DETERMINANTS OF MOBILE LEARNING ADOPTION IN THE PUBLIC UNIVERSITIES IN SAUDI ARABIA: THE MEDIATING ROLE OF LECTURERS' ATTITUDES

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UNIVERSITI SAINS MALAYSIA

2018

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by

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Thesis submitted in fulfilment of the requirements
for the degree of
Doctor of Philosphy

January 2018

ACKNOWLEDGEMENT

First of all, I thank Almighty Allah who made all of this and everything possible. Then, I would like to express my deepest appreciation to my supervisor, Dr. Azidah Abu Ziden, and to my co-supervisor, Dr Amelia Binti Abdullah for all their support and guidance throughout the programme.

The outcome and the achievement of this research is dedicated to the soul of my late father, may Allah bless his soul. I would also love to dedicate this work to my mother, Alya Almarwani and to my dear brothers, Salem, Nassir, Mohammed, and also to my dear friend, Fahd Alhomrani. I would also love to dedicate this achievement to my beautiful daughters, Shadin and Nawar. Finally this achievement is dedicated to every single one who supported me and also to every knowledge seeking individual out there. May Almighty Allah bless all humanity.

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LIST OF ABBREVIATIONS

TPB Theory of Planned Behaviour

TAM Technology Acceptance Model

ECM Extended Case Method

KSA Kingdome of Saudi Arabia

ICT Information & Communication Technologies

MOE Ministry of Education

GCC Gulf Corporation Council

PENENTUAN PENERIMAAN PEMBELAJARAN BERGERAK DI UNIVERSITI AWAM, ARAB SAUDI: PERANAN PENGANTARAAN SIKAP

ABSTRAK

Kajian ini bertujuan menilai kesan beberapa pemboleh ubah anteseden terhadap penggunaan kaedah 'M-learning' dalam konteks pengajian tinggi di universiti awam Arab Saudi. Kajian ini berhasrat untuk menilai sikap pensyarah sebagai perantara dalam perkaitan di antara pemboleh ubah anteseden dan penggunaan kaedah 'M-learning'. Secara khususnya, kajian ini mengandungi tiga set pemboleh ubah, iaitu pemboleh ubah bebas dari segi kemampuan pensyarah, latihan, kesediaan, dan komitmen universiti, pemboleh ubah bersandar iaitu penggunaan kaedah 'M-learning', dan akhir sekali pemboleh ubah sikap perantaraan terhadap 'M-learning'. Kajian ini menggunakan kaedah reka bentuk gabungan, iaitu kaedah kuantitatif dan kualitatif digunakan bagi mengumpul dan menganalisis data soal selidik dan temu ramah. 381 responden digunakan sebagai sampel kajian, iaitu 38 pensyarah mewakili bahagian sampel kualitatif. SPSS digunakan sebagai alat analisis data iaitu statistik deskriptif digunakan untuk memberi penjelasan tentang data, manakala analisis korelasi pula digunakan untuk menentukan perkaitan di antara pemboleh ubah dan juga dalam menguji hipotesis. Hasil kuantitatif menunjukkan terdapat pemboleh ubah tak bersandar kemampuan pensyarah, latihan, kesediaan dan komitmen universiti dilaporkan berkaitan dengan penggunaan 'M-learning' dan pembinaan sikap pengantara di antara pemgambilan pemboleh ubah tak bersandar dan 'M-learning'. Sebagai tambahan, hasil kualitatif yang didapati melalui analisis temu bual menunjukkan hasil yang hampir sama. Ia tidak memberi kesan kepada tujuan penggunaan komponen kualitatif kajian yang merupakan usaha menyokong dan menghuraikan hasil kajian kualitatif yang

menambahkan lagi nilai penghuraian kajian yang didapati daripada soal selidik. Perbincangan hasil kajian dan perkaitannya antara pemboleh ubah disediakan dalam bab terakhir. Kajian disertai dengan beberapa teori dan cadangan praktikal dan lain-lain bagi penyelidikan pada masa akan datang.

DETERMINANTS OF MOBILE LEARNING ADOPTION IN THE PUBLIC UNIVERSITIES IN SAUDI ARABIA: THE MEDIATING ROLE OF LECTURERS' ATTITUDES

ABSTRACT

The study attempted to examine the impact of a number of antecedent variables on the adoption of m-learning in the Saudi higher educational context represented by the Saudi public universities. The study also attempted to examine the mediating role of lecturers' attitudes on the relationship between the antecedent variables and m-learning adoption. Specifically, the study included three main sets of variables, namely the independent variables of lecturers' capacity, training, readiness, and university commitment, the dependent variable of M-learning adoption, and finally the mediating variable of attitudes towards M-learning. The study adopted a mixed design methodology where a quantitative and qualitative methods were used to collect and analyse the data of the questionnaires and interviews. 381 respondents constituted the sample of this study for the quantitative part 38 lecturers constituted the qualitative sample. SPSS was used as the data analysis tool where descriptive statistics were utilised to describe the data while correlational analysis was utilised to determine the relationships between the variables and test the hypotheses. The quantitative findings revealed that the independent variables of lecturers' capacity, training, readiness, and university commitment were reported to be positively related to m-learning adoption and that the construct of attitudes mediates the relationships between these independent variables and m-learning adoption. In addition to that, the qualitative findings generated from the analysis of the interviews reported similar results with minor differences that did not affect the overall purpose of using the qualitative component of the study which is

the attempt to support and further elaborate on the study's quantitative findings which in turned added valuable elaboration on the findings generated from the questionnaires. Discussions on the findings of the study and the links between the variables have been provided in the last chapter. The study concluded with the number of theoretical and practical recommendations including others for future research.

CHAPTER 1

INTRODUCTION

1.1 Introduction

The primary goal of this study is to examine the impact of a number of antecedent variables on the adoption of m-learning in the Saudi higher educational context represented by the Saudi public universities. Another goal the study attempts to achieve is to examine the mediating role of lecturers' attitudes on the relationship between the independent variables and m-learning adoption. This chapter is constructed in a way that responds to achieving these goals. Specifically, the chapter begins with the background of the study in which an overview about m-Learning is provided together with the factors that contributed to its appearance and adoption worldwide and also in Saudi Arabia. The chapter proceeds with presenting the statement of the problem in which some gaps in the literature regarding m-Learning are presented and discussed. Research objectives and research questions are then provided. The chapter proceeds with presenting the significance of the study in which it is divided into two sections, namely, theoretical significance and practical significance. The chapter concludes with providing the definitions of related terms including their operational definitions in this study followed by the theoretical framework upon which the study is grounded. The following section addresses the background of the study.

1.2 Background of the Study

Fletcher (2004) argues that it is obvious that the environmental imperatives that have emerged for the sake of improving the process of teaching and learning in higher education and which incorporates new technologies have been seen as essential and necessity in the field of education in general and higher education in particular. The researcher further elaborates that these new paths should be incorporated in the process of teaching and learning so that this process can move hand-in-hand with the rapid technological advances that are taking place in the world today. In support of Fletcher's (2004) claims, Utulu (2012) argues that teaching and learning techniques in universities worldwide today have been continuously reshaped in a way that responds to the environmental and technical changes that are taking place in the world today. Among the most recent teaching methodologies that are related to the technological advances in the world today is the construct of m-learning (ibid, 2012). This type of learning is seen as latest trends in education in which a shift occurred in the educational process from d-learning (Distance Learning) to e-learning (Electronic Learning) to finally so far m-learning (Mobile Learning) (Chanchary & Islam, 2011).

M-learning is a new stage of e-learning having the ability to learn everywhere at every time through use of mobile and portable devices as suggested by Hilton (2006) and Sarmad (2013). Various definitions have emerged for the construct of m-learning in the previous studies in the literature and such variance shows how evolving the construct is and is even expected to continue evolving considering the rapid changes that are taking place in the new technologies of this era (Peng et al., 2009). In this context, m-learning has been defined as "e-learning using mobile devices and wireless transmis-

sion" as suggested by Hoppe et al. (2003). There are two important aspects related to the construct of m-learning, namely its ubiquity and its mobility. Specifically, ubiquitous computing can be understood in terms of their access to computing technologies regardless of time or place which means they can be easily accessed whenever and wherever they are needed while mobility can be understood in terms of the learning on the go as suggested by Peng et al. (2009). Furthermore and in order to understand the conceptualisation of m-learning, while e-learning, which is also a term that has recently emerged in the educational field, is dependent upon desktop personal computing (PC), to a large extent, m-learning, on the other hand, is solely dependent on mobile devices as suggested by Orr (2010).

Today, more people than ever are learning on the move rather than sitting in traditional classrooms and there are many universities around the world that have been adopting m-learning technology as one of their methods in the learning (Carlson, 2005; Mortera-Gutierrez, 2006). Bal & Arici (2011) argue that m-learning has the ability to be utilised independently of time and place and that while mobile technologies were previously preferred by youths are now being widely used by all people regardless of their age. The researchers further states that there has been a dramatic decline in the use of old technologies such as cable phones and also the TV sets while, on the other hand, there has been a dramatic increase in the use of laptops and mobile phones. This trend opened doors for educational institutions to utilise the newly emerged technologies into their favour by incorporating mobile technologies in the teaching and learning practices.

Odabas (2009) defines m-learning is an educational model that emerged with the

development of mobile technologies and which makes use of these technological advancements in the teaching-learning process. Odabai (2009) further elaborates that today, some technological devices make a significant contribution to the process of learning and such devices include cell phones, tablet PCs, portable games, computers, digital sound recorders. In addressing the increasing significance of m-learning within the educational process, (Tarimer, Senli and Dogan, 2010) argue that day by day, the use of mobile technological devices is preferred to those that are immobile.

A major contribution to the process of m-learning occurred in the past few years when mobile devices have developed so rapidly both in hardware and software especially in terms of processing power, memory and mobile operating systems (Sarrab et al., 2013). The researchers further elaborate that current mobile devices have many advanced capabilities such as rich text processing, ability to process high quality pictures, high definition (HD) videos and voices. In addition, Broadband Wireless Access (BWA) networks have provided high speed connections with low costs. This technology increases the opportunities to apply mobile devices and wireless network technologies in the learning environment, particularly for accessing pedagogical applications on hand-held devices in different locations. The integration between these two technologies (mobile devices and wireless network) represents a huge opportunity to improve and facilitate of the education process (Som, 2006).

In addressing the importance of m-learning in the educational context, Cobcroft et al. (2006) propose that m-learning has the ability to support the way knowledge is constructed socially, particularly among learners. This social construction of knowledge can be achieved through enhancing the learners' critical, creative, collabora-

tive, and also their communicative engagement the various application of this knowledge. The researchers further elaborate that by challenging learners to embark on many technology-related individual and collaborative activities such as the creation of content, blogging, or game-playing, m-learning possesses this ability to contribute to building distributed networks of learning where participants involved in these activities can critically reflect on their own work and also the work of others. Apart from that, Traxler (2005) addressed the idea that m-learning is cost-effective as teachers could make use of the availability of smart phones and other technical gadgets available in the hands of students which in turn would save time, materials and textbooks.

Researchers and educators seem to agree that the implementation of technology and e-learning/m-learning is necessary so that education evolves and develops with the advancements of technology and internet (Dalsgaard; 2005; Bertea, 2009). In this context, Smedley (2010) argues that there is no look behind whatsoever; mobile and technology-based learning cannot be abandoned and a shift from traditional classes and methods of teaching to technology-based methods is urgently needed. Bertea (2009) states that the question is not whether to adopt m-learning teaching styles as such styles are a necessity for this particular era but the question should be how to effectively implement m-learning and how to train our teachers on using such styles.

In addition, m-learning offers individual empowerment with greater control over learning (Smedley, 2010). The researcher further elaborates that learners who are comfortable with technology and have a positive attitude towards it are more likely to succeed within an m-learning environment. However, to improve the use and utilisation of m-learning in an institutional context does require holistic and strategic im-

plementation of plans (Al-adwan & Smedley, 2012). The researcher elaborate on this stating that this as well requires many assurance processes to be taken into account and implemented and such processes and procedures include constant evaluation and measurement tools such as the use of surveys in order to know whether teachers and their students receive the support they need in m-learning adoption and implementation (Sarmad, 2013). Furthermore, Sarmad (2013) further claims that that the support and sponsorship of different educational institutions, such institutions are more likely to remain outdated in terms of m-learning implementation or the innovative practices related to it.

The adoption of m-learning by various educational institution, particularly higher education institutions has been increasing rapidly worldwide. However, as compared to developed countries in the West such as in the States and Europe or even in some Eastern countries such as Japan, Singapore, and South Korea, it seems that emerging and developing countries have adopted m-learning activities to a less extent (Barker et al., 2005). Sarmad (2013) supports the view that the developing countries are still way behind developed countries in the use of m-learning in the educational process, particularly in higher education context. The researcher gives an example of Bahrain as one of these developing counties and stated that the country's educational policies do not incorporate enough m-learning policies and training to teachers whether in schools or in higher educational contexts.

Traxler (2005) attributed lack of m-learning adoption in developing countries to the lack of telecommunication infrastructure in these countries as compared to their developed countries counterparts. However and despite the wide gap between the use of

m-learning between developed and developing countries, Barker et al. (2005) argues that the adoption of m-learning teaching activities found its way recently in the developing countries and the use of these m-learning activities has been increasing rapidly. In addition, Kennedy et al. (2008) attributed the lack of m-learning implementation to the existing gap, or what he calls 'digital divide' between younger generations of students and older generations of teachers in the knowledge about technological advancements in technology-based skills. In addressing the 'digital divide' between students and their lecturers, Prensky (2001) and others have suggested that undergraduate university students can be characterized as 'Digital Natives' due to their intense exposure to digital technologies while growing up, whereas their older lecturers can be characterized as 'Digital Immigrants'. This indicates that a knowledge gap exists between younger generations of students and their older generations of lecturers in the use of technology and technological gadgets.

In addition and due to the rapid changes that are taking place in the technologies field, contemporary research has not fully covered the potential of incorporating mobile technologies beyond a single classroom activity, nor has it covered the potential of giving students the change to utilise personal mobile device and tablets as educational tools, whether inside the classroom or even outside it (Vaataja, 2012). This lack in the research and the full coverage of the potential mobile devices could bring to the educational field together with a sense of fear from the side of educators that such devices may also distract young learners from learning together with the idea that these devices may also provide a means for cheating, has led to the ban of mobile devices in many classrooms worldwide. In this context and despite the lack of data availability on how many universities or educational institutions banned mobile devices, there has

been a recent survey on whether this ban can work. The findings of the survey revealed that 63 percent of high school students reported using mobile devices anyway despite of the ban. Consequently, educators need to respond to such reality and they also need to understand that individuals nowadays rely heavily on mobile devices. Thus, the question should not be whether to ban these devices or not, rather what we, as educators, should do to cope with such reality (Vaataja, 2012).

Jeffery (2013) argues that advanced skills in mobile technology and basic ICT skills play significant roles in students' and teachers' intention to adopt m-learning in the process of teaching and learning. In this context, Pollara (2011) reported a variance in the students' and their teachers' attitudes towards the use of mobiles in the teaching-learning process. Specifically, the researcher found that while faculty members' perceptions about the use of mobile devices by their students is that such devices are used primarily to socialise or 'chat', students' perceptions about their own use, on the other hand, were different where students reported that their mobile devices are used to perform a wide variety of educational tasks, apart from 'chatting'.

Attitudes towards the use of technology-based learning in general and m-learning in particular constitute an important determinant of m-learning adoption in the teaching-learning process. In this context, Yun, and Murad (2006) argue that teachers' negative attitude towards the importance of gaining technical skills might highly prohibit them to participate in m-learning teaching activities. In addition, Iqbal and Qureshi (2012) argue that attitudes towards the use of m-learning in higher educational context have a great deal of impact on students' intention to use m-learning which would in turn influence their m-learning adoption. Drawing from the Technology Acceptance Model

(TAM), a number of determinants for attitudes toward m-learning have been identified in Iqbal and Qureshi's (2012). Specifically, five determinants have been identifies, namely perceived usefulness, perceived ease of use, perceived playfulness, facilitating conditions, and finally social influence.

The present research adopts a similar scope to Iqbal and Qureshi's (2012) by examining the factors that influence m-learning adoption in the public universities in Saudi Arabia. The difference between the two studies, however, is the idea that Iqbal and Qureshi's (2012) examined the attitudes of university students without examining the attitudes of their lecturers. There is no doubt that the attitudes of students, being the end users of m-learning is of high importance, however, it is critical that the attitudes of teachers be investigated as they are the key players in the educational process (Banks, 2005). Banks further elaborates by stating that even the best curricula materials will fail if the teachers' hearts and attitudes are involved in the teaching-learning process. Thus, the present research attempts to examine the attitudes of the lecturers of the Saudi public universities towards the use of m-learning. Another difference between the two studies is that the present research, while maintaining the original determinants of attitudes in the TAM framework, perceived usefulness and perceived ease of use, other determinants from the ones appeared in Iqbal and Qureshi's (2012) are investigated. These other determinants include lecturers' capacity in m-learning, lecturers' training in m-learning, lecturers' readiness to m-learning and finally, university commitment to m-learning. Such factors have been hypothesized by many researchers to have an impact on m-learning adoption.

Lecturers' capacity in m-learning refers to the lecturers' ability to conduct and

handle m-learning teaching activities or what researchers call 'm-learning capacity building'. In this context, Kaur (2006) points out that teachers are asked to learn new content, pedagogies, and technology tools for learning, particularly in this era of information technologies and internet. Cook and Giardina (2011) argue that ensuring that teachers who pursue m-learning teaching activities should be capable of doing such activities and that the educational institutions should make sure that their teachers are equipped with the necessary skills to conduct m-learning based teaching techniques as this is regarded as an essential component for the effective implementation of m-learning (Balavivekanandhan & Arulchelvan, 2015).

Lecturers' training in m-learning has been also identified as an important factor that would facilitate an effective implementation of m-learning. Sharples et al. (2009) argue that mobile learning is relatively a new concept to many if not most lecturers and educators. The researcher further elaborate stating that the concept is defined by its association with mobile devices and tablets that can be utilised as a support to these educators to implement non-traditional teaching styles and 'learning on the move'. Consequently, one could assume that teachers are not equipped with adequate skills and capabilities to conduct and handle m-learning techniques and activities. Cushing (2011) also supports such claims stating that universities have the responsibility to equip their teaching staff with the latest technological methods of teaching such as m-learning activities.

Lecturers' readiness for m-learning is also one of the critical factors that have been proposed in the literature on ICT and m-learning to influence an effective implementation of m-learning. Turnbull et al. (2010) defines the construct of readiness as

the individual' state or their quality of being ready prepared, prompt, and willing to do something or to embark on an experience. This definition also include being able or being equipped with the necessary tools that are needed to embark on the experience. Abas, Peng and Mansor (2009) addressed the importance of teachers' readiness for m-learning as an influential indicator of their later m-learning adoption. In addition, Rahamat et al. (2011) argue that lecturers' readiness to embark on m-learning is vital in ensuring effective m-learning implementation. The researchers recommend that future work studies are encouraged to investigate lecturers' readiness to use their mobile phones for learning purposes.

University commitment to m-learning has also been identified to be one of the influential factors in the effective implementation of m-learning. In this context, Dhlamini (2011) argues that the need for policies and strategies to support m-learning implementation arises because m-learning is a relatively new phenomenon to the majority of universities worldwide and Middle Eastern universities in particular. The researcher further elaborates that universities are required to be fully committed to m-learning implementation in terms of finances, training skills and time for planning in which a support from top university management becomes very critical to the overall success of m-learning implementation.

Considering its paramount importance for the development of people and countries alike, education is regarded as one of the most critical field and thus it has been the subject of a great deal of concern and focus of the government in Saudi Arabia, represented by the Ministry of Education (MOE). In response to this realisation of the importance of education, the Saudi government allocated a huge budget of 154.7 billion dollars

for education in 2011 (Allam, 2011). In this budget, implementing new technologies and the policies associated with this implementation constituted an important part. For example, e-learning, which was one of the Saudi e-government initiatives, was also given a considerable attention and focus by the Ministry of Higher Education. This is why education in general in Saudi Arabia and in higher education represented by the Saudi universities, in particular has shifted gradually from traditional teaching and learning styles to distance learning (d-learning) first followed by electronic learning (e-learning). However, the utilisation of Mobile Learning (M-Learning) as a new technology is still in its development stage in Saudi Arabia.

A number of factors have contributed to the recent interest of the Saudi higher educational institutions to embark on m-learning teaching practices. One of the important factors is the rapid increase of internet users in the country. In this regard, the number of internet users in the country increased rapidly and in a sharp manner during the past decade or so and this sharp increase constituted one of the early blocks for mobile learning to take place. Specifically, the percentage of internet users was 38.10 per cent of the total population in the year 2010 as compared to only 0.09 per cent in the year 2000 (Internet World Stats, 2010). Furthermore, there was only one operating telecommunication company in Saudi Arabia before the year 2005, namely the Saudi Telecom Company (STC). Then another company came on board, namely Etisalat of the UAE followed by a third company, namely Zain of Kuwait which started their business during the late 2008 and it was in that year when 3G mobile technologies were introduced which positively influenced communication and also the competition among the three companies. 3G services was then introduced by the other two telecommunication companies and since that time, more reliability, faster and better digital communica-

tion services were implemented and such services are highly essential for m-learning environment (Chanchary & Islam, 2011).

The above mentioned factors contributed a great deal to paving the way for the introduction and adoption of m-learning teaching practices. However, before the adoption of new educational methods and techniques, it is critical that lecturers' attitudes and readiness are examined so that effective adoption is achieved (Chanchary & Islam, 2011). Therefore, one could argue that there is an urgent need or an attempt to examine m-learning adoption from the perspectives of the lecturers in the context of higher education so that a successful m-learning implementation in Saudi Arabia is achieved in the near future (Al-Debei, Al-Lozi & Al-Hujran, 2014). Thus, the present research attempts to examine the Saudi lecturers' attitudes towards the use of m-learning which would in turn influence their m-learning adoption. This is done through examining the influential factors that have an impact on the lecturers' adoption of m-learning. In addition and by applying the mediation principles of Baron and Kenny (1986), attitudes towards m-learning in this study act as a mediating variable that influences the relationship between the factors hypothesised and m-learning adoption. In other words, this study attempts to examine whether the mediation principles of Baron and Kenny (1986) apply on the construct of attitudes.

1.3 Problem Statement

Resistance to use new technologies such as mobile learning for educational purposes has been addressed by a number of researchers in the literature. In this context, Mafenya (2011) found that most teachers do not consider the potential of mobile

phones and other m-learning tools for education. The researcher further elaborates that the truth of the matter is that many teachers lack the necessary awareness of how important mobile phones are in the educational setting, taking into account the sparsity of evidence to support m-learning. Teachers' resistance to use mobile technologies inside the classroom has also been supported by other researchers. In this context, Mac Callum, Jeffrey, and Kinshuk (2014) argue that research has shown that a large portion of lecturers still resists the integration of technology into the classroom. Thus, the question is do Saudi lecturers also hold similar views to the teachers in Mafenya's (2011) and also in Mac Callum, Jeffrey, and Kinshuk's (2014) study? It does not seem that this question can be easily answered due to the lack of research studies on lecturers' adoption of m-learning or the factors that could influence such adoption in Saudi Arabia. More importantly, Alebaikan and Troudi (2010) stated that one major challenge to be considered in the implementation of technology-based learning in general in Saudi universities is the adaptation of this element in the traditional university culture where lecturers seem to be in their comfort zone of doing the traditional teaching. In this context and in a study that attempted to examine the adoption of m-learning in the school of education in King Saud university, Ghnnam and Obaikkan (2016) reported that the high percentage of lecturers in the school strayed away from using mobile learning in their teaching styles when majority of them used mobiles mainly to send emails and text messages to their students while the study also reported that the students in this school use mobile learning much more than their lecturers for educational purposes. Another study recommended the examination of m-learning adoption and its influential factors was conducted by Aljuaid, Alzahrani and Islam (2013) who attempted to assess m-learning readiness in the higher educational context in Saudi Arabia.

Another challenge that also seems to be related to the attitudes of university lecturers towards mobile learning was addressed by Al-Kahtani, Ryan, and Jefferson (2006) who reported that many university lecturers avoided using mobiles and internet in learning for some conservative reasons claiming that the use of mobiles and internet inside educational classrooms represents a danger to societal norms because of its unethical content. This could also be attributed to the lack of skills in using technology-based learning methods among lecturers themselves. In this context, Sait et al. (2003) reported that instructors in Saudi Arabia universities are characterised by limited skills in Internet usage and these lecturers were reported in the study to be hesitant in using any technology in their teaching which makes it important that the construct of capacity is examined in this study.

To enhance the capacity of lecturers in the use of m-learning technologies, it is important that more training should be allocated to these lecturers as training has been hypothesised to be a strong determinant of m-learning adoption. Apart from that, not much is known about the case of university lecturers in Saudi Arabia in terms of training provided to their staff considering the lack of research in this matter (MacCallum & Jeffrey, 2009). Thus, the current research attempts to respond to this gap in the literature by examining the factors that have been hypothesised to influence m-learning adoption in the teaching styles of the lecturers in the Saudi higher educational context.

Despite the increasing use and adoption of m-learning teaching activities in developing countries context, most of the previous research studies focused on m-learning perceptions and adoption in developed countries (Concannon et al., 2005; Davies & Graff, 2005; Huang et al., 2007; Wang et al., 2009) while developing countries have

been left with scares research (Iqbal & Qureshi, 2012; Al-Debei et al., 2014). This means that there is a lack of research on m-learning studies in developing countries in general and Saudi Arabia in particular. This also means that our understanding of m-learning and the factors that influence its provision have been significantly shaped by the research findings of Western scholars and revelations. This is why there have been calls to develop a contextualised framework where the factors that influence m-learning adoption in developing and emerging countries is conceptualised (Nassuora, 2013; Kaliisa & Picard, 2017). Thus, a contextualized Saudi study in m-learning adoption and the factors that influence its provision is highly needed so that suitable recommendations are generated.

1.4 Research Objectives

The present research attempts to respond to the following research objectives:

1. To examine the extent to which lecturers' capacity in m-learning influence their adoption of m-learning in the Saudi public universities.

2. To examine the extent to which lecturers' training in m-learning influence their adoption of m-learning in the Saudi public universities.

3. To examine the extent to which lecturers' readiness influence their adoption of m-learning in the Saudi public universities.

4. To examine the extent to which university commitment towards m-learning influence lecturers' adoption of m-learning in the Saudi public universities.

5. To examine the extent to which lecturers' attitudes towards the use of m-learning

influence their adoption of m-learning in the Saudi public universities.

6. To examine the mediating role attitudes play in the relationship between lecturers' capacity in m-learning, their readiness to m-learning, their training in m-learning, and university commitment to m-learning from one side and their adoption of m-learning in the Saudi public universities.

1.5 Research Questions

The primary goal of this study is to examine the impact of a number of antecedent variables (independent variables) on the adoption of m-learning in the Saudi higher educational context represented by the Saudi public universities. Another goal the study attempts to achieve is to examine the mediating role of lecturers' attitudes on the relationship between these independent variables and the dependent variable of m-learning adoption. Thus, the present study attempts to answer the following research questions.

1. To what extent does lecturers' capacity in m-learning influence their adoption of m-learning in the Saudi public universities?

2. To what extent does lecturers' training in m-learning influence their adoption of m-learning in the Saudi public universities?

3. To what extent does lecturers' readiness influence their adoption of m-learning in the Saudi public universities?

4. To what extent does university commitment towards m-learning influence the lecturers' adoption of m-learning in the Saudi public universities?

5. To what extent does lecturers' attitudes towards the use of m-learning influence their adoption of m-learning in the Saudi public universities?

6. To what extent does lecturers' attitudes towards m-learning mediate relationship between their capacity in m-learning, their readiness to m-learning, their training in m-learning, and university commitment to m-learning from one side and their adoption of m-learning in the Saudi public universities?

1.6 Research Statements of Hypotheses

In line with the objectives and questions of this study and also in line with the conceptual framework that is designed for this study, a number of hypotheses are proposed. It is noteworthy that the design of these hypotheses were constructed based on a number of arguments from the literature on m-learning (further details in chapter two). Specifically, nine main hypotheses are proposed in this study; they are as follows:

Ha 1: There is a positive relationship between lecturers' attitudes towards M-learning and their decision to adopt M-learning technology.

Ha 2: There is a positive relationship between lecturers' capacity of M-learning and their decision to adopt M-learning technologies.

Ha 3: Lecturers' attitudes towards M-learning mediates the relationship between their capacity and their decision to adopt M-learning technologies.

Ha 4: There is a positive relationship between lecturers' training and their decision to adoption M-Learning.

Ha 5: Lecturers' attitudes towards M-learning mediates the relationship between their training and their decision to adoption M-Learning.

Ha 6: There is a positive relationship between university commitment to m- learning and the lecturers' decision to adopt M-learning.

Ha 7: Lecturers' attitudes towards M-learning mediates the relationship between university commitment towards M-learning and their decision to adopt M-learning technologies.

Ha 8: There is a positive relationship between lecturers' readiness about M-learning and their adoption of M-Learning technologies.

Ha 9: Lecturers' attitudes towards M-learning mediates the relationship between their readiness and their adoption of M-Learning technologies.

1.7 Significance of the Study

It has been mentioned earlier that the primary goal of this study is to examine the impact of a number of antecedent variables on the adoption of m-learning in the Saudi higher educational context represented by the Saudi public universities. Once this goal is achieved, the will have the potential of carrying out theoretical and practical significant practices to be taken into account. Specifically, this research is bound to have a contribution to the whole theoretical body of research that has been done on m-learning in general and in the one conducted in higher education context in particular. In addition, the study is also expected to contribute to the educational process in the Saudi public universities by generating useful findings and recommendations that could con-

tribute positively to the process of m-learning in these universities which would in turn enhance the educational process in Saudi Arabia. The following section addresses the two type of the study's contribution.

1.7.1 Theoretical Significance

It has been stated earlier that m-learning lacks theoretical ground when most of the previous studies utilized the TAM framework in explaining the adoption of new technologies in different fields in general and the educational field in particular as suggested by Monsuwe, Dellaert and Ruyter (2004); Ramayah and Lo (2007); and Lee (2010). However, no construct has been provided in the literature that would represent an overall estimation of the adoption process in TAM itself as communicated by Kim, Chan and Gupta (2007). The model only explains adoption behaviour with two factors namely ease of use and usefulness which alone could not provide a deep and accurate estimation of the adoption process. Apart from that, many calls have been expressed and reported by researchers to embark on expanding the theoretical framework of the TAM model and these calls suggested that other theories that could provide deeper understanding of the factors that influence individuals' attitudes towards adoption of m-learning should be included and utilised (Kim et al., 2007; Iqbal & Qureshi, 2012). Thus, it is hoped and expected that this study would contribute to the existing literature by extending the TAM perspective by adding other variables that have been hypothesized to influence the adoption construct. This would in turn lead to filling in this gap of the literature for future research studies and providing a better understanding of the m-learning adoption process. TAM is stated in this section as its application can differ from a country to another and this means that a modification to the original model

could provide an understanding of how the model works across cultures.

Apart from that, it has been stated earlier that most of the previous studies on m-learning have been conducted in Western or developed countries context while emerging and developing countries like Saudi Arabia have been left with limited research (Al-Debei, Al-Lozi & Al-Hujran, 2014). This means that our understanding of the construct of m-learning and the factors that influence its adoption and the attitudes associated with its users are grounded on theories and revelations of Western scholars and researchers. Although technologies are to a large extent standardized worldwide and one could argue that such theories should be global and valid in different countries, many researchers stated that individuals' attitudes are significantly shaped by the cultural and social backgrounds of where these individuals come from (Fu, 2006; Cirnu & Kuralt, 2013). Thus, the present study contributes to the literature on m-learning by providing a cross-cultural understanding of the construct of m-learning and the factors that influence its effective implementation and adoption. This would in turn contribute to the knowledge around the construct in the literature where researchers understand how it operates within various countries and background so that they can make use of the study's findings, particularly when comparing and contrasting the results.

1.7.2 Practical Significance

Al-Debei, Al-Lozi & Al-Hujran (2014) addressed the huge efforts done by the Saudi government in an attempt to invest in technology within the educational field whether in schools or universities. However, the researcher further elaborate that before adopting and utilising any techniques related to m-learning, it is necessary the

Saudi educational institutions are exposed to the lecturers' attitudes and readiness towards the adoption of m-learning. Thus, the present study is expected to contribute to the educational field in Saudi Arabia by generating a number of useful findings and recommendations for the Saudi educational institutions in general and public universities in particular about what determines the adoption of m-learning in the higher educational context. Universities in return can respond to the findings generated form the study and can then develop their m-learning systems and infrastructure based on the attitudes of the lecturers. This would in turn ensure that the Saudi universities produce more productive graduates who are ready to deal with the technological market and are exposed to the latest technological advancements in the world.

1.8 Scope of Study

The study attempts to seek the attitudes of the Saudi lecturers in the Saudi public universities regarding m-learning and its implementation in these universities. The study also seeks to examine the factors that influence the attitudes of these groups which would in turn lead to their intention to adopt m-learning in the teaching and learning process. The sample of the study come from different faculties in the university so that a generalisation of the findings is achieved. The study utilises a mixed methodology in which quantitative and qualitative methodologies are utilised. In addition and in order to ensure more generalizability of the findings, stratified random sampling technique is followed for the purpose of data collection which was then followed by simple random sampling to increase the generalizability.

1.9 Operational Definitions

- **M-learning Adoption**

  M-learning is defined as an educational model that emerged with the development of mobile technologies and which makes use of these technological advancements in the teaching-learning process (Odabasi, 2009). In this research, m-learning refers to the use of mobile phones and tablets in the process of teaching and learning for educational purposes inside and outside the university's classrooms by lecturers and students.

- **Attitudes**

  According to Schneider (1988: 179), 'Attitudes are evaluative reactions to persons, objects, and events. This includes beliefs and positive and negative feelings about the attitude object.' In this study, attitudes refer to the evaluative reactions and the beliefs of the Saudi lecturers towards the use of m-learning using mobile phones and tablets in the educational process of teaching and learning.

- **M-Learning Lecturers' Capacity**

  Lecturers' Capacity in m-learning refers to the lecturers' ability to conduct and handle m-learning teaching activities and whether these lecturers perceive themselves to possess the ability to use mobile phones and tablets for educational purposes inside or outside the classrooms (Kaur, 2006). In this study, capacity in m-learning refers to the Saudi lecturers' perceptions about their own ability in handling and utilising m-learning in their teaching styles, whether inside or outside university classrooms.

- **Readiness to M-Learning**

Readiness has been defined by Turnbull et al. (2010) as the individual' state or their quality of being ready prepared, prompt, and willing to do something or to embark on an experience. This definition also include being able or being equipped with the necessary tools that are needed to embark on the experience. In this study readiness refers to the perceptions of lecturers towards the idea whether they are ready, able, and prepared to embark on m-learning activities in the Saudi universities.

- **Mediating Role**

  The concept of mediation was introduced by Baron and Kenny (1986) who argued that some independent variables that have a direct impact on a given dependent variable may also influence this dependent variable indirectly through a mediator. This mediator acts as a bridge between the independent variables and the dependent one. The mediator may possess the ability to alter the impact (make it stronger or weaker). In the context of this study, the independent variables of lecturers' capacity, lecturers' training, lecturers' readiness, and university commitment (causal variables) may have an impact on the dependent variable of m-learning adoption but this impact may change when the mediating variable of attitudes is inserted in the relationships.

- **Saudi Public Universities**

  Saudi public universities refer to the universities that are owned and governed by the Saudi government represented by the Saudi Ministry of Higher Education (MOHE). Currently, the total number of the Saudi public universities is 25 universities (Ministry of Higher Education, 2015). In this study, a random selection