learning in terms of accessible resources irrespective of your location; rich interaction; strong search capabilities; powerful support for effective learning; and performance-based assessment”.
Brown (2002)	“Mobile learning or (M-learning) is a natural extension of e-learning”.
Geddes (2004)	“Mobile Learning is the acquisition of any knowledge and skill via mobile technology, anywhere, anytime”.
O’Malley (2005)	“Mobile learning is all modes of learning that occurs when the learner is not at a specific location or learning that occurs when the learner grabs the learning opportunities offered by mobile technologies”.
Sharples (2005)	“A process of coming to know, in which learners construct transiently stable interpretations of their world in cooperation with their peers and teachers”.
Hong and Horng (2009)	“Mobile learning is a process and system that connects learners with circulated learning resources; while distance learning takes a wide array of forms”.
El-Hussein and Cronje (2010)	“Mobile learning is any mode of learning that occurs in learning environments and spaces, that considers the mobility of learner, technology and learning”.
Liu and Han (2010)	“M-learning is a new education channel that assists people in acquiring knowledge and skill universally, using mobile technologies”.
Santosh and Sidho (2013)	“Mobile learning is a natural extension of e-learning”.
Ally (2014)	“Mobile Learning is the delivery of learning content to mobile devices”.
Sánchez-Prieto et al. (2016)	“M-learning is a method of learning which is directly linked to the e-learning and it belongs to the independent typology, where teaching and learning process can have an electronic context”.

2.4 The Differences between M-Learning and E-Learning

The majority of authors mention that mobile learning is a normally advanced type of e-learning. Anyway, this assessment has a few insufficiencies. Another type of distance learning is E-learning and its phrasing is near those of conventional learning. Albeit the uses of m-learning are viewed as a development of e-learning, m-learning is an innovation and has its own specific terminology. For example, hyperlinked, Multimedia, interactive, the rich media environment is one of the phrases of e-learning; terms like informal, location, spontaneous, lightweight are the concepts emerging from m-learning (Korucu & Alkan, 2011).

E-and M-learning comparison

Table 2.2
E- and M-Learning Comparison

E-Learning	M-Learning
Hyperlinked	Networked
Collaborative	Lightweight
Media-rich	Situated learning
Distance learning	Informal
More formal	Realistic situation
Computer	GPRS
Bandwidth	Bluetooth
Simulated situation Hyper learning	Constructivism, situations, collaborative
Multimedia	Spontaneous
Interactive	Connected

Source: Behera, 2013

Communication among students

Table 2.3
Communication among Students

Face-to-Face	Flexible
E-mail-to-e-mail	24/7 instantaneous
Audio-teleconference common	Audio- and video-teleconference possible 24/7 instantaneous
Dedicated time for group meetings	Flexible timings on 24/7 basis
Travel time to reach to internet site	No travel time since wireless connectivity
Private Location	No geographic boundaries
Poor communication due to group consciousness	Rich communication due to one-to-one

Source: Behera, 2013

Variation in terms of assessment processes between E-learning and M-learning environments

Table 2.4
Tests and Assignments

Need to be in class or on computer	At any place(location)
Dedicated time limited time	24/7 Instantaneous Non limited time
Standard test	Individualized tests
Usually delayed feedback	Instant feedback possible
Not flexible -length tests	Not fixed -length/number of questions

Source: Sharma and Kitchens, 2004

2.5 Benefit of M-Learning

Studies (Becking et al., 2005; Attewell, 2005; Yousuf, 2007; Sarrab et al., 2012; Embi & Nordin, 2013; Al-Adwan et al., 2018) had discussed the reasons for m-learning usage. Among the major reasons is its ability in facilitating learners in improving their literacy and numeric skills, identifying their current competencies and finding out the area that requires help. Also, m-learning usage solves the issue of the digital divide, while learners will find themselves immersed in an informal learning mode, which will increase both their self-esteem and self-confidence. In addition, considering that m-learning is portable in nature, the learner could access their learning material in real-time as well. The aforementioned criteria make m-learning appropriate for independent and collaborative learning experiences. It has been evidenced that mobile learning and mobile technologies can give the platform for various activities of learning within various circumstances.

Learners irrespective of age could also use this method of learning. Also, through the incorporation of a blended path, Naismith et al. (2004) indicated the ability of m-learning in enhancing traditional lessons in terms of quality. Vovoula (2005) added that as opposed to traditional learning, m-learning compels learners to interact more because m-learning involves more contact and more 'bustle,' in addition to allowing the learner to communicate and collaborate with each other more. Also, the essence of mobile learning might lie in the function of saving data of mobile technologies so that users could retrieve the stored information whenever and wherever they need it (Zhonggen and Xiaozhi, 2019).

Hwang and Tsai (2011) stated that learning through m-learning is unique and personalized and isn't bound by time and place. M-learning offers convenience

(Norman, 2011) as well as secure and personalized learning (Lam et al., 2010). M-learning also offers flexibility and ease of access via personalized devices (Caudill, 2007; Rueckert et al., 2013).

Hence, for the context of universities as a part of higher education institutions and also colleges and schools, mobile learning is a practicable learning method, and the concept of learning is no longer bound to the classroom. Also, learning becomes possible beyond the bounds of formal education.

2.6 Higher Education's Mobile Learning Trends

Technologies of mobile and wireless have a huge impact in higher education, the equivalent in their portrayals of learning spaces (Johnson & Lomas, 2005, Wedge & Kearns; Chen et al., 2012; Shonola et al, 2016). Moreover, the institutions limit extended by ICT technology innovation in the institution that presently happens anywhere or whenever. Along with brilliant phones, portable and remote communication encourages user access to data without being obliged by location or time. All things considered, these gadgets can possibly modify the idea of the traditional classroom (Wentzel, 2005; El-Hussein, & Cronje, 2010; Goundar, 2011; Kassem, 2018).

To give better learning conditions, the education institutes have endeavored to provide learners with the most recent innovation in mobile technologies as in proportion to their beliefs or needs. This takes to the cycle of integration of ICTs technologies throughout most recent ages when teachers like to utilize different technologies like PCs and the internet in classrooms (Hsu, 2010). Yet the positive overall discernment and acknowledgment of mobile learning, a few specialists analyzed the pros and cons of

“mobile learning” and they have shown that from multiple points of view E electronic learning equalize the m-learning adapting particularly (Jan et al., 2016).

2.7 M-Learning Limitations

While examining the usage, some imitations issues of ought should not be disregarded on the grounds that dissimilar to e-learning, the limit related issues in m-learning are more common because of the restricted capacity of the current technologies. In any case, it can't be denied that the utilization of mobile learning innovation in the school curriculum is for the most part less expensive when comparing with old technology (Sadeghi, 2019). The ability of mobile devices is limited by including for example: a keyboard, small monitors, battery life, etc. Kim in 2013 and Sadeghi in 2019 prove that all these can block the utilization of versatile innovation in electronic learning.

It recommended to increase the wireless services across the education institutions and redesign the system for the aim of m-learning, with the end goal are suggested as a solution so the university will adequate capacity to promptly execute the most recent development innovation with regard to the technology (Islam et al., 2018).

Three significant issues relating to the use of mobile education have been recognized in the context of lifelong learning: student acceptance, qualities of mobile technologies, and cell phones' imitation of the display, and the protection and secrecy of client information (Yordanova, 2007). Furthermore, in light of the current impediments of mobile technologies, (Seppala et al., 2002; McLean 2003; Kukulska and Shield 2008; Corlettt et al., 2005; Sadeghi, 2019) have distinguished various critical difficulties looked by the community of users in executing m-learning. The difficulties are as follow: It requires high expenses to start, the internet connectivity issues, third part

networks incur a very high cost, multiple parties need to give authorization in case of the issue with negotiated access, the device has confined memory and capacity limit; these are main problems, insufficient screens size (excessively little) to in modern applications, cross-platform arrangements are unavailable, the industry suffers from the solutions that have been patented, current applications can't be effortlessly fused to the mobile technology, security is a critical issue and continuous innovation advancement causes precariousness and blocks supportability.

Regarding the feasibility of m-learning applications. Even with the inadequacies referenced above, m-learning can in any case be viewed as a deep-rooted action that changing society and as individuals enhance expertise and ability, the framework can be fused into their life conditions (Kalz, 2014). Another study led by the LSDA organization in the United Kingdom on the utilization of mobile devices by understudies matured 16 years to 24 years uncovered almost 50% of participants demonstrated are intrigued to utilize phones, perusing math and language-related issues. Also, albeit just (half) of the respondents as of now use palmtops pc, the greater part of them (55%) expressed that they may utilize the gadget (palmtops pc) in the event that it is sold at lower costs.

2.8 M-Learning Acceptance

'Acceptance of technology' is a broad concept, and within the context of students, Dillon and Morris (1996) described the concept as the discernible readiness within a user group to utilize IT to lend support to its designated tasks, and this definition is regarded as appropriate for m-learning acceptance, and thus, the present study will refer the concept to this definition. Also, models associated with this subject of study are numerous, and some were developed for examining and predicting the impacting

factors of user acceptance towards IT in various settings. In view of that, the present research aims to seek for the successful factors affecting the student intention when using mobile services in their universities.

2.9 Technology Acceptance Theories

As reported in studies including Grantham and Tsekouras (2005), Williams (2009) and Ghobakhloo et al. (2012), technology diffusion affects the success of implementation. Relevantly, having the awareness towards the theoretical understanding of online learning will be enhanced by factors that assess student acceptance of m-learning, resulting in the establishing good efficient and effective benefits while using these services.

Scholars in the past two decades have attempted to examine and explain the intention and accept to use of new information systems and have proposed some theories. The theory of (TAM) that proposed by Davis, (TRA) “Theory of Reasoned Action” proposed by Ajzen and Fishbein, (TPB) “Theory of Planned Behavior” proposed by Ajzen, (IDT) “Innovation Diffusion Theory” proposed by Rogers, the theory of “Extended technology acceptance model” (TAM 2) proposed by Venkatesh and Davis, and (UTAUT) “Unified Theory of Acceptance and Use of Technology” model that proposed by Venkatesh, Morris, Davis, and Davis. The years from (1989, 1980, 1985, 1991, 1995, 2000, and 2003) respectively are among the renowned ones.

2.10 Theoretical Framework

Two applicable theoretical constructs are brought forth in this study, and they are: consumer (student) acceptance, adoption, and behavior prediction. Accordingly, this study utilizes the model of acceptance (TAM) in the construction of a theoretical base.

TAM, which is one of the famous adoption models and intention, is reviewed in the following subsections.

2.10.1 Technology Acceptance Model (TAM)

TAM is the theory of technology acceptance model it describes the determining factors of user acceptance of various types of technologies (Davis, 1986). TAM was underpinned by TRA which is the theory of reasoned action proposed by Ajzen and Fishbein (1980) (Tung et al., 2014). TRA is an established model as well and it has been frequently applied in numerous fields for human behavior description and prediction.

TAM was initially made up of five components as follows: perceived ease of use (PEOU), perceived usefulness (PU), attitude toward using (ATU), behavioral intention to use (BI), and behavior system use. Davis (1989) as the creator of TAM stated that PEOU denotes the degree to which a user is confident that the application of a certain service would be free from effort, while PU is the level to which a person is sure that the application of a given system would improve his/her job performance. For system use, the most crucial factors are PEOU and PU. In view of this, Liu and Han (2010) and Abdullah et al. (2016) mentioned PEOU and PU as the main factors that form person acceptance when using any information system.

TAM in fact remains an efficient instrument for measuring acceptance. At the same time, assessment techniques that could appropriately evaluate the technology process – in this context, m-learning – needs to be established. Also, there needs to be a study that could comprehensively address the many environmental influences to acceptance of technology.

2.10.2 Extension of TAM (TAM2)

In order to provide an additional explanation on the intent of the user and the perceived usefulness of employing the process of the cognitive instrument and also the process of social influence, TAM was expanded by Davis and Venkatesh (2000) and TAM2 was created. The process of social influence has three factors impacting individual behavior. The purpose of the process is to ascertain if the technology is rejected or accepted by the user. These three factors are interrelated and are explained next.

The first factor is the subjective norm. The second factor is the image and the third factor is voluntariness (Moor & Benbasat, 1991). In short, this model the extended technology acceptance (TAM2) was developed as a way to improve and enhance the first mode of TAM's weakness points (i.e. not including the factor of social influence), by adding the subjective norm the theory as a deciding factor of users' behavioral intention to use and the attitude to utilize an information system. In the extended technology acceptance, the three components, namely perceived ease of use, perceived usefulness, and subjective norm were argued as factors of behavioral intention and also reflect social influence. These components also have found their place in this research indirectly. As mentioned previously, perceived usefulness and perceived ease of use came from performance expectancy and effort, while subjective norms came from social influence.

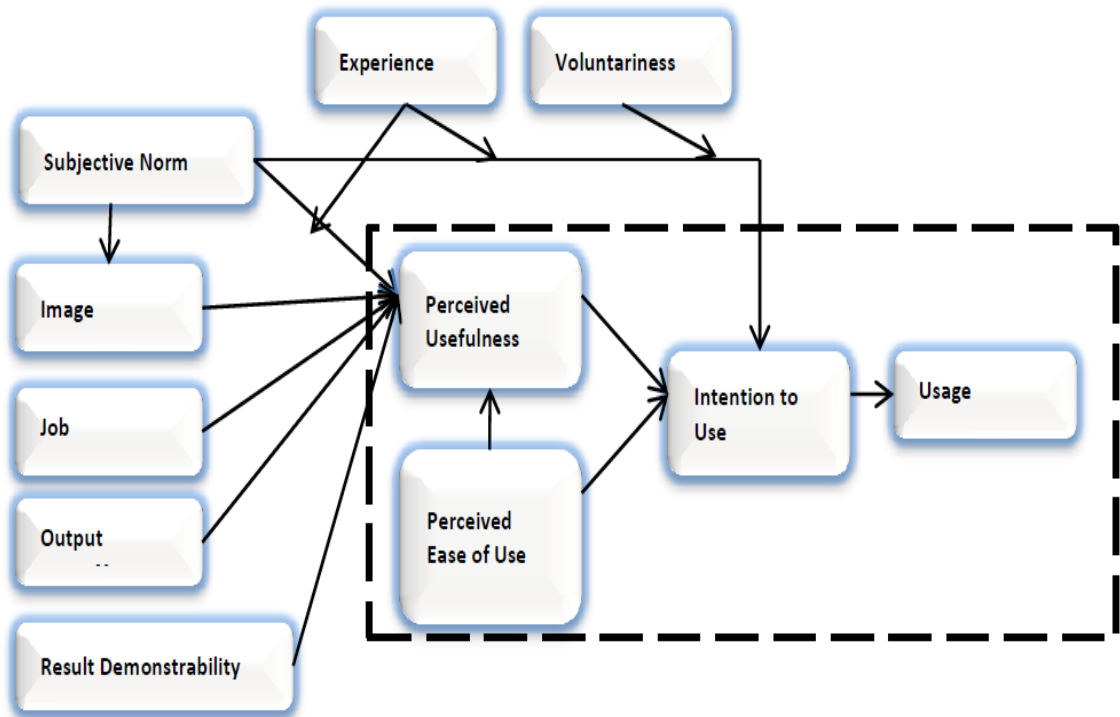


Figure 2.1
Extended technology acceptance model (TAM2)

Table 2.5
TAM2 instrumental determinants

Process	Variable	Definition of variable
Social influence	- Subjective norm	"A person's perception that most people who are important to him/her think he/she should or should not perform the behavior in questions" (Fishbein & Ajzen, 1975).
	- Voluntariness	"Extent to which potential adopters perceive the adoption decision to be non-mandatory" (Venkatesh & Davis, 2000).
	- Image	Image "The degree to which use of an innovation perceived to enhance one's status in one's social system" (Moore & Benbasat, 1991).
	- Experience	Experience "The direct effect of subjective norm on intentions may subside over time with increased system experience" (Venkatesh & Davis, 2000)

Source: Venkatesh and Davis, 2000

2.11 Research Model Factors

Several factors are included in the final research model. The factors are discussed in the following subsections.

2.11.1 Perceived Ease of Use (PEOU)

Perceived ease of use (PEOU) is a concept that can be referred as the level to which a given individual is confident that the usage of a certain information system is effort-free. The highly significant impact of perceived ease of use on the person's behavioral intention, directly or indirectly via perceived usefulness has been reported in many studies. Relevantly as reported in Asher Irfan Saroia and Shang Gao (2019), among other factors, perceived ease of use would be highly significant in the prediction of the intention of the user to use mobile learning management system systems (Saroia & Gao, 2019). Notably, several relevant factors have been mentioned in Totolo (2011) and these factors were linked to very low adoption and use of information technology, and lack of perceived ease of use is one of them. Further, effort expectancy would impact the intention of the user to use Internet technologies (Gupta et al., 2008), and this reaffirms the related past finding that the use of a system is dependent on its ease of use. In a related study by Lu Huang (2017) on acceptance of mobile learning in the classroom in China, it was concluded that perceived ease was one of the key variables that influence the intention to use mobile technologies (Huang, 2017).

2.11.2 Perceived Usefulness (PU)

Perceived usefulness (PU) is a concept that means the degree to which a person is sure that the use of a certain system would increase his/her job performance. In this regard, Davis et al. (1989) stated that the personal intention for a user to use any system is more likely to be impacted by a personal view of perceived usefulness. The significant effect

of perceived usefulness on users' behavioral intention has been reported in many studies including that of Liu et al. (2010) and Lu Huang (2017) who extended the TAM model in examining the factors that affect users' intention to use online learning. From the results, the authors affirmed the strong and direct impact of perceived usefulness on users' intention to use an online learning system.

Among University students, Saroia and Gao (2019) reported perceived usefulness as the primary reason for students' intention to use mobile learning systems (Saroia & Gao, 2019). In another study, Scherer et al. in 2015 concluded the highly significant impact of perceived usefulness on the intention of the teacher to use online learning systems

Further, in understanding the factors that could affect online learning systems adoption among university instructors, Motaghian et al. (2013) concluded the direct impact of perceived usefulness on the intention to use of instructors of web-based learning systems.

Perceived usefulness is a concept that has frequently been dubbed as a highly efficient predictor of the intentions of technology adoption within various circumstances (Lai et al, 2012). Appositely, Lai and Gu (2011), as cited in Lai et al. (2012) in their study on technology adoption of students concluded that the value of perception of learner concerning the educational potentials of technological resources in facilitating the determination of their willingness to implement these resources for learning purposes. Within the context of Egyptian Universities, Farahat (2012) utilized TAM to examine the behavioral intention of students to use online learning and found users' perceived usefulness as a very significant predictor. Moreover, it was discovered from the study

about e-Learning in Libyan Higher Education that Perceived Usefulness is an important factor for predicting a student's and teachers' behavioral intention to use social networking media for e-learning in Libyan higher education (Elkaseh, et al., 2016).

2.11.3 Information Quality (IQ)

Information quality is a concept that relates to the level to which users would view the information as relevant, on time, correct as well as thorough (Lee et al, 2002). This concept has been expansively researched and has been an important construct in information search studies. In Saeed et al. (2003), this construct (information quality) was found to significantly impact the online Behavior of users. Also, Information quality, as the antecedents of e- learning acceptance can provide detailed accounts of the key forces underpinning users' perception with regard to their beliefs, and this situation can further enhance the usage intention of the e- learning system (Cheng, 2012).

Ramayah et al. (2009) in examining the intention of users in using e-learning systems in Malaysia found the information quality factors to positively impact users' behavioral intention, and that noticeable change in the quality of information would lead to the increase of the intention of the user to use e-learning system. The findings led the authors to conclude that information provided by the e-learning system needs to be consistently sufficient and updated in order to improve the behavioral intention towards e-learning systems particularly between university users of higher educations within the Malaysian context.

In their study, Pai and Huang (2010) reported that Davis and Venkatesh mentioned the positive effect of IQ on the PU, which shows that a knowledge management system

with efficient information quality will generate accurate output charts. In this regard, the output knowledge becomes good for use and reuse, and users would perceive that the information and knowledge provided by the system are correct. The authors further mentioned that the positive attitude of users towards the information quality will improve their level of perceived usefulness towards the given information. Concerning the information system, the authors mentioned the positive effect of IQ on user's PEOU (Pai & Huang 2010).

Aanchal Aggarwal and Manmohan Rahul (2017) in their study on the Impact of perceived information quality on consumer purchase intentions in online shopping had reported a very strong positive relationship between information quality of the system and the satisfaction expressed by users (Aggarwal & Rahul, 2017). The results of this study indeed show a very significant role of information quality on the perceived satisfaction of user/learner.

In a relevant study by (Babya, & Kannammalb, 2020), a study focuses on building a user centric framework for e-learning technologies was proposed, and the authors concluded the direct impact of information quality on user satisfaction. In this regard, the increase in content and information quality will increase the satisfaction of users towards the use of the information systems, which will consequently increase the accomplishment of personal and educational goals of the users. The authors further mentioned that the direct impact of user satisfaction on the benefits of using the system will increase the values of utilizing such a system while also increasing the knowledge of the user and encouraging the use of the system. Hence, in e-learning systems usage, information quality can impact users' intention to use.

Lin and Lu (2000) as cited in Ramayah et al. (2009) reported information quality as a pivotal factor in leading individuals to be sure of the benefits of the information system. Confidence towards the usefulness of the information system will increase the possibility of system use. Also, in the study about the actual usage of information systems, researchers found that Information quality has a positive effect and it influenced the usage of any information system (Ameen et al., 2019).

On the other hand, the perception that the information provided by the information system is very vague, inadequate, or flawed will create doubts on the reliability of the given information system while also increasing the chance of detrimental opportunistic behaviors, leading to lower adoption to use. Contrariwise, in the context of students, their intent to successfully engage in the system could increase if the given information system could offer them the content of high quality.

2.11.4 Social Influence (SI)

Social influence is a concept relating to the degree to which one is confident that his/her significant others are sure that a person should utilize a given technology (Al-Gahtani et al., 2007). Hence, for the technology context, this concept describes how far a given user is confident that their important others are confident that he/she (the user) should make use of the new technology. The notion that social influence could potentially impact technology adoption that a specific behavioral intention is a function of people's expectation that significant others expect them to perform the behavior (Beldad and Hegner, 2017)

Within the context of mobile learning especially, the concept of social influence suggests that social influences, for instance, teachers, peers, family members and so

forth, will strongly affect the students' intention of utilizing and accepting mobile devices to learn. Also, social influence on behavior has been found to be more significant in the early stages of mobile learning. However, its impact appears to diminish as the user becomes more experienced by the continuous usage of the mobile device. In view of this, Davis et al. (1989) had mentioned in their study that social influences greatly impact the acceptance and usage of information technology and that TAM needs to be understood well in order to understand the acceptance of user in real life applications. Moreover, in the study by (Beldad & Hegner, 2018) about expanding the Technology Acceptance Model with the other factors including social influence to determine the Users prediction to use a mobile application, the researchers found that social influence significantly contributes to user's trust in using mobile applications. Another study by (Sathye et al., 2018) "found that social influence also impacts perceived usefulness and perceived ease of use and through these the intention to adopt mobile technology services".

2.11.5 Behavioral Intention (BI)

It is the degree to which a person has formulated conscious plans to perform or not perform some specified future behavior (Venkatesh et al., 2003). The behavioral intention was mentioned in many other studies before such TRA, TPB, DTPB, TAM, TAM2, and C-TAM-TPB with a direct relation with actual use behavior (Ajzen & Fishbein, 1980; Ajzen, 1985; Davis et al., 1989; Taylor & Todd, 1995; Venkatesh & Davis, 2000)

2.12 Summary

In this chapter, m-learning was deliberated within the domain of higher education institutions as the study background. From the review of literature, it was evident that e-learning services have been implemented in higher education as a learning mode in addition to the traditional learning media. Still, its application has been restricted by issues associated with connectivity and mobility. Further, accessibility of e-learning has been facilitated and boosted by wireless technology but devices like pc or laptops are still needed so that the system could operate. Hence, it can be said that e-learning is still limited by devices. Notably, the issue of mobility is under scrutiny as it restricts the present utilization of e-learning, and scholars are making efforts to determine the best resolution in order that accessibility could be maximized without being limited by time and also place. On the other hand, the extant literature is showing the feasibility of mobile technology in higher education, considering the need for universities to provide learning services to their students, specifically, learning services that are unbounded by time and place. It has been found that the environment and the infrastructure of institutions of higher education are generally conducive for and appropriate for m-learning diffusion and implementation. As it is informative, m-learning services have been the most successful and the most favored learning method among higher education institutions students. Still, the capabilities of mobile devices for m-learning applications are somewhat limited, for which, some possible resolutions have been recommended. Furthermore, the motivation of students to adopt m-learning has been impeded by several hurdles that need to be addressed prior to implementing this learning mode. Lastly, the factors that make up the constituents of the research model proposed in this study and the theory base are discussed as well.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

In chapter three will discuss the methodology of this research. Amongst others, this chapter will go over the details of the study's conceptual model, research design, the population and sample of the research, in addition the data collection procedure. This chapter ends with a discussion of the statistical techniques that will be used to analyze the research study data.

3.2 Research Framework

In today's era, technology has progressed significantly. Still, Technology Acceptance Model (TAM) remains relevant as the main instrument among scholars in understanding acceptance ever since its introduction by Davis in 1989. TAM in fact remains an efficient instrument for measuring acceptance. At the same time, assessment techniques that could appropriately evaluate the technology process – in this context, m-learning – needs to be established. Also, there needs to be a study that could comprehensively address the many environmental influences to acceptance of technology (Chen, 2010). Notably, the application of TAM has evolved but a more thorough evaluation is still needed to allow the establishment of a method of model usage within the context of m-learning.

Markedly, perceived ease of use, perceived usefulness, information quality, and social influence are the factors that have been frequently used in past extant studies. However, it should be noted that none of these factors were included in the studies completed model. Hence, in terms of m-learning use in institutions of higher education, the multifaceted relationships among the aforementioned factors and the behavioral

intention are yet to be assessed and understood. A more complete model is thus needed and the present study will propose novel ideas for m-learning implementation to facilitate learning among higher education institution students.

Accordingly, the following Figure 3.1 illustrates the study's proposed model. This model is aptly known as the Mobile Learning Acceptance Model.

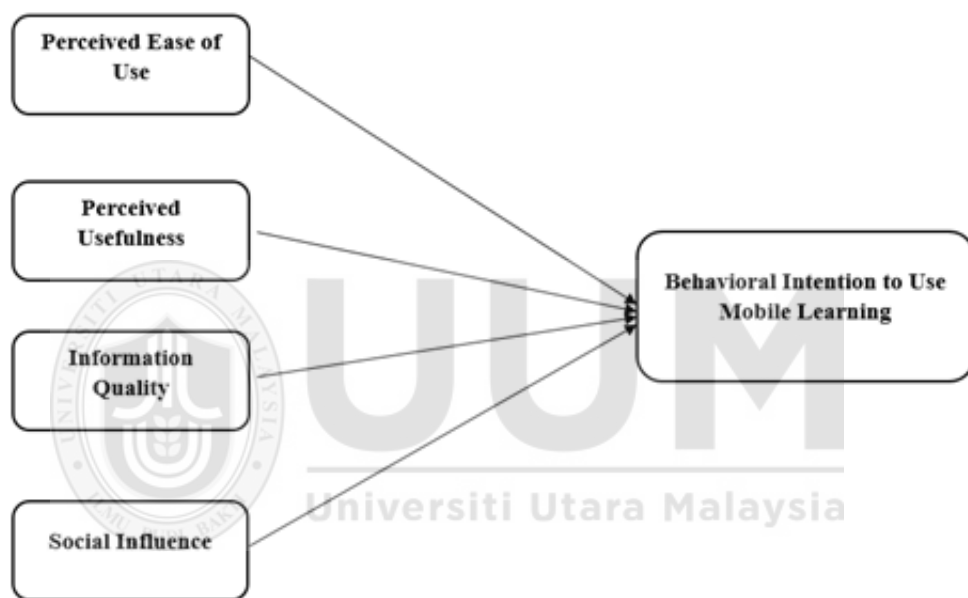


Figure 3.1

Research Framework

Source: Developed for the research study

3.3 Hypotheses Development

The present study will construct a hypothetical model with the ability to explain and predict the acceptance and usage of students in the context of m-learning services, specifically students in Yemeni higher education. The model utilizes TAM's intention–Behavior relationship, and the relationship proposes that the use of m-learning by students is directly ruled by (BI) their behavioral intention to use (Venkatesh et al., 2003).

Accordingly, the concept of belief in TAM is expanded in the model proposed in this study. Hence, two more constructs are added, and they are perceived information quality and social influence. The construct of perceived information quality represents the information-oriented aspect of m-learning. On the other hand, the construct of perception captures students overall concern towards mobile technology and the internet. Thus, the study's proposed model postulates that perceived ease of use, perceived usefulness, information quality, social influence construct the attitude of a student towards m-learning. The hypotheses below are thus presented:

H1: Student's perceived ease of use of m-learning service has a direct effect on behavioral intention to use the m-learning service.

H2: Student's perceived usefulness of m-learning service has a direct effect on behavioral intention to use the m-learning service.

H3: Student's information quality of m-learning service has a direct effect on behavioral intention to use the m-learning service.

H4: Student's social influence of m-learning service has a direct effect on behavioral intention to use the m-learning service.

3.4 Research Design

This research applies the quantitative approach in carrying out the research. This approach produces research that is very formal, objective and a very systematic process, with the purpose of describing and testing relationships and probing the cause and effect interactions between different variables (Creswell, 2012). Among the tools used in gathering the data for this type of research is a questionnaire survey. Thus, this study has chosen to apply a descriptive survey design owing to its descriptive nature as highlighted in Gorard (2013).

In general, as mentioned in Gorard (2013), the quantitative survey method is used for gathering original data for the purpose of describing a population that is too large for direct observation. Using this method, the researcher could obtain data from a sample of individuals with the use of self-reporting mechanism, which, as Cresswell (2012) had stated, allows people to produce their responses to a series of questions presented by the research (Creswell, 2012). In this research, online questionnaires are used to gather data. These questionnaires will be circulated online to all respondents.

The decision was made to use a descriptive survey because it provides a very precise and accurate depiction of the respondent's characteristics, such as their opinions, behavior, beliefs, abilities and their knowledge in relation to the research topic (Gorard, 2013). This particular research design was selected to help achieve the research objectives, which involves examining the Higher Education students' intention to use

the Mobile Learning System and determining the most influential factors that may affect their intention to accept the Mobile Learning System.

3.5 Operational Definition and Measurement of Instrument

The research instrument that this study has chosen to adopt is detailed in this section. The development of the data gathering instrument is particularly discussed. The instrument will collect information on the student's demographics. Further, the instrument will evaluate the perceptions of m-learning and also of mobile technologies. Additionally, factors of (PEOU) perceived ease of use, (PU) perceived usefulness, (IQ) information quality, (SI) social influence, (BI) behavioral Intention to use are utilized in measuring the requirements and awareness of mobile learning activities when it reaches the last step of data collection on the acceptance students towards m-learning.

Data quality appears to be greatly impacted by the established instrument (Eccles et al., 2011). Accordingly, this study follows Gay's et al. (2006) guidelines in its construction of data gathering instrument. The effectiveness of the instrument should be assured as well because it could capture the participant's willingness to respond. Hence, the questionnaire needs to appear attractive to them. Also, the researcher needs to present items with clarity, and the items need to fittingly represent the research objectives set by the study and gather just the necessary information with a focus on certain topics or ideas. As clarity is very important, clear words need to be used. Item organization is important as well, and items are usually arranged from a general view to specific ones. Furthermore, should combine the items with their response options. The items of the questionnaire used by research developed from those of previous studies. All Constructs items and Variables of Research Model below will be measured using a Likert five-point scale type (it ranges from 1 to 5 = strongly disagree to strongly agree).

Several terms in this research study need to be focused on and defined to ensure that the concept and theory related to the study can be established. The operational definitions and the items used to measure each of the variables are defined and explained as below:

a) Perceived ease of use (PEOU)

(PEOU) the degree to which an individual her or she believes and considers that using a specific information system is easy to use and free of effort (Davis et al.,1989).

Table 3.1
Perceived ease of use

Variable	Description	Items	Source
PEOU	Perceived ease of use	<ul style="list-style-type: none"> - (PEOU1) “I find it easy to get what I want with the m-learning services” - (PEOU2) “I find the m-learning services to be a flexible system to interact with.” - (PEOU3) “It is easy for me to be the m-learning services expert” - (PEOU4) “It is easy for me to learn how to use the m-learning services.” - (PEOU5) “I find that m-learning services are easy to use.” 	Davis et al.,(1989),Venkatesh (2000) and Venkatesh and Davis (1996)

b) Perceived Usefulness (PU)

(PU) defined as the degree an individual her or she believes and considers that using a particular system would enhance his or her job performance (Davis et al., 1989).

Table 3.2
Perceived Usefulness

Variable	Description	Items	Source
PU	Perceived Usefulness	<ul style="list-style-type: none"> - (PU1) “I could complete my tasks more quickly with m-learning services” - (PU2) “I could improve my performance in education environment with m-learning services” - (PU3) “I could engage in education environment easier with m-learning services” - (PU4) “M-learning services are useful in my education environment.” - (PU5) “I could improve my effectiveness in education environment with m-learning services” 	Davis et al.,(1989),Venkatesh (2000) and Venkatesh and Davis (1996)

c) Information Quality (IQ)

(IQ) is identified as the extent to which users think that information is relevant, timely, accurate, and complete (Lee et al., 2002; Cidral et al., 2018).

Table 3.3
Information Quality

Variable	Description	Items	Source
IQ	Information Quality	<ul style="list-style-type: none"> - (IQ1) “I would use the m-learning services if the system can provide up-to-date information” - (IQ2) “I would use the m-learning services if the system can provide information that is easy to understand” - (IQ3) “I would use the m-learning services if the system can provide sufficient information (the content is rich in quantity and quality)” - (IQ4) “I would use the m-learning services if the system can provide relevant information for my job.” 	DeLone and McLean (1992) and Rai et al, (2002)

d) Social Influence (SI)

(SI) is a concept relating to the degree to which one is confident that his/her significant sure that the user should utilize a given system (Al-Gahtani et al., 2007; Briz-Ponce et al., 2017).

Table 3.4
Social Influence

Variable	Description	Items	Source
SI	Social Influence	<ul style="list-style-type: none"> - (SI1) "People who influence my behavior believe that I should use m-learning services in my studies." - (SI2) "People who are important to me believe that I should use m-learning services in my studies." - (SI3) "Students in my university who use the m-learning services are more successful than those who do not." - (SI4) "Students in my university who use the m-learning services have a high profile." - (SI5) "The m-learning method is a symbol of status in my university." 	Venkatesh and Davis (2000) Taylor and Todd (1995a; 1995b)

e) Behavioral Intention (BI)

(BI) It is the degree to which a person has formulated conscious plans to perform or not perform some specified future behavior (Venkatesh et al., 2003)

Table 3.5
Behavioral Intention to use

Variable	Description	Items	Source
BI	Behavioral Intention to use	<ul style="list-style-type: none"> - (BI1) "I intend to use the m-learning services" - (BI2) "I plan to use the m-learning services" - (BI3) "I think I would use the m-learning services" - (BI4) "I will definitely use the m-learning services" 	Venkatesh et al. (2003).

3.6 Sampling

The research will be carried out at the University of Aden / Yemen. The University of Aden is the second large University in Yemen and caters to local and international students. The University have a good reputation and is regarded as one of the more progressive educational institutions in the country.

3.6.1 The Study Population and Sample

The term of Population is usually defined as encompassing including various elements, such as the individuals, objects, and events that satisfy the sample criteria of inclusion into a study (Adèr et al., 2008). The population chosen in this study comprises students currently enrolled in an academic program at the University of Aden in Yemen.

According to Sekaran and Bougie (2013), a research sample comprises of a proportion of the population. On the other hand, Chambers and Skinner (2003) defined the concept of a research sample as being the elements that are selected with the purpose of finding out certain facts about the total population from which the sample was originally taken.

“A good sampling strategy will collect accurate information in a way which is as efficient as possible so that it obtains the most accurate information for the lowest cost” (Adèr et al., 2008). The sample taking is drawn from a subset of the population that is convenient and close to hand, and that is the convenience or accidental sampling, which is defined as elements in the sample chosen by the interviewer because the participants happened to be at the right time in the right place. There is no way to conduct random sampling when there is no sampling frame available, the sample must then be chosen on a different basis. (Saunders et al., 2012). All of the remaining options are non-probability sampling techniques, which are used in this research study because they are

inexpensive, quick, and convenient. Furthermore, it is useful for certain purposes that require less difficulties and planning. Researchers simply use participants who are a group of people who are easy to contact or reach and are available at the time. The chosen respondents are those who fulfilled the sample criteria; they were students at Aden University who expressed their agreement to participate in the research. A total of 381 students from Aden University will be chosen, and the number is seen as sufficiently representing the student population.

According to Sugiono (2014), the sample is part of the number and characteristics possessed by that population. The researcher will use the sample size of research based on the table produced by Krejcie and Morgan (1970), which concludes that the appropriate number of sample from 23,458 populations based on the last statistics and the sample size would be 381 respondents.

3.6.2 The Sampling Criteria

According to the study of Burns and Grove (2003), they defined the process of sampling as the selection of a group of people, events, or specific behavior with which to carry out a research. It is opined by Polit et al (2001) that in sampling, a portion that represents the entire population would be selected. In essence, sampling is very closely linked to the generalizability of the research findings.

The subjects that were included within the sample were chosen to meet specific criteria which included the following: active students in the university, mobile device users and willingness to participate voluntarily.

3.7 Data Collection

The main data gathering instrument used in this study is a questionnaire. It contains a printed self-report form which is specifically designed to collect information that can be acquired through written responses provided by the subjects (Gillham, 2008). The data that is obtained through using a questionnaire is similar to what can be acquired from an interview but questions asked in the questionnaire lack in depth and do not produce very comprehensive answers (Burns and Bush, 2010).

The data will be collected using questionnaires in order to measure the student's intention to use mobile learning tools for the purposes of learning and to determine the most factors that may be influential and have an effect on student intention to use the mobile learning system in the higher education institutions.

It is appreciated that the questionnaire being used for this research comprises of an online questionnaire and an online questionnaire is said to come with a number of distinct advantages over traditional paper based questionnaires and these are discussed below:

1. Online questionnaires are much faster, simpler and less costly to administer in comparison to paper based questionnaires (Groves et al., 2011).
2. The overall time which is taken during the process of data collection period is significantly reduced as online questionnaire data can be collected on the database of the website which provides the service and the data can be processed using online tools in a matter of hours (Dillman, 2011).

3. The online questionnaire method provides a very dynamic interaction between the respondent and the questionnaire, in contrast to paper based questionnaire (Dillman, 2011).
4. Online questionnaires are less intrusive and they do not have much social desirability effect (Dillman, 2011).
5. Online questionnaires are capable of providing pop-up instructions which can be provided for individual questions in order to assist the respondents with the process of answering the questions (Groves et al., 2011).
6. Online questionnaires can be enhanced using methods like usability testing, whereby the usability would be measured according to the speed that a task can be capable of being performed, the overall frequency of errors and also the user satisfaction with the interface of the questionnaire (Groves et al., 2011).
7. There would be a high response rate because the questionnaires are distributed online and would only take 10-15 minutes to answer (Oppenheim, 2000).
8. The questionnaire method allows for the fast and efficient collection of data from a very large number of respondents (Oppenheim, 2000).
9. Using a questionnaire means that the anonymity of the respondents can be assured as the respondents do not have to provide their personal details like name, address, etc (Oppenheim, 2000)
10. There is not much opportunity for the presence of bias, such as when carrying out interviews (Gillham, 2008).

It must be noted here, however, that questionnaires do have their weaknesses. For instance, there is always the question about the validity and accuracy of questionnaires (Gillham, 2008). There are situations when the subjects would not provide answers

which reflect their real opinions and they might provide answers which they believe would please the researcher and this might result in valuable information being lost and there is also the problem of answers given being very brief (Oppenheim, 2000).

3.8 Data Collection Procedure

The process of data collection involves the gathering and also measuring of information in relation to variables of interest, in a well-established and highly systematic method and which enables the research to provide accurate and precise answers to the research questions (Mitchell and Jolley, 2001). It also involves the researcher making an effective test of the research hypotheses and making a comprehensive evaluation of outcomes (Trochim, 2006). It is not doubted that methods adopted might vary by discipline, but the emphasis on ensuring highly accurate and honest collection of data are the same. The primary aim of data collection would be to collect quality evidence that can be translated into rich data analysis and which allows the research to have the ability to build a highly convincing and credible answer to research questions that are posed. In research such as the one being carried out here, a formal process of data collection is very essential as it ensures that the information which is collected is well defined and accurate and that any decisions based on arguments that are present in the findings are highly valid (Burns and Bush, 2010). In essence, the data collection process would be capable of providing the foundation from which the researcher is able to measure and target on what aspects of the research to improve (Trochim, 2006).

In this research, the process of data collection will be carried out online using a questionnaire. This questionnaire will be distributed online to respondents via google form survey. The research will deliver the survey to the student by using two main platforms facebook and whatsapp to send the questionnaire to all respondents. The

researcher will look for different Facebook groups that students of the University of Aden were in, and paste the link of the questionnaire on the main group page or send the link directly to the members of that group. The respondents will be given the link to this website and when the respondent clicked the link, they will be presented with a webpage containing the questionnaire with the instructions of what the purpose of the questionnaire is and what required from the respondents to do in order to successfully complete and submit the questionnaire. After completing the questionnaire and submit it this would enable the questionnaire data to be sent to the researcher, who will retrieve it from the database on the website providing the questionnaire services. This data will then be subjected to a data analysis procedure in order to make the data relevant and usable for the purposes of answering the research questions. The data will be collected from this database for a period of one month.

3.9 Questionnaire Design

Two sections are included in the questionnaire and each section is as detailed in the following subsections.

3.9.1 Initial Instrument Structure

The first important task before the organization of the survey questions is to draft clear and understandable instructions. These instructions are compiled on a cover page that also contains the study title and a brief description of the research. Also contains information relating to the study's anonymity and confidentiality, respondents' rights and contact information as well. The study questionnaire comprises two sections and five subsections, as detailed below:

Section 1: This section presents the general information items of the participants such as the participant gender, participant age, education background of the participants and the current study program.

Section 2: This section contains Subsection 1 through Subsection 5 as detailed as follows:

Subsection 1: This subsection comprises four items that gauge the construct of information quality (IQ) of m-learning in universities. These items specifically gauge the performance of using m-learning services. Each of the items is answered measured by using the five-point Liker-type scale (it ranges from 1 = strongly disagree to 5 = strongly agree).

Subsection 2: This subsection comprises five items that gauge the construct of (SI) to use m-learning in universities. Accordingly, the dimensions of social influence and subjective norm image are reflected. Each of the items is answered measured by using the five-point Liker-type scale (it ranges from 1 = strongly disagree to 5 = strongly agree).

Subsection 3: This subsection comprises five items that gauge the construct of (PU) of using m-learning services in the environment of higher education. The view of participants towards the usefulness of the use of m-learning services within the setting of higher education is particularly gauged by these five items. Each of the items is answered measured by using the five-point Liker-type scale (it ranges from 1 = strongly disagree to 5 = strongly agree).

Subsection 4: This subsection comprises five items that gauge the construct of (PEOU) of m-learning in the universities. In particular, the perception of participants in their m-learning services use in their higher is measured, in terms of the service being ‘easy to use.’ Each of the items is answered measured by using the five-point Liker-type scale (it ranges from 1 = strongly disagree to 5 = strongly agree).

Subsection 5: This subsection comprises four items that gauge the construct of behavioral intention (BI) to use m-learning services in the environment of higher education. Accordingly, the participant’s behavioral intention towards the use of m-learning services in the setting of higher education is particularly gauged by these four items. Each of the items is answered measured by using the five-point Liker-type scale (it ranges from 1 = strongly disagree to 5 = strongly agree).

3.10 Technique of Data Analysis

Analyzing data is a process that generally includes the examination of data that the outcome would show relationships, trends and patterns which that the data are showing. As mentioned in Argyrous (2000), the analysis of data could involve subjecting the data to statistical operations, and these operations expose the types of relationships existing among the research variables. It is also helpful in educating the researcher about the level that the answers can be trusted. It could even mean making a comparison of the available information to information obtained from other groups, in order to draw certain conclusions from the data. The aim here is to obtain an accurate assessment so as to have a better understanding of the overall situation (Oppenheim, 2000).

Since this is quantitative research, data that will be collected would be translated into numbers and displayed and analyzed in a mathematical way. Typically, quantitative

data would be subjected to various statistical procedures, which could involve calculating the mean or the average number of times which a particular event or behavior would be occurring (Argyrous, 2000). Such operations are capable of giving definite answers because numbers are essentially complicated data that cannot interpret. Analysis of quantitative data could also indicate the changes within a dependent variable in relation to the overall frequency, timing, duration, intensity, etc. It allows the researcher to make comparisons of the changes in another variable or changes in another population, for instance. Such data analysis could help the researcher make precise identification of the relationships present between different variables (Oppenheim, 2000).

The process of quantitative data analysis is considered to be objective and human bias is not present. This is because it is largely dependent on making a comparison of various numbers, in accordance with mathematical computations. It needs to be appreciated, however, that quantitative data analysis could also be influenced by various subjective factors. The fact is that what the researcher has selected to measure, the overall precision of the observations and also the way the study is structured so that only certain questions are asked are all factors that could have an influence on the results. In addition, the results can also be influenced by the researcher's own understanding and also the interpretation of the subsequent analyses (Argyrous, 2000).

Through questionnaires that are distributed online, quantitative data will be obtained. These data will be analyzed using Statistical Package for Social Sciences (SPSS), which is a software that is commonly used for statistical analysis. SPSS is widely used by market researchers, survey companies, education researchers, etc. SPSS comes with a manual that allows ordinary researchers to carry out their own statistical analysis

(Argyrous, 2000). In this research study, will analyze the data by using SPSS it will be displayed as descriptive statistics. Hence, as mentioned in Chambers and Skinner (2003), several frequency tables and figures will be constructed, and data will be displayed in tables, bar as well as pie charts.

3.11 Reliability and Validity

3.11.1 Reliability

Reliability, as described in Eisinga et al. (2012), refers to how consistently an instrument would measure a characteristic. It is supposed to measure. Relevant to the study context, it is important that the questionnaire will yield responses that are consistent. Equally, when sources of measurement error (e.g., data collector bias) are minimized, reliability can be achieved (Dunn et al., 2013). However, since the questionnaires will be administered by just the researcher (one person), the problem of data collection bias can be minimized. In addition, the use of standardizing conditions in this study, e.g., the display of similar personal attributes to each respondent, friendliness and support, will also reduce the problem of measurement error (Oppenheim, 2000).

As mentioned earlier, the questionnaires will be distributed to the respondents online. In this regard, to assure comfort during questionnaire completion, the respondents are assured in terms of their privacy and confidentiality. Hence, following the advice of Andres (2012), no personal questions will be asked. Also, the wordings of the questionnaires are simple and the information provided is not excessive, as to ease the respondents in answering the items.

3.11.2 Validity

The instrument's validity relates to the level to which the given instrument would measure what it has been designed to measure (Leung, 2001). Relevantly, content validity is a concept that is associated with the extent that an instrument would represent the various factors being studied (Wilson & Schumsky, 2012). In order to achieve efficient content validity, the questionnaire designed to include a variety of questions that would efficiently measure the student's intention to use these kinds of tools for learning purposes and what are the most influential factors that may influence the intention of student's to use the Mobile Learning System, as well as the most influential factors that may influence their intention to adopt the Mobile Learning System.

Questionnaire development is a process that is ongoing because new questions would be regularly added to the current ones. This is to assure representativeness of a high level. Additionally, Eisinga et al. (2012) suggested rephrasing the questions that appear vague or ambiguous or complicated or incomprehensible. Also, in order to assure a more efficient and meaningful process of data analysis, the author proposed using different choices of response.

External validity will be also ensured in this process and the concept of external validity is said to refer to the extent to which the research findings are capable of being generalized beyond the sample which was used (Mitchell and Jolley, 2001).

In this research, all the individuals who will be selected to participate in the research will be sure that they manage to complete the questionnaires and they answered all the questions. They will participate voluntarily and will have a clear appreciation and understanding of the purpose and nature of the research. Hence, generalizing the

findings to all the members of the population is justified (Mitchell and Jolley, 2001). From the 381 respondents whom the questionnaire will be sent out to, the researcher expected to get all respondents sent back completed questionnaires and this will show that no respondent declined to participate and this essentially increases the external validity of the research (Mitchell and Jolley, 2001).

3.12 Pilot Testing the Questionnaire

According to Burns and Bush, (2010), a pilot test makes reference to a trial administration of an instrument in order to make an identification of flaws. Practically speaking, a pilot test essentially involves a small scale preliminary research done in order to make an evaluation of the overall feasibility, cost, time, adverse events and statistical variability to make an attempt to accurately predict the appropriate sample size and also to improve on the research design before carrying out full-scale research (Teijlingen and Hundley, 2001). The use of a questionnaire for the purposes of collecting data necessitates a determination of whether the questions are clear to all the respondents and whether they fully understand what is required from them. Such an act is labeled as pretesting of a questionnaire (Trochim, 2006). Pilot tests are appropriate to be performed before carrying out an actual large-scale quantitative research as it helps the researcher avoid wasting money and time on an improperly designed project. The pilot test would normally be performed on members from the relevant population but not the respondents who will form the final sample. The reason for this is that it could influence the behavior of research subjects much later if they were already involved in the research before the real test was performed (Haralambos and Holborn, 2000).

The pilot testing phase is a very essential phase of the research as it is capable of providing highly valuable insights about how the research instrument is performing and whether anything is missing during the pilot study and which can be added to the full-scale survey in order to improve the chances of a having a very clear outcome (Teijlingen and Hundley, 2001).

In this study, the researcher pre-tested the questionnaire on 36 respondents who comprised students from Aden University. However, these students will not be part of the actual respondents from the final sample. These respondents will be asked to complete the questionnaire successfully without any difficulty and certain comments and suggestions from these respondents will be taken into account and a number of changes will be made if necessary to the questionnaire in order to improve its effectiveness (Burns and Bush, 2010).

3.12.1 Instrument Reliability

As mentioned earlier, the pilot test is performed to ascertain the reliability of the measurement instruments prior to the main empirical study. As a starting point, Devellis (1991) and Nunnally (1978) indicated that the minimum satisfactory reliability coefficients vary from 0.70 to 0.80 and more specifically, Nunnally (1978) proposes that the value must be greater than 0.7. In terms of sample size for the pilot test, it should not be less than 30 (Hunt et al., 1982) and as such, the pilot test for this study was conducted on 36 students been selected with easily accessed and conveniently selected from the University of Aden Table 3.6 present the test results.

Table 3.6
Alpha Reliability Scale– Model Pilot Test Questionnaire (n=36)

Variable	N. of Items	Alpha (a)
Information Quality (IQ)	4	.850
Social Influence (SI)	5	.893
Perceived usefulness (PU)	5	.883
Perceived Ease of Use (PEOU)	5	.884
Behavioral Intention to Use (BI)	4	.892

3.13 Ethical Considerations

The fact is that carrying out research like this would require expertise and diligence and also a high degree of honesty and integrity (Trochim, 2006). This will be done in order to have recognition of and to protect the various rights of the respondents involved in the research (Leung, 2001). Also, the ethicality of the study is observed by assuring the rights of the respondents to self-determination, anonymity and confidentiality. Informed consent will also be assured. Hence, written permission will be obtained from the university management prior to performing the study. Furthermore, the researcher will obtain the respondent's consent prior to asking them to complete the questionnaire. As described in Trochim (2006), informed consent is the prospective participant's agreement to voluntarily participate in the research study, which would be reached after the assimilation of important information relating to the study. As discussed in Burns and Bush (2010), the respondents need to be informed concerning their rights, and that their consent must be voluntary. Also, they need to be informed that they could decline participation or withdraw at any time during the study.

The study respondents will all be informed sufficiently about the research's main aim and purpose, in addition to the procedure that the study would utilize in data gathering.

At the same time, the respondents will be given assurance that they will not be facing any risks or costs from the research. Also, the anonymity and confidentiality of the respondents will be preserved all through the study. Anonymity can be defined as when the participant cannot be linked with their individual answers. The anonymity of the respondents was ensured in this research by not disclosing the names of the respondents on the questionnaire (Andres, 2012).

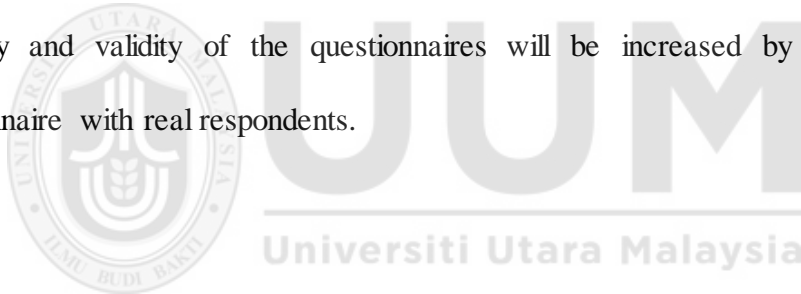
Ensuring a high level of confidentiality means that all the information which they would provide would not be made public. Confidentiality will be properly maintained in this study by keeping the data collected very confidentially and not revealing the identities of the subjects when publishing or reporting matters relating to the study. There will be no identifying data entered into the questionnaires.

Next, the principle of self-determination will be maintained as the respondents will be treated like autonomous agents, whereby the respondents will be informed about the purpose of the research and they will be allowed to make a voluntary decision as to whether or not to participate (Burns and Bush, 2010).

The researcher also will provide information about herself in the event of any of the respondents having questions or queries relating to the research. It is noted here that scientific honesty is a very essential ethical responsibility when research is being carried out and dishonest conduct such as the manipulation of design and methods as well as the retention or manipulation of data was avoided (Andres, 2012).

3.14 Conclusion

In this study, the researcher utilized a survey design that is quantitative and descriptive in nature. The questionnaire will be administered online by the researcher in order to collect data from a sample of 381 respondents from students of the University of Aden. The questionnaire comprised of closes ended questions and Likert-style questions. The sample comprised of students from Aden University who are registered for an academic program at the University. Permission will be obtained from the University management in order to carry out this research. In addition, consent will be obtained from all the respondents who will take part in this research. Steps will also be taken in order to ensure the anonymity, self-determination and confidentiality of the respondents will administering the questionnaires and also when writing the report writing. The reliability and validity of the questionnaires will be increased by pre-testing the questionnaire with real respondents.



CHAPTER FOUR: FINDING AND DISCUSSION

4.1 Introduction

This chapter will highlight the analysis by using the statistical software package SPSS to present all reports for the current research. The first section of this chapter provided preliminary analysis such as data screening and normality test, then the profile of the respondents' that presented the basic statistic information for all participants and their demographics information (i.e., gender, age, educational level, and current study program). The following section presents the descriptive analysis followed by the reliability analysis which is an instrument that produces stable and consistent results/scores and the factor analysis. The last section endeavored to test the research hypothesis using a multiple regression method.

This current research intended to analyze the factors influencing student's behavior intention to use mobile learning in higher education in Yemen. The following four hypotheses were adapted to analyze the collected data:

H1: Student's perceived ease of use of m-learning has a direct effect on behavioral intention to use the m-learning.

H2: Student's perceived usefulness of m-learning has a direct effect on behavioral intention to use the m-learning.

H3: Student's information Quality of m-learning has a direct effect on behavioral intention to use the m-learning.

H4: Student's social influence of m-learning service has a direct effect on behavioral intention to use the m-learning.

This research study incorporates a total of twenty-three measurement items to measure five variables (i.e., five items for perceived ease of use, five items for perceived usefulness, five items for social influence, four items for information quality and four items for behavioral intention). The variables in this research were categorized at a scale level, which meant the score of each variable were calculated as the sum of its correspondent measurement items. Such as, the score of the variable perceived ease of use (PEOU) was the sum of its five measurement items PEOU1, PEOU2, PEOU3, PEO4, and PEOU5.

4.2 Data Screening

Data Screening was used in this study to modify the data to ensure the data is free from irrelevant and incorrect information. The goals of this are to identify the data patterns that are missing, it can be carried out manually by using data wrangling tools or can be automated through software is SPSS which identifies incomplete, invalid and missing parts of a data set and clean it. To guarantee statistical assumptions are met by identifying outliers and obtaining the skewness and kurtosis values. However, all of the data collected were precise, and there were no missing data.

4.3 Response Rate

For this research study, the main target is University of Aden students, who are using mobile devices for learning purposes. The target sample size of the 381 respondents collected from this survey was achieved 100 percent and the response rate was 84.6 percent, From the 450 questionnaires that have been distributed. Choices of answers for

this questionnaire were limited because close-ended questions were used to develop this questionnaire.

4.4 Normality Assessment and Outliers

Before performing any extensive analysis, a normality test was used to determine whether or not the population data had a normal distribution. The researcher can use a variety of statistical tools to determine the distribution of the data. However, in this study, the Skewness and Kurtosis tests were used to assess the normality distribution of the data. The distribution could not be normal if the data shows Skewness outside of the range between -2 to 2 and Kurtosis outside of the range between -7 to 7 (Brown, 2006; Hair et al., 2010 & Bryne, 2010). As shown in Table 4.1 below.

Table 4.1
Skewness and Kurtosis for Normality Test

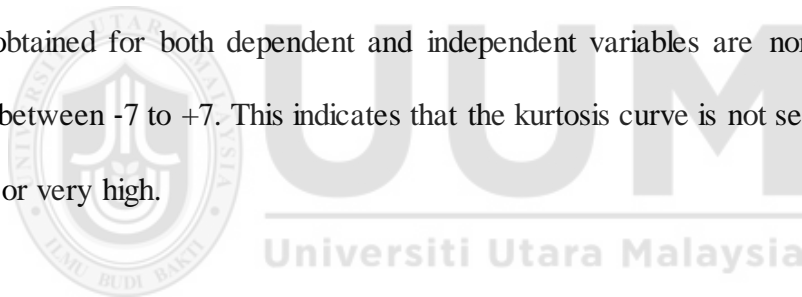
	N	Mean	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
BI	381	17.4751	-.487	.125	.243	.249
PEOU	381	22.0394	-.446	.125	.012	.249
PU	381	21.9423	-.204	.125	-.903	.249
SI	381	21.5774	-1.026	.125	2.326	.249
IQ	381	18.1234	-.680	.125	.060	.249
Valid N (listwise)	381					

Source: Analysis for the research study

As shown in table 4.1 that the results point to the distribution pattern of the data for the dependent variable and independent variables which indicates normal data distribution. As mentioned by (Brown, 2006; Hair et al., 2010; & Bryne, 2010) that data will be considered to be normal if Skewness is between the values of -2 to +2 and Kurtosis is between the values of -7 to +7.

According to the results above the Skewness data for the dependent variable is $-.487$, following by the independent variables which are; perceived ease of use, perceived usefulness, social influence and information quality showed Statistic skewness with $-.446$, $-.204$, -1.026 , and $-.680$ respectively. The skewness data for both the variables dependent and independent is between the values of -2 to $+2$ which indicates that all the values are normal.

The Kurtosis analysis showed a positive result for the dependent variable the behavioral intention to use and for independent variables which are; the perceived ease of use, social influence, and information quality with $.243$, $.012$, 2.326 , and $.060$ respectively. Perceived usefulness showed negative kurtosis with $-.903$. From the results, kurtosis values obtained for both dependent and independent variables are normal values that are still between -7 to $+7$. This indicates that the kurtosis curve is not seemed to be very sloping or very high.



4.5 Profile of the Respondents

This section describes the demographic profile of 381 students from different faculties of the University of Aden. For this research study, the main target is University of Aden students, who are using mobile devices for learning purposes.

Table 4.2
Gender of respondent

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Female	158	41.5	41.5	41.5
	Male	223	58.5	58.5	100.0
	Total	381	100.0	100.0	

Source: Analysis for the research study

1. What is your gender / ما هو جنسك

381 responses

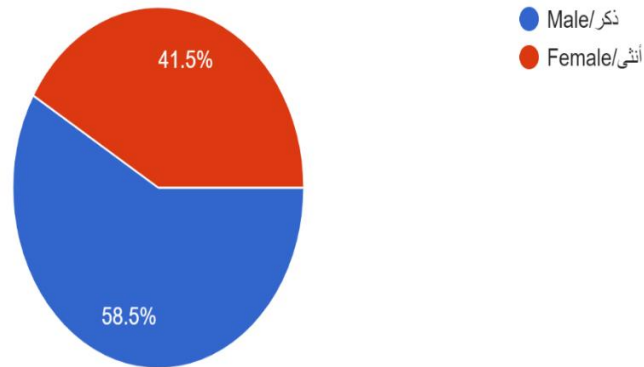


Figure 4.2

Gender of Respondent

Source: Analysis for the research study

As shown in Table 4.2 and Figure 4.2, out of 381 respondents, 223 are male (58.5%) and 158 are female (41.5%). The number of male respondents is higher than female respondents by 17%.

Table 4.3

Age of respondent

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Under 20	6	1.6	1.6	1.7
	20 – 25	317	83.2	83.2	100.0
	26 – 30	38	10.0	10.0	11.8
	Above 30	20	5.2	5.2	17.1
	Total	381	100.0	100.0	

Source: Analysis for the research study

2. What is your age / ما هو عمرك؟

381 responses

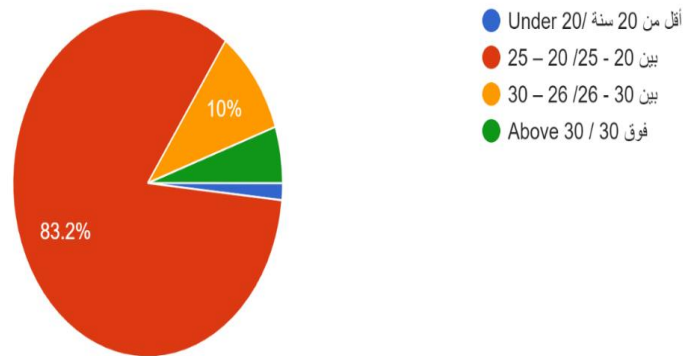


Figure 4.3

Age of Respondent

Source: Analysis for the research study

We can notice in Table and Figure 4.3 above shows the distribution according to the main four age groups which are under 20, 20 to 25 years, 26 to 30 years, and above than 30 years. Here, there are 6 (1.6%) respondents who are under 20, 317 (83.2%) respondents who are 20 to 25 years, 38 (10%) respondents who are 26 to 30 years, and 20 (5.2%) respondents who is more than 30 years. This indicates that the bulk of respondents are between the ages of 20 and 25.

Table 4.4
Faculty of respondent

	Faculty	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Administrative Sciences	29	7.6	7.6	7.6
	computing	27	7.1	7.1	14.7
	Dentistry	28	7.3	7.3	22.0
	Economics	35	9.2	9.2	31.2
	Education	38	10.0	10.0	41.2
	Engineering	34	8.9	8.9	50.1
	languages	32	8.4	8.4	58.5
	Law	20	5.2	5.2	63.8
	Literature	29	7.6	7.6	71.4
	Medicine and Health Sciences	23	6.0	6.0	77.4
	Nursing	6	1.6	1.6	79.0
	Pharmacy	33	8.7	8.7	87.7
	science	22	5.8	5.8	93.4
	Social and Applied Sciences	25	6.6	6.6	100.0
	Total	381	100.0	100.0	

Source: Analysis for the research study

3. Your Education background / خلفيتك التعليمية :

381 responses

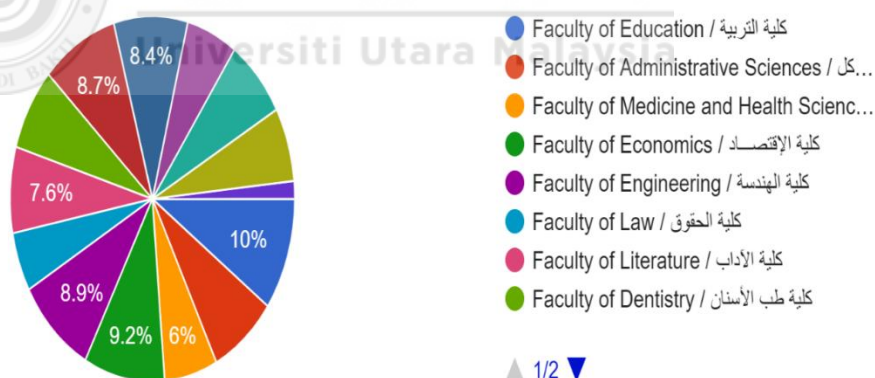


Figure 4.4
Faculty of Respondents

Source: Analysis for the research study

There are fourteen different types of faculties were the students of the University of Aden study, and they are, Faculty of Administrative Sciences, Computing, Dentistry, Economics, Education, Engineering, Languages, Law, Literature, Medicine, Nursing,

Pharmacy, Science and Social and Applied Sciences. Based on the data presented, in Table 4.4 and Figure 4.4 above, 29 (7.6%) students are studying in the Faculty of Administrative Sciences, 27 (7.1%) students studying in the Faculty of computing, 28 (7.3%) students studying in the Faculty of Dentistry, 35 (9.2%) students are studying in the Faculty of Economics, 38 (10%) students are studying in the Faculty of Education, 34 (8.9%) students are studying in the Faculty of Engineering, 32 (8.4%) students are studying in the Faculty of Languages, 20 (5.2%) students are studying in the Faculty of Law, 29 (7.6%) students are studying in the Faculty of Literature, 23 (6%) students are studying in the Faculty of Medicine and Health Sciences, 6 (1.6%) students are studying in the Faculty of Nursing, 33 (8.7%) students are studying in the Faculty of Pharmacy, 22 (5.8%) students are studying in the Faculty of science and 25 (6.6%) students are studying in the Faculty Of Social and Applied Sciences. Here, it has been noticed that most respondents are studying in the Faculty of Education followed by the students from the Faculty of Economics.

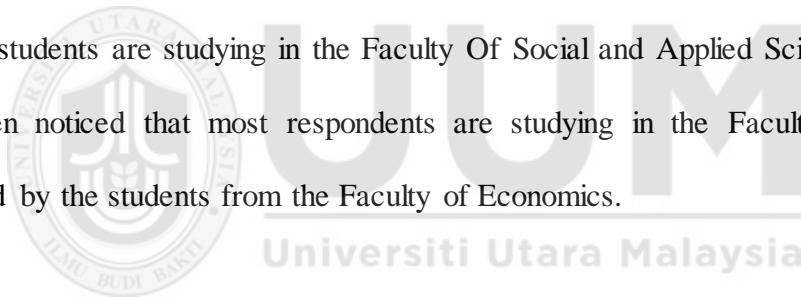


Table 4.5
Education level of respondent

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Bachelor's	331	86.9	86.9	86.9
	Master	33	8.7	8.7	95.5
	PhD	17	4.5	4.5	100.0
	Total	381	100.0	100.0	

Source: Analysis for the research study

4. Your current study program / برنامج دراستك الحالي :

381 responses

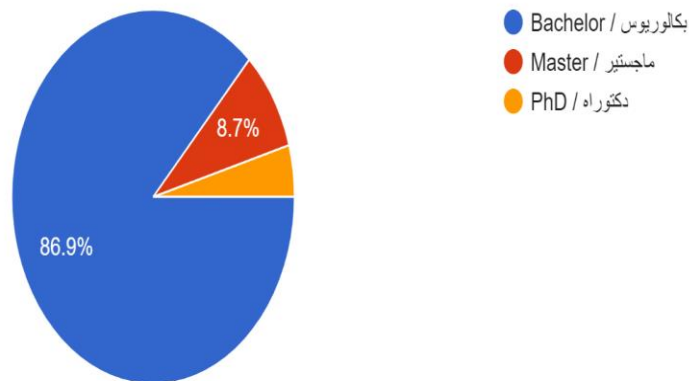


Figure 4.5

Education level of Respondents

Source: Analysis for the research study

It shows above in Table and Figure 4.5, there are three various education levels which are Bachelor's, Master's, and Ph.D. Here, 331 (86.9%) respondents are currently Bachelor's students, and 33 (8.7%) participants are currently Master students, while only 17 (4.5%) respondents are doing Ph.D.

4.6 Descriptive Analysis

The following tables are the descriptive statistics for each item of all variables which are perceived ease of use, perceived usefulness, social influence, information quality, and behavioral intention to use mobile learning system.

Table 4.6
Grand Mean Statistics

Variable	Mean	Std. Deviation
Behavioral Intention to use (BI)	4.36	.779
Perceived ease of use (PEOU)	4.40	.575
Perceived usefulness (PU)	4.38	.605
Information quality (IQ)	4.53	.557
Social influence (SI)	4.31	.713

Source: Analysis for the research study

According to the table 4.6 above the mean measures, the central tendency and standard deviation measure the dispersion. (Sekaran & Bougie, 2009). The results find that the variable of (IQ) has a higher value of 4.53 comparing to others with SD =.557. On the other hand, the lowest mean value of (SI) with 4.31 and SD = 0.779 comparing to other variables so according to the result in the table above have the mean ranges for all variables from 4.31 to 4.53 which is the value within the high mean range score.

Table 4.7
Descriptive statistic for Perceived Ease of use (PEOU)

	N	Minimum	Maximum	Mean	Std. Deviation
1. (PEOU1)	381	1.0	5.0	4.407	.5937
2. (PEOU2)	381	2.0	5.0	4.407	.5803
3. (PEOU3)	381	3.0	5.0	4.402	.5609
4. (PEOU4)	381	2.0	5.0	4.412	.5765
5. (PEOU5)	381	2.0	5.0	4.412	.5673
Valid N (listwise)	381				

Source: Analysis for the research study

Table 4.7 describes the items that have been asked regarding the level of perceived ease of use when using mobile learning system. The respondent mean rate was all more than 4 and the standard deviation for all measurement items was between the ranges of .56 to .59. Most respondents find it easy to use mobile learning systems. They also agreed

that using these kinds of tools is quick and flexible. As an example, the participants agree that using m-learning services makes it easy to get what they need or want with a mean of 4.407.

Table 4.8
Descriptive statistic for (PU)

	N	Minimum	Maximum	Mean	Std. Deviation
1. (PU1)	381	1.0	5.0	4.391	.5998
2. (PU2)	381	2.0	5.0	4.399	.5879
3. (PU3)	381	2.0	5.0	4.357	.6355
4. (PU4)	381	2.0	5.0	4.402	.5929
5. (PU5)	381	1.0	5.0	4.394	.6090
Valid N (listwise)	381				

Source: Analysis for the research study

Table 4.8 describes the items that have been asked regarding the perceived usefulness when using mobile learning system. The respondent mean rate was between 4.3 and 4.4 and the standard deviation for all measurement items was between the ranges of .58 to .63. In general, most respondents find it useful to use mobile learning system. As an example, the participants agreed that they could improve their performance in the education environment with m-learning services with a mean of 4.39.

Table 4.9
Descriptive statistic for Information Quality (IQ)

	N	Minimum	Maximum	Mean	Std. Deviation
1 (IQ1)	381	2.0	5.0	4.520	.5738
2.(IQ2)	381	2.0	5.0	4.538	.5446
3.(IQ3)	381	2.0	5.0	4.525	.5643
4.(IQ4)	381	2.0	5.0	4.541	.5492
Valid N (listwise)	381				

Source: Analysis for the research study

Table 4.9 describes the items that have been asked regarding the effect that Information Quality has on student's intention to use mobile learning systems. The respondents' mean rate was all around 4.5 and standard deviation between the ranges of .54 to .57.

As an example, most respondents agreed that they will use the mobile learning system if the system can provide information that is easy to understand and also if the system can provide relevant information for their study activities. These two points have got the highest mean rate with 4.5.

Table 4.10
Descriptive statistic for Social Influence (SI)

	N	Minimum	Maximum	Mean	Std. Deviation
1. (SI1)	381	1.0	5.0	4.339	.6870
2. (SI2)	381	1.0	5.0	4.341	.6602
3. (SI3)	381	1.0	5.0	4.299	.7572
4. (SI4)	381	1.0	5.0	4.312	.7179
5. (SI5)	381	1.0	5.0	4.286	.7431
Valid N (listwise)	381				

Source: Analysis for the research study

Table 4.10 describes the items that have been asked regarding the social influence that affects the student's intention to use mobile learning system. The respondents' mean rate was between 4.2 and 4.3 and the standard deviation between .66 and .75. Most respondents expressed a high level of influence by this variable. They also agreed that they would use the mobile learning system if people who influence their behavior think it would be helpful and they should use m-learning in their studies. As an example, most respondents agreed that those who are important to them believe that they have to use m-learning in their studies with a mean of 4.34.

Table 4.11
Descriptive statistic for Behavioral Intention (BI)

	N	Minimum	Maximum	Mean	Std. Deviation
1. (BI1)	381	2.0	5.0	4.365	.6162
2. (BI2)	381	2.0	5.0	4.373	.6093
3. (BI3)	381	2.0	5.0	4.354	.6265
4. (BI4)	381	2.0	5.0	4.383	.5984
Valid N (listwise)	381				

Source: Analysis for the research study

The last table for this descriptive statistic describes the level of student's Behavioral Intention to use mobile learning systems. The respondents' mean rate was around 4.3 and standard deviation around between .59 and .62. Most respondents expressed their intention to use mobile learning systems in the future, and they stated that they are planning to use mobile for learning purposes in the future.

4.7 Reliability Test

Cronbach's Alpha reliability tests were conducted for perceived ease of use, perceived usefulness, information quality, social influence, and behavioral intention to use mobile learning system to determine consistency across items for each scale. Tables 4.12 show the Cronbach's Alpha values for all variables of this study.

Table 4.12
Cronbach's Alpha results

Factors	Cronbach's Alpha	N of Items
PU	0.975	5
PEOU	0.973	5
IQ	0.967	4
SI	0.964	5
BI	0.971	4

Source: Analysis for the research study

As (Gliem & Rosemary, 2003) stated that the value of Cronbach's alpha when it is closer to 0.9 is a signify of high reliability and good internal item consistency in the scale, we notice from the tables above that results demonstrated high reliability for all constructs. Perceived usefulness attained the highest value of Cronbach's Alpha with 0.975, while social influence (SI) achieved the lowest value with 0.964.

4.8 Factor Analysis

The 23 items of this questionnaire were factor analyzed with a sample of 381 students from the University of Aden. Table 4.13 shows that the Bartlett's test was significant at $p < .000$. Also, the overall value of KMO test was .873, this indicates that the data set is suitable for factor analysis as the KMO value is recommended to be greater than 0.5 (Polit et al., 2001).

Table 4.13
KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.873
Bartlett's Test of Sphericity	Approx. Chi-Square	1616.753
	df	10
	Sig.	.000

Source: Analysis for the research study

Table 4.14
Eigenvalue and cumulative % of variance

Component	Total Variance Explained					
	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3.862	77.241	77.241	3.862	77.241	77.241
2	.499	9.975	87.216			
3	.342	6.838	94.054			
4	.182	3.646	97.700			
5	.115	2.300	100.000			

Extraction Method: Principal Component Analysis.

Source: Analysis for the research study

Table 4.14 shows the eigenvalues and cumulative percentage of variance for all factors. The results in this table showed the factors were retained and this is consistent with the research hypothesis that has been set at the beginning of this study.

4.9 Regression Analysis

4.9.1 Correlation Analysis

According to table 4.15, the correlation coefficient values of this study ranges from .600 to .846 which represents a positive correlation. Also, there is no correlation value higher than 0.90. This indicates that no problem was discovered in this study.

Table 4.15
Pearson Correlation

Pearson Correlation	BI	1.000	.600	.691	.804	.846
	IQ	.600	1.000	.535	.648	.627
	SI	.691	.535	1.000	.782	.709
	PU	.804	.648	.782	1.000	.867
	PEOU	.846	.627	.709	.867	1.000
	Sig. (1-tailed)	BI	.	.000	.000	.000
IQ		.000	.	.000	.000	.000
SI		.000	.000	.	.000	.000
PU		.000	.000	.000	.	.000
PEOU		.000	.000	.000	.000	.
N		BI	381	381	381	381
	IQ	381	381	381	381	381
	SI	381	381	381	381	381
	PU	381	381	381	381	381
	PEOU	381	381	381	381	381

Source: Analysis for the research study

Table 4.15 shows the Pearson correlation result analysis between perceived ease of use, perceived usefulness, Information quality, and Social influence, have an influence on students' Behavioral Intention to use mobile learning system. The result shows the perceived ease of use with the highest value at ($r = .846$, $p < 0.01$) as shown in the correlation analysis there is a significant positive. Second highest value is the relationship between perceived usefulness and behavioral intention to use which is ($r = .804$, $p < 0.01$) followed by the relationship of social influence with correlation value ($r = .691$, $p < 0.01$) and lastly, there is a significant relationship between information quality toward the behavioral intention to use mobile learning system ($r = .600$, $p < 0.01$).

As stated by Pallant (2011), the correlation strength is by determined the $r = 0.50$ to 1.0 which is taken into account as a strong correlation, $r = 0.30$ to 0.49 is considered as moderate correlation, and $r = 0.10$ to 0.29 is considered as weak correlation.

4.9.2 Multiple Regression Analysis

Multiple regression analysis involves the comparison between the dependent variable and two or more independent variables. As shown in the Table 4.16 below, R Square of 0.74 signifies that 74% of the variation in the dependent variable (BI) can be explained by all the independent variables (PEOU, PU, IQ, and SI). Besides that, the remaining 26% of variation can be explained by other factors which were not taken into account in this study.

Table 4.16
Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.862 ^a	.743	.740	.29961

a. Predictors: (Constant), IQ, SI, PEOU, PU
Source: Analysis for the research study

Table 4.17
ANOVA of Multiple Linear Regression for Intention to Use

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	97.436	4	24.359	271.360	.000 ^b
	Residual	33.752	376	.090		
	Total	131.188	380			

a. Dependent Variable: BI
b. Predictors: (Constant), IQ, SI, PEOU, PU
Source: Analysis for the research study

Table 4.18
Coefficient Analysis

		Coefficients ^a									
		Unstandardized Coefficients		Standardized Coefficients		Correlations			Collinearity Statistics		
Model		B	Std. Error	Beta	t	Sig.	Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	.211	.141		1.491	.137					
	IQ	.074	.038	.067	1.932	.054	.600	.099	.051	.562	1.778
	SI	.096	.037	.109	2.579	.010	.691	.132	.067	.383	2.610
	PU	.197	.066	.184	3.007	.003	.804	.153	.079	.183	5.473
	PEOU	.579	.055	.567	10.593	.000	.846	.479	.277	.239	4.180

a. Dependent Variable: BI

Source: Analysis for the research study

Based on the Table 4.17 the table of ANOVA is used to identify whether there is an important difference in the treatment effects under study (Richter, 2006). The table shows that the F value is 271.360 with 4 and 376 degrees of freedom (df) and a probability of occurrence by chance alone is less than 0.000 if there is no significant effect between the variables. It can be concluded that there was a statistically significant interaction at the significance level of 0.000 ($p < 0.05$).

As shown in table 4.18 above, Coefficient analysis showed that the (4) dimension have the significant relationship with the dependent variable (BI) “behavioral intention to use” where the significance level is less than 0.05 ($p < 0.05$) which are (**PEOU**) ($p = .000$), (**PU**) ($p = .003$), (**SI**) ($p = .010$) and (**IQ**) ($p = .054$). Regarding the beta analysis, all the four variables showed the positive beta values which are perceived ease of use ($\beta = .567$), perceived usefulness ($\beta = .184$), information quality ($\beta = .067$) and social influence ($\beta = .109$).

Table 4.19 below shows all hypotheses and their descriptions. In addition, Beta and the significance level are stated because they justify the decision if a hypothesis is accepted or if a hypothesis is rejected.

Table 4.19
Testing of Hypotheses

Hypothesis	Description	Beta	Significance	Accepted/Rejected
H1 (PEOU)	Student's "perceived ease of use" of m-learning service has a direct effect on behavioral intention to use the m-learning service.	.567	.000	Accepted
H2 (PU)	Student's "perceived usefulness" of m-learning service has a direct effect on behavioral intention to use the m-learning service.	.184	.003	Accepted
H3 (IQ)	Student's "information quality" of m-learning service has a direct effect on behavioral intention to use the m-learning service.	.067	.054	Accepted
H4 (SI)	Student's "social influence" of m-learning service has a direct effect on behavioral intention to use the m-learning service.	.109	.010	Accepted

Source: Analysis for the research study

The previous table shows a clear connection between all factors that had been considered in this research. As shown in the table 4.19 PEOU and PU are the strongest factors to BI with .567 and .184 respectively and the weakest is IQ with only .067. This means that the perceived ease of use (PEOU) in mobile learning has the greatest influence on the student's intention to use these kinds of tools. Also, increasing student's perception of the system's usefulness (PU) to improve their study performance will encourage their intention to use this system.

4.10 Conclusion

This chapter includes the results from all the data analyses (normality test, the profile of the respondent, descriptive analysis, factor analysis, and regression analysis). Descriptive analyses provided the calculations for mean and standard deviation that were made, the profile of the respondent presented the basic statistic information for all participants and their demographics information (i.e., gender, age, educational level, current study program). 381 participants from different faculties of the University of Aden were enrolled in this research to answer the questionnaire. Most of the participants were male with 58.5% while the other 41.5% were female. The next part of this chapter measures the reliability of the questionnaire and the factor analysis. The Cronbach's Alpha reliability test showed the quality of individual items and also the whole questionnaire. This was a necessary step before moving forward to do factor analysis. This proved that questioner is reliable and the instruments used in this research are valid and can be used by other researchers in further work. To simplify the questionnaire the Factors analysis was used to discover the relatedness of the several questions to each other. The results of the factor analysis showed that all factors which have been set at the beginning of the research were retained and this is consistent with the research hypothesis. The last part of this chapter is the regression analysis. The overall results from the regression analysis support the four hypotheses that has been set at the beginning of the research. It has shown the TAM's ability to predict the user's intention to use mobile learning systems. Moreover, the results showed that perceived ease of use and perceived usefulness are the strongest factors that determine the intention for students to use these kinds of services Overall, the analysis shows that all hypotheses were significantly positive and accepted.

CHAPTER FIVE: CONCLUSION AND RECOMMENDATION

5.1 Introduction

The purpose of this study was to explore the successful factors that determining the intention to use mobile learning systems by students. The researcher constructed a model to test the hypothesis proposed at the beginning of the study and data was collected to achieve this goal. The theoretical background of this study was based on the extended Technology Acceptance Model and was revised for the purpose of this study. The factors proposed for this study are PEOU, PU, IQ, SI, and BI. The study aimed to explore the influence that PEOU, PU, IQ, and SI have on the behavioral intention to use mobile learning systems.

The main objectives of this research have been reached; firstly by exploring the nature of mobile learning in education including social and technical issues of collaborated learning. This exploration put a clear insight into the potential advantages of mobile in teaching and learning. The research provided the main aspects of mobile learning and highlighted the complex issues of this field. Secondly, the research was able to present the theoretical background which this study banked on (TAM), and also provide understanding and identification of the factors that affect student's intention in the mobile learning system.

5.2 Summary of Statistical Analysis

Table 5.1
Summary of Statistical Analysis

Profile	Category	Frequency	Percentage (%)
Gender	Male	223	58.5
	Female	158	41.5
Age group	Under 20	6	1.6
	20 – 25	316	83.2
	26 – 30	38	10
	Above 30	20	5.2
Education Level	Bachelor	331	86.9
	Master	33	8.7
	PhD	17	4.5
Faculty	Administrative Sciences	29	7.6
	computing	27	7.1
	Dentistry	28	7.3
	Economics	35	9.2
	Education	38	10.0
	Engineering	34	8.9
	languages	32	8.4
	Law	20	5.2
	Literature	29	7.6
	Medicine and Health Sciences	23	6.0
	Nursing	6	1.6
	Pharmacy	33	8.7
	science	22	5.8
	Social and Applied Sciences	25	6.6
Total	381	100.0	

Source: Analysis for the research study

Based on the data in table 5.1 the demographic status of participants shows an apparent difference between the number of males and females as the male participants is 17% more than female. Also, the majority of the respondents are from the second group of age which is from 20 – 25. Moreover, most of the respondents are studying Bachelor degree with 86.9 %, only 8.7 % are doing Master and 4.5% doing Ph.D. Different students from different faculties have enrolled in this questionnaire and students from the Faculty of Education have got the highest percentage of participation with 10.0%.

5.3 Discussion of Major Findings

5.3.1 Relationship between Perceived Ease of use and Behavioral Intention to use Mobile Learning

In this study, PEOU point out to the degree to which a person believes that using mobile learning system is effort free. After data analysis, PEOU has been verified to positively influence the behavioral intention (BI) to use mobile learning systems. This result is consistent with (Gupta et al., 2008), (Totolo, 2011), (Farahat, 2012), (Lu Huang, 2017), and (Saroia & Gao (2019), which have been discussed earlier in the literature review. Students find that the mobile learning system is clear and understandable and using a mobile learning system does not require a lot of mental effort. This means students will have the intention to use mobile as a learning content when they feel that these tools are easy and simple. Also, the results of this research found that perceived ease of use (PEOU) is more influential factor comparing to perceived usefulness (PU) when it comes to behavioral intention to use mobile learning systems. This means that no matter how useful the mobile learning system, students will not have the intention to use it if it was not considered easy. Moreover, the beta value of PEOU toward BI is .567 which represent that PEOU has a positive influence in behavioral intention to use mobile learning system. Therefore, H1 is supported.

5.3.2 Relationship between Perceived Usefulness and Behavioral Intention to use Mobile Learning

In this study, PU refers to the degree to which students believe that using a mobile learning system would enhance his or her job performance. After data analysis, (PU) to behavioral intention to use mobile learning system (BI) have shown significant positive impact which is in agreement with (Wang and Wang, 2009), (Liu et al., 2010), (Farahat,

2012), (Lai et al., 2012) (Motaghian et al., 2013), (Scherer et al., 2015), (Elkaseh, et al., 2016), (Huang, 2017) and (Saroia & Gao, 2019). Students believe a mobile learning system is useful for their study activities and using such tools would improve their learning performance. The beta value of PU toward BI is .184 which represent that PU has a positive influence in behavioral intention to use mobile learning system. Therefore, H2 is supported.

5.3.3 Relationship between Information Quality and Behavioral Intention to use Mobile Learning

In this study, IQ refers to the degree to which students would perceive the information as being of relevance, timely, accurate, and complete. The result of the analysis found that IQ is a factor which positively influences student's intention to use mobile learning system. Based on the survey results, Students would use the mobile learning system if the system can provide sufficient, relevant and up-to-date information. (Ramayah et al., 2010) found that there is a positive effect of information quality on the users' behavioral intention. This result is also in line with (Ozkan & Koseler, 2009), (Ramayah, et al., 2009), (Pai & Huang, 2010), (Hassanzadeh et al, 2012), (Cheng, 2012), (Aggarwal & Rahul, 2017), (Ameen et al., 2019) and (Babya, & Kannammalb, 2020). The beta value of IQ toward BI is .067 which represent that IQ has a positive influence in behavioral intention to use mobile learning system. Therefore, H3 is supported.

5.3.4 Relationship between Social Influence and Behavioral Intention to use Mobile Learning

In this study, SI refers to the perception of a student that most other people who are influenced to him or her, think that he or she should or should not carry out the intention to use mobile learning system. After analysis, SI has been verified to positively

influence the behavioral intention (BI) to use mobile learning systems. This result is in line with (Elizabeth et al., 2007), (Al-Harbi, 2010), (Lee, 2010), (Karaali et al., 2011), (Chen et al, 2012), (Tarhini et al., 2013), (Beldad and Hegner, 2017), (Beldad & Hegner, 2018), and (Sathye et al., 2018). Students of the University of Aden stated that they would use the mobile learning system if people who influence them think it would be helpful and they should use m-learning in their studies. In general, the respondents agreed that those who are important to them believe that they have to use m-learning in their studies. The beta value of SI toward BI is .109 which represent that SI has a positive influence in behavioral intention to use mobile learning system. Therefore, H4 is supported.

5.4 Proposed Framework for Successful Factors Influencing Students' Intention to Use Mobile Learning in Higher Education

Fig. 5.1 below shows the proposed Framework by the researcher for the Factors Influencing Students' Intention to Use Mobile Learning in Higher Education – Yemen.

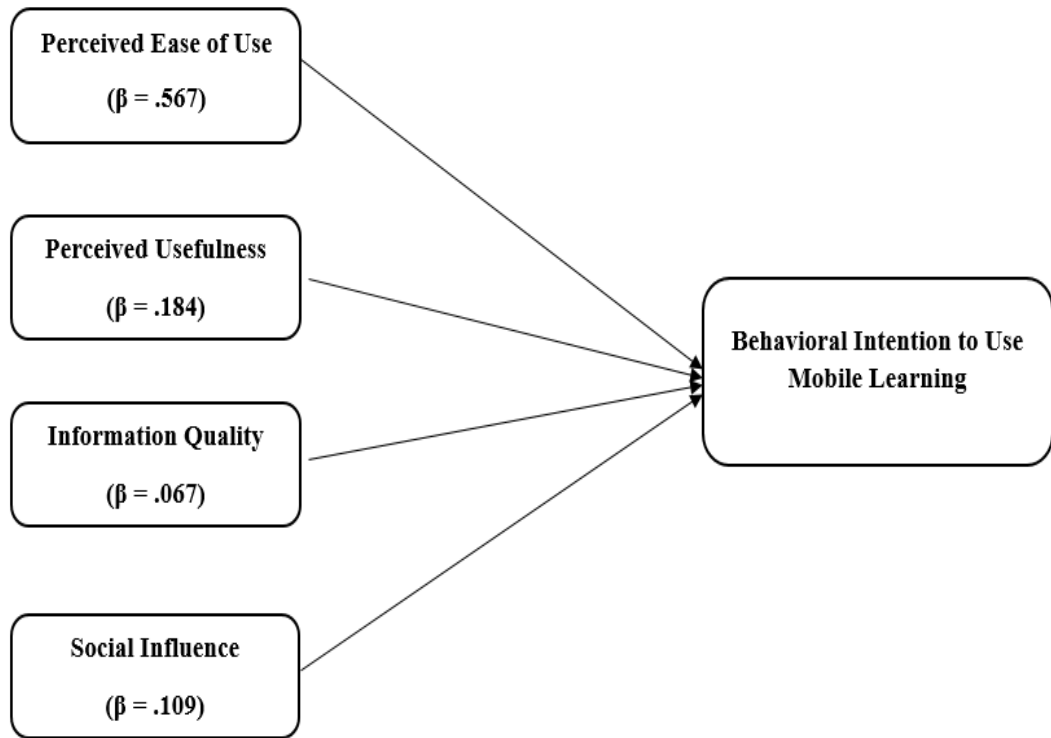


Figure 5.1
The proposed Framework for the Factors Influencing Students' Intention to Use Mobile Learning in Higher Education - Yemen
 Source: Developed for the research study

5.5 Academic implication of the study

This study successfully identified some of the characteristics of the University of Aden students. Based on the results of this research the following implications are recommended in the field of mobile learning context. The first implication of this research is that it is important to understand the factors that affect students' intention to use mobile as a learning system. Understanding these factors can help the management of the University to use this information in the future when they plan to adopt the mobile learning system.

Second, the study showed that Ease of Use “PEOU” is the most influential factor that affects the students’ intention to use mobile learning system. Therefore, in the future, designers of the system, management and instructors of the university should consider this point and emphasize on the system’s easiness to be closer to students’ perspectives that this factor is the most influential factor for them to use mobile learning system.

5.6 Limitation of the study

There were some limitations linked to this research. First, is the data collected for this research study was only from students of the University of Aden. The second Limitation, this study used only one theoretical background which is the TAM model and this might be hard to achieve reliability and validity of the mentioned factors. The third limitation is the lack of control over the respondent. As the survey was distributed online the researcher had no control over the students who answered the survey questions. Although there was contact information about the researcher, the respondent might find it difficult for them to ask questions related to the survey. This might lead to some misunderstanding for some statement of the survey and as a result might lead to incorrect answers. In order to avoid such misunderstanding, the researcher made it clear about the purpose of the study and all terms of the study explained at the beginning of each part of the questionnaire.

This study is limited to identify student intention factors that determine the usage of mobile learning systems but not to study the actual usage or create any model. Although the results of this study are valid and true, it cannot be said that to be true and generalize for all other intention to use studies.

5.7 Recommendation

Based on the limitations mentioned in the previous part, further work should include respondents from different Universities or conduct a comparison study between more than one university to better understand the students' intention to use mobile learning systems. Moreover, further research can use more than one theoretical background to explore more factors determining students' intention to use mobile learning systems.

Further work can use a qualitative approach by interviewing the respondent to avoid any misunderstanding might the online survey caused to the respondents. Lastly, further research can use these results to be a part of other future research about adopting mobile learning in the University of Aden.

5.8 Conclusion

The successful factors influencing students' intention to use mobile learning system has been successfully identified and examined using TAM model. Data of this study has been collected from students of the University of Aden / Yemen. Results of this study found that PEOU is the most influential factor on students' intention to use mobile learning system, followed by PU, SI, and IQ respectively. Overall, the results of this study are important and helpful for other researchers in the mobile learning and behavioral intention context.

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APPENDIX



SURVEY

A Questionnaire on Successful Factors Determining the Usage of Mobile Learning in Yemen

Dear Sir/ Madam,

Please read this information carefully before deciding whether or not you wish to participate in this research. Participation is entirely voluntary. You may be assured of complete confidentiality if you choose to participate.

Purpose: I am conducting a survey as partial fulfilment of the requirements for the degree of Master Science of Management at the University Utara Malaysia (UUM)

Definition: Mobile learning services (m-learning services), for this research project, refers to anywhere, anytime access to educational and university services such as course registration, result, timetable and my courses through the use of mobile technology (eg. Smartphone, Tablet, laptop/notebook computer), whether connected or disconnected from the network.

Instructions:

Please read the information before completing survey.

Select the answer that best reflects your views. Answer all questions as honestly as possible. There is no correct or best answer.

If you require additional information or have questions, please feel free to contact me at the email listed below.

Shuhd Saleh Basurra

Master of Science (Management) - University Utara Malaysia (UUM), Malaysia

Email: shahd.basurra@gmail.com

SECTION ONE : General Information

This section is about background information. Please fill up the blanks and mark {✓} the most appropriate (please tick one only).

- 1) What is your gender: 1. () Male 2. () Female

- 2) What is your age _____ Years.
 1. Under 20 ()
 2. 20 – 25 ()
 3. 26 – 30 ()

4. Above 30 ()
- 3) Your Education background (Please Tick one only):
1. Faculty of Education ()
 2. Faculty of Administrative Sciences ()
 3. Faculty of Medicine and Health Sciences ()
 4. Faculty of Economics ()
 5. Faculty of Engineering ()
 6. Faculty of Law ()
 7. Faculty of Literature ()
 8. Faculty of Dentistry ()
 9. Faculty of Pharmacy ()
 10. Faculty of languages ()
 11. Faculty of science ()
 12. Faculty of computing ()
 13. Faculty Of Social and Applied Sciences ()
 14. Faculty of Nursing ()
- 4) Your current study program :
1. Bachelor ()
 2. Master ()
 3. PhD ()

SECTION TWO:

Subsection 1) The aim of this section is to understand the **Information Quality (IQ)** factor of mobile learning services. For each statement given, please indicate your level of agreement based on the given scale below. Circle only ONE option.

1= Strongly Disagree, 2= Disagree 3= Neutral, 4= Agree, 5= Strongly Agree

		SD	D	N	A	SA
1	I would use the m-learning services if the system can provide up-to-date information	1	2	3	4	5
2	I would use the m-learning services if the system can provide information that is easy to understand	1	2	3	4	5
3	I would use the m-learning services if the system can provide sufficient information (the content is rich in quantity and quality).	1	2	3	4	5
4	I would use the m-learning services if the system can provide relevant information for my job.	1	2	3	4	5

Subsection 2) The aim of this section is to understand the **Social Influence (SI)** factor of mobile learning services. For each statement below, indicate the level of your agreement based on the scale provided below. Circle only ONE option.

1= Strongly Disagree, 2= Disagree 3= Neutral, 4= Agree, 5= Strongly Agree

		SD	D	N	A	SA
1	People who influence my behavior believe that I should use m-learning services in my studies.	1	2	3	4	5
2	People who are important to me believe that I should use m-learning services in my studies.	1	2	3	4	5
3	Students in my university who use the m-learning services are more successful than those who do not.	1	2	3	4	5
4	Students in my university who use the m-learning services have a high profile.	1	2	3	4	5
5	The m-learning method is a symbol of status in my university.	1	2	3	4	5

Subsection 3) The aim of this section is to understand the **Perceived Usefulness (PU)** factor of mobile learning services

For each of the statements below, please indicate your level of agreement based on the scale provided below. Circle only ONE option.

1= Strongly Disagree, 2= Disagree 3= Neutral, 4= Agree, 5= Strongly Agree

		SD	D	N	A	SA
1	I could complete my tasks more quickly with m-learning services	1	2	3	4	5
2	I could improve my performance in education environment with m-learning services	1	2	3	4	5
3	I could engage in education environment easier with m-learning services	1	2	3	4	5
4	M-learning services are useful in my education environment.	1	2	3	4	5
5	I could improve my effectiveness in education environment with m-learning services	1	2	3	4	5

Subsection 4) The aim of this section is to understand the **Perceived Ease Of Use (PEOU)** factor of mobile learning services.

For each of the statements below, please indicate your level of agreement based on the scale given below. Circle only ONE option.

1= Strongly Disagree, 2= Disagree 3= Neutral, 4= Agree, 5= Strongly Agree

		SD	D	N	A	SA
1	I find it easy to get what I want with the m-learning services	1	2	3	4	5
2	I find the m-learning services to be a flexible system to interact with.	1	2	3	4	5
3	It is easy for me to be the m-learning services expert.	1	2	3	4	5
4	It is easy for me to learn how to use the m-learning services.	1	2	3	4	5
5	Overall, I find that m-learning services are easy to use.	1	2	3	4	5

Subsection 5) The aim of this section is to understand the **Behavioral Intention (BI)** factor of mobile learning services.

For the statement below, please indicate your level of agreement on each of the options given based on the scale provided. Circle only ONE option.

1= Strongly Disagree, 2= Disagree 3= Neutral, 4= Agree, 5= Strongly Agree

		SD	D	N	A	SA
1	I intend to use the m-learning services	1	2	3	4	5
2	I plan to use the m-learning services	1	2	3	4	5
3	I think I would use the m-learning services	1	2	3	4	5
4	I will definitely use the m-learning services	1	2	3	4	5