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Attitudes of Second Language Learners of Arabic and their Teachers to Mobile Assisted Language Learning

by

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Statement of Ethical Conduct

The research associated with this thesis abides by the international and Australian codes on human and animal experimentation, as approved by the Human Research Ethics Committee (Tasmania) Network-Social Science, Ethics Reference No: H0016893.

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Abstract

This research investigated the attitudes of second language (L2) Arabic learners and their teachers in Saudi Arabia towards using mobile devices in their Arabic language learning. This included who was using mobile devices, what kind of mobile devices were being used, how the devices were being used in the Arabic language, what their attitude was towards using mobile devices, and what factors were affecting their attitude toward using mobile devices.

A mixed-methods sequential explanatory design was used. This process involved two distinct phases: a quantitative phase, followed by a qualitative one. A total of 303 learners of L2 Arabic and 150 teachers, from seven Arabic language institutes, participated in the quantitative phase of the study using a questionnaire. Sixteen L2 Arabic learners and 14 teachers participated in the qualitative phase through semi-structured interviews. A random stratified sampling technique was used for selecting the participants in the quantitative phase, whilst a purposeful technique was used for the qualitative phase.

The findings of the study revealed that mobile devices were widespread between L2 Arabic learners and their teachers. The most common use of mobile devices was focused on social media and dictionary applications. Although there were many mobile applications and online programmes which taught Arabic as a second language, including two applications were launched by Saudi universities, none of the participants mentioned using any of these applications. Interviews indicated that there was an apparent lack of awareness around what mobile applications and online

programmes, or websites were available for L2 Arabic learning and teaching. This explained why their usage was limited to social media and dictionary applications.

L2 Arabic learners and teachers showed a positive attitude towards using mobile devices in Arabic language learning and agreed with the noted benefits of using them in class. Such benefits included the new opportunities brought in by mobile devices (M = 4.4, SD = 0.92 for teachers and M = 4.1, SD = 0.97 for learners) which would improve communication between students and teachers (M = 4.1, SD = 1.10 for teachers and M = 4.0, SD = 1.05 for learners).

Using principal component analysis, data analysis revealed three factors which influenced the attitude of L2 Arabic learners and their teachers toward Mobile Assisted Language Learning (MALL). The three factors were prior knowledge, internet-specific considerations, and Arabic specific considerations. The prior knowledge of L2 Arabic learners and their teachers was high and had a positive influence on their attitude toward using mobile devices. 94% of teachers and 86% of learners were able to download mobile applications onto their mobile devices, and 88% of teachers and 82% of learners were able to translate a sentence into another language using their mobile device.

The other two factors, Internet-specific considerations and Arabic specific considerations had a negative impact on their attitude. Arabic specific considerations included items such as unsatisfactory Arabic language learning materials and training/support in Arabic mobile assisted language learning. Internet-specific considerations included the availability of items, speed and reliability of the internet, which were also considered unsatisfactory.

This study is unique in that it investigated the attitude of both L2 Arabic learners and their teachers in Saudi Arabia. The findings from this study revealed the potential for using an adapted model for mobile learning acceptance for L2 Arabic institutes within Saudi Arabia. The application of a model was driven by the data collected, as it aligned with the Technology Acceptance Model (TAM) – a model that has received a great deal of attention in the literature on user acceptance of technology; although the TAM was not used specifically, as the study sought to examine Arabic learners' use of, and attitudes towards, mobile technology.

This adapted model indicated that L2 Arabic learners and teachers, at the seven Arabic language institutes, were ready to accept using mobile devices in their Arabic language learning. However, the lack of awareness around what mobile applications and online programmes were available for L2 Arabic learning and teaching played an essential role in the current use of mobile devices in Arabic language learning.

The results of this study will support Saudi universities in the creation of workflows and strategies to introduce mobile technologies in L2 Arabic learning. This will enhance Saudi Arabia as a leader in the field of teaching Arabic as a second language.

Dedication

To my father, **Abdullah**, and my mother, **Fatimah**, who highlighted the role of education and sacrificed a lot for us, their children, so that we could get the opportunities they really did not have.

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Chapter 1

Introduction

1.1 Overview

The rationale for this research is to investigate the attitudes of learners of Arabic as a second language (L2) and their Arabic language teachers in Saudi Arabia towards the use of mobile devices in their learning of the Arabic language.

This chapter presents an overview of the research undertaken in this study. After the background of the study is described, the context of the study will be presented. Following this, the motivation and significance of the study are explained. The research aims, along with the research questions, are presented next. The chapter concludes by outlining the structure of the thesis.

1.2 Background of the Study

Mobile technologies have become an integral component of modern life (Albion, 2001). According to recent statistics (Clement, 2020a), over 4.5 billion people - that is more than half the population of the world - as shown in Figure 1.1 currently use the internet, with more than two-thirds of that number using mobile devices. The number of internet users worldwide increased from just 413 million in 2000 to over 3.4 billion in 2016, reaching the one billion users milestone as early as 2005 (Roser, Ritchie, & Ortiz-Ospina, 2015). The number of internet users is expected to increase exponentially as more mobile devices become internet-capable,

and as the number of locations where the internet is available wirelessly increases

(Thorne, Black, & Sykes, 2009).

World Population, Internet Users and Smartphones Users 2020 Stats
(in billions)
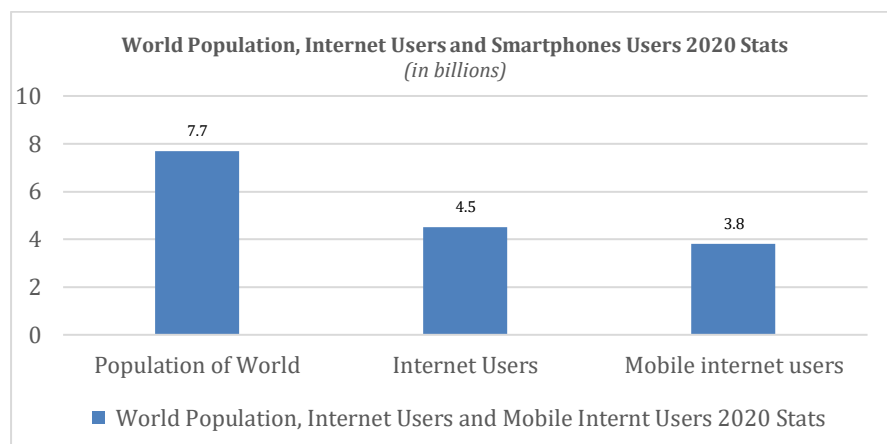
Figure 1.1 World Population, Internet Users and Smartphones Users 2020 Stats (in billions)

Over the last few years, mobile technologies have changed substantially and

continue to do so. Mobile devices, such as smartphones and tablet PCs, now have

superior cellular connectivity and expanded wireless fidelity (Wi-Fi) capabilities.

These capabilities support the idea that learning is not limited to space or time and

learning is increased by "mobility" and "ubiquity" (Mercier & Higgins, 2013). The

evolution of Wi-Fi started in 1985 when the American Federal Communications

Commission (FCC) decided to open some wireless radio spectrum rangers, allowing

these frequencies to be used without the need for a government licence (Berg, 2011).

In 1997, a committee called "802.11" was established, and Wi-Fi was made accessible

to the general population on two main frequencies: 2.4Ghz (802.11b) and 5Ghz

(802.11a) (Berg, 2011). For many years afterwards, 2.4Ghz was the most used

frequency for many reasons, including being less expensive. In 2009, an 802.11n

version of 2.4Ghz, which was reliable and fast, was released (Banerji & Chowdhury,

2013). A few years later, the new version 802.11n was not enough when there were so

2

many Bluetooth devices using the same frequency. This makes the 5Ghz range better as it is four times the speed of 802.11n (Banerji & Chowdhury, 2013).

New mobile devices, such as the iPhone 11, support 802.11ax also known as Wi-Fi 6. Wi-Fi 6 "significantly improves the user experience in high-density deployment" and successfully achieves the average per user throughput "by four times compared to the legacy IEEE 802.11" (Qu et al., 2019, p. 1461). The new version 802.11ax is designed especially for very crowded public locations, for instance, on trains and in stadiums (Moate et al., 2017). These expanded Wi-Fi capabilities would address the current societal demands of lifelong learning and growing societal pressure to be keeping up with technological advances and usage (Luisa Sevillano-García & Vázquez-Cano, 2015). With the fast pace of daily life, it is challenging to have enough time to increase our knowledge with school learning or career training (Ying & Qi, 2010). Moate, Chukwuere, and Mavhungu (2017) claim that if better Wi-Fi speed is offered by an institution, it increases its chances of accomplishing teaching and learning objectives.

The widespread use of mobile devices has had a significant impact on our lives. They can assist with many daily life tasks and are readily available wirelessly almost everywhere - at home, in cafés, and at universities. People have become dependent on mobile devices and mobile applications to assist with a number of daily tasks in their lives, such as online shopping, ordering food, checking their bank accounts, or keeping up with friends using social media (Sarwar & Soomro, 2013) To some extent, it is hard to imagine that this significant transformation happened in a matter of only ten years after Apple and Google launched their own app stores.

In 2008, when Apple's App Store launched, there were only 500 apps (Iqbal, 2020). In a new report from the first quarter of 2020, Android platform users can now select from 2.56 million applications, leaving Google Play the app store with the biggest number of available apps. Apple's App Store is the second-largest app store, with about 1.85 million apps available for iOS (Clement, 2020b).

Social transformation affects the education sector. In November 2019, out of the millions of mobile apps on the market, education apps were the third most used category of apps available from the Apple App Store at around 9% after games applications with 23% and business applications with 10% (Clement, 2019). Learners and teachers from various subjects are not limited in their use of applications specifically designed for their particular field. Educators have adapted and used other popular applications, such as Facebook or the WhatsApp messaging app, to meet their needs for effective communication and sharing files with colleagues, students and their parents (Wang et al., 2012).

Mobile language learning applications have their own share of the application market. These applications provide varied types of language support for language learners. *Duolingo* or *Memrise* have varying entry-level skills for learners. Other applications can support language learners with their language skills, such as vocabulary learning. These Mobile language learning applications are available in many languages. For example, the United Nation's official languages - English, French, Chinese, Russian, Spanish and Arabic - are available on most mobile language applications, such as *Duolingo*, *Rosetta Stone*, and *Memrise*.

The download rates for language learning applications reflect the high interest worldwide in using mobile devices and mobile language learning applications as a

new way of learning. In April 2019, *Duolingo* was the most downloaded language learning application, with more than 4.6 million installations (Chan, 2019). Another mobile language learning called *U-Dictionary* was the second most installed application, with almost three million insuallations (Chan, 2019).

There are a variety of reasons for encouraging people to learn a second language, such as education, business, tourism, or diplomacy. However, learning a second language is a long and complicated process, and it is generally more demanding and less successful than first language acquisition (Abdullahi et al., 2018; Mohammed, 2018). Several researchers have highlighted many issues concerning the difficulties L2 learners can encounter. These difficulties include:

- Teaching methods and approaches

- Teaching materials

- Motivation

- Lack of exposure to the target language

- Negative transfer

- Learning environment

- Grammar

- Cultural differences

- Attitude (Abdullahi et al., 2018; Keeves & Darmawan, 2007; Stevens, 2006)

Using technology to overcome some of the challenges of L2 learning is not a recent phenomenon. Television, radio programmes and audio/videotapes have been used in education since the 1970s and became known broadly as distance learning (D-learning) (Moore & Kearsley, 2012). These technologies propelled D-learning, providing access to learning for those who were geographically distant, from the first

generation that was defined by postal correspondence, to the second generation that was defined by the use of mass media, such as television and film (Anderson & Dron, 2012).

As technologies developed, new learning and teaching methodologies, such as web-based learning, virtual classrooms and technology-enhanced learning, became part of a technology-driven methodology for learning called electronic learning (E-learning) (Alebaikan & Troudi, 2010; Robles et al., 2019). Although E-learning was the first recognised term that connected technologies specifically to education, its definition has changed over time (Crompton, 2013). Each E-learning definition has a different focus: some definitions are centred on the content, some on the communication method used and some highlight the technology used. Currently, E-learning is defined as "online learning that takes place in a formal context and uses a range of multimedia technologies" (Nair, 2013, p. 15).

The latest generation of smartphones and tablet computers have faster cellular connectivity and increased Wi-Fi capabilities. This has ushered in a new way of learning known as mobile learning (M-learning). M-learning places emphasis on continuity and spontaneity across different contexts of use. Although many researchers have attempted to define the concept of M-learning, there is still no definitive agreement on its definition (Crompton, 2013; Kukulska-Hulme, 2009).

The wide popularity of mobile devices, including applications, has attracted many researchers to investigate the use of mobile technologies in their learning and teaching (Fleischer, 2012; Hwang et al., 2011; Persson & Nouri, 2018; Sung et al., 2016).

Sung, Chang, and Liu (2016) performed a meta-analysis and synthesis of the effects of integrated mobile devices on teaching and learning in 110 studies published between 1993-2013. The findings from these studies show that using mobile devices in teaching and learning are a positive and effective method. Sung, Chang, and Liu (2016) conclude that "the overall effect of using mobile devices in education is better than using desktop computers or not using mobile devices" (p. 265).

Using mobile devices to help language learners and teachers is a topic which has received a significant amount of attention. The ubiquity and accessibility of such devices have the potential to enhance students' vocabulary learning, listing skills, communication skills and motivation that would assist language learning (Alzahrani, 2015; Cooney & Keogh, 2007; Ogata et al., 2010; M. Rahimi & Soleymani, 2015). Persson and Nouri (2018) conducted a systematic review of L2 learning with mobile technologies. They reviewed 54 articles out 1,424, published between 2010 and 2017, which focussed primarily on the use of smartphones and tablets. They found that mobile devices are widely used to support L2 learning, particularly in the arena of vocabulary learning.

Duman, Orhon, and Gedik (2015) examined 69 studies, published between 2000 and 2012, associated with mobile assisted language learning (MALL) to investigate their features and research trends. They found that by 2008, the number of studies grew at a fast rate and peaked in 2012. The most important feature of the studies examined was the use of mobile phones and personal digital assistant (PDA) to teach vocabulary. In another study, Darmi and Albion (2014) reviewed 33 empirical studies, published between 2004 and 2013, on the integration of mobile devices in a language learning context. They found that L2 learners widely use mobile

phones, which is consistent with Traxler (2005), who highlights the readiness of language teachers to integrate the use of mobile phones in their teaching, and learners quickly adopting the use of technology to support their learning process. Darmi and Albion (2014) also found that most studies which employ mobile devices originated in Japan, with vocabulary being the most studied area of learning using mobile devices.

Shadiev, Hwang, and Huang (2017) studied articles published between 2007 and 2016 to discover the trends in publications; their research centre; the technology used; methodologies, and current issues. They discovered a growing trend in the publications, with the most common research topics being related to students' perceptions of technology and language proficiency. Here, English was the most common target language, while university and elementary school students were the most common participants in reviewed studies. Language learning activities were carried out in the classroom, and specified locations outside of campus, and most of the activities were based on instructor-centred approach. Finally, it was noted that published work around L2 learning and technology used qualitative and quantitative data.

Despite the widespread use of mobile devices and mobile applications, their successful use in L2 learning requires focussing on many factors (Alrasheedi & Capretz, 2015). Whether L2 learners accept M-learning styles depends on the influence of certain psychological aspects. This means that a positive or negative attitude can lead directly to different behavioural intentions, such as whether a student will join in mobile learning or not (Zhao & Zhu, 2010).

As attitudes can play a significant role in accepting the use of mobile technologies, many studies have investigated the attitude of learners or teachers toward mobile devices in language learning, whether it is the first or second language, in various contexts. Many studies agree that using mobile devices to support L2 learning processes has a positive impact, with language learners and their teachers tending to have a positive attitude towards using mobile devices in their learning (Persson & Nouri, 2018; Shadiev & Yang, 2020). However, not all languages have received enough attention and research. Previous studies have shown that the English language is the most frequently investigated target language in studies of mobile device use. Other languages, however, are still in need of more research (Persson & Nouri, 2018). One of these languages is the Arabic language.

The Ministry of Education has signed an agreement with Microsoft to integrate information technologies in all Saudi schools and universities. This agreement includes many initiatives and training programs such as "Microsoft Innovative Educator" (Alharthi, 2016). As part of the Saudi Arabia National Transformation Program 2030 vison (Saudi Vision 2030, n.d.), the Ministry has also signed an agreement with K12 to benefit from its long experience, as well as a recognised company in designing digital school curriculums (Ministry of Education, 2016)

Saudi Arabia has a leadership role in the field of teaching Arabic as a second language going back to 1987 when the Institute of Arabic Language, King Saud University, held their first Symposium about teaching Arabic as a second language worldwide (Facchin, 2019; Sieny, 2017). In 2008, Saudi Arabia launched the "King Abdullah Bin Abdulaziz International Center for The Arabic Language". This well-

known centre has many publications, training facilities, and international cooperation. The centre has also organised and participated in numerous programmes in more than 21 countries, including Russia, France, Singapore, China, India and Morocco.

The use of mobile devices in L2 Arabic learning has not received much attention as yet. Shadiev and Yang (2020) studied 398 research articles, published between 2014 and 2019, which focus on using technologies for language learning and teaching. Of those, they found 267 focussed on English studies and 24 focussed on Chinese studies. However, they found no studies that focussed on learning Arabic as a second language.

This lack of research is despite the Arabic language being the fifth most spoken language worldwide - after Mandarin, Hindi, Spanish and English – and it is the sixth United Nation's official language (Ariew & Palmer, 2009; Al-Huri, 2015). It is also the mother language of approximately 300 million people, used by over one billion Muslims around the world as the language of Quran, and is a liturgical language (Abedalla, 2015; Saiegh-Haddad & Henkin-Roitfarb, 2014).

The Foreign Service Institute (FSI) has more than 70 years' experience in teaching languages to U.S diplomats and has categorised the Arabic language as being one of the most challenging languages to learn (Foreign Service Institute, 2019). FSI estimates that Arabic language learning requires approx. 2,200 hour to achieve a general level of proficiency (Foreign Service Institute, 2019). FSI base this estimate of number of hours on observing the average length of time for a learner to reach a "Professional Working Proficiency" or a score of "Speaking-3/Reading-3" on the Interagency Language Roundtable scale (Foreign Service Institute, 2019).

Irving (1957) explains that the Arabic language could be challenging to learn for several reasons. One of these reasons is related to the student's mother tongue being an Indo-European language, which may not contain the same 'throaty' letter combinations or be based a non-Latin derived alphabet. As such, a student will have to learn new grammatical sounds and systems, as well as the entirely new vocabulary. Irving (1957) also found the verbal system of Arabic to be very complicated. Alsrhid (2013) adds that Arabic writing systems, the Arabic root system, and morphology could also be complicated. The Arabic language is written from right to left, which is uncommon and contrasts directly with languages that use the Latin alphabet - the most widely used alphabet worldwide.

However, Stevens (2006) questions FSI's language classification, mentioning that this grouping of languages' difficulty is based on "the difficulty for native speakers of English, not necessarily for speakers of any other language" (p. 36). Alternatively, Stevens (2006) adds that learning Arabic is "harder" than many other languages as Arabic involves acquiring both Modern Standard Arabic (MSA) and colloquial dialect (p. 56).

Arabic mobile language applications have received some attention recently. In one study, Hisham (2019) evaluated L2 mobile language applications which teach Arabic as a second language. He selected these mobile language applications based on the criteria of five elements:

- Being an application to learn Arabic as a second language
- Having Modern Standard Arabic (Dialect is excluded)
- Providing at least one language level
- Being designed for adult learners
- Having general Arabic (not for specific purposes).

The 12 applications selected are:

- Rosetta Stone
- Busuu
- Drops
- Memrise
- Learn50 Languages
- Beelinguapp
- Learn Arabic Lang Offline
- Learn Arabic Salaam
- Learn Arabic for Beginners
- Interactive Arabic
- Learn Arabic Essentials
- Kumu

Hisham (2019) found that the best three mobile language applications for L2 Arabic were Rosetta Stone, Busuu, and Drops. In addition, Heil et al. (2016) points out that there were indeed 19 applications, out of 50 apps selected based on their ranking on Google Play and App Store, which teach the Arabic language.

The use of mobile technologies in the learning and teaching of L2 Arabic in both formal and informal contexts, from the perspective of teachers and students in Saudi Arabia, has yet to be investigated in the academic literature. Published studies have been retrieved from ProQuest, Google Scholar, while ERIC shows the following studies, listed in Table 1, were available when this study commenced

Table 1.1 List of studies about using mobile technologies in Arabic language learning

Focus	Author	Year	Location	Participants	Methods
Students' perceptions of the use of mobile applications	Abedalla	2015	USA	40 - NNS	Mixed
perspectives and usage of technology of Arabic language teachers in the United Arab Emirates	Alhumaid	2014	UAE	NS	Quan
Teachers' perceptions of the effectiveness of using Arabic language teaching software in Omani basic education	Al-Busaidi, et al.	2016	Oman	12 NS female	Quan
Modern standard Arabic learners' views about the effect of portable technology on L2 learning proficiency in listening and reading at the Defence Language Institute Foreign Language Center	Ahmed	2015	USA	30 - NNS	Qual
Web assisted language learning system for enhancing Arabic language learning using cognates	Shehab & Zeki	2015	Malaysia	10 NNS	Quan
Students' Feedback towards Using Facebook in Learning Arabic Language	Rahimi, et al.	2015	Malaysia	22 NNS	Quan
Online vocabulary games for teaching and learning Arabic	Sahrir, et al.	2012	Malaysia	111 NNS	Mixed
Perceptions of Arabic language teachers toward their use of technology at the Omani basic education schools	Al Musawi, et al.	2016	Oman	350 NS	Quan
The impact of WhatsApp on interaction in an Arabic language teaching course	Aburezeq, et al.	2013	UAE	17 NS	Qual

(NNS) Non-Native Speakers, (NS) Native Speakers, (Quan) Quantitative, (Qual) Qualitative

It appears that only two studies, Abedalla (2015a) and Ahmed (2015), have investigated the perceptions of Arabic language learners toward using mobile technologies in the context of L2 Arabic learners. Both studies were carried out in the US. Abedalla (2015) investigated the perceptions of L2 Arabic learners at three universities in Pennsylvania about the use of mobile apps. The participants, both male and female, were graduates and undergraduate students with elementary Arabic skills and chosen by convenience sampling. Ahmed (2015) examined the strengths and weaknesses of classroom activities designed explicitly for portable technology (iPad/MacBook Pro) in enhancing reading and listening proficiency for four US military services. The two studies found there was a positive impact of using mobile technologies with L2 Arabic learning.

The current study aims to provide an overview of L2 Arabic learners and their teachers in the context of Saudi Arabia and how they use their mobile devices to learn and teach Arabic. This includes researching who is using mobile devices; what kind of mobile devices are being used; how the devices are currently being used in the learning and teaching of Arabic; their attitudes toward using mobile devices, and what factors are affecting their attitudes toward using mobile devices.

1.1 Context of the Study

The current study has investigated the attitudes of L2 Arabic learners and their teachers towards mobile assisted language learning (MALL) at seven Saudi university institutes. These institutes are:

- King Saud University (KSU), Arabic Linguistics Institute
- Umm Al-Qura University (UAU), Institute of Arabic Language for Non-Native Speakers

- Islamic University of Madinah (IUM), Institute of Arabic language for non-native speakers

- Imam Mohammed Ibn Saud Islamic University (IMISU), Institute of Arabic Language for Non-Native Speakers

- Princess Nourah Bint Abdulrahman University (PNU), Teaching Arabic Language Institute for Non-Arabic Speakers

- King Abdulaziz University (KAU), The Arabic Language Institute for Speakers of Other Languages

- Qassim University (QU), Unite of Teaching Arabic Language for Non-Native Speakers

Most of the L2 Arabic learners at these universities had been granted full scholarships by their universities to study the Arabic language programme. The learners would be able to upgrade their scholarships to study for a bachelor's degree in a variety of subjects once the Arabic language programme had been completed. Some of the learners were living with their parents, who work in Saudi Arabia in the public or private sector, while the majority were living in student accommodation that was provided by their universities. It is notable that most of the students at these institutions were Muslims and are either seeking to learn Arabic to support gaining employment in the Middle East in a variety of fields, such as economics, teaching English, and an array of other subjects; or are studying Arabic for religious reasons so that they can understand the Qur'an and other key religious texts. As the nationalities of these students changes over time due to employment and family requirements, and so is not static or representative, steps were not taken in the research to focus on such demographic understandings.

When this study commenced in 2016, the seven universities had more than 1,400 L2 Arabic learners, from more than 100 nationalities, and more than 300 teachers from five Arabic countries. Table 1.2 presents additional information about the seven university language institutes.

Table 1.2 Demographic descriptors of institutes

Name of Institute	Hours per week	Weeks per semester	Semesters	Total hours
IMISU Institute	25	16	4	1,600
KSU Institute	20	15	4	1,200
PNU Institute	25	15	4	1,500
UAU Institute	30	16	4	1,920
IUM Institute	30	16	4	1,920
KAU Institute	15	16	4	960
QU Unite	20	16	4	1,280

Although these seven language institutes teach the Arabic language for four semesters, there are differences in the teaching staff used, the number of hours taught per week, and the learning materials used. KSU uses their own designed and published Arabic learning materials, including *Arabic for Live* (a total of four books), *Arabic for the World* (up to four levels), *Arabic for Medical Purposes* and *Arabic for Beginners.* Comparatively, IMISU uses their own materials and has published a total of 50 books, including a comprehensive curriculum for the Arabic language for non-native speakers. The same could be found at UAU, where they are using their own published learning material, which includes a total of 22 books. However, other Arabic language institutes, such as KAU and QU, use Arabic learning materials, such as *Arabic at Your Hands* consisting of eight books across four levels, and an Arabic-Arabic dictionary that are designed by a private organisation in Saudi Arabia called *Arabic for All*.

Regarding the number of teaching hours, none of the programmes offered by these seven language institutes, these comprise the number of hours estimated by the Foreign Service Institute, which is approx. 2,200 hours to achieve a general level of proficiency (refer to Section 1.1). For example, KAU is teaching Arabic for only 15 hours per week, which is the lowest among the seven institutes and less than half of the number of hours estimated by the Foreign Service Institute to be necessary to achieve a general level of proficiency (see Table 1.2). There are many mobile applications and programmes that could increase KAU learners' contact with the Arabic language. Arabic-Online is, as an example, a program with 796 interactive videos, 6,320 pictures, 12,000 sound files, 10,067 exercises to help with Arabic language learning. The program comprises 16 levels, and achievement tests are indexed at the end of each stage (Arabic-Online, n.d.).

Technology, "if used wisely, can play a major role in enhancing L2 learners' contact with the target language" (Blake, 2013), and mobile technology can also increase interaction, which is considered as a key factor in language learning (Muho & Kurani, 2014). The lecture format is the most used method of teaching Arabic at these seven institutes (Elnaggar, 2019). While lectures are widely criticised as a teaching method, they have managed to survive in the face of many technological developments (Kaur, 2011). In the lecture process, there is little collaboration and interaction between the teachers and the students, which has been seen as a disadvantage (Kaur, 2011). In L2 learning, mobile technologies can be very useful to increase interaction with multimedia materials such as videos or animations that can contextualise spoken text, offering visual support and insights into pragmatics (Pegrum, 2014).

1.2 Motivation

This study is motivated by my own experience of learning the English language. In 2010, I was granted a scholarship to study a master's degree in the United Kingdom. In preparation to travel, I bought the most recent available mobile phone at that time in Saudi Arabia, which was the Nokia E71, and an electronic dictionary, SD7100C, to assist me inside and outside my English classes. It was during my English class that I saw a student with a touch screen device that I had never seen before. Discovering it was an iPhone, I bought one and compared its features and Apps to my previous two devices. I quickly realised that having such a device, for me as a language learner, was priceless. The iPhone had a bigger screen than the Nokia E71, which made using the internet more accessible. It also had a dictionary application which did most of the work I needed as a language learner. So, it became clear that carrying one device on the move, which does the job of the two previously owned devices was more straightforward and more practical for me.

This study is also motivated by my experience of being an Arabic teacher of non-native speakers in Saudi Arabia for many years, with almost a year of teaching in the United Kingdom. In Saudi Arabia, students are from various countries and speak numerous unrelated languages, including English, Chinese, Malay, Swahili and Thai. Students come to an institute to study Arabic mainly for purposes related to work or religion. However, some students also want to learn L2 Arabic for their own benefit. In the classroom, mobile devices have helped me, as a teacher, with L2 Arabic learners in various situations, especially with learners who have a very low-level understanding of Arabic. I sometimes use Google Translate or Google Images to explain some new words to learners.

1.3 Significance of the Study

This study represents a contribution to the field of teaching and learning L2 Arabic by investigating the attitude of learners and their teachers towards using mobile devices. This will hopefully provide a comprehensive view regarding using mobile devices for teaching and learning L2 Arabic. Additionally, this study includes participants of various Arabic language levels and many backgrounds from these seven Arabic language institutes. This is in contrast to the study by Abedalla (2015), which was limited to elementary level Arabic learners, and the study by Ahmed (2015), which was limited to reading and listing.

As indicated earlier in Section 1.2, the Arabic language has been categorised by the FSI as being one of the most challenging languages to learn, requiring approx. 2,200 hours to achieve a general level of proficiency. None of the programmes offered by the institutes in Saudi Arabia comprises that number of hours. Technology, if used wisely, can play a significant role in enhancing L2 learners' contact with the target language (Blake, 2013); therefore, the findings of this study will provide an insight into the extent to which mobile devices can be used to help learners with their exposure to Arabic as a target language. This could help to address the gap between the teaching hours currently provided by language institutes and the estimated required hours by the FSI needed to achieve a general level of proficiency.

New projects have just begun to support L2 Arabic learning with technology such as "Interactive Arabic" and "Arabic Online". Hence, conducting this study in Saudi Arabia should help to develop these current projects and inform the design of future l2 Arabic programmes. This study will provide information that can assist decisions makers with regards to integrated mobile devices at these current Arabic language institutes, or at new institutes in Saudi Arabia.

Saudi Arabia has had a leadership role in the field of teaching L2 Arabic since 1987 (see Section 1.2). Since 2018, Saudi Arabia has opened several new Arabic language units to teach Arabic to non-native speakers at King Khalid University, Jouf University, Taif University, University of Tabuk, Jazan University, Albaha University, University of Bisha, and the University of Hail. The findings of this study will draw attention to the need for further research on using mobile technologies in L2 Arabic learning.

This study is also consistent with the Ministry of Education's "Transformation Program 2020" in Saudi Arabia, which aims to cease using print books and replace them with digital books (Toumi, 2017). This programme is part of the Saudi Arabia National Transformation Program 2030 vision (*Saudi Vision 2030*, n.d.), as The Ministry of Education has signed an agreement with Microsoft and K12 (see Section 1.2).

The Arabic learners who took part in this study were from a variety of backgrounds and were studying for a range of reasons. As with all teaching contexts, the demographics and motivations for students learning vary from year to year, therefore, these factors have not been focused on in the current study. Moreover, learning Arabic is gaining in popularity, as described by Ryding and Allen (2013 p.2) who state that "in an interconnected world with ever-increasing international links and interests, as well as key economic and political concerns at the global level, have raised the public profile of Arabic language and literature, Arab society and culture and the Arab world in general." Section 2.3.4 and 2.4 of this thesis contain further details on the particularities of the Arabic language which added to the complexity of understanding how mobile technology could be used to support Arabic language learning.

Due to the varied cultural backgrounds and e-literacy levels of the target learners and their teachers at these Arabic language institutes, the findings of this study will provide

other students and teachers with a clearer idea of how mobile devices can assist Arabic language learning. This investigation will also find out the extent to which learners and teachers have the necessary skills and understanding to make the best use of mobile devices in the context of teaching and learning L2 Arabic.

1.4 Research Aim and Questions

This research has investigated the attitudes of L2 Arabic learners and their teachers at seven Arabic language institutes that currently use mobile devices for learning and teaching Arabic. Additionally, it aimed to discover what kind of mobile devices, platforms, and software are being used, how the devices are currently being used, and why.

The research questions posed by this study are:

1. Which mobile devices, platforms, and operating systems do L2 Arabic learners and their teachers currently use?

2. How do L2 Arabic learners and their teachers currently use their mobile devices?

3. What are attitudes of L2 Arabic learners and their teachers toward MALL?

4. What factors influence attitudes of L2 Arabic learners and their teachers toward MALL?

1.5 Thesis Structure

The thesis contains seven chapters, which are as follows:

Chapter One introduces the research field through a detailed background to the study, the context of the study, and its significance. Following these introductory sections, the study's motivation, research aims, and research questions are presented.

Chapter Two presents a review of the most pertinent literature on the use of technologies in education and language learning. Following this, the importance of attitude in using technology is examined. Furthermore, it includes the history of using information communication technology in the Arabic language, as a first or second language, till new mobile technologies surfaced.

Chapter Three provides an account of the research methodology used, with a description of the techniques, designs and strategies used during the study, including instruments, sampling, procedure, and ethical considerations.

Chapter Four (Phase 1) presents the quantitative findings using descriptive and inferential analysis techniques such as Principal Component Analysis and one-way ANOVA. This chapter provides a general view of mobile device availability, the current use of mobile devices, attitudes towards using mobile devices, and factors influencing the participants' attitudes.

Chapter Five (Phase 2) presents the qualitative findings collected to explain and answer some of the quantitative findings in phase 1. This provides a more in-depth insight to better understand the reasoning for selecting types of mobile devices, as an example, and the individual use of mobile devices.

Chapter Six sets out the data gathered from the two phases of this study and is used to illustrate details concerning the importance of the implementation of mobile devices used in L2 Arabic learning: improving incentives for learning, and the build-up of knowledge.

Chapter Seven presents a summary of this study and how the findings from the research have addressed the research aim and answered the research questions. It will also provide an overview of the knowledge, limitations, implications, and suggestions for possible future research.

Chapter 2

Literature Review

2.1 Introduction

This chapter is divided into four sections. The first section provides the background to the use of Information and Communication Technology (ICT) in education within Saudi Arabia. The second section focuses on the definition of mobile learning (M-learning), mobile-assisted language learning (MALL), the potential benefits and barriers of using MALL, and the key factors towards successful M-learning. The third section reviews M-learning in Saudi Arabia, including mobile technologies and previous studies on the subject. The fourth section focusses on the Arabic language, including a brief history of the language, the challenges of Arabic as a second language, ICT's relationship with the Arabic language, and using mobile devices for Arabic language learning.

2.2 ICT in Education

ICT has become a critical part of almost every facet of daily life and a significant influence on teaching-learning practises and environments (Helles, 2013; Kalhoro et al., 2010; Maryska et al., 2012; Rahimi & Miri, 2014). However, there were different concerns in the past relating to progress that ultimately pushed forward the advancement of telecommunications.

Telephone and communication satellites have decreased both the time and space required for transactions and communication, which has had a profound impact on people and society. The advent of personal computers (PCs) and the launch of the digital revolution have had a strong influence on economies, travel, industry, and education. On

the other hand, educational programmes have been implemented and have incorporated computers into the school system to varying degrees (Groff, 2013).

Most universities, colleges, schools and institutes use ICT for various purposes, including administration, learning, and data storage (Devi et al, 2014). One benefit of using ICT is that it supports collaborative learning, allowing learners to communicate and work together anytime and anywhere (Gon & Rawekar, 2017).

2.2.1 ICT in Saudi Arabia

Over the years, the Kingdom of Saudi Arabia has assigned extensive resources to developing its education system. In 2007, the $2.4 billion King Abdullah Public Education Development Project, commonly referred to as Tatweer, was implemented (Tayan, 2017). A government-owned holding company called Tatweer was established, consisting of four separate companies: Tatweer Company for Educational Services, Tatweer Educational Transportation Services Company, Tatweer Building Company, and Tatweer Educational Technologies Company. Together, they played a strategic role in supporting the Ministry of Education and the private sector in raising the level of education (Alyami, 2014).

Opportunities created by ICT have attracted the interest of numerous researchers in Saudi Arabia (Albugami & Ahmed, 2015). Therefore, using ICT in various aspects, skills, and subjects at all levels of education in Saudi Arabia have been investigated (Albugami & Ahmed, 2015; Alenezi, 2017; Alkahtani, 2017; Jabli & Qahmash, 2013). Many of these studies show that learners and teachers have a very positive attitude towards using ICT technology in their learning and teaching. They also indicate that ICT is well established in Saudi Arabia and that the country has been "taking strident steps in the field of ICT by leaps and bounds, either in public education or private education, including university education" (Al-Turki, 2014, p. 15).

The usage and acceptance of ICT is high among academic staff and students in Saudi Arabia. Nassuora (2012) conducted a study to examine the acceptance of mobile devices for learning in higher education within Saudi Arabia, using a quantitative approach (a survey) with 80 students. The results from Nassuora's statistical analysis show there is a high level of acceptance of mobile devices for learning amongst students. Alkhasawneh and Alanazy (2015) examined the use of ICT among academic staff at Al Jouf University in Saudi Arabia. They conclude that the staff there had a high level of digital literacy "as most academic staff members are most likely familiar with the use of technology in their everyday lives" (Alkhasawneh & Alanazy, 2015, p. 494).

Conversely, there are challenges and barriers to using ICT when teaching in Saudi Arabia. Al Mulhim (2014) found that a lack of time and effective training are barriers. For example, with each class being only 45 minutes, and a lot needing to be covered in that time, the teachers in their study claimed that they find it easier not to use ICT.

Workload and a lack of ICT strategies are also barriers for some teachers when it comes to using ICT in their classes. Al-Turki (2014) conducted a study to assess the level of awareness and use of this technology at two Saudi universities, Jazan University and King Faisal University, among the students, faculty and staff. He concludes that there were a lack of ICT strategies and a low skill level among the maintenance personnel and librarians.

While there has clearly been progress, the appropriate implementation of ICT in Saudi Arabia has the potential to make higher education available to millions of people both locally and internationally. This can be done by facilitating faster and cheaper sharing of knowledge, resources and information via the internet and other digital technologies (Jabli & Qahmash, 2013).

2.2.2 Arabic Language and ICT

ICT has been prominent in the Arab world since its beginnings. Just a few years after the first PC was created in the mid-70s, the Sakhr Software Company (Sakhr) was established in Kuwait as a division of Alamiah Electronics in 1982 (Sakhr Software - About Sakhr, n.d.). Sakhr became a market leader in Arabic language technology and solutions. Sakhr holds three US patents and in Natural Language Processing (NLP) and has produced many products from its core NLP capabilities, such as Arabic to English machine translation, optical character recognition for Arabic-script based languages including Dari and Pashto, Arabic text-to-speech TTS, and Arabic search engine.

Years later, the internet, as we know it now, appeared when Tim Berners-Lee led MIT's Laboratory for Computer Science around 1991 (Leiner et al., 2009). With the internet being an essential element for international communication, it should support the varied languages of the world (Block, 2004). However, globalisation has boosted English from being an international language like French, Spanish or Arabic, to being a global one (Block, 2004). Furthermore, 85% of international organisations around the world, 85% of the world film market, and 65% of scientific papers in various important academic subjects are published in English (Rao, 2019). Hence, users of the Arabic language on the internet face different challenges, including because of this dominance of the English language online. For example, within the education system, many universities in the Arab world teach computer science, engineering, medicine, and information technology in the English language, and as a result, the demand for Arabic language resources has been limited unless students are majoring in Arabic (Fahmy & Rifaat, 2010; Warschauer, 2002).

Another challenge facing the use of the Arabic language on the internet is Arabic materials and content. As the Arabic language uses a unique character set, Arabic materials

require a language identification system that recognises and classifies different sets and codes. Many researchers have indicated that typing a search word in Arabic may lead to different results than those intended (Albalooshi et al., 2011). As a result, "researchers all over the world have suffered from inadequate access to Arabic materials" (Kamel et al., 2005, p. 25). Moreover, Abubaker, Al-Muhairi and Bentiba (2015) claim that the internet today lacks a sufficient amount of Arabic language content, and this lack of high-quality Arabic language learning content has been repeatedly noted in governments reports (Weber, 2018).

Achour and Abdesslam (2012) evaluated several Arabic language learning websites using a model with nine sections:

- General website information

- Language skills and field

- Education materials

- Multimedia use

- Communication

- Aid tools and linguistic resources

- Website ergonomics

- Content quality

They found that the majority of sites do not specify the target audience and target level. Writing and listening are important skills found on a large number of the learning websites evaluated; however, the speaking skill in the Arabic language seems to be more challenging to integrate (Achour & Abdesslam, 2012). In addition, educational materials

lack exercises and evaluation tests for learners. While multimedia, such as sound and video, is generally well-used, feedback on completed activities is usually not provided. Email is often the only communication channel available, but there are no chat nor discussion forums, therefore, content usefulness and accuracy, as well as and reliability, are inadequate. Recently, Shorman and Al-Shoqran (2019) performed an analytical study to conduct a review of Arabic language learning using internet websites. They conclude that "there is still a shortage and scarcity in the number of articles and websites on the internet that teach the Arabic language".

Different Arabic governments, including Saudi Arabia, Jordan, and the United Arab Emirates, and various organisations, have been pushing to increase Arabic content online. Saudi Arabia launched the "King Abdullah Initiative for Arabic Content" in 2007, in Riyadh under the supervision of the King Abdulaziz City for Sciences and Technology (KACST). KACST collaborated with the World Publisher "Springer" and published eight issues of the strategic technologies' journal. Importantly, the online platform of "Springer" has become available in Arabic for utilisation by Arab scientific journals. KACST has also published 33 books on strategic technologies, and KACST has launched many research projects to enrich the content of Arabic language on the internet. For example, KACST built The Arabic Corpus, which has been made available online (https://corpus.kacst.edu.sa/). The Arabic Corpus includes 1,323,158 texts with 9,006.585 non-repeated words. These efforts have resulted in Arabic content rising on the internet from 0.3% in 2008 to 2% in 2012 (KACST "Science and Technology" Exerts Strenuous Efforts to Support and Enrich the Arabic Content on the Internet, 2012), which reflects internet users' desire to use Arabic resources, and this may be encouraging students to focus more on improving their Arabic language skills.

As technology developed, the capabilities of a new generation of mobile devices such as smartphones and tablet PC have become more and more sophisticated (Shadiev & Yang, 2020). Consequently, many people are reliant on mobile applications in their lives (Daud et al., 2018). Ramya (2017) state that 25 billion iOS apps and 50 billion Android apps were downloaded in 2015. Education was the third most popular category on Apple App store with 8.5% of the share of availability, and was 18th on Google Play (Blair, 2019).

Despite the changes that are occurring, Arabic mobile application users, designers and developers are still facing some challenges to designing mobile applications that support an Arabic language interface (Zawati & Muhanna, 2014). The Arabic language has particular linguistic characteristics, such as right-to-left reading, and a complex orthography that leads to spelling variations, which still present challenges for Arabic mobile applications designers and developers. On the other hand, not all mobile applications support Arabic, such as time management apps, so the user has no option but to use the English language (Zawati & Muhanna, 2014). Duolingo is a popular language app, with seven million exercises completed each month, and a total of 300 million users (Chan, 2019). Duolingo expanded to include Arabic at the end of June 2019, despite promotions claiming it would do so by December 2017! Michaela Kron, a spokesperson for Duolingo, said to the UAE newspaper, The National: "There were various starts and stops – Arabic is a very difficult language to learn, as well as teach, and we wanted to get it right" (Carrie, 2019).

2.2.3 Technology Acceptance Theories and Models

Attitudes play a key role in the acceptance and usage of technology for learning. Therefore, in an attempt to understand the acceptance and use of technologies environment, social scientists and researchers have used a variety of models (Taherdoost, 2018).

Samaradiwakara and Gunawardena (2014) mentioned many theories/models that have been used to explain and predict user acceptance with technology, such as: Cognitive Dissonance Theory (Festinger, 1957) , Innovation Diffusion Theory (Rogers, 1995), Task Technology Fit Model (Goodhue & Thompson, 1995), Expectation-Disconfirmation Theory (Oliver, 1980), Theory of Reasoned Action (Fishbein & Ajzen, 1975), Theory of Planned Behaviour (Ajzen, 1991), Technology Acceptance Model (Davis, 1989), Model of PC Utilisation (Thompson et al., 1991), Decomposed Theory of Planned Behaviour (Taylor & Todd, 1995), and the Unified Theory of Acceptance and Use of Technology (Venkatesh et al., 2003). Out of these models, four models are more popular and widely used in different settings (Samaradiwakara & Gunawardena, 2014), therefore, these four models are the focus here and they are discussed below in the following order:

1. Theory of Reasoned Action (TRA)
2. Theory of Planned Behaviour (TPB)
3. Technology Acceptance Model (TAM)
4. Unified Theory of Acceptance and Use of Technology (UTAUT).

2.2.3.1   The Theory of Reasoned Action

One of the most well-known models that was developed to explain how attitudes predict behaviour is Fishbein and Azjen's (1975) Theory of Reasoned Action (TRA) (Haddock & Maio, 2008; Vaughan & Hogg, 2010), which is illustrated in Figure 2.1 below. In TRA, two factors specify an intention to perform a behaviour: The first factor is attitude, which refers to "the individual's attitude regarding the behaviour whether he or she considers that doing the action is good or bad" (Haddock & Maio, 2008, p. 131). The second factor is subjective norms, which refers to "the views of an individual concerning how important others view the relevant behaviour" (Haddock & Maio, 2008, p. 131).
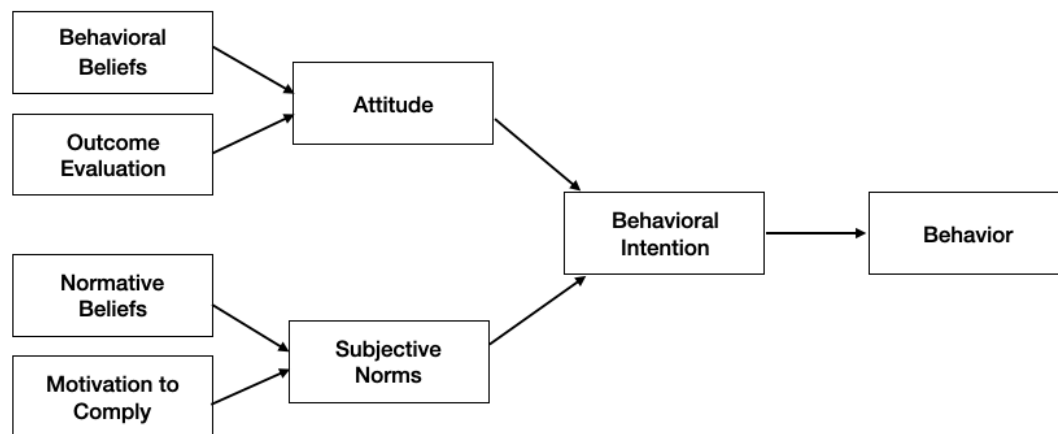
Figure 2.1 Theory of Reasoned Action (Vallerand et al. 1992, p. 99)

Despite TRA being influential within the field of social psychology for the past few decades, it has been an object of various criticisms. For example, Haddock and Maio (2008) claim that while TRA did a remarkable job of predicting behaviour, it soon became apparent that individuals' actions are often impacted by whether or not they think they can generate the relevant behaviour or not. Furthermore, a major limitation of TRA is the assumption that the person can control their behaviour, and in this regard, Samaradiwakara and Gunawardena (2014) explained that there were various constraints that can prevent an individual from performing a particular behaviour; for example, having enough time to do so, their personal attributes and abilities, and issues related to cost.

Consequently, TRA has been revised to incorporate the notion that behaviour prediction is informed by whether individuals feel they can perform the required behaviour or not. The revised model is called the Theory of Planned Behaviour (Ajzen, 1991), and it is discussed next.

2.2.3.2 Theory of Planned Behaviour

Ajzen (1991) explains that the Theory of Planned Behaviour (TPB) is an extension of TRA (see Figure 2.2 below). This extension is necessary to deal with the limitations of

the TRA with respect to people having incomplete volitional control. That is, TPB recognises that individuals do not always have full control over whether they carry out a specific behaviour or not. Therefore, TPB was designed to extend the TRA model to include determinants of *perceived behavioural control* (PBC).
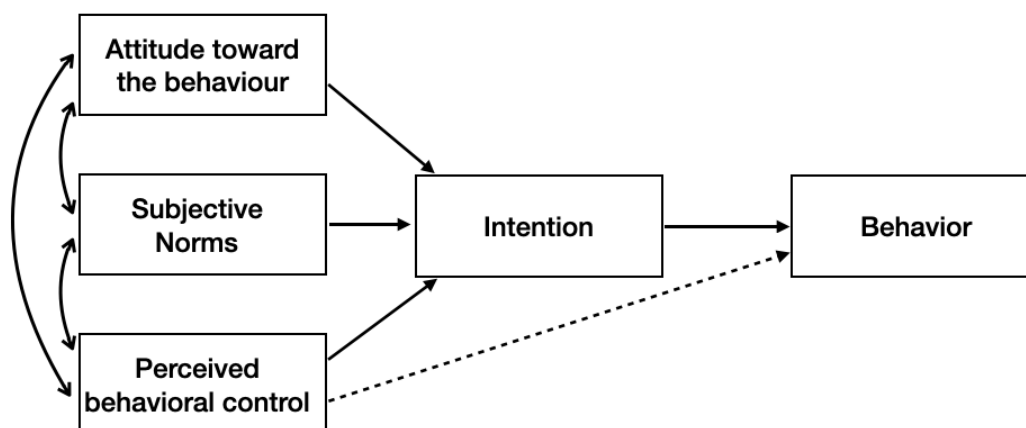
Figure 2.2 The Theory of Planned Behavior (Ajzen. 1991, p.182)

According to TPB, the performance of a behaviour is a multifaceted function of attitude, norms and perceived behavioural control, which lead to intention and then the behaviour (Ajzen, 1991). Ajzen (1991) posits that three conditions must be met to predict behaviour accurately. First, intentions and perceptions of control must be assessed in relation to the particular behaviour of interest, and the context specified must be the same as that in which the behaviour is to occur. Second, intentions and perceived behavioural control must remain stable in the interval between their assessment and observation of the behaviour. Third, full consideration that behaviour is affected by perceived behavioural control should improve the extent to which behavioural control perceptions realistically reflect actual control.

However, some disagree with TPB, arguing that the model does not examine how intention and behaviour are linked (Armitage & Conner, 2001). Moreover, TPB has been criticised by Sheeran et al. (2013) for focusing on rational reasoning, whereas in reality, people are affected by their emotions and even unconscious influences (Conner et al 2013; Sheeran et al., 2013). In addition, TPB may be said to be static as it does not take into consideration future behaviours (McEachan et al., 2011).

Not all behaviour is prepared and deliberative. Very frequently, without consciously thinking about what we want to do, we act spontaneously. However, TRA and TPB are the most frequently tested models of attitude–behaviour relations and the predictions derived from the models have received substantial empirical support (Haddock & Maio, 2008).

2.2.3.3 Technology Acceptance Model

The Technology Acceptance Model (TAM) was introduced in the 1980s and continues to be the most widely used theoretical model for describing the acceptance of information systems by an individual, and it is particularly useful for looking at technology use (Lee et al., 2003; Zhao & Zhu, 2010). This section will start with an overview of the TAM and its advantages, followed by more recent criticism of the model (Gerhart et al., 2017; Hai & Kazmi 2015; Hojjati & Khodakarami, 2016). Lee et al. (2003) indicated that the TAM presumes that two significant variables influence the acceptance of information systems by a user: Perceived Usefulness (PU) and Perceived Ease of Use (PEOU), see Figure 2.3. Venkatesh and Bala (2008) defined PU as "the extent to which a person believes that using an IT will enhance his or her job performance" and PEOU as "the degree to which a person believes that using an IT will be free of effort" (p. 275).
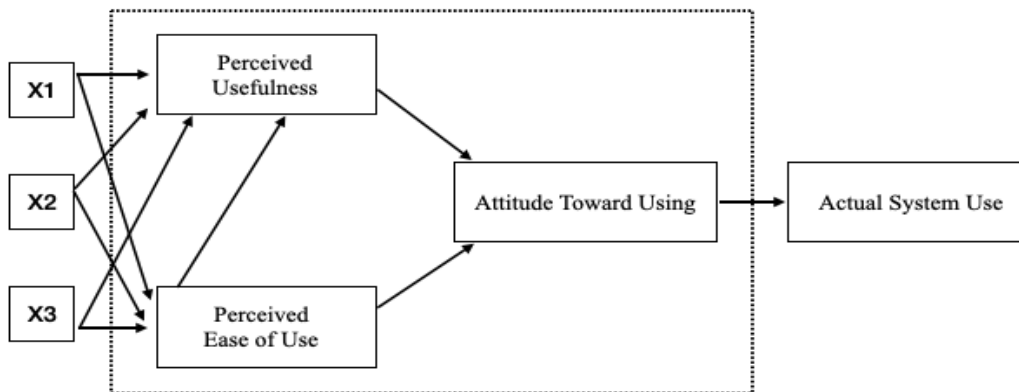
Figure 2.3 Original TAM proposed by Fred Davis (Davis, 1986, p. 24).

Davis (1989) conducted an experiment involving 40 participants and their use of two IBM PC-based graphic systems to validate TAM, as shown above in Figure 2.3 (note that X1, X2 and X3 represent external variables, for example social influence). In this experiment, a regression analysis was used to determine the relationships between the TAM model constructs. It was found that PU has a direct influence on Actual System Use without necessarily an attitude being formed, that is, the person may simply recognise that it makes the task easier; therefore, TAM was refined, and a new variable called *Behavioural Intention to Use (BI)* was added the model (see Figure 2.4).
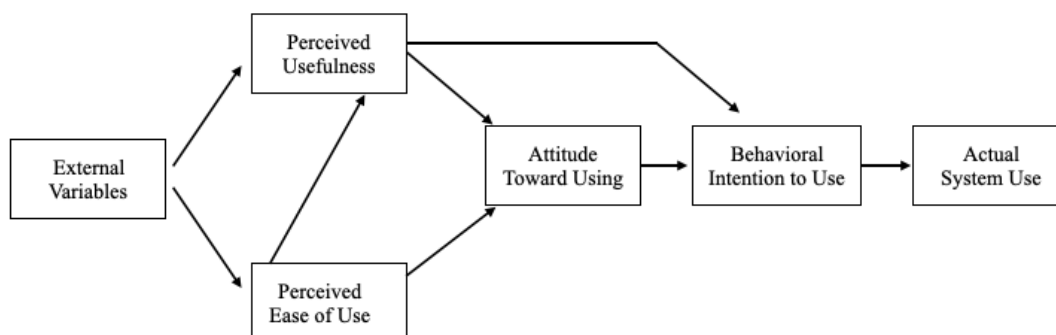
Figure 2.4 First refined TAM version (Davis, Bagozzi and Warshaw, 1989, p. 985)

The refined model above was used to measure the intention of 107 users to use a system after a one-hour introduction to the system and once again after 14 weeks. The findings showed that both PU and PEOU directly affected behavioural intention. This removed the need for the attitude construct and led to the final model of TAM (Chuttur, 2009) (see Figure 2.5).
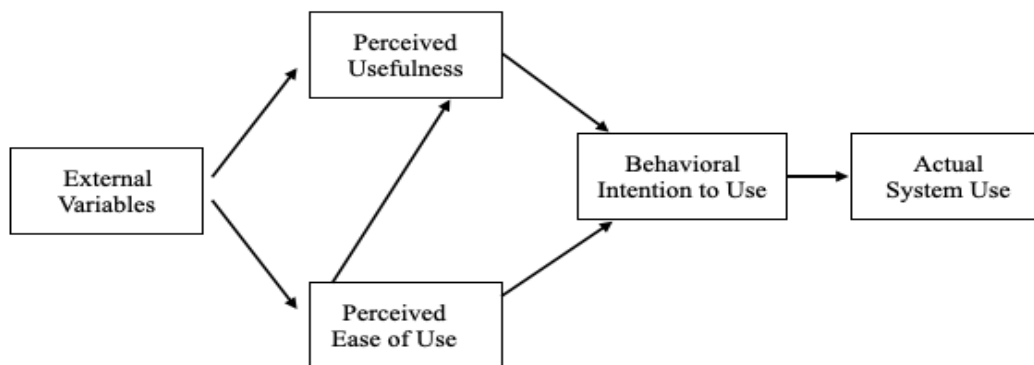
Figure 2.5 Final version of TAM (Venkatesh & Davis, 1996, p. 453)

TAM has been widely used and has found many supporters in the literature. There were more than 4,100 citations inside the Social Science Citation Index database in November 2013, and more than 17,600 identified by Google Scholar for Davis's article (Davis, 1989; Rondan-Cataluña et al., 2015). Lee et al. (2003) examined 101 articles published by leading information systems journals over a period of 18 years (between 1985-2003). They found that TAM had been refined in four overlapping stages over the course of this period: introduction, validation, extension, and elaboration, as shown in Figure 2.6.
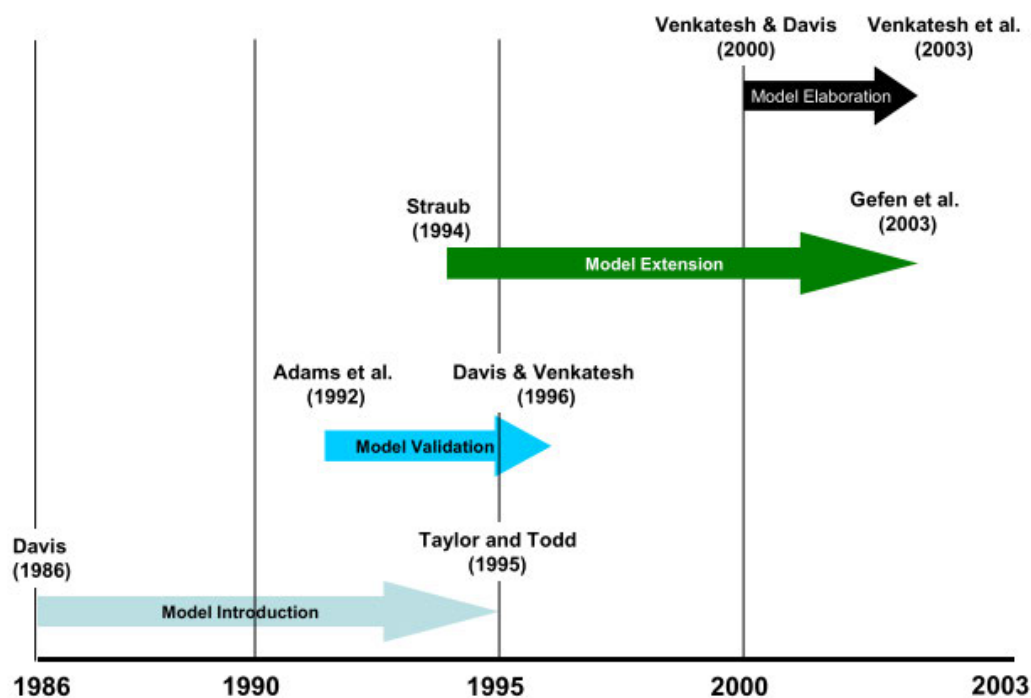
Figure 2.6 Chronological Progress of TAM Research (Lee et al., 2003, p. 755)

Despite the TAM becoming well established as a robust, powerful, and parsimonious model for predicting user acceptance, it is still imperfect and has some limitations (Lee et al., 2003; Rondan-Cataluña et al., 2015). Furthermore, one of the most reported limitations of TAM studies is their reliance on self-reported data, which is known to lead to method bias, involving distorting and exaggerating the causal relationship between independent and dependent variables (Lee et al., 2003). The second most cited limitation of the studies is the tendency to examine only one information system with a homogeneous group of subjects on a single task at a single point of time (Lee et al., 2003). However, King and He (2006) performed a statistical meta-analysis of the technology acceptance model TAM using 88 published studies in different fields. The findings indicated that TAM is "a valid and robust model that has been widely used, but which potentially has wider applicability" (King & He, 2006, p. 740).

As mentioned above, the TAM model has faced a range of valid criticisms, for example Hojjati and Khodakarami (2016) claim that while the relationships contained in the TAM are valid, it cannot predict the actual acceptance of technology for e-learning. Furthermore, the TAM does not consider the precursors to the use of technology, or the way in which behaviour is influenced by the social environment of the individual (Napitupulu, 2017; Gerhart et al., 2017). Added to that, Hai and Kazmi (2015), claimed that the TAM is weak in relation to the way users purchase technology and buy or reject certain components of technology.

2.2.3.4 Unified Theory of Acceptance and Use of Technology

Venkatesh et al. (2003) introduced the Unified Theory of Acceptance and Use of Technology (UTAUT) as an aggregation of various research efforts expressed in different models and technology acceptance theories. The UTAUT includes four core predictors of intention and usage and four moderators of key relationships (Samaradiwakara & Gunawardena, 2014). The four constructs are:

1) performance expectancy

2) effort expectancy

3) social influence

4) facilitating conditions, See Figure 2.7.

One significant difference between UTAUT and its precursors, TRA, TPB, and TAM, is that UTAUT proposes four moderators (i.e., gender, age, experience, and voluntariness) to further enhance the predictive power of the model (Dwivedi et al., 2019).
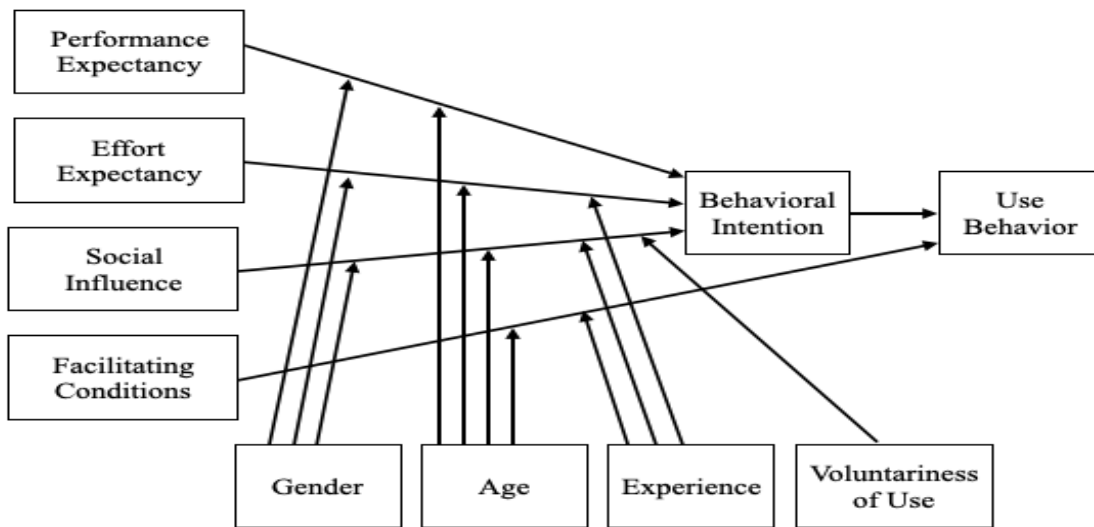
Figure 2.7 Unified Theory of Acceptance and Use of Technology (Venkatesh et al., 2003, p. 447)

For over a decade, UTAUT has been widely used in fields such as information management, mobile banking, and mobile technologies (Park, 2011), and there are many citations of the original paper that introduced the theory (Venkatesh et al., 2016). In a comparison study between existing technology acceptance models and theories, UTAUT was found to be a useful tool for assessing the likelihood of the success for technology acceptance studies (Samaradiwakara & Gunawardena, 2014). Samaradiwakara and Gunawardena (2014) claimed that it is evident that moderators can play a significant role in the explanatory ability of theories/models, even for similar situations using similar approaches.

As found in Venkatesh et al. (2003) study, prior studies did not generally use all of the factors in the full UTAUT model (Dwivedi et al., 2019). Venkatesh et al. (2012) state that "our review of this body of work revealed that most studies using UTAUT employed only a subset of the constructs, particularly by dropping the moderators" (p. 158). This thought seems consistent with Taylor and Todd (1995), who claim that " a model that provides a good prediction while using the fewest predictors is preferable" (p. 169).

Despite the wide use of the UTAUT model, Dwivedi et al. (2019) pointed out that most research studies have not applied the UTAUT model in its entirety, as set out by Venkatesh et al. (2003), but instead have utilised a subset of the moderators included in the UTAUT model. Furthermore, "Despite the evidence that these four constructs explain a significant proportion of variance in the adoption and usage behaviours, a key element missing from the UTAUT model is the "individual" engaging in the behaviour - i.e., individual characteristics that describe the dispositions of the users may be influential in explaining their behaviours" (Dwivedi et al., 2019, p. 716). In addition, Dwivedi et al. (2019) recommended that attitude should be added as a construct to the original UTAUT model. Therefore, while the UTAUT is a useful model for predicting technology usage, it requires further research, including the addition of attitude as a construct.

2.2.3.5 Application of Models to the Research

The aim of the current research was to examine attitudes towards the use of mobile learning devices among L2 Arabic teachers and learners, and to support this, the key concepts from the four models analysed above have been drawn on. The Combined Models Framework illustrated below in Figure 2.8 reveals the various aspects that are emphasised by each model, and the focal points from each that have provided a useful basis for examining attitudes. Again, no specific model has been used, as the testing of a particular model was not an objective of the research, and it should be noted that it is common in CALL and MALL research to use an eclectic approach that draws on multiple theories (Levy & Stockwell, 2013).
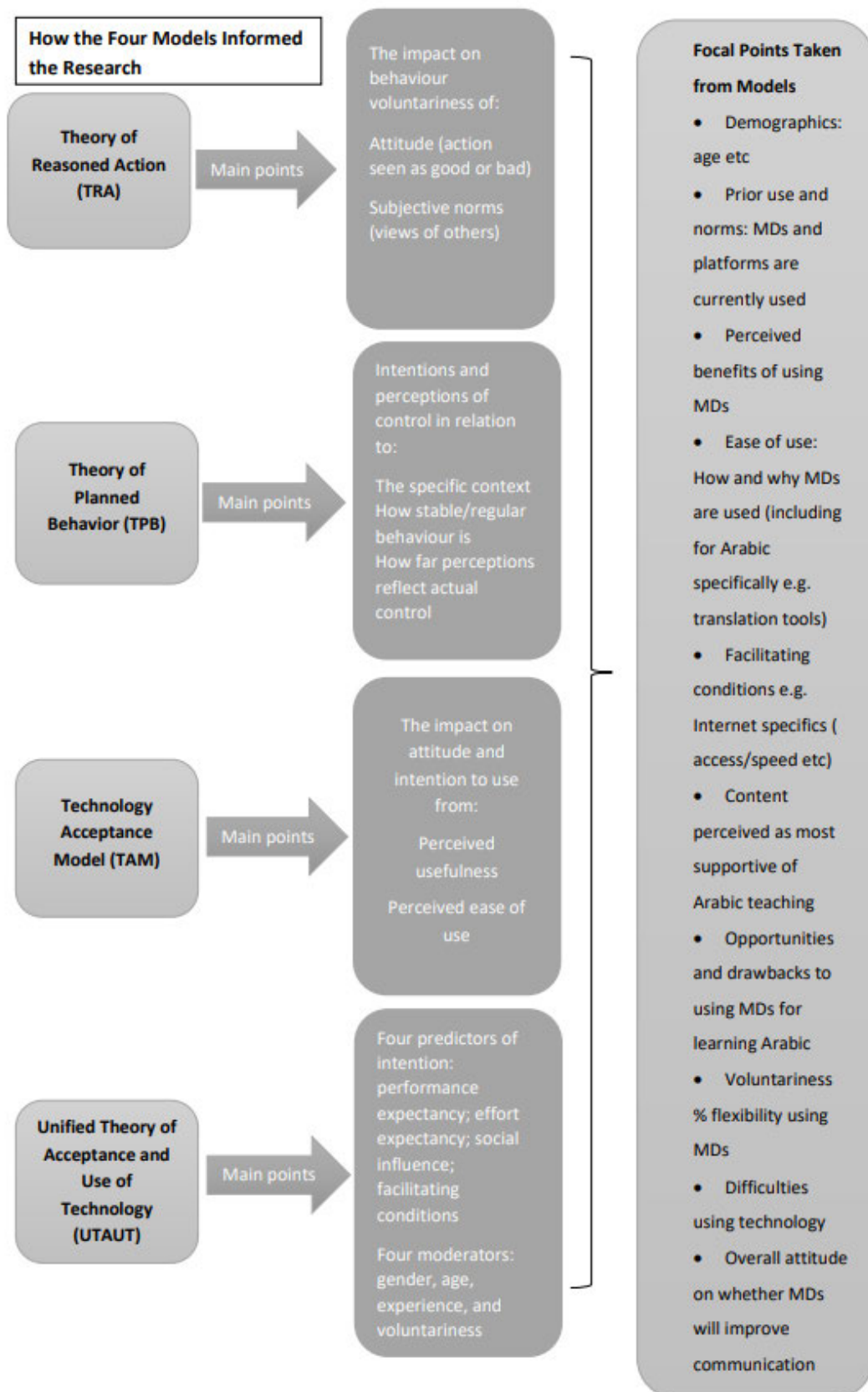
Figure 2.8 Combined Models Framework

2.2.4 Mobile Technologies

Mobile devices have improved significantly in recent years and continue to progress. Today's mobile devices have faster cellular connectivity and increased Wi-Fi capabilities that endorse the idea that knowledge is not limited to space or time, and enhance the "mobility" and "ubiquity" of access to knowledge (Mercier & Higgins, 2013). This enables the learner to create and share their own digital content and offers access to open education resources distributed on Wikipedia, blogs, social media, and virtual worlds (Thorpe & Gordon, 2012; Luisa Sevillano-García & Vázquez-Cano, 2015). Furthermore, Rosell-Aguilar (2016) described the ubiquitous nature of mobile technologies in that they can be used anytime, anywhere. However, Rosell-Aguilar (2016) also warned that the use of mobile technology is often limited as a tool of communication to approaches such as drill activities; therefore, greater variety of methods is required, and this may have a positive impact on language learning users' attitudes towards mobile technology as a learning tool.

It is also notable that different types of technologies can be considered "mobile". Naismith et al. (2004) used two orthogonal dimensions of personal vs shared and portable vs static to classify a range of mobile technologies, as shown in Figure 2.1 below.
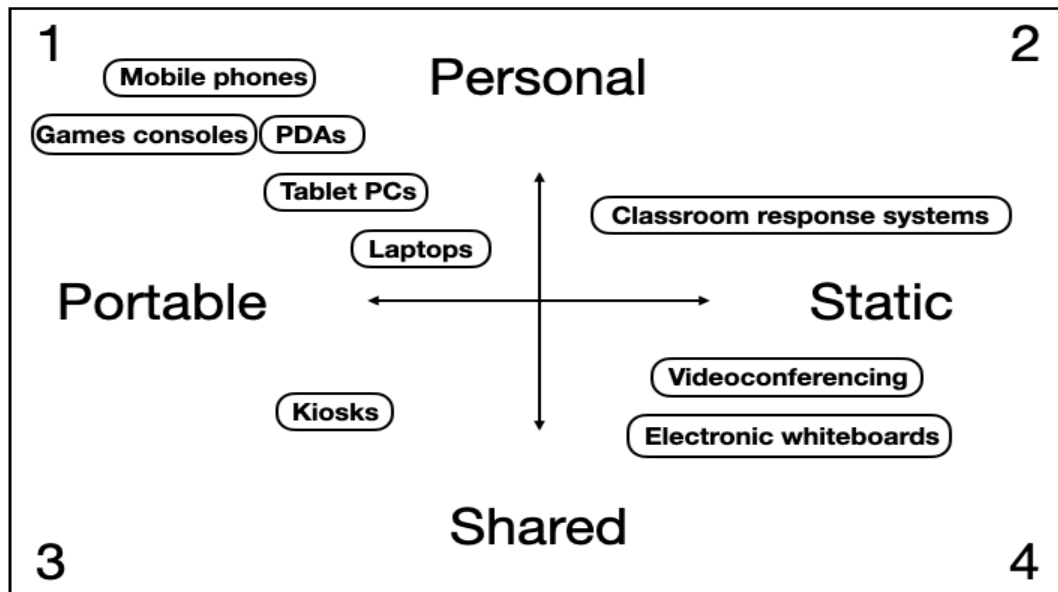
Figure 2.9 Classification of mobile technologies (Naismith et al., 2004, p.7)

Devices in quadrant 1, portable and personal, are what people commonly think of as mobile technologies (Naismith et al., 2004). However, others have characterised mobile devices more strictly. For example, Van 't Hooft (2013) defines mobile devices as having the characteristics of:

- High mobility, i.e., small enough that they can be easily carried in one hand

- A small form factor, which means they are unobtrusive and do not interfere with face-to-face interactions

- Accessibility, i.e., relatively cheap, easy to use, and the ability to turn on instantly without lag time

- Adaptability to the learning context and the learner

- Capabilities to create, collect, access, and display a variety of information in multiple modalities (text, graphics, audio, video)

- The ability to support communication, collaboration, and sharing of information (p. 175).

In the current study, the classification by Naismith et al. (2004) has been used to define mobile devices as either a smartphone, tablet PC, or laptop. These mobile devices use different platforms and operating systems, such as iOS, Android or Windows, which manage files differently (Farley et al., 2015). As this study has attempted to attain a greater understanding of what mobile devices are available to L2 Arabic learners and their teachers, these three different types of devices, and their software, provide a broader perspective for developers when designing an M-learning programmes, applications, or learning materials for the Arabic language (see section 2.3.1 below for a definition of M-learning).

2.2.5 Mobile Technologies in Saudi Arabia

Since this current research was undertaken in Saudi Arabia, it is essential to analyse the country's current situation and usage of mobile technologies, and to consider earlier studies on the use of mobile devices in this setting, in order to equate those studies' results with the current study later on.

Telecommunication in Saudi Arabia was established in 1962, with 20 wireless stations introduced to connect all towns and villages, while the fibre optical network was operational from 1984. The telecom sector was privatised in 1998 and owned by Saudi Telecom Company (STC) until 2004, and Mobily and Zain joined the telecommunication market in 2007 and 2009 respectively (Ali & Haque, 2017).

Nowadays, Saudi Arabia has the biggest market of information communication and technology in the Middle East in terms of capital volume and spending (Elaraby, 2016). According to the Saudi Arabian General Authority for Statistics (2018), in 2018 99% of people used their mobile phone to communicate, 90% of families in Saudi Arabia had

access to the internet through mobile broadband, with 69% of families using mobile internet packages, and 31% using mobile modems, which is comparable to Australia, where in 2018 72% of the population had access to a smartphone (Granwal, 2018)

Regarding smartphone usage, smartphone penetration exceeds the global average in Saudi Arabia, with more than 44 million mobile phones subscribers and 88% ownership of a smartphone. This is almost double the international average, which was 41% in 2019 (O'Dea, 2019; Thankaooan, 2017). As the total population was estimated at 34 million in 2018, these statistics indicate that many people in Saudi Arabia have several mobile phone subscriptions and use different phones for different purposes, such as having a second mobile for work or business.

Despite the internet only becoming available in 1990, Saudi Arabia has developed rapidly in this area, especially regarding the connectivity of the internet (Alshahrani, 2016). This can be seen by the number of internet users, which increased exponentially from 100,000 in 1999 to one million in 2001, to 16.5 million in 2013, which represents 55% of the Saudi population (Alshahrani, 2016). In 2018, 90% of families in Saudi Arabia had access to the Internet, mainly through Mobile Broadband Network. About 69% of them had access to the Internet via cell phone packages, while 33% via Mobile Modem (General Authority for Statistics, 2018). Even so, Saudi Arabia is still improving its internet network. It currently ranks third globally and first in the Middle East, Europe, and North Africa region in the deployment of 5G network as 57,979 towers across 30 cities were installed (Naar, 2020).

The growth of mobile technologies has changed social interactions (Ferris-Lehman, 2016). For instance, 3.5 billion people are online, 1.7 of those people have an active social media account and 71% use a social media app on their mobile. According to the General

Authority for Statistics demographic report (2016), more than 50% of the population are aged between 25-54 years old, and 15% are aged between 15-24 years old. This youth demographic can explain the heavy use of social media in Saudi Arabia. Saudi Arabia ranked fifth in using Twitter after the United States, Japan, Russia, and the United Kingdom. Also, Saudi Arabia ranked fifth in using Snapchat after the United States, India, France, and the United Kingdom. (Clement, 2020c).

The widespread use of mobile devices and comprehensive internet connectivity in Saudi Arabia creates an excellent foundation for M-learning. Al-Shehri (2012) claim that the Arab world is a suitable and effective context of study for M-learning due to the widespread use of mobile devices.

2.3 Mobile Learning (M-learning)

2.3.1 Mobile Learning Definition

Mobile learning (M-learning) became a recognised term in 2005 (Crompton, 2013). Since that time, scholars have attempted to define M-learning with varying results. The definition of M-learning used herein is that of Crompton (2013a), who has defined M-learning as "learning across multiple contexts, through social and content interactions, using personal electronic devices,"(p. 4). Even so, an examination of various definitions of M-learning is required in order to understand the decision to adopt Crompton's (2013) definition.

The differing definitions of M-learning have come under scrutiny for being either too limited in scope "to differentiate M-learning from E-learning" or too broad "to accommodate M-learning in all of its variety" including technologies not yet invented (Farley et al., 2015, p. 285). Some of these definitions centre on technologies which are

seen as "any educational provision where the sole or dominant technologies are handheld or palmtop devices" (Traxler, 2005, p. 262) or, in a contextual sense, focus on "any educational provision where the sole or dominant technologies are handheld or palmtop devices" (O'Malley et al., 2005, p. 7).

E-learning as a field is well known, and it is defined as the educational use of digital technology such as desktop and laptop computers, the web and particularly web 2.0, and is a whole field of scholarship (Pegrum, 2014). Tavangarian's (2004) definition of E-learning is "all forms of electronic supported learning and teaching" (p. 274), and Laurillard's (2005) definition of E-learning is "the use of any of the new technologies or applications in the service of learning or learning support" (p. 2); both cover M-learning, yet M-learning is restricted to the use of mobile, handheld devices. Moreover, since the devices used for M-learning are electronic devices, the definition of M-learning cannot easily be distinguished from existing definitions of E-learning. However, Pegrum (2014) explained that M-learning and mobile assisted language learning (MALL) began to diverge from E-learning and computer assisted language learning (CALL) "When context-aware M-learning and MALL make the most of the affordances of mobile technologies for combining the local and the global, and for learning in the real world rather than just learning about it" (p. 9).

In development of mobile learning, 2002 was a very important year (Parsons, 2014), as the first authored book about mobile learning appeared (*Learning Unplugged: Using Mobile Technologies for Organizational Training and Performance Improvement* by Gayeski 2002), and the first meetings of two conference series took place, which have continued to serve as important forums for the science community. The International Workshop on Wireless and Mobile Technologies in Education (WMTE) took place at Växjö University in Sweden, while the first World Conference on Mobile and Contextual

Learning (mLearn) was held at the University of Birmingham in the UK (Parsons, 2014). Additionally, M-learning shares enough common ground that it regularly appears in major E-learning conferences, journals and books (Pegrum, 2014).

The concept of *mobility* has been a key focus in the M-learning literature. Kakihara and Sorensen (2002) indicate that *mobility* should not be tied only to human physical movement, and they discuss three interrelated aspects of mobilities called spatial, temporal, and contextual. Laurillard (2005) pointed to aspects of mobile learning's uniqueness as a learning mode by referencing "learner generated contexts", and three "mobilities" that have to be addressed to ensure success from M-learning (learners, technology objects, and information). Similarly, Traxler (2007) and Pachler et al. (2010) argue that *mobility* should not be limited to mobile devices, but mobility should include learners and learning itself. However, Pegrum (2016) suggested that the "focus must be primarily on mobile digital devices" (p. 88), otherwise, learning with a book in café would be included in M-learning and this would broaden the concept too far.

Pegrum (2016) identified three reasons for *mobility* being the unifying focus in M-learning. Firstly, *mobility* is the main idea that ties mobile devices, mobile learners and mobile learning environments together. Secondly, despite ongoing developments in communication technologies, *mobility* is expected to remain at the centre of its functionality. Thirdly, mobile technologies' affordances for education and contemporary pedagogical approaches are highly affected by the degree of *mobility* associated with the device, the learners, and the learning experiences.

The concept of M-learning is multi-faceted. Traxler (2007) indicated that M-learning is "noisy" and "problematic" as M-learning is essentially personal, contextual, and situated (p. 1). Crompton (2013) added that probably for a long time to come, there will be

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no permanent concept of M-learning, due to the continued introduction of new technologies. Furthermore, it is very difficult to capture M-learning in a way that is both concise and detailed, as mobile learning technology is changing, with new applications and use in diverse cultural settings (Pegrum, 2014). Despite that, many scholars generally agree that M-learning comprises four central constructs: learning pedagogies, technological devices, context, and social interactions. Moreover, Crompton (2013) has integrated these four components and defines M-learning as "learning across multiple contexts, through social and content interactions, using personal electronic devices"(p. 4).

2.3.1.1 Mobile Learning in Saudi Arabia

Many researchers and academics have integrated mobile technologies into their teaching and learning practices due to the widespread use of mobile technologies in our daily lives (Park, 2011), and Saudi Arabian researchers and academics are not exceptions. Research has been carried out to investigate different aspects of M-learning, such as attitude and effectiveness, in a variety of subjects, such as languages and maths, and for learning levels from primary school to university level (Al-Fahad, 2009; Al-Hujran et al., 2014; Allam et al., 2017; Alshabeb & Almaqrn, 2018; Chanchary & Islam, 2011; Khalaf, 2019; Seliaman & Al-Turki, 2012a).

Attitudes and perceptions on using mobile technologies in education were one of the first aspects to be investigated. Al-Fahad (2009) is one of the earliest studies that examined the usage of mobile devices in Saudi Arabia. This study investigated the attitudes and perceptions of university students from different colleges towards the effectiveness of M-learning in their studies at King Saud University. Although new generations of mobile technologies, such as smartphones, were not popular in Saudi Arabia in 2009, and download speed was 7.2Mbps at that time, students' attitudes were still positive. Six years

later, Al-Said (2015) investigated students' perceptions of Edmodo, which is an education network that enables teachers to share content, distribute quizzes, assignment and manage communication with students, colleagues and parents, and toward M-learning at Taibah University in Saudi Arabia. In this study, students showed positive perceptions of M-learning. Similar findings were reported in studies carried out at Najran University, King Saud University, and Prince Sultan College for Tourism & Business where the majority of students showed a positive attitude toward M-learning (Alhassan, 2016; Chanchary & Islam, 2011; Nassuora, 2012).

These findings from a Saudi Arabian context are consistent with the results of studies conducted in many other contexts. Shadiev and Yang (2020) reviewed 398 articles published between 2014 and 2019 on technology-enhanced language learning and teaching. They found that the majority of the studies they reviewed had positive results toward using technology in supporting language learning. This positive attitude toward using mobile technologies in Saudi Arabia is very promising for any M-learning project.

The concept of "anytime anywhere" access to learning materials represents the two main features of mobile wireless technologies-mobility and reachability (Alhassan, 2016). Learners in many studies in Saudi Arabia indicated that using mobile devices increases the flexibility of accessing learning resources (Al-Fahad, 2009; Alhassan, 2016; Chanchary & Islam, 2011). Constant access to learning materials can create new learning opportunities in higher education. For example, learners can use their mobile in public places such as at the airport or on the bus, which will take learning opportunities further.

According to West (2012), for the first time in history, the majority of teachers, whether in developed or developing countries, have individual access to influential communications technology, and this creates advantageous educational opportunities, for

example, learning via messaging applications, such as WhatsApp, and social media applications, such as Twitter and Facebook. Fattah (2015) used WhatsApp to develop students' writing skills at Qassim University in Saudi Arabia, and the results reveal that the use of WhatsApp yielded significant effects on students' writing skills. Facebook groups were also used as a learning management system and were found to be satisfactory for students and were easy to implement (Wang et al., 2012). Learners also indicated that using mobile technology in their studies increased communication between themselves, other learners and their teachers (Al-Said, 2015; Chanchary & Islam, 2011).

As the Saudi Arabian people are heavy users of social media applications, such as Twitter and Snapchat (see Section 2.4.2), these have become an area of interest for researchers as a form of M-learning mainly for language learning purposes. Allam and Elyas (2016) investigated perceptions of male and female English language teachers towards using social media as a teaching tool in Saudi Arabia. The majority of the participants strongly believed in the pedagogical values and benefits of using social media as an ELT tool in EFL classes in the Saudi context. Alshabeb and Almaqrn (2018) examined the usage of mobile social media apps by EFL students for learning. Learners showed positive attitudes toward the usage of social media applications via mobile devices in English classes. These findings were not surprising to some extent, as both EFL teachers and learners were familiar with the use of mobile technologies; had an experience of using social media applications, and mobile devices were widely available along with internet connections.

Discussion of M-learning in Saudi Arabia would not be complete without a look at the disadvantages and challenges as well. Chanchary and Islam (2011) examined the prospects and challenges of M-learning in Saudi Arabia. Learners indicated two challenges

while using their mobile devices in their courses. These are the small screen size of their mobile devices and the cost of using M-learning (Chanchary & Islam, 2011).

As indicated earlier in Section 2.3.4, mobile technologies are advancing quickly. Smartphones were not popular in Saudi Arabia at the time of Chanchary and Islam's study in 2011, and these days, mobile phones screens sizes are 5.5-6.5 inches with high resolution (HD) 2688×1242 pixels. Maniar (2007) found that learners learned significantly more when the screen size was more than 2.28 inches.

Regarding the cost involved in the use of M-learning, Maniar's study did not indicate if the cost was related to mobile device ownership or related to the internet. However, if the cost is related to mobile devices ownership, these days, smartphones are prevalent in Saudi Arabia, as indicated in the General Authority for Statistics (General Authority for Statistics, 2018). Also, Alshabeb and Almaqrn (2018) have confirmed that smartphones are widespread in Saudi Arabia as they explored university students' use of social media applications and their role in English language learning. In the case of costs related to the internet, in 2018 90% of families had access to the internet through mobile broadband, where 69% of families use mobile internet packages, and 31% use mobile modems (General Authority for Statistics, 2018). Nearly every university, college and educational institute has free internet access in Saudi Arabia, as indicated in recent research such as Allam et al. (2017) and Alshahrani (2016).

2.3.2 Key Factors for Successful Mobile Learning

This section examines the use of mobile technologies for learning in general, precursor to the following section on Mobile Assisted Language Learning. Several researchers have conducted studies to determine the critical success factors for M-learning (Abu Hamdeh & Hamdan, 2010; Alrasheedi & Capretz, 2015; Özdoğan et al., 2012).

Alrasheedi and Capretz (2015) investigated 19 quantitative studies which discussed the critical success factors (CSFs) for M-learning in higher education published after 2007, which are shown in Table 2.1. In these 19 studies, 21 factors were indicated as CSFs for M-learning. Of these, six CSFs factors are considered by all researchers studying M-learning to be important. These six factors are:

- User-friendly design

- Technical competence

- Learner community development

- Learner perceptions

- Content

- Ownership.

Of these, learner perceptions were found to be the most crucial factor. To meet statistical requirements for meta-analysis, CSFs that have appeared in very few studies, and for which there were insufficient statistical data, were removed. This resulted in a total of six CSFs in nine studies being used for meta-analysis. That all six CSFs have an aggregate response higher than 2.5, indicates that each of these factors has an appreciable influence on participants' current experiences of the M-learning platform.

Table 2.1 Meta-analysis of CSF Statistics, Alrasheedi and Capretz (2015)

CSFs	Meta-Analysis Statistics					
	No. of Studies	No. of Participants	Net Mean	Net SD	CSF Rank	Pearson Corr.
Learner Perceptions	9	1808	3.379	1.119	NA	1
User Friendly Design	8	1753	3.646	1.065	3	0.92961
Learner Community Development	5	514	3.564	1.21	4	0.64153
Technical Competence	4	1079	3.848	1.11	2	-0.5595
Content	7	1289	3.958	1.136	1	0.80454
Ownership	8	1547	3.499	1.164	5	0.6064

Content and user-friendly designs have highly positive correlations with learner perceptions (Alrasheedi & Capretz, 2015). This means that these two factors are essential for learners in the future if M-learning as a platform is to be successfully adopted. These findings are also consistent, to some extent, with recent research where the availability of learning resources, content, and technical support had a positive impact on the attitude toward using mobile devices (Ifenthaler & Schweinbenz, 2016; Khlaif, 2018).

Interestingly, Alrasheedi & Capretz, (2015) found that technical competence negatively correlated with learner perceptions. Thus, learners considered themselves as capable of using mobile technologies, but this does not necessarily mean that they had high technological competencies. Even so, technical competence needs to be considered with any project as a critical factor for M-learning, as many types of research indicate that the relationship between technical competence and the adoption of new technology in M-learning is essential to its success (Hasan & Ahmed, 2010; Potosky, 2002).

Ownership of mobile devices and learner perceptions are correlated (Alrasheedi & Capretz, 2015). Whether mobile devices are provided for learners, or learners bring their own mobile devices, making mobile technologies available is a critical factor for any M-learning project. The two models of acquiring mobile technology in M-learning are known as 'bring your own device' (BYOD) or organisation provided device (OPD) (Handal et al., 2014). Naturally, each model brings with it its own advantages. The BYOD model brings with its ubiquity, familiarity, and an acceptable cost for the organisation. Meanwhile, the OPD model can provide instant equity and security/institutional control over patterns of use (Reid & Pechenkina, 2016). As such, decision makers need to consider which model would best suit their project.

In the past, many mobile projects relied on the provision of mobile technologies to learners (Handal et al., 2014), yet mobile device distribution between learners is not always constant, and equity between learners is needed. Furthermore, Farley et al. (2015) found that students from non-English speaking backgrounds at the University of Southern Queensland were significantly less likely to own a tablet computer than those from an English speaking background, which would put them at a disadvantage. However, this point is related to the teaching and learning context and the specific demographics of students, rather than their attitudes towards the use of mobile technologies.

Integrating new technology into classrooms is not always readily accepted by learners or teachers. A large number of teachers still resist the integration of new technologies into the classroom (Mac Callum et al., 2014). Two reasons are regularly reported as influencing lecturers' acceptance of using technology in their classes. The first reason is the lecturers' beliefs toward using new technology. Notably, the perceived value of the new technology (perceived usefulness) and the perceived work required to be familiar

with the use of new technology (perceived ease of use) were found to be essential elements affecting the acceptance of technology. The second reason found to influence lecturers' acceptance of using technology is digital literacy, and the skills needed to incorporate a new technology into their teaching (Dündar & Akçayır, 2014; Ifenthaler & Schweinbenz, 2013; MacCallum et al., 2014).

To integrate mobile devices into the student experience, Wang et al. (2012) recommended starting with something that already exists to make its mobile device use more manageable and more engaging. Social media and messaging applications, such as Facebook and WhatsApp, are good examples. Facebook groups have been used as a learning management system to administer and document tasks, facilitate collaboration, and track joint tasks, and were found to be satisfactory and easy to implement by students (Wang et al., 2012). Students have also shown a positive attitude towards sharing information through WhatsApp groups, which they felt led to an improvement in their learning process (Cetinkaya, 2017; Luaran et al., 2016).

2.4 Mobile Assisted Language Learning (MALL)

A sub-area of the growing field of M-learning is mobile assisted language learning (MALL) (Palalas & Hoven, 2016; Viberg & Grönlund, 2012). As indicated earlier, M-learning is "noisy" and "problematic" for both definition and evaluation (Traxler, 2007). By extension, MALL is also "a fuzzy concept" (Pegrum, 2014, p. 16).

Mobile devices can be used in various ways in language learning. Pegrum (2014) indicates that at least four distinct styles of MALL emerge, although they interconnect with each other:

- MALL for content,

- MALL for tutorials,

- MALL for creation, and

- MALL for communication (Pegrum, 2014, p. 94)

MALL for content, which covers graded materials involving a specific structure, as well as authentic content, is seen as the easiest and simplest use of new technologies whether in E-learning or M-learning, or CALL or MALL (Pegrum, 2014). There may well be a considerable amount of material accessible, or very little, based on the language being targeted (Khlaif, 2018). Multimedia materials provide benefits when it comes to language learning: images or animations can contextualise spoken text, provide visual encouragement and insights into pragmatics (Pegrum, 2014). Social media applications, such as Facebook, Twitter, WhatsApp, and WeChat, have attracted millions of users around the world and can be used as part of MALL (see section 2.5.4.3). These applications have been used by L2 learners and their teachers as language learning sites to provide authentic content or as a learning management system (Aldiab et al., 2019; Mompean & Fouz-González, 2016; Xu & Peng, 2017).

In tutorials, behavioural exercises can be incorporated into MALL material, or can take the form of freestanding pronunciation, letter forming, vocabulary or grammar exercises, quizzes and sports (Pegrum, 2014). Mobile devices can be used in various ways to make these behavioural exercises readily available, such as using short message service (SMS), mobile-based games, and mobile-based flashcards to assist vocabulary development for second language learners (Alzahrani, 2015; Erradi et al., 2012; Ogata et al., 2010).

In MALL for Creation and MALL for Communication, a breakthrough into a more thoroughly communicative and sociocultural territory can be seen (Pegrum, 2014).

According to West (2012), for the first time in history, the majority of teachers, whether in developed or developing countries, have individual access to influential communications technology. This creates useful educational opportunities, for example, learning via messaging applications, such as WhatsApp, and social media applications, such as Twitter and Facebook (Albantani et al., 2020). However, technologically, MALL creation and communication normally involve newer hardware, better connectivity and faster applications, making it more difficult to introduce in the developing world (Pegrum, 2014).

2.4.1 Pedagogical Shifts Towards MALL

MALL comes with its own characteristics, affordances, potential and limitations (Palalas & Hoven, 2016). In MALL, language learners use their mobile technology to access the Internet, which provides more attractive alternatives to formal language learning (Kukulska-Hulme, 2020). Such activities might include, for instance, playing language games, watching movies in the target language, reading blog posts linked to personal interests, collaborating, and communicating (Kukulska-Hulme, 2020; Palalas & Hoven, 2016) (see section 2.5.3).

As MALL has expanded the contextual and interactional dimensions of language learning practices and use, pedagogical shifts have accrued in mobile learning and learning teaching relationships, including location, social interaction, approaches, time and more (Kukulska-Hulme, 2020; Palalas & Hoven, 2016). Location is directly related to the concept of mobility in terms of learners, teachers, or learning experiences (Palalas & Hoven, 2016). Persson and Nouri (2018) conducted a systematic review of second language learning with mobile technologies and found that the use of mobile devices makes it possible to expand outdoor second language learning (SLL) tasks, that is, tasks outside the traditional classroom setting, creating a blended atmosphere that facilitates second language

learning anytime anywhere. Mobile devices can help language learners to mediate process by providing assistance necessary to engage in authentic communicative situations such as finding an appropriate vocabulary during a conversation.

Social software, such as social networking and instant messaging apps, has made major pedagogical contributions to both formal and informal learning. Dron and Anderson (2014) identified many benefits for using social software such as: it helps build communities; creates knowledge; engages, motivates, and is enjoyable; encourages active learning; spans the gap between formal and informal learning; addresses both individual and social needs it; easy to use; supports creativity, and many other (p.15-24). Furthermore, social software such as Facebook, WhatsApp, and WeChat have been shown to be useful in second language learning (Aburezeq & Ishtaiwa, 2013; Alshabeb & Almaqrn, 2018; N. Rahimi et al., 2015; Xu & Peng, 2017) (also see section 2.5.3).

Various learning theories and teaching approaches have been discussed in mobile learning, such as learner-centred methods and constructivist paradigms (Palalas & Hoven, 2016; Rosell-Aguilar 2016). Moreover, mobile technologies add more versatility to teaching in the classroom, and can push instruction out of the classroom; however, this may be beyond the teacher's scope and control (Kukulska-Hulme, 2020). As a result, students shift from a passive role to a more active one. Instead of receiving information from one source (the teacher), students work individually and collaboratively, interact, compare, and establish new meaning with their fellow students, teachers, and other people from around the world.

2.4.2 Potential Benefits of Using MALL

Mobile devices provide opportunities for language learning, such as language skills development, new learning materials, and unique teaching approaches.

MacCallum et al. (2017) explain that, in general, mobile technologies allow educators and learners to find new approaches to structuring and supporting learning. Mobile technology has unique features that support certain types of learning, such as allowing the learner to develop and share their knowledge with others. However, Burston (2014) explained that mobile technologies for language learning have some specific difficulties that need to be overcome. For example, when practising speaking out loud using mobile technologies, the language learner may feel self-conscious about other people outside the classroom hearing them. Added to that are software issues in relation to audio and speaking skills, such as how to test oral responses and provide feedback, although some recently developed speech recognition and pronunciation correction software can help with that (Burston 2014).

The aforementioned points are practical constraints that relate specifically to language learning, yet it also needs to be borne in mind that the Arabic language has its own unique obstacles to mobile learning. For example, Durkawi and Binmoeller (2017) explained that everyday use of Arabic is either colloquial or Modern Standard Arabic, and that use is based on the individual Arabic speaking country. Therefore, Arabic learners and software developers alike face challenges when using or designing tools for Arabic learning. Furthermore, there is a shortage of web tools "that specifically address the particularities of Arabic language, namely, its diglossic nature and its use of a non-Latin alphabet" (Durkawi & Binmoeller, 2017, p.49).

Despite the challenges to using MALL for language learning, and for Arabic in particular, it remains a highly useful tool. The following sub-sections will focus on some opportunities for using mobile devices in language learning, including Arabic.

2.4.2.1 Language Skills Development

Various mobile devices and applications are used to support learners' language skills development. For example, Xu and Peng (2017) used the WeChat application to help support Chinese second language learners. In this study, nine discussion topics were assigned over the semester, and learners were asked to submit their recordings via WeChat. The results revealed that feedback provided through WeChat enhanced learners' speaking ability. In another study focused on language skills, Alzahrani (2015) used short message service (SMS) mobile flashcards to assist vocabulary development for second language learners. Alzahrani found that mobile devices were effective, and learners had a positive attitude towards them. Andujar (2016) used WhatsApp group to support 80 Spanish students taking a B1 English course where they participated in a daily interaction for six months. Andujar (2016) found a significant decrease in the number of errors in the experimental group in relation to the control, whether grammatical, lexical or mechanical, which illustrated the positive effects of the treatment in terms of linguistic accuracy. Mobile devices can also support writing skills, for example Li and Hegelheimer (2013) used mobile devices to facilitate learners' writing and grammar learning using a web-based mobile application called *Grammar Clinic.* This application was designed as a series of outside-class grammar exercises in the format of sentence-level error identification and correction, so learners could access learning materials that contained specific errors and corrective feedback options to help them improve the quality of their writing.

Ghanizadeh et al. (2015) conducted a study to review articles published between 2004 and 2014 that focussed on technology-enhanced language learning. They found that when technology was used in almost all language learning domains, learners' listening, writing, reading, grammar, and vocabulary, technology had a positive impact. The findings of Ghanizadeh et al. (2015) are interesting, as they were conducted in a variety of

educational contexts, from elementary school to university, in diverse countries, with different instruments used, and with different languages learning, and they discovered broad acceptance of using mobile devices in language learning.

2.4.2.2   Language Learning Materials

The authenticity of language learning materials is a critical prerequisite for effective learning (Shadiev et al., 2017). Shadiev et al. (2017 p.285) explain that:

"An authentic environment provides several critical characteristics. First, it provides authentic contexts that reflect the way the knowledge will be used in real life. Second, it provides authentic activities that have real-world relevance, ideally ones which present complex tasks to be completed over a sustained period of time. Third, it creates an opportunity for sharing learning experiences and accessing the experiences of learners regardless of their level of expertise. Finally, it promotes reflection and enables authentic learning assessment within the tasks."

Mobile devices provide language learners with authentic materials using, for example, video, instant messaging and social media. These materials provide natural and context-rich linguistic and cultural situations that can reflect social changes more effectively than printed sources (Ghanizadeh et al., 2015). Online video, instant messaging, and social media are commonly used in language learning teaching situations (Shadiev & Yang, 2020). Millions of people around the world have been attracted by social media platforms, such as Facebook, Twitter, WhatsApp, and WeChat. L2 learners, and their instructors have used these applications as language learning platforms to provide authentic content or as a method of learning management.

Albantani et al. (2020) used Facebook to facilitate discussions among students of a target language equipped with culturally relevant materials. They conclude that the process of learning a foreign language by using Facebook is effective and learners can use the Facebook media network today to freely choose the material that they want. In another example, Gon and Rawekar (2017) noticed the increasing use of WhatsApp for groups of teachers and their students has been initiated by high infiltration of smartphones to help the learning process by providing direct access to a variety of online services. WhatsApp has become a modern and convenient platform for teaching learning experiences by integrating media such as animations, photographs and voice notes, with the continuous availability of a facilitator and learning anytime, anywhere.

2.4.2.3 Learning Approach

Since mobile devices provide more learning experiences and mutual influence over the content and method of learning, learners are more responsible for successfully controlling their learning (Palalas & Hoven, 2016). This may be considered as a threat, but it is also certainly an opportunity to revitalise and reinvent existing teaching and learning methods (Kukulska-Hulme, 2020).

Mobile devices facilitate a more student-centred approach to learning, where the learner is more accountable for obtaining, processing, and using information. Mobile devices also allow for improved interactivity between teachers and learners, enabling teaching and learning to be a more personal activity (Ganapathy et al., 2016). However, regardless of the fact that mobile devices can encourage self-directed learning and language learner autonomy, the role of the teacher is still essential as they must still help the student in migrating to the new environment (Al-Sulaimani, 2010; Kukulska-Hulme et al., 2015).

Students will need teachers to navigate them to appropriate content and optimal instructional methods for their individual needs (Palalas & Hoven, 2016).

2.4.3 Potential Barriers to Using MALL

Mobile technology has advanced rapidly and changed dramatically in recent years, and it has actually transitioned to the mobile phone being a tool that is an appropriate tool for language learning (Andujar, 2016; Shadiev et al., 2017; Xu & Peng, 2017). However, the popularity of mobile devices has led some lecturers and universities to ban them as a result of them being a distraction (Roberts & Rees, 2014). This is an example of how quickly mobile technologies are advancing, problematising the efforts of researchers to keep up with these advancements.

Several barriers to the use of mobile devices in language learning are indicated in the literature, and one concern is that many users will lack the motivation needed to use mobile phone learning frequently (Shudong & Higgins, 2006). On the other hand, studies on language learning have found that using mobile devices provides extra motivation for learners (Niño, 2015; Sahrir et al., 2016). Furthermore, Pegrum (2014) argued that there are inherent motivational advantages often linked to mobile learning that appear to be related to personalised technology ownership and the opportunity to interact with others both locally and internationally.

Shudong and Higgins (2006) identified technical barriers for using mobile devices, including small screens with low resolutions. They point out that back in 2005 most mobile phone screens size were 1.5-2.6 inches with the highest resolutions being 240×320 pixels. However, this is no longer a barrier, as currently, mobile phone screens sizes are 5.5-6.5 inches with high resolution 2688×1242 pixels. In addition, previously, small memory and

storage capacity were barriers that limited the use of a mobile phone. Back in 2006, Shudong and Higgins (2006) found the largest storage capacity to be 40MB, yet mobile phones these days, such as the iPhone and Galaxy, offer 64GB, 128GB, 265GB, and 521GB of storage. Also, free cloud storage is available, such as Google Drive (15GB), OneDrive (15GB), and Mega (50GB).

A lack of learning materials can be a barrier to learners and their teachers using mobile devices. A study by Dündar and Akçayır (2014) assessed students' attitudes and opinions toward use of Tablet PCs, and they found that learners were unsatisfied with the range of learning materials available on this platform. In addition, Khlaif (2018) examined factors influencing teachers' attitudes toward mobile technology, and similarly, he found that the lack of learning materials was a barrier for many teachers. However, participants in both studies, (Dündar & Akçayır, 2014; Khlaif, 2018), also admitted to a lack of knowledge about the availability of educational applications for their mobile devices, despite claiming proficiency in using their mobile devices. Therefore, learning materials might not be a barrier, especially in the context of the current study, due to the widespread use of mobile technologies in Saudi Arabia (Allam et al., 2017).

Regardless of this, it is obvious that the nature of the student-teacher interaction fundamentally changes based on their particular criteria and learning needs, including regarding mobile technologies. Social media and instant messaging applications, such as Facebook and WhatsApp, have been adapted for learning in various ways such as learning management system to share language learning materials and create groups for communication. Robles et al. (2019) found that there was complete acceptance of the WhatsApp method and this improved the contact between the students; moreover, they claim that it encouraged the closure of distance between the instructor and the students.

2.4.4 Different Levels of MALL for the Arabic Language

Mobile innovations have opened up new ways of enhancing the features of teaching, learning and the administration of education via faster cellular connectivity and increased Wi-Fi capabilities (Shafika, 2012). Teachers and students have access to up-to-date information at anytime anywhere, without being tied to a desktop, which has traditionally restricted their ability to learn or share knowledge (Aburezeq & Ishtaiwa, 2013). The mobile technologies available are a combination of those especially designed for learning a specific language, as well as technologies that were not originally designed for language learning but that can be used to support it.

2.4.4.1 Language Resources for Access and Looking Up

Mobile devices can also help Arabic language learners via online resources such as dictionaries and translating apps, which are not designed for teaching purposes, but involve traditional methods. Congruently, Al-Busaidi (2015) stated that traditional teaching methods, such as grammar translation and memorisation, are widely used in Arabic teaching. For example, the mobile language learning called *U-Dictionary* has been installed three million times (Chan, 2019).

According to Taufiqurrochman (2019), electronic dictionaries are useful due to their simple design, and because they allow a variety of media to be added, such as sounds, images and videos, which is not possible with conventional print dictionaries. However, Taufiqurrochman (2019, p. 758) also claimed that while they are popular, "the text translation feature in the electronic dictionary is still unable to translate text correctly according to Arabic grammatical rules." This was confirmed by Jabak (2019) who fed texts from the book Thinking Arabic Translation into Google Translate and found lexical and syntactic errors, which resulted in poor quality of translation, and even unintelligible

translations. Moreover, Hadla et al. (2014) also conducted a similar study using Google Translate and Babylon and discovered problems due to the literal translation and the lack of consideration of the sociocultural aspects of Arabic proverbs. Conversely, Pegrum (2014) claimed that MALL can ensure better consideration of communicative and sociocultural issues. While dictionaries and translation tools may be useful, they may not be as effective as the specifically designed applications, such as games, now available on mobile technologies, or the interactive nature of social media applications.

2.4.4.2   Mobile Technologies Developed Specifically for Teaching Arabic

There are number of mobile technologies that have been specifically designed to teach the Arabic language, such as game-based learning, and those involve remedial learning strategies.

Researchers have explored the use of Game-based Learning (mGBL) in the Arabic language. For example, Ghafar and Noor (2017) developed an mGBL application to help secondary school students in Malaysia to learn Arabic vocabulary using dictionaries and contextual guessing strategies. They used two dictionaries, *Qomusika: Kamus Klasik Kontemporer and Al-Mu'jam al-Arabi al-asasi*, to develop this mobile application. The students agreed that this mGBL application, which employed both dictionary use and contextual guessing strategies, helped them learn Arabic vocabulary. Ghani, Ramli, Hamzah and Daud (2019) examined the utility of digital mobile games in Arabic language learning in Malaysia. One hundred twenty-three learners from three Malaysian universities participated and highly agreed on the usefulness of digital games in the classroom, as they allow learners to enjoy and enhance their creativity through mGBL learning.

Wihidayat, Utami and Budianto (2018) explained that the Teacher Centred Learning (TCL) method is widely used in Arabic language learning in Indonesia. In this learning

process, students listen to teachers explain the meaning of words or sentences whilst the teacher writes the letters or the words on the classroom board. Hence, Wihidayat, Utami and Budianto (2018) designed and developed a mobile application that can be used as self-directed learning media to help students who need a remedial learning process. Remedial learning strategies target learners with a more reduced rate of academic progress (Wu, 2012). The approach is recognised as being able to improve academic success and increase student and staff satisfaction (Wihidayat et al., 2018). The application they used is called Learn Arabic Language App (LALA). Sixteen students in 4th grade Arabic Language classes at an elementary state school found that LALA is very easy to use for self-directed learning. In addition, the learners were motivated and enjoyed the learning process (Wihidayat et al., 2018).

This section has shown that mobile devices can be used in a variety of ways, and they make accessing learning exercises convenient, such as via short message servers (SMS); through mobile based games, or using mobile based flashcards (Alzahrani, 2015; Erradi et al., 2012; Ogata et al., 2010).

2.4.4.3 Other Technologies and Materials Providing Access to the Arabic language

The widespread use of mobile devices and applications has led to an increase in the use of social media, such as Facebook. These social media networks were not initially intended as educational tools for learning and teaching, but were designed for specific purposes, such as forming friendship networks. However, the role of social networking sites has now developed into an effective mechanism through which it can bridge the divide and establish partnerships between government and individuals, companies and their customers, and academics and students alike (Rahimi et al., 2015).

The use of mobile devices in Arabic language learning, such as smartphones and tablet PCs with superior cellular connectivity and expanded Wi-Fi capabilities, is in its infancy. Few researchers have investigated the use of these devices in Arabic as a first or second language. Aburezeq and Ishtaiwa (2013) investigated the impact of WhatsApp on interaction in an Arabic language teaching course at Professional Diploma Program in Teaching at Al-Ain University of Science and Technology (AAU) in the United Arab Emirates (UAE). They found that WhatsApp had the potential to boost the educational communication of students, especially student-student interactions. The key purpose of using the WhatsApp platform was to provide a free and accessible environment for participants to interact, share ideas and exchange knowledge. However, the hidden costs involved with using WhatsApp, the additional workload, disruption to learning, lack of dedication by students to successful engagement, lack of WhatsApp development expertise and the limited screens of mobile devices, have been described as the key obstacles to the efficient development of WhatsApp as a learning application (Aburezeq & Ishtaiwa, 2013).

Arabic language researchers have also examined the use of Facebook in Arabic language learning. In Malaysia, Rahimi et al. (2015) looked at students' feedback on using Facebook when learning the Arabic language as a foreign language. They opened a new Facebook account for the study named "Hassin Lughatak" (Improve your Language). The researchers used videos, photographs, links and notes during the study period, which was for four weeks. The participants confirmed that Facebook boosted their learning of new vocabulary during communication and chats.

Similarly, in Indonesia, Albantani, Madkur and Rozak (2020) investigated the use of Facebook in Arabic language classes at two departments at Syarif Hidayatullah State Islamic University Jakarta. An account called "Belajar Bahasa Arab" which means "Learning Arabic Language" was set up. The lecturer invited all of his students to use it,

and they conclude that using Facebook made the learning process more effective and easier (Albantani et al., 2020, p. 3).

2.5 Arabic Language

2.5.1 Introduction to the Arabic Language

Arabic is the fifth most spoken language worldwide, after Mandarin, Hindi, Spanish and English, and ranks sixth out of the United Nation's official languages, alongside Chinese, Russian, English, French and Spanish (Ariew & Palmer, 2009; Al-Huri, 2015). It is also the mother language of approximately 300 million and used by over one billion Muslims around the world as the language of Quran and liturgical language (Abedalla, 2015; Saiegh-Haddad & Henkin-Roitfarb, 2014).

Historically, Arabic is considered to be a member of the Semitic languages (Al-Huri, 2015). As a Semitic language, see Figure 2.2, Arabic is rich in its morphology and syntax (Shaalan & Talhami, 2006). It possesses exclusive linguistic characteristics, such as writing from right to left, and a dual number of nouns that do not exist in English (Al-Huri, 2015).
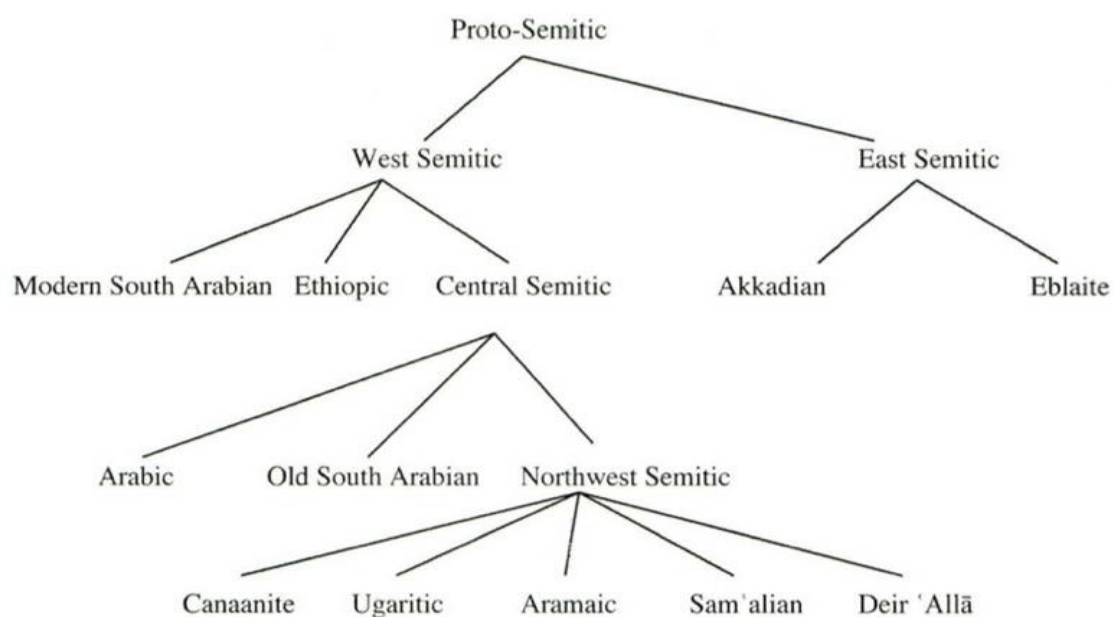
Figure 2.10 The Semitic languages (Pat-El & Wilson-Wright, 2018, p.782)

Owens (2006) explains that the Arabic language can be categorised into three stages that occurred over time. The first stage is old Arabic, which is the language of the Quran and old Arabic literature. Second, middle Arabic, which refers to the language spoken outside the Arabian Peninsula at the dawn of Islam. The third is neo-Arabic, which is composed of the modern Arabic dialects spoken in Arabic countries. However, there are many other classifications of the Arabic language. The Arabic language has been classified into two types called Classical Arabic (CA) and Modern Standard Arabic (MSA) (Al-Sobh ., 2015). CA is the language of the Quran and old Arabic literature. At the same time, MSA is the language of formal speech in Arabic countries used in the education system, news, and political speeches. In this study, when the Arabic language is mentioned, it is referred to as MSA.

2.5.2 Arabic as a Second/Foreign Language

By the 1940s, foreign language education had developed as an educational field and influenced Arabic language teaching (Al-Busaidi, 2015). Teaching Arabic as a Foreign

Language (TAFL) flourished in Egypt in the 1960s. In the 1970s, Saudi Arabia, Sudan, Tunisia, Libya, and Lebanon saw a growth in TAFL (Facchin, 2019). This led to the establishment of Arabic language institutes to teach Arabic as a foreign/second language in the Arab world or outside the Arab world (Al-Busaidi, 2015). In the Arab world, the most important Arabic language institutes established between 1958-1979 were:

- Centre for Arabic Studies, Lebanon, 1958

- The Arabic Unit of the Language Centre, Kuwait University, 1965

- The Institute of Teaching Arabic, Islamic University of Medina, 1965

- Habib Bourguiba Institute, Tunis, 1968

- Centre of Arabic Studies at the American University in Cairo, 1974

- Khartoum International Institute in Sudan under the support of the Islamic Educational, Scientific and Cultural Organisation (ISESCO), 1974

- Institute of Arabic Language, King Saud University in Riyadh, Saudi Arabia, 1975

- Institute of Arabic Language, University of Umm Al Qura, Makkah Al-Mukarramah, Saudi Arabia, 1979

Al-Busaidi (2015), however, does not mention any justification for choosing the time frame between 1985-1979 or any criteria for selecting these institutes as the most important ones. The Institute of Teaching Arabic at the Islamic University of Medina was a language unit until 2001 when it became a language institute and was selected. However, The Institute of Teaching Arabic at Al-Imam Muhammed Ibn Saud Islamic University started as a language school in 1977 until 1981 and was not selected.

Facchin (2019) classified the history of TAFL intro three eras: Growth Era (1970s), Development Era (1980s), and New Challenges Era (1990s). In the 1970s, TAFL institutes

were built for training teachers and with them came the call for new teaching methods. Until 1987, TAFL stayed underdeveloped until the first symposium on the Arabic language as a foreign language was held in Saudi Arabia at the Institute of Arabic Language, King Saud University in March 1987 (Facchin, 2019; Sieny, 2017). It was attended by scholars and researchers from Arabic countries, Europe, and the United States. From there, a series of dedicated meetings were organised, and many types of research on TAFL were published.

These talks, at the end of the 1970s, had a positive effect going into the 1980s. Saudi Arabia maintained a leading role in the field of TAFL: Mecca, Riyadh and Medina became the centre stages for brand new projects, research units, publications and talks (Facchin, 2019). At this time, Arabic became an official language of many organisations, including the United Nations, UNESCO, African Union, World Health Organisation (WHO), and the Food and Agriculture Organization (FAO). Also, master's degrees dedicated to TAFL were being offered at university level, some TAFL institutes began to expand, and brand-new ones arose in Khartoum, Riyadh and Cairo. In particular, the interest in TAFL expanded in Saudi Arabia, where dedicated research, theoretical and practical studies and textbooks were published (Facchin, 2019).

In the 1990s, the Arabic language captured the attention of many people for different reasons, including the socio-political scenario with the invasion of Kuwait by Saddam Hussein in the 1990s (Facchin, 2019). Other reasons such as "immigration, the abundance and availability of new media in Arabic, and the widely used interactive communication technology put a new focus on the choice of language varieties to consider in teaching, as well as on the content and the kinds of teaching materials to use" (Nielsen, 2009, p. 147) gave Arabic a far more noticeable station in Western culture. As a result of

these different reasons, TAFL spread over the Arab world and outside it, and debates focused on both classical themes, such as Arabic language teaching methods and diglossia, and new ones such as Arabic language proficiency and testing, which shifted the focus of TAFL to new problems and questions, and led Arab specialists to enter and face the challenges of the nineties (Facchin, 2019).

In the 2000s, TAFL was still growing, and Saudi Arabia continued to play an important role as a leader in the field of teaching the Arabic language as a foreign language. In 2008, Saudi Arabia launched "King Abdullah Bin Abdulaziz International Center for The Arabic Language", which became a well-known centre. The centre has many programmes, including publications, training and international cooperation. The centre has organised and participated in numerous programmes in more than 21 countries, such as Russia, France, Singapore, China, India, and Morocco. It has also created three databases called Bena 1, Bena 2, and Bena 3. Bena 1 contains details of all Arabic language institutions in Saudi Arabia, including a list of researchers at these institutes. Bena 2 is a list of international Arabic institutes. Bena 3 contains resources for teaching Arabic to non-native speakers.

In 2018 and 2019, Saudi Arabia opened new Arabic language units to teach the language to non-native speakers at King Khalid University, Jouf University, Taif University, University of Tabuk, Jazan University, Albaha University, University of Bisha, and the University of Hail.

2.5.2.1 Challenges of Arabic as a Foreign Language

As a foreign language, Arabic language programmes face many challenges. Al-Busaidi (2015) has categorised these challenges into two main categories: first, linguistic difficulties that are related to the Arabic language itself; and second, difficulties related to

pedagogical factors such as the quality of materials, quality of teachers, and quality of Arabic programmes.

One of the most reported linguistics challenges for Arabic as a foreign language is diglossia (Al-Busaidi, 2015; Palmer, 2008). Diglossia is defined by (Ferguson, 1959) as "a relatively stable language situation in which, in addition to the primary dialects of the language (which may include a standard or regional standards), there is a very divergent, highly codified (often grammatically more complex) superposed variety, the vehicle of a large and respected body of written literature, either of an earlier period or in another speech community, which is learned largely by formal education and is used for most written and formal spoken purposes but is not used by any sector of the community for ordinary conversation" (p. 334).

Almost every one of the 23 Arabic countries uses its own "dialect", and then Arab people learn Modern Standard Arabic (MSA) in school. As such, some researchers have stated that Arabs are bilingual as they are native speakers of Non-Standard Arabic, not MSA (Palmer, 2008). MSA is significantly different in structure and vocabulary from non-standard Arabic (NSA) (Al-Busaidi, 2015). This means that foreign learners of Arabic have limited chances to practice outside of their classroom or with their friends. However, Arabic learners for religious purposes are less likely to face this challenge. For example, most Islamic lectures or lessons held at masjids (mosques) are in MSA.

Al-Busaidi (2015) highlights the following challenges facing Arabic as a foreign language: a shortage of materials, a lack of qualified teachers, and a lack of coordination between Arabic programmes. Although Al-Busaidi's research was published in 2015, most of the resources for the pedagogical challenges were from the 1990s, such as Allen and Allouche (1986), Alosh (1997) and Lambert (1992). These studies were undertaken outside

the Arab world where most Arabic as foreign language activities, research and publications were developed (See Section 2.5.2). As a result, some of these challenges might exist in the US only or have disappeared a long time ago. Since 1985, the Institute of Teaching Arabic at Imam Mohammad Ibn Saud Islamic University has been providing a Master of Teaching the Arabic Language for Non-native Speakers from which tens of qualified teachers have graduated. Concerning the shortage of materials, Arabic language institutes in Saudi Arabia have published many L2 Arabic learning materials, for example, KSU Institute has published eight books, IMISU Institute has published a total of 50 books and UAU Institute has published 22 books (Sieny, 2017).

2.5.3 Arabic Language Learning and the Use of ICT Technologies

This section provides a broad overview of the use of various ICT technologies, including traditional computer-based ICT technologies and mobile devices, to assist Arabic language teaching and learning in a range of contexts. However, the aim of this thesis was to investigate the attitudes of second language (L2) Arabic learners and their teachers in Saudi Arabia towards using mobile devices in their Arabic language learning. This included who was using mobile devices, what kinds of mobile devices were being used, how the devices were being used to learn the Arabic language, what their attitudes were towards using mobile devices, and what factors were affecting their attitudes toward using mobile devices.

The potential of technology has attracted the interest of many researchers who are interested in Arabic language learning, and recent improvements in the field of ICT have opened up new scopes for linguistic analysis researchers (Redkin & Bernikova, 2014). It covers a wide variety of areas and enables the development of new Arabic script-based resources, such as databases, automated translation, search engines, and teaching software.

Researchers have investigated the use of a range of ICT technologies, such as personal computers and the internet in Arabic language learning. There is a significant amount of research studies underway which are developing standards for the use of Arabic in ICT. A great deal of work has begun on promoting and unifying the implementation of ICT concepts in Arabic (Redkin & Bernikova, 2014). In addition, different aspects and skills of the Arabic language, such as reading, listening, speaking and writing, are being studied in many contexts to explore the extent to which ICT technologies can help Arabic language learners and teachers.

Regarding Arabic as a first language, few studies have investigated the use of ICT technologies. Hamed (2012) investigated how Arabic language teachers use technology in secondary schools in Saudi Arabia. The data collected reveals that many electronic instructional technology tools, such as computer labs, overhead projectors, interactive whiteboard, and TV monitors, are available in secondary schools in Riyadh. Also, the use of electronic instructional technology activities in teaching the Arabic language in secondary schools is high.

In another Arabic country, Oman, Al Musawi, Al Hashmi, Kazem, Al Busaidi, and Al Khaifi (2016) examined the perceptions of Arabic language teachers toward their use of technology at Omani basic education schools. The study included 350 female teachers from three educational districts of Oman. It was found that teachers mostly use computer software and presentation devices to introduce and explain their lessons. However, it seems that there is a need to increase the use of educational technology in the lessons' activities and evaluation.

Albasheer et al. (2019) conducted a study in Kuwait involving 355 teachers from three subjects - Arabic language, Islamic education, and social studies - selected as a

representative sample to explore the utilisation of M-learning devices in these three subjects. The study included teachers from primary schools, secondary schools, and high schools. The results reveal that the iPad was the most used device between teachers in the three subjects, whereas social studies stated the highest percentage of use, followed by the Arabic language, and then Islamic education (Albasheer et al., 2019).

Worldwide, many studies have explored the use of ICT in learning Arabic as a second language. In Russia, for example, Redkin and Bernikova (2014) developed and implemented a one month long training programme called "The Arabic Language and Innovative Education", which has trained more than 100 Arabic language teachers over the last three years from seven different institutes. The program aimed to provide teachers of Arabic language with extra skills to improve their professional capability, such as creating digital teaching materials (e-books, presentations, and multimedia applications); acquiring competency in ICT, and supporting learning capacities. From their analysis of ICT implementation, the researchers drew three conclusions: First, they found that the programme led to better quality teaching in all types of educational institutions. Second, the best way for Arabic teaching is the combination of classical methods of teaching and ICT. Third, the results show how 'digital literacy' opens up new prospects for the use of ICT in Arabic language teaching and thus increases its effectiveness. ICT can also enrich Arabic language teaching by integrating new social and cultural elements.

Malaysia is a centre of development for the Arabic Language. For example, Shuib, Aziz, Daud and Hasan (2014) have developed an Arabic teaching-learning tool for non-native Arabic speakers that has been developed to analyse texts written in Arabic. The program is used to perform two tasks: Firstly, to measure the difficulty level of texts written in Arabic and determine their level of readability; secondly, to translate the Arabic text

online. These two features are useful for both teachers and learners of Arabic, and this software can assist teachers in choosing materials at the right level of difficulty for teaching. This programme also uses the established King Abdulaziz City for Sciences and Technology Arabic Corpus (KACSTAC) (Shuib et al., 2014). Similar studies have investigated systems based on the principle of pedagogical indexing and the characteristics of the Arabic language, as well as the possibility of adapting the standard for describing learning resources (Boudhief et al., 2013).

Many studies have investigated the use of the web in Arabic language learning in Malaysia. Sahrir and Yusri (2012) implemented an online Arabic vocabulary learning games prototype among teenage learners in the Centre for Foundation Studies (CFS) at International Islamic University Malaysia (IIUM). The findings from several participants made up of specialists, teachers and learners reveal that the online games applications could increase and enhance learners' attitude, motivation and vocabulary acquisition in learning Arabic. In another study, Ghani, Daud and Sahrir (2016) examined the effectiveness of using websites in learning the Arabic language for tourism purposes among 43 students at the Department of General Studies at Poly-Tech College, Malaysia. The findings show that the use of a website in learning the Arabic language for tourism is effective among learners, and it provides good and proactive support for students learning a language for specific purposes. Additionally, Shehab and Zeki (2015) explored the use of the web in the learning and teaching of Arabic as a second language. Also, they aimed to study a combination of Web Assisted Language Learning (WALL) and cognate (words similar in meaning and pronunciation) transfer for the Arabic language. Five Malay speakers and five Malaysian Arabic language teachers were included. The majority of the participants were satisfied

using the system and they found that they preferred it over traditional learning. They also found the system to be a useful learning tool.

The use of some online tools in Arabic language learning has been examined too. Gharawi and Bidin (2016) examined 35 Arabic language teachers' perception of using Computer Assisted Language Learning (CALL) in Malaysia, supporting Arabic as a second language. The teachers' perceptions were highly positive toward using CALL in their teaching of Arabic. Interestingly, teachers aged 40 and above had a very high preference for CALL (100%), while teachers aged 23-40 had less preference (70%). This could mean that younger teachers are looking forward to using MALL rather than CALL due to the advantages of greater flexibility and mobility.

Furthermore, Abdullahi, Rouyan and Noor (2018) used a computer-assisted language learning tool called "QuizCreator Online" to determine the performance level of 156 final year Malay undergraduate learners of Arabic as a foreign language in reading and listening skills; according to the standards of United Certification Services Limited UNICERT at Malaysian public Islamic universities (University Sultan Zainal Abidin, International Islamic University Malaysia and Islamic Science University of Malaysia). The study data were collected utilising a research instrument developed and labelled based on the TOAFL (Test of Arabic as a Foreign Language) (AL-ARABIA) labelling scheme implemented in "QuizCreator Online". They found that about 47% of students achieved a pass mark, which was 25 points out of 50 points, in reading skills, while around 68% of students achieved a pass mark in listening skills.

The perceptions of learners towards using mobile technologies in the learning of Arabic as a second language has attracted attention from some researchers. For example, two studies investigated the perceptions of L2 Arabic learners towards using mobile devices

in Arabic learning in the US (Abedalla, 2015a; Ahmed, 2015). Abedalla (2015a) investigated the students' perceptions of the use of mobile applications technology in learning Arabic as a second language at three universities in the state of Pennsylvania. The participants were 42 male and female students at basic Arabic level (Arabic 101 and Arabic 102). These two levels of Arabic reflect no or very little knowledge of the Arabic language. The participants indicated that the use of mobile devices for the Arabic language was useful and it helped them to develop their language skills and boost their ability to understand Arabic. Using mobile devices enabled the participants to interact outside the classroom with other class members, and to compare their language and culture with the Arabic language and culture. Ahmed (2015) examined the strengths and weaknesses of classroom activities designed explicitly for portable technology (iPad/MacBook Pro) in enhancing reading and listening proficiency for four US military services departments. Thirty students participated, both male and female, aged between 18-25 years. The results revealed that the use of mobile technologies is advantageous, but the advantages of mobile technologies for learning Arabic could be considerably enhanced by creating multifaceted and more engaging tasks.

In summary, it appears that only two studies, Abedalla (2015a) and Ahmed (2015), have specifically investigated the perceptions of Arabic language learners toward using mobile technologies in the context of learning Arabic as a second language. Therefore, attitudes toward using mobile technologies in the learning and teaching of Arabic as a second language, in both formal and informal contexts, from the perspective of learners and teachers in Saudi Arabia, have yet to be investigated. Hence, this study addresses an area of need and a gap in the literature.

Chapter 3

Research Methods

3.1 Introduction

This chapter presents an overview of the research methods employed in this study. It focuses on the methodology and justification for the qualitative and quantitative collection of data in an attempt to answer the research questions of this study. To restate, the primary aim of the research was to investigate the attitude of second language Arabic learners, and their teachers at seven Arabic language institutes using their mobile devices for learning and teaching Arabic.

 The research questions posed for this research were:

1. Which mobile devices, platforms, and operating systems do L2 Arabic learners, and their teachers currently use?

2. How do L2 Arabic learners and their teachers currently use their mobile devices?

3. What are attitudes of L2 Arabic learners and their teachers toward MALL?

4. What factors influence attitudes of L2 Arabic learners and their teachers toward MALL?

In this study, the Naismith et al. (2004) classification of mobile devices was used to assist in defining mobile devices. As such, mobile devices in this study referred to smartphones, tablet pcs, and laptops. These mobile devices use different platforms and operating systems to manage files, such as iOS, Android, and Windows (Farley et al., 2015). This study sought to obtain a greater understanding of mobile devices available to

L2 Arabic learners and their teachers, including these three types of mobile devices, as well as their different platform and operating systems. It will provide a more comprehensive view for developers when designing a mobile learning programme, application, or learning materials for the Arabic language.

For this study, a versatile research approach was implemented for the method of data collection and analysis. This was intended to promote a broader understanding of the use of mobile devices in studying Arabic as a second language in Saudi Arabia. The consistency of the results also depended on straightforward disclosures by the participating learners and teachers randomly selected for participation in this study.

For this study, there must be a clear distinction between the following:

- Methodology - the philosophy of choices in how the research has been conducted
- Methods - how the theory has been put into practice.

McGregor and Murnane (2010) indicated that scholars often use the terms methodology and method interchangeably, though they differentiated the methodology from the methods. They suggested that methodology deals with the general principles, or axioms, of generating new knowledge. As such, methodology refers to logic, reality, values and what counts as knowledgeable, informed research. At the same time, methods are the techniques and procedures followed in conducting research such as sampling, data analysis, and data analysis.

3.2 Overview of Research Paradigm and Approach

A paradigm is a collection of beliefs, principles, values, and behaviours that constitute a way for the society to interpret the reality that reflects them (McGregor & Murnane, 2010). Teddlie and Tashakkori (2009) identified the paradigm as a procedure for

conducting a study investigation commonly recognised by "worldviews and belief systems that guide researchers" (p. 17)

There are three research paradigms which guide the fundamental base of conducting research which is widely used in academia (Gunasekare, 2015).

The first paradigm is quantitative, which articulate assumptions that conform to what is commonly referred to as positivist philosophy. Following this train of thought, educational investigators should aim to exclude their prejudices, stay emotionally disconnected and detached with the objects of study, and test or empirically explain their indicated hypotheses (Creswell, 2018; Johnson & Onwuegbuzie, 2004).

The second paradigm is qualitative, also called interpretivism. In this research paradigm, explanations are inductively created from the data, and the knower and known cannot be separated since the subjective knower is the only source of reality (Gunasekare, 2015).

The third paradigm is mixed methods. In this paradigm, researchers try to arrive at evidence-based conclusions by combining information gathering techniques that allow bias to be restricted and controlled (Gunasekare, 2015; Johnson & Onwuegbuzie, 2004).

Quantitative research relies on numerical data collection and analysis to identify, explain, forecast or monitor the variables and phenomena of interest. This replicable procedure will yield identical results across various subject bodies (Gay et al., 2012). As the current study aims to obtain an exceptional understanding of the current use of mobile devices at Arabic language institutes, using a quantitative research methodology will help achieve a more comprehensive view of some critical factors for mobile learning, such as

mobile devices availability between Arabic language learners and their teachers or the internet connection at these seven institutes included in the study.

On the other hand, qualitative research employs a larger technique of gathering text, thoughts, photographs and observations, finding an interpretation of a phenomenon without explicitly pursuing a definable reality or hypothesis (Guest et al., 2013). It focuses on the processes and concepts that cannot be precisely analysed or calculated in terms of their quantity, as opposed to quantitative principles which attempt to reconcile behavioural variables to describe a given process (Creswell, 2018; Newman & Benz, 1998). The main focus of the study is predicated on the use of mobile devices as a tool to help second language Arabic learners and their teachers at Arabic language institutes. Variables, such as the availability of mobile devices, have some possibility of measurement through the use of quantitative tools, however, it would be less possible in terms of measuring attitude. Therefore, the use of qualitative research tool will add an extra angle to explain deeply the quantitative findings of the current study.

The usefulness of mixing the two fundamental traditional research methods, with the philosophies that underlie the processes, adds qualitative opinions to the learners and their teachers' quantitative evidence of change in the setting of this research. The methods are planned and applied in a way relevant to the different stages of the study objectives, the quantitative methodology at the first level for generation purposes, and the qualitative stage is to obtain more data from learners and teachers' points of view towards the use of mobile devices in Arabic language learning.

3.3 Pragmatism

Pragmatism is based on the assumption that researchers will use the conceptual and/or methodological methodology best suited to the specific research issue under investigation (Kaushik & Walsh, 2019). Both sets of purists, qualitative and quantitative, see their paradigms as the best for research. Supporters suppose that qualitative and quantitative research paradigms, with their related processes, cannot and should not be combined, indirectly if not directly (Johnson & Onwuegbuzie, 2004). For practising researchers who would like to see methodologists identify and improve strategies that are similar to what researchers currently use in practice, mixed methods research offers great promise. Mixed methods research can also help bridge the divide between quantitative and qualitative research as the third research paradigm (Johnson & Onwuegbuzie, 2004).

Despite there being several significant paradigmatic variations between qualitative and quantitative research that have been often discussed, some matches are often ignored between the two different methods. For instance, both quantitative and qualitative researchers use empirical remarks to address research questions (Johnson & Onwuegbuzie, 2004).

As a consequence of pragmatism, philosophical discussions do not end, and definitely, they should not cease. Nonetheless, we agree with others in the research movement on mixed methods that the analysis and discussion of pragmatism by research methodologists and empirical researchers would be useful since it proposes a philosophically and methodologically instant and valuable middle position. It provides a method of selecting methodological mixes that can enable the researcher to respond better to many of their research questions (Johnson & Onwuegbuzie, 2004; Kaushik & Walsh, 2019).

Researchers need to focus on the best effective method of verifying and evaluating data for the study subject, particularly when it is not mainly focused on the quest for proof of a theoretical reality. Therefore, a pragmatic paradigm was adopted for this study, which combines characteristics associated with both positivistic and interpretive paradigms. This is reinforced by the mixed process approach in which the reliability of the methods used has been given due consideration (Ivankova et al., 2006)

In the context of this study, a pragmatic mixed methods research was used to study the attitude of L2 Arabic learners, and their teachers toward mobile assisted language learning. Mixed methods research is described as "the third research paradigm" (Johnson & Onwuegbuzie, 2004, p. 15) and defined as "the collection or analysis of both quantitative and qualitative data in a single study. In this study, the data is collected concurrently or sequentially, prioritised, and involved the integration of the data at one or more stages in the process of research" (Creswell, Plano Clark, Gutmann & Hanson, 2003, p.212).

The purpose of mixed methods research is not to substitute any of the quantitative or qualitative approaches, but instead to draw on the strengths and reduce the boundaries of both single and cross studies research (Johnson & Onwuegbuzie, 2004). It can help to raise confidence in the results and offer more evidence while compensating for possible deficiencies with a single approach (Bowen et al., 2017). Pragmatic mixed methods research facilitates data gathering with analyses that make results beneficial to implementation in the context of Saudi higher education.

Seven Arabic language institutes are included, see Section 1.2. These institutes are located in five cities in Saudi Arabia. The quantitative method will help to provide a broad view of the current availability and use of mobile devices. In contrast, the qualitative method will provide essential explanations that will lead to a deep understanding of the

overview situation of mobile devices in Arabic as a second language learning in Saudi Arabia.

Mixing the advantageous features of both traditional methods, quantitative and qualitative, in this research is assisted by capabilities offered by methodological triangulation that mean comparing of the findings from various methods (Ivankova et al., 2006). This triangulation enables the integration of collected data via various sources and allows the creation of a common set of qualitative and quantitative findings in alternative ways.

Although it is recognised alternate ways of explaining learning and attitude exist, there is ample collaboration between the concepts of quantitative and qualitative research in the mixed-method paradigm to build validity for the findings of this research. Irrespective of paradigmatic positioning, all research in the social sciences is an effort to provide accurate affirmations about human beings (or specific groups of human beings) and the societies in which they live and develop (Johnson & Onwuegbuzie, 2004).

3.4 Mixed Methods Approach

This study has several goals involving to the exploration the use of mobile devices by Arabic second language learners and their teachers in Saudi Arabia including mobile devices availability, current use, the attitude of learners and their teachers toward using mobile devices, and factors affecting their attitude. This requires different measuring and analytical approaches, therefore directing the researcher to use a specific approach.

In this study, the mixed methods approach and the conventional data collection and analysis approaches are well adapted for performing a multilevel analysis. Researchers in applied linguistics and education have accepted and used a mixed methods approach that

merging distinctive methods of data gathering which enhance each other over the last three decades (Dörnyei, 2007).

To establish a foundation for qualitative interviewing, quantitative measurement of perceived advantages and disadvantages of using mobile learning devices and applications in Arabic language learning was required, primarily through the Likert Scale for the learners and their teachers. It is a rational assumption that learners and their teachers will just use what they consider to be of usefulness to their language learning. Using a methodology that implies gathering quantitative and qualitative data from individuals and placing the same in a broader societal setting is well recommended. This encourages a more detailed understanding of the topic under investigation. Additionally, the integration of evidence from supplementary sources supporting the research findings and enhancing the research importance. There is a substantial appeal to the effectiveness of using a mixed methods approach. However, some academic researchers have an inclination to point out concerns when there is a disagreement with, or undermining of, their favourite methodologic approach.

A researcher must make two key decisions to build a mixed-method design. First, whether or not one wants to work mainly within a single dominant paradigm. Second, whether one wants to carry out the phases simultaneously or sequentially (Johnson & Onwuegbuzie, 2004), as can be seen in Figure 3.1, there are many mixed methods research designs that researches can select from based on their study objective. In this study, the explanatory sequential research design (QUAN $\rightarrow$ qual) is considered the most suitable design. In the following section, more details and justifications for this selection will be explained

Note. "qual" stand for qualitative, "quan" stands for quantitative, "+" stands for concurrent, " → " stands for sequential. Capital letters denote high priority or weight, and lower case letters denote lower priority or weight.

Figure 3.1 Mixed-method design matrix with mixed-method research designs (Johnson & Onwuegbuzie, 2004, p. 22

3.4.1 The Sequential Explanatory Mixed Method Design

The Mixed Methods Sequential Explanatory Design involves two distinctive phases: quantitative followed by qualitative (Creswell, 2018). In this design, quantitative data (numeric) is collected and analysed first to provide a general understanding of the research problem. Qualitative data (text) collected, builds upon the quantitative phase and involves collection and analysis to explain or elaborate the quantitative results in more depth (Ivankova, Creswell & Stick, 2006).

Typically, a sequential explanatory design is used to explain and interpret quantitative outcomes through the collection and analysis of qualitative follow-up data (Creswell, 2018). When unexpected results arise from a quantitative study, this design can be particularly useful. In this case, the following qualitative data collection can be used to take a more thorough look at these unexpected findings. The straightforward nature of this

design is one of its main strengths. Implementation is simple because the steps fall into straightforward, distinct phases as one type of data collected at a time so that a single researcher can conduct the research. Furthermore, this design feature making it easy to be described and reported in two phases that provide a clear picture for readers (Creswell, 2013)

On the other hand, a sequential explanatory design is not empty of challenges. One of the main challenges of this design is the length of time involved in data collection with the two separate phases as the first phase has to be collected and analysed before the research can start collecting the second phase. This challenge is becoming more significant, especially if the two phases are given equal priority (Creswell, 2013).

As in every mixed-method design, priority, implementation and integration of quantitative and qualitative methods had to be addressed in a sequential explanatory design (Ivankova et al., 2006).

- Priority means to which method, quantitative or qualitative (or both), a researcher donates more weight or attention during the data collection and analysis process in the study.
- Implementation means whether the quantitative and qualitative data collection and analysis come in sequence - one following another - or concurrently.
- Integration refers to the step or steps in the research procedure, where the incorporation of the quantitative and qualitative methods happens.

3.4.1.1 Sequential Explanatory Visual Model

To promote a better understanding of the sequential explanatory model's procedure, a graphical representation, see Figure 3.2 was created by Ivankova et al. (2006). This model

has been modified to explain the process carried out by the researcher in the preparation of the applied methods and data collection techniques, established as a result of the analytical implementation of the mixed methods and pragmatic paradigms described in the earlier sections of this chapter.

Phase	Procedure	Product
QUANTITATIVE Data Collection	• Questionnaires to 303 students & 150 teachers	• Nominal & Numerical data
QUANTITATIVE Data Analysis	• Data screening • Factors analysis • Frequencies • inferential analysis	• Descriptive statistics, normality • Factors loadings • Descriptive statistics • ANOVA
Connecting Quantitative and Qualitative Phases	• Purposeful selecting • Developed interview questions	• 16 students & 14 teachers • Interview protocol
Qualitative Data Collection	• Individual Semi-structure telephone interview	• Interview transcripts
Qualitative Data Analysis	• Coding and thematic analysis using ATLAS.ti 8	• Codes and themes
Integrating the Quantitative and Qualitative Results	• Interpretation & explanation of the QUAN and QUAL results	• Discussion • Implication • Future research

Figure 3.2 Visual Model for Mixed-Methods Sequential Explanatory Design Procedures (Ivankova et al., 2006, p. 16)

3.5 Research Design and Methods

This section outlines the methodological concepts are applied to the data collection used in this study to investigate the attitude of second-language Arabic learners and their

teachers towards using mobile devices as assistance tool Arabic language learning in higher education in Saudi Arabia as support for conventional, formal methods of teaching.

This study used a sequential explanatory design. The priority was given to the quantitative method, which denotes a major aspect of the mixed-methods data collection process in this study. The qualitative approach in the second phase was to explain the outcomes of the quantitative in-depth.

Regarding implementation, quantitative data was collected and analysed descriptively first and then inferentially. This step allowed the researcher to get a broad view of the current situation of mobile devices used in Arabic language learning at the selected institutes. The second phase, qualitative data, helped to explain some unexpected results of the first phase.

The integration of quantitative and qualitative methods occurred at different stages. The first phase of the study was analysed, and the findings were used to inform and direct data collection during the second phase. Additionally, when participants selected for follow-up, it was based on quantitative results.

The research was divided into two phases. The first phase is the quantitative method which offers a detailed overview using questionnaires for Arabic language learners and their teachers at selected seven universities in Saudi Arabia. This led to the qualitative phase two, using semi-structured interviews that were conducted after the quantitative results were analysed to obtain a deeper understanding and to explain the quantitative outcomes.

3.5.1 Study Setting and Participant Sampling

This study was carried out at seven Saudi Arabian universities, refer to Table 3.1. The target population was L2 Arabic learners and their teachers at seven Arabic language institutes situated in seven Saudi Arabian universities:

- Al-Imam Mohammad Ibn Saud Islamic University (IMISU)
- King Saud University (KSU)
- Princess Nourah Bint Abdul Rahman University (PNU)
- King Abdulaziz University (KAU)
- Islamic University of Madinah (IUM)
- Qassim University (QU)
- Umm Al-Qura University (UMU)

Table 3.1: Demographic descriptors of participants

University	Established	No. of Teachers	No. of Students	No. of nationalities	Location	World Ranking	Arab Region Ranking
						Shanghai	QS
KSU Institute	1974	33	162	20	Riyadh	151-200	3
IMISU Institute	1980	37	99	25	Riyadh	-	35
PNU Institute	1980	30	46	9	Riyadh	-	91-100
KAU Institute	2010	17	119	29	Jeddah	151-200	4
IUM Institute	1966	60	520	86	Madinah	-	51-60
UAU Institute	1979	50	352	52	Makkah	-	18
QU Unite	2011	18	131	28	Qassim	-	46
Total	-	245	1429				

The seven universities were selected as they were the only universities offering Arabic language course for non-native speakers at the time when this study was conducted.

For cultural reasons, male and female students are taught separately on various parts of the university campus. Nonetheless, the researcher was able to administer the questionnaire to all students via research units for both males and females at the chosen universities. Furthermore, the cooperation of the Arabic language institutes played an important role in easing data collection since they had been contacted by the researcher for obtaining the data collection approval.

3.5.1.1 The quantitative sampling (phase one)

The two main practices for population sampling are probability and non-probability. Probability sampling guarantee that a sample is selected randomly and that each component inside the population has an alike venture of being selected (Ary et al., 2010). Non-probability sampling is derived from the researcher target group, and does not represent the wider population (Cohen et al., 2013). This technique is normally the most practicable sampling method for small-scale research.

This study makes generalisations constructed on the data gathered. As such probability sampling was selected as, when contrasted with a non-probability sample, it achieves representativeness when sampling from a broader population, with a minimized threat of bias. (Cohen et al., 2013). There are different forms of probability sampling; however, the form of probability sampling used in this study is known as random stratified sampling (Barreiro & Albandoz, 2001). This form of sampling can provide "more precise information inside the subpopulations about the variables we are studying" and "raise precision of the estimators of the variables of the whole population", but it may be hard in some populations to divide into strata (Barreiro & Albandoz, 2001).

The stratified random sample involved two stages (Cohen et al., 2013). In the first, the population was divided into seven groups depending on which university the students

attended. Each group was comprised of discrete collections of students and teachers, and males and females where applicable. In the second stage, the researcher used proportional allocation to keep sample size proportional from each of these groups (Etikan & Bala, 2017).

The minimum sample size is different among texts. Corder and Foreman (2009) indicated that Pett (1997) and Salkind (2004) noted that most researchers suggest n>30, Warner (2008) encouraged considering n>20 as a minimum and n> 10 per group as an absolute minimum (Corder & Foreman, 2009, p. 2). However, From a statistical point of view, to have a normal distribution, a minimum sample requires 30 people or more (Hatch & Lazaraton, 1991).

In this study, the total population was 1,429 students and 245 teachers. In determining the sample size for the probability sample, the confidence level and confidence interval have to be considered (Cohen et al., 2013). To achieve that, Yamane's sample formula, shown below, was used (Yamane, 1973)

$$n = \frac{N}{1 + N(e^2)}$$

Where, n= sample size, N = population size, and e = margin of error, e = 0.05

Yamane's sample formula revealed that 303 learners and 150 teachers would be representative samples.

The learners' population (a total of learners 1,429) was divided into seven strata (based on universities), the same with teachers' population (a total of 245 teachers) was divided into seven strata (based on universities). Pandey, Ashraf, and Verma's (2012)

formula was then used to proportionally determine the sample learners and teachers from each selected university to the total number in each university.

$$n_i = \frac{N_i}{N} n$$

Where n_i is the number of learners or teachers required to be selected from a university with a total number of N_i learners or teachers, and the n= the total number of learners or teachers required to be sampled from all the seven universities. The detailed sampling is indicated in the following Table 3.2.

Table 3.2: Sampling for the quantitative method (Phase One)

University	Total number of Teachers (N_i)	Sample teachers (n_i)	Total number of learners (N_i)	Sample learners (n_i)
KSU Institute	33	20	162	34
IMISU Institute	37	23	99	21
PNU Institute	30	18	46	10
KAU Institute	17	10	119	25
IUM Institute	60	37	520	110
UAU Institute	50	31	352	75
QU Unite	18	11	131	28
Total	N= 245	n= 150	N= 1429	n= 303

All learners and teachers at the Arabic language institutes selected in this study were invited to complete the survey as recommended by Gat, Mills, and Airasian (1976, p. 139). Their recommendation suggested that "for smaller populations, say, $N=100$ or fewer, there is little point in sampling; survey the entire population". A total of 303 learners and 150

teachers were selected via a simple random technique using the lottery method (Acharya et al., 2013).

3.5.1.2 The qualitative sampling (phase two)

Qualitative methods give priority to saturation while quantitative methods prioritise generalizability (Palinkas et al., 2015). As such, sampling in qualitative research is different and tends to be smaller than sampling for quantitative research (Gay et al., 1976). Marshall, Cardon, Poddar, and Fontenot (2013) examined 83 qualitative studies in leading IS journals and made the following recommendations "(a) grounded theory qualitative studies should generally include between 20 and 30 interviews; (b) single case studies should generally contain 15 to 30 interviews" (Marshall et al., 2013, p. 21).

There are three sample techniques used in qualitative research, namely: convenience sample, purposeful sample, and theoretical sample (Oppong, 2013). Of these, the purposeful technique is the most widely used (Cohen et al., 2011; Palinkas et al., 2015). In the purposeful technique, individuals or groups of individuals that are exceptionally knowledgeable or experienced with a phenomenon of interest identified are selected (Creswell & Plano Clark, 2017).

As this study used the explanatory sequential research design, the semi-structured interviews in this study were built on the quantitative phase, and then collected and analysed to explain or elaborate the quantitative results in more depth. The purposeful technique was used, and 14 teachers and 16 learners were selected.

Table 3.3: Demographic descriptors of participants

University	No of Teachers	No of learners
KSU Institute	2	2
IMISU Institute	2	3
PNU Institute	2	2
KAU Institute	2	2
IUM Institute	2	2
UAU Institute	2	3
QU Unite	2	2
Total	14	16

3.5.2 Instruments

To study the attitude of L2 Arabic learners and their teachers toward MALL, the explanatory sequential research design used through two instruments. The first instrument was a questionnaire, and the second was a semi-structured interview.

3.5.2.1 The questionnaire (Phase One)

Howard and Borland (1999) claimed that a quantitative research methodology could be used to explain, predict or control analysis by focusing on collecting numerical data, making it highly suitable for establishing the size, extent or duration of specific phenomena or to establish that a particular cause or intervention results in a pre-specified effect.

For the purposes of this study, quantitative data gathered in the first stage of data collection through a questionnaire. The questionnaire was chosen as the primary method of data collection for several reasons.

The questionnaire is a convenient way to collect factual and attitudinal information necessary to answer the research questions set by this study (Dörnyei, 2003). This method of data collection is efficient in terms of the time required by both the researcher, as a large amount of data can be collected without them needing to be present, and the participants, as they can complete the questionnaire at their own convenience within a short space of time.

Further, the design stage of a questionnaire can be completed with the data analysis stage in mind; saving subsequent time and effort (Dörnyei, 2003; Ruane et al., 2005; Walliman, 2006).

The questionnaire was subdivided into two sections (see Appendix C). The first section served to provide a general student and teacher profile with questions on nationality, first language, university, age and level of Arabic for learners or level of experience for teachers. This section included five questions. Of these, two were open ended for nationality and first language as it was hard to include it as a list in the paper-based questionnaire. The remaining questions of this section were categorised. For example, a question about universities was categorised to seven options and language level of learners' question categorised to four levels as all language institutes included in this study teach Arabic for four levels. Regarding age, learners were categorised into four categories with two years gap. The reason for using a gap of two years is that the minimum age for enrolling at all Arabic language institutes is 18 years old and the maximum age varies between 23 and 25 years old.

The second section consisted of questions designed to map students and teachers' prior knowledge, current use of mobile devices, attitude toward using mobile devices, and factors influencing attitude toward mobile devices. This section included nine closed ended, three open-ended and 37 Likert scale questions. The student-specific questionnaire had one further question about using mobile devices in the classroom under the current use of mobile devices with 13 items close ended questions.

The invitation to participate in the study was sent to the teachers and students at the seven chosen universities via "The Research Unit" at some universities or via the Dean's Office/Head of Department office at other universities.

3.5.2.1.1 Pilot Questionnaire

The questionnaire was based on an analysis of five prior instruments using thematic analysis approach to understand the major themes in previous researches on mobile language learning (Abedalla, 2015a; Al-Fahad, 2009; Alkhalaf, 2015; Pollara, 2011; Rogers et al., 2010). The questionnaire was piloted at Imam University in order to test and, if necessary, adjust the instruments to ensure language clarity, adequacy, validity and reliability. There are different recommendations for the required sample size of a pilot study. Connelly (2008) suggested 10% of the full sample of the project. However, Isaac and Michael (1995) suggested that 10-30 participants would be suitable. In this study, a sample of 35 learners and 12 teachers were randomly selected for the pilot study.

As this study gives priority to the quantitative method, conducting the pilot study helped in the evaluation and adjustment of the questionnaire design by detecting data collection and processing issues that would impact the validity, accuracy and reliability of the findings of the central part of the analysis in phase one (Cohen et al., 2011; Mackey & Gass, 2015). It requires consideration of the design and structure of the questions that participants should be asked to concentrate more effectively on achieving the objectives during the second phase of the research. The period consumed by thinking and preparation proved invaluable.

The pilot study resulted in some items being removed as it was not easy for the participants to understand these items clearly. Some of the Level One were unable to understand Arabic as they were at a very low skill level of Arabic. Some Arabic language institutes have similar learners in Level One, where they were learning the Arabic alphabet, meaning they were unable to read or understand the questionnaire. So, Level One learners were excluded at all Arabic language institutes from this study to ensure that the responses

were valid. Learners from Level 2 and above were able to understand the questionnaire thoroughly. Teachers indicated no issue which needed any significant change to the main study.

3.5.2.2 The semi-structured interview (Phase Two)

The second instrument for the second phase of this study was a semi-structured interview. The second phase, qualitative method, was carried out once the questionnaire data collection and analysing process was completed. The semi-structured interviews were included to provide the researcher with a more in-depth analysis of the data collected from the questionnaire. The researcher used the interviews to obtain information related to the individualised current use of mobile devices, attitude, factors affecting their attitude toward mobile devices in Arabic language learning.

As this study used a mixed-methods sequential explanatory research design, results from the quantitative data (Phase One) was used to inform qualitative results data collection (Phase Two) and to develop interview questions which explain the results of the quantitative analysis in greater depth. The participants in the second phase of this study were selected purposefully. In order to explain the results of the quantitative method, questions for the semi-structured interview were categorised into four main themes. The themes are:

- Mobile devices and platforms

- Current use of mobile devices

- Attitude toward using mobile devices

- Factors influence their attitude toward using mobile devices

The quality of an interview and its results rely on the researcher's skill to remain aware of the possibility of bias being implemented in the main questionnaire and potential follow up questions (Braun, Clarke, & Gray, 2017). Having a set standard for how the interview is managed and, where achievable, what questions were raised, would increase the quality of the responses and validity of the interview (Knapik, 2006).

Various types of interview been indicated (Cohen et al., 2011). However, three types of interviews are common and the most significant difference between them is the amount of influence that the interviewer has over the experience and the interview goal (Stuckey, 2013):

1. Structured

2. Semi-structured

3. Unstructured

In a structured interview, the questions were conducted through a structured interview control, the information obtained by the respondent pretty firmly. The interview is structured as the researcher follows a precise set of questions in a prearranged instruction with a controlled number of response classifications (Denzin & Lincoln, 2008). It is rigid in the variety of answers open to the interviewee. It creates an obligation to answer questions that are not wholly understood or are best answered by a displeasing collection of options. This type of interview is not suitable for this research as learners studying Arabic as a second language might not be entirely comfortable explaining what might be needed to simplify certain aspects.

Contrarily, unstructured interviews involve the interviewer and the participant in a discussion about a topic in reply to open-ended questions from the interviewer. It can be

seen as a "trawl (which) may lead to unexpected information" (Gillham, 2005, p. 47). This type of interview can have a beneficial approach as a preliminary study to evaluate responses and define areas for exploration with is not the case in this study where priority was given to the quantitative method.

Semi-structured interviews are usually planned in advance, and a list of topics or questions are prepared for reference during the interview. The interviewer may change the wording and order of the questions or may add additional questions as the interview progresses for expansion or clarification (Lodico et al., 2010). This interview design should enable participants to elaborate on their feelings, tell their stories in their own words and provide a broader spectrum of data and perspectives (Kvale, 1996).

Telephone interviews were selected for this study. It has long been recognised as an effective data collection tool (Cohen et al., 2011) and were selected in this study for many reasons. First, the participants in this study were from seven universities located at five cites in Saudi Arabia, so cost included in travelling to these five universities to do face to face interview is very high. Second, the researcher was unable to access to female campuses as they are taught separately from male campus, so telephone interviews were accessible for both genders. Thirdly, it has a great uniformity in conducting the interview and standardisation of questions. In addition, it is easier and quicker to administrate over the phone due to the time required being estimated to be about 15 minutes (Cohen et al., 2011).

The interviews were mostly shaped as a conversation between the researcher and the participants. However, in accordance with the semi-structured method, the researcher had some prepared questions for the interviewees to explain some of the quantitative results within the four themes indicated earlier in this section.

3.5.2.2.1 Pilot Semi-structured Interview

The semi-structured telephone interview was piloted with two teachers and two learners at IMISU Institute. This decision was made to ease excluded the pilot participants in both phases, quantitative and qualitative, from the main study. The participating teachers' comment and feedback had previously contributed to the wording of the interview questions. These pilot interviews of both learner and teachers helped the researcher to test the recording experience to ensure voice clarity during the interviews over the phone.

3.6 Main Study Procedure

As indicated earlier in this chapter, a sequential explanatory design was used to conduct this study, see Section 3.4.1.1 for the visual model. As such, the procedure began with the quantitative phase using a questionnaire as a tool for collecting quantitative data followed by a qualitative phase using semi-structured telephone interviews.

The seven universities were contacted to obtain written approval to conduct the study. While in Australia, the researcher contacted each Arabic language institute at these universities via phone to establish organisational details together. The researcher travelled to each of the language institutes at the seven selected universities during the first phase of the data collection. These visits gave the researcher significant opportunities to speak to some of the Arabic language institutes deans included in this study and some of the head of departments, teachers, and learners. Also, the researcher was able to look at the available technologies at these Arabic language institutes, which helped, to some extent, to understand some of the outcomes.

3.6.1 The questionnaire administration

The paper-based questionnaire was the first phase of the data collection involved in this study. It was distributed by the Arabic language teachers at the selected universities, see Table 3.4. As these universities were located in different cities, the questionnaire was sent via email to some and delivered personally to others. The questionnaire was in the Arabic language had been piloted with another group of learners and teachers at IMISU Institute, so any possibility of misunderstanding was minimalised, see Section 3.5.2.1.1.

Table 3.4: The distribution of questionnaires across the seven selected universities

University	No of Students	No of Teachers
KSU Institute	34	20
IMISU Institute	21	23
PNU Institute	10	18
KAU Institute	25	10
IUM Institute	110	37
UAU Institute	75	31
QU Unite	28	11
Total	303	150

3.6.2 The semi-structured interviews

The qualitative data was the second phase of this study, and data were collected through semi-structured telephone interviews. All interviews were in Arabic and took place from May to June 2018. After quantitative data were thoroughly analysed, the interviewees were selected purposefully to explain the results of the quantitative analysis. The selected interviewees had previously indicated that they were happy to participate in the interview on their questionnaires. They had also added their preferred contacts number, so the researcher contacted them first to confirm their willingness to take part in the interviews and arrange a time that would suit them best. The interviews were recorded and transcribed by the researcher.

3.7 Data analysis procedures

Following a mixed-methods sequential explanatory research design (Ivankova et al., 2006), the data collection process consisted of two phases. Quantitative data collected and analysed first, followed by Qualitative data collection and analysis.

3.7.1 The questionnaire

SPSS software version 25.0 was used to analyse both the teachers' and students' questionnaires descriptively and inferentially. Each questionnaire was given a unique identification code to ease finding it when needed. Coding process began by defining the questionnaire variables such as name, type, width, and label. Following this, answers were converted into numerical data, for example: (5) strongly agree, (4) agree, (3) neutral, (2) disagree, (1) strongly disagree. Before the analysis, the data were checked for entry mistakes and missing values.

The analysing procedure included two steps. First, descriptive analysis using frequencies and means were used to analysis participants' demographics, type of mobile devices, platforms, and mobile applications being used. Second, the principal component analysis (PCA) was run to refine and reduce the scales' items of this study attitudes of L2 Arabic teachers toward MALL to a smaller number of coherent subscales.

In the second step, where data for inferential analysis was intended to be used, the normality of data was examined. Parametric tests, such as one-way ANOVA, was used to explore the impact of these three independent variables - age, teaching experience/level of Arabic, and university - on the attitude of second language Arabic language learners and their teachers.

3.7.2 Connecting the questionnaire and the semi-structured interview

As indicated earlier, refer to Figure 3.2 for a visual model, this stage is for selecting purposeful interviews participants and developing interviews questions. These two steps are based on the quantitative findings as the second phase is supposed to explain or elaborate on the quantitative results in more depth. In this study, data from the two methods, quantitative (QUAN) via questionnaire and qualitative (QUAL) via semi-structured interview, were integrated using the following steps:

- Providing open-ended questions in the questionnaire (QUAN)

- Developing semi-structured interview questions (QUAL) based on QUAN data

- Selecting participants for (QUAL) who participated in (QUAN)

3.7.3 The semi-structured interviews

As described in Section 3.5.2.2, the qualitative data were collected through semi-structured telephone interviews. ATLAS.ti 8 software was used to aid the data analysis. The participants' responses, transcribed from audio interviews into Microsoft Word, were imported to ATLAS.ti 8. A theoretical thematic analysis approach was used to analyse these qualitative data. In the theoretical thematic analysis, data analysis was driven by the research questions or analyst's focus (Maguire & Delahunt, 2017).

3.8 Assessing data quality

3.8.1 Reliability and Validity

Reliability is defined as "a matter of whether a particular technique, applied repeatedly to the same object, yields the same result each time" (Babbie, 2013, p. 152). In this study, the reliability of the questionnaire's scales was checked using Cronbach Alpha coefficient. Cronbach's Alpha is one of the most popular methods to assess the reliability of

the questionnaire (Hinton et al., 2014). Cronbach's Alpha ranges from 0 to 1 for a completely reliable test. Despite the debate about what value of Cronbach's Alpha we need for a questionnaire to be reliable, statisticians suggest the following as a role for Cronbach Alpha:

- $\alpha > 0.9$ – excellent
- $\alpha > 0.8$ – good
- $\alpha > 0.7$ – acceptable
- $\alpha > 0.6$ – questionable
- $\alpha > 0.5$ – poor
- $\alpha < 0.5$ – unacceptable.

In this study, the analysis of the questionnaire indicated that scales were very reliable as the scores were between .7 and .9, so ranged from acceptable to excellent, as can be seen in Table 3.5 & Table 3.6.

Dörnyei (2003) indicated that two conditions must be achieved in order to have internal consistency. First, a questionnaire must have a multi-items scale. Second, each scale's items must be homogeneous. Both conditions were achieved in this study.

Table 3.5: Reliability for teachers' questionnaire

Scales	Cronbach's Alpha	N of Items
Prior knowledge	.86	9
Attitude toward using mobile devices	.74	21
Factors influence using mobile devices	.84	15

Table 3.6: Reliability for learners' questionnaire

Scales	Cronbach's Alpha	N of Items
Prior knowledge	.85	9
Mobile devices usage in classroom	.77	10
Attitude toward using mobile devices	.73	21
Factors influence using mobile devices	.77	15

Regarding validity, which refers to "the correctness and truthfulness of an inference that is made from the results of a research study" (Christensen et al., 2011, p. 159), the researcher has considered different types of validity. The first type of validity considered was content validity, defined as "the degree to which elements of an assessment instrument are relevant to and representative of the targeted construct for a particular assessment purpose" (Haynes et al., 1995, p. 238). The questionnaire was based on an analysis of five prior instruments to understand the major themes in previous researches (Abedalla, 2015a; Al-Fahad, 2009; Alkhalaf, 2015; Pollara, 2011; Rogers et al., 2010) and piloted at IMISU Institute, see Section 3.5.2.1 and Section 3.5.2.1.1. The questionnaire was translated into the Arabic language, with a qualified translator verifying the translation at a Saudi Arabian university (refer to Appendix E). Also, the interview questions were grounded on the quantitative phase findings.

External and internal validity was considered too. Dörnyei (2007) identified six types of threats to validity as follows: participant mortality, the Hawthorne effect, practice effect, maturation, the social desirability bias, and history. If the researcher avoids these threats, Dörnyei claims external and internal validity could be achieved.

In this study, participant mortality (dropping out rate) was not a significant threat as the questionnaire took place at the selected Arabic language institutes where both learners and teachers were present. Also, both learners and teachers participated only once in the questionnaire, so practice effect (the effect of repeatedly testing participants using the same measures) was also not a significant threat. Maturation (the impact of time as a variable in a study) was not a serious threat as the questionnaire and interviews were both collected in approximately five months. History (events which may influence the outcome of studies that occur over some time) was not a key threat as well as during the data collection no events were recorded to have an impact on the study in any way.

The Hawthorne effect and the social desirability bias were the only two possible threats relevant to this study. As the study only explores the attitude of L2 Arabic learners and their teachers toward MALL and not assessing their achievements or performance, the Hawthorne effect would be minimal. The social desirability bias was also reduced by designing the questionnaire carefully and checking the language clarity during the pilot study.

3.8.2 Credibility and trustworthiness

Qualitative research trustworthiness is often questioned by positivist researchers (Shenton, 2004). Guba (1981) theorised four features to the criteria employed by the positivist as follows: credibility (internal validity), transferability (external validity/generalisability), dependability (reliability) and confirmability (objectivity).

Credibility seeks to ensure that the study measures or tests what is intended (Shenton, 2004). It focuses on the accuracy of representing realities indicated by participants. In this study, participants were allowed to comment on the researcher's

understanding of their responses as the interviews were mostly as a conversation between the researcher and the participants (Schwandt et al., 2007).

Dependability, in contrast to the reliability, refers to "techniques show that, if the work were repeated, in the same context, with the same methods and with the same participants, similar results would be obtained" (Shenton, 2004, p. 71). In this study, the researcher kept the data organised using ATLAS.ti 8 software and files.

Transferability defined as the degree to which the findings of qualitative studies may have transferability in other contexts or with other subjects (Guba, 1981). Korstjens and Moser (2018) indicated that it is a researcher responsibility to provide a " thick description" of the participants and the research process to make the reader able to assess the transferability of the findings to their own setting (p. 122). In this study, a detailed description of the participants and the research process included.

Confirmability refers to "the degree to which the findings of the research study could be confirmed by other researchers" (Korstjens & Moser, 2018, p. 121). Confirmability is responsible for ensuring that data and results interpretations are not figments of the investigator's imagination or preferences, but rather explicitly derived from the data. Confirmability can be addressed by providing a complete set of notes on decisions made during the research process, the emergence of the findings and information about data management (Korstjens & Moser, 2018). In this study, details of sampling, data management, and research process included enabling the reader to study the transparency of the study path.

3.9 Ethical considerations

As conducting this research means dealing with participants from various background and culture, ethical behaviour is very important. The researcher obtained ethical approval for this study from the Social Science Human Research Ethics Committee of the University of Tasmania, Australia (Ethics Ref No: H0016893). The researcher also received permission letters from the seven universities to conduct his research at these universities. Although the topic of this research was not especially sensitive, all data was treated confidentially, and individual participants cannot be traced back using the data collected.

3.9.1 Participation

All participants, including teachers who supported the researcher in the administration of the questionnaires, participated in both phases of this study voluntarily.

3.9.2 Confidentiality and data storage

The data collected from the participants was stored in electronic files accessed by a password-protected computer in the School of Education at the University of Tasmania. Paper copies of data used for qualitative and quantitative analysis were kept in a locked filing cabinet at the University and were only accessible to the researcher.

Names and other identifying information were removed from these data and replaced with codes. Computer files were password protected and stored on a secure server in the Faculty of Education, Launceston campus. Files connecting participant names and codes were stored separately from the data.

Chapter 4

Quantitative Data Analysis

4.1 Introduction

In this chapter, the results from the statistical analysis of the questionnaire data are presented with reference to the aim of the study. This will achieve a greater understanding of the attitude of L2 Arabic learners and their teachers toward MALL. SPSS software version 25.0 was used to conduct the analysis for both the teachers' and students' questionnaires. This chapter is divided into two sections. The first section concentrates on the results of teachers' questionnaires, while the second deals with the results of students' questionnaires. Each section is structured as follows:

1. Reliability of scales

2. Demographic results

3. Mobile devices and platforms (*Research Question 1*)

4. Current use of mobile devices (*Research Question 2*)

5. Principal components analysis (PCA), reliability and normality of data

6. Attitudes towards MALL (*Research Question 3*)

7. Factors influencing their attitude (*Research Question 4*)

4.2 Results of Teachers

4.2.1 Reliability

Although reliability can be assessed in several different ways, Cronbach's Alpha is one of the most popular methods (Hinton et al., 2014). Cronbach's Alpha ranges from 0 to 1

for a completely reliable test (Hinton et al., 2014). Despite the debate about the value of Cronbach's Alpha required for a questionnaire to be reliable, statisticians suggest .7 is acceptable (Pallant, 2016). In this study, the teachers' questionnaire began with two questions about the type of mobile devices, platforms and operating system they use, followed by three open-ended questions about the current use of mobile applications, and contents. After this, 45 items were included to assess the following three scales:

- Prior knowledge

- Attitude toward using mobile devises MDs

- Factors influencing attitudes of using MDs.

The three scales were reliable, see Table 4.1, as Alpha values were >.7 for the three scales.

Table 4.1 Reliability Statistics

Scales	Cronbach's Alpha	N of Items
Prior knowledge	.86	9
Attitude toward using MDs	.74	21
Factors influence using MDs	.84	15

4.2.2 Demographics

The underlying data were collected from 150 L2 Arabic teachers at seven Saudi universities, as referred to in Table A1 in Appendix A. These teachers were categorised into two groups: Saudi and Non-Saudi. More than half of the sample was from Saudi Arabia. The Islamic University of Madinah (IUM) represented the highest number of teachers. Additionally, the majority of the sample was male. The majority of the sample was also made of those people in the 40+ age bracket. The years of experience teaching Arabic was generally found to be from 1-5 years and more than 15 years.

4.2.3 Mobile devices and platforms

The first question of the study asked which mobile devices and platforms were currently used by L2 Arabic learners and their teachers. Three types of mobile devices were investigated in this study: smartphones, tablets, and laptops, see Table 4.2. The results showed that most of the sample used a smartphone, followed by a laptop. 97.4% of all teachers used a mobile device irrespective of device type. This indicated widespread use of mobile devices between L2 Arabic teachers in Saudi Arabia.

Table 4.2 Mobile devices used by L2 Arabic teachers

Type of MDs	Number	Percentage
Smartphone (iPhone or similar)		
Yes	143	95
No	7	5
Tablet PC (iPad or similar)		
Yes	74	49
No	76	51
Laptop		
Yes	133	88
No	17	11
No device		
Yes	4	3
No	146	97

With regards to the platforms and operating systems used by the teachers, Windows was the most common for laptops (69%), while Android was the most used platform for smartphones (53%) followed by IOS (47%).

4.2.4 Current use of mobile devices

Three open-ended questions were asked relating to how L2 Arabic learners and their teachers currently use their mobile devices. The first question asked what lifestyle mobile app they used the most. The second was what mobile app was used the most to support Arabic teaching. The third focussed on what content was used the most to support Arabic teaching.

WhatsApp was shown to be the most used lifestyle mobile app (87%), followed by YouTube (78%). Other apps, such as Facebook, Twitter, and Snapchat, were used less. In Arabic language learning, YouTube was the most used application (62%), followed by a Dictionary app (55%). Surprisingly, although there were 19 applications which teach the Arabic language, and a mobile application called 'Interactive Arabic' launched by KSU Institute included in this study, none of the participating teachers mentioned using any of these applications (Heil et al., 2016). In L2 contents, PDF books were the L2 learning contents most accessed by teachers (55%) followed by audio files (7%). *Arabic Between Your Hands* was the only PDF book mentioned (40%).

4.2.5 Principal Components Analysis (PCA)

Despite the reliability of the three scales, as shown in Table 4.1, a PCA was also conducted. The goal of using PCA was to refine and reduce the scales' items of attitudes of L2 Arabic teachers toward MALL to a smaller number of coherent subscales. PCA was run on a 45-item question questionnaire that measured attitudes of L2 Arabic teachers toward MALL and the factors influencing their attitude. The suitability of PCA was assessed before analysis. The inspection of the correlation matrix showed that all variables had at least one correlation coefficient greater than .3. The overall Kaiser-Meyer-Olkin (KMO) measure was .72, exceeding the recommended value of .6 (Kaiser, 1970, 1974). Bartlett's Test of Sphericity was statistically significant ($p < .005$), indicating that the data was likely factorable.

PCA revealed five components that had eigenvalues more significant than one and which explained 28.5%, 18%, 11.8%, 7.2% and 6% of the total variance, respectively. The five-component solution explained 71.5% of the total variance. Varimax rotation was employed to aid interpretability. The rotated solution revealed a simple structure

(Thurstone, 1947). The five components showed several strong loadings, and all variables loading substantially on only one component, as presented in Table 4.3 and Table 4.4. The interpretation of the data was consistent with the attitude toward which the questionnaire was designed to measure with strong loadings of benefits of MDs items on Component 1, prior knowledge items on Component 2, Arabic specific items on Component 3, internet specifics items on Component 4 and drawbacks of MDs items on Component 5. Component loadings and the rotated solution are presented in Table 4.3 and 4.4.

Table 4.3 Total Variance Explained by initial Eigenvalue and Rotation

	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
1	6.27	28.501	28.501	6.27	28.501	28.501	4.695
2	3.963	18.013	46.514	3.963	18.013	46.514	3.475
3	2.598	11.81	58.325	2.598	11.81	58.325	3.24
4	1.591	7.23	65.555	1.591	7.23	65.555	2.292
5	1.321	6.004	71.559	1.321	6.004	**71.559**	2.041

Extraction Method: Principal Component Analysis

Table 4.4 Pattern Matrix

Items	Components				
	1	2	3	4	5
ML will be a more flexible method of LL as it can be done anytime, anywhere	.89				
ML can be an effective method of learning as it can give immediate support	.87				
ML will bring new opportunities for learning	.86				
MDs are effective tools for delivering Arabic learning content to students	.75				
The use of MDs can increase the flexibility of access to resources like YouTube	.73				
Learning through MDs will help me to utilise my time productively	.71				
ML will improve communication between students and teachers	.67				
Download a mobile application on an MD		.90			
Access a social networking site on an MD		.88			
Send an email on an MD		.83			
Translate a sentence into another language on an MD		.72			
Find the definition of a word I do not know on an MD		.64			
Lack of training in Arabic mobile assisted language learning			.92		
Luck of support in Arabic mobile assisted language learning			.87		
Quality of Arabic language learning materials			.85		
Availability of Arabic language learning materials			.76		
Internet connection speed				.86	
Internet connection availability				.83	
Internet connection reliability				.77	
My lack of interest					.84
My difficulties in using technology					.73
ML cannot be used because MDs are expensive.					.67

Extraction Method: Principal Component Analysis
Rotation Method: Varimax with Kaiser Normalization
a Rotation converged in 5 iterations.

Extracted components (themes) were named and connected to the research questions, as shown in Table 4.5. Items on Component 1 (Benefits of MDs) and items on Component 5 (Drawbacks of MDs) addressed the third research question regarding the attitudes of L2 Arabic learners and their teachers toward MALL. Items on Component 2 (Prior Knowledge), Component 3 (Arabic Specific), and Component 4 (Internet specifics) addressed to answer the fourth research question regarding what factors influenced the attitudes of L2 Arabic learners and their teachers toward MALL.

Table 4.5 Five extracted components (themes)

Component name	No items	Loading range	Research Question
Benefits MDs	7	.60 to .87	RQ3
Prior knowledge	5	.64 to .90	RQ4
Arabic specific	4	.76 to .92	RQ4
Internet specific	3	.77 to .86	RQ4
Drawbacks MDs	3	.67 to .84	RQ3

4.2.5.1 Reliability of the extracted themes

After exploring and extracting components (themes) with corresponding items using PCA, it was very important to examine the reliability of the themes. This was implemented by measuring how much closely related a set of items were as a group. Cronbach's Alpha, which is also known as the coefficient of reliability, is used to measure an internal consistency of items so that reliability for each scale (theme) is evaluated. Hinton et al. (2014), recommended using thresholds for Cronbach's alpha: $\alpha > .9$ – excellent reliability; $\alpha > .7$ to $.9$ – high reliability; $\alpha > .5$ to $.7$ – moderate reliability; and α 0.5 and below low reliability. Cronbach's Alpha given in Table 4.6 ranged from high reliability (.71) to excellent (.91), which indicated that the reliability of themes ranged from adequate to exceptional, indicating that the tool was reliable.

Table 4.6 Cronbach's alpha for the five themes

Theme	Cronbach's Alpha
Benefits	.91
Prior knowledge	.85
Arabic specific	.90
Internet specific	.83
Drawbacks	.71

4.2.5.2 Normality of Data

A normal distribution is the arrangement of a data set in which most values cluster in the middle of the range while the rest taper off symmetrically toward extreme. The

common method for checking the normality is looking at skewness and kurtosis values (Pallant, 2016). According to George & Mallery (2010) skewness values of larger than +2 or smaller than -2 indicate a substantially skewed distribution. For the values of skewness and kurtosis for teachers' questionnaire (see Appendices A2, A3, and A4).

Norman (2010) argued the normality distribution concept. He believed that the assumption of normality of the distribution of means, not of the data, and for a sample size larger than 5 or 10 per group, the means are roughly distributed regardless the original distribution. He concluded that "parametric statistics can be used with Likert data, with small sample sizes, with unequal variances, and with non-normal distributions, with no fear of coming to the wrong conclusion" (Norman, 2010, p. 631).

The Parametric tests, such as ANOVA, can capture the variation in the dataset since it deals with actual values which is not the case for a non-parametric approach. In addition, parametric tests are robust when analysing the data based on the Likert scale (Glass et al., 1972). Keselman et al. (1998) found that one-way analysis of variance (ANOVA) or F-test is one of the most common statistical techniques in educational and psychological research. Blanca, Alarcon, Arnau, Bono, & Bendayan (2017) provided a systematic examination of F-test (ANOVA) robustness to violations of normality. They concluded that "the present results provide empirical evidence for the robustness of F-test under a wide variety of conditions involving non-normal distribution" (p. 556).

4.2.6 Attitude of L2 Arabic teachers toward MALL

After PCA was run, the two components, Benefits and drawback of mobile devices, as seen in Table 4.5, were used to assess the attitude of L2 Arabic teachers toward MALL, see Table 4.7. Most teachers strongly agreed with that the benefits of using mobile devices in L2 Arabic learning, such as MALL, will bring new opportunities. In addition, MALL

will be an effective method for immediate support and will increase the flexibility of access to recourses. On the other hand, some teachers disagreed with statements regarding the drawbacks of using mobile devices, such as not being able to use MALL because mobile devices are expensive, the difficulty in using the technology, and lack of interest. Overall, the teachers showed a positive attitude towards using mobile devices in L2 Arabic learning.

Table 4.7 Attitude toward using mobile learning

No	Statement	M	SD
1	ML will bring new opportunities for learning	4.4	0.92
2	ML can be an effective method of learning as it can give immediate support	4.4	0.96
3	The use of MDs can increase the flexibility of access to resources like YouTube	4.3	1.06
4	MDs are effective tools for delivering Arabic learning content to students	4.3	0.93
5	ML will be a flexible method of LL as it can be done anytime, anywhere	4.2	1.02
6	Learning through MDs will help me to utilise my time productively	4.1	1.07
7	ML will improve communication between students and teachers	4.1	1.10
8	ML cannot be used because mobile devices are expensive.	2.6	1.10
9	Difficulties in using technology	2.57	1.33
10	Lack of interest	2.12	1.20

(5) strongly agree, (4) agree, (3) neutral, (2) disagree, (1) strongly disagree

As the participating teachers in this study were of different ages, from different universities, and had varied teaching experience, it was beneficial to explore the impact of these three independent variables - age, teaching experience, and Institute - on their attitude.

As the attitude had two themes or dependant variables, titled Benefits and Drawbacks of mobile devices, there were two tests that could be used to explore the impact of independent variables on the two dependent variables. The two tests are a series of one-way analysis of variance (ANOVA) and multivariate analysis of variance (MANOVA).

MANOVA is rarely used in second language research (Larson-Hall, 2015). Many researchers do a series of one-way ANOVA separately for each dependant variable (Pallant, 2016). By choosing to do this, the risk of type 1 error is increased (Pallant, 2016). One way to avoid 'inflated Type 1 errors' is by using a Bonferroni adjustment, which means dividing the normal alpha value by the number of tests (Pallant, 2016). In order to measure the impact of the age, teaching experience, and Institute on the attitude of L2 Arabic teacher, the normal alpha value .05 will be divided by two, the number of dependent variables, giving an alpha value of .025. This new value, .025, will be considered as the cut-off, so differences between groups need value less than .025 to be considered statistically significant.

4.2.6.1 Age

A one-way Welch ANOVA was conducted to determine whether there is a statistically significant difference between the means of the groups at the two themes or not based on their ages. The participants were classified into four groups: (Group 1: 26 to 30yrs; Group 2: 31 to 35yrs; Group 3: 36 to 40yrs; Group 4: 41yrs and above). There was no statistically significant difference at the $p < .025$ in Benefits of MDs for the four groups

Welch's $F_{(3, 47)} = 4.1$, $p = .14$ and Drawbacks of MDs Welch's $F_{(3, 40)} = 2.9$, $p = .98$.

See Table 4.8 for means and standard deviation.

Table 4.8 Mean and Standard Deviations based on age

How old are you?		MDs Benefits	MDs Drawbacks
From 26 to 30 years	M	4.34	2.38
	SD	0.51	1.16
From 31 to 35 years	M	4.46	2.47
	SD	0.40	0.88
From 36 to 40 years	M	4.36	2.38
	SD	0.62	0.82
More than 40 years	M	4.15	2.41
	SD	0.97	1.00

(5) strongly agree, (4) agree, (3) neutral, (2) disagree, (1) strongly disagree

4.2.6.2 Teaching Experience

A one-way Welch ANOVA was conducted to determine whether there is a statistically significant difference between the means of groups at the two themes or not based on their teaching experience, see Table 4.9 for means and standard deviation. The participants were classified into four groups: (Group 1: less than a year; Group 2: 1 to 5 years; Group 3: 6 to 10 years; Group 4: more than ten years. There was no statistically significant difference at the $p < .025$ in Benefits of mobile devices for the four groups Welch's $F_{(4, 31)} = 4.1$, $p = .051$ and Drawbacks of mobile devices Welch's $F_{(4, 28)} = 2.9$, $p = .55$.

Table 4.9 Mean and Standard Deviations based on teaching experience

How many years have you taught Arabic?		MDs Benefits	MDs Drawbacks
Less than one year	M	4.57	2.44
	SD	0.34	0.75
From 1 to 05 years	M	4.45	2.49
	SD	0.56	0.89
From 6 to 10 years	M	4.06	2.23
	SD	0.82	0.77
From 11 to 15 years	M	3.88	2.71
	SD	1.31	1.23
More than 15 years	M	4.28	2.38
	SD	0.88	1.14

(5) strongly agree, (4) agree, (3) neutral, (2) disagree, (1) strongly disagree

4.2.6.3 Institute

A one-way Welch ANOVA was conducted to determine whether there is a statistically significant difference between the means of groups at the two themes or not based on their universities, see Table 4.10 for means and standard deviation. The participants were classified into seven groups (Group 1: IMISU Institute; Group 2: KSU Institute; Group 3: PNU Institute; Group 4: UAU Institute; Group 5: KAU Institute; Group 6: IUM Institute; Group 7: QU Unite). There was no statistically significant difference at the $p < .025$ in Benefits of mobile devices for the four groups Welch's $F (6, 48) = 7.40$, $p = .20$ and Drawbacks of mobile devices Welch's $F (6, 48) = 6.05$, $p = .77$.

Table 4.10 Mean and Standard Deviations based on Institute

Which Institute are you studying at?		MDs Benefits	MDs Drawbacks
IMISU Institute	M	4.20	2.49
	SD	0.95	1.07
KSU Institute	M	4.41	2.21
	SD	0.50	0.66
PNU Institute	M	4.42	2.50
	SD	0.41	0.94
UAU Institute	M	4.19	2.17
	SD	0.88	0.87
KAU Institute	M	4.57	2.11
	SD	0.46	0.89
IUM Institute	M	3.88	2.87
	SD	1.13	1.05
QU Unite	M	4.36	1.94
	SD	0.73	0.86

(5) strongly agree, (4) agree, (3) neutral, (2) disagree, (1) strongly disagree

4.2.7 Factors influencing the attitude of L2 Arabic teachers toward MALL

PCA revealed that three factors influence the attitude of L2 Arabic teachers toward MALL. The three factors were prior knowledge, Internet-specific considerations, and Arabic specific considerations. As the fourth research question of this study was to find out the factors influencing the attitude of L2 Arabic toward MALL, these three factors were analysed descriptively, using means and percentages, and inferentially, using a series of one-way ANOVA to explore the impact of age, teaching experience, and Institute on L2 Arabic teachers' attitude.

The first factor to be analysed was prior knowledge, refer to Table 4.11. The results indicated that the ability to access a social network was the most frequently reported element of prior knowledge by teachers. This was consistent with their current use of MALL findings, where WhatsApp and YouTube were the most used applications in their lifestyle and their Arabic language learning. Overall, the results showed that the prior

knowledge of teachers was high and positive as the percentages of the items 88% and above.

Table 4.11 Prior knowledge of using mobile devices for teachers

Statement	Total number	YES	%
Access a social networking site on a mobile device	150	144	96
Download a mobile application on a mobile device	150	141	94
Send an email on a mobile device	150	138	92
Find the definition of a word I do not know on a mobile device	150	137	91
Translate a sentence into another language on a mobile device	150	132	88

The second factor was Arabic specific considerations, refer to Table 4.12. It had four items which can be classified into two groups. First, unavailability and inferiority of Arabic materials. Second, lack of support and training in Arabic MALL. Generally, all four items' means were > 3, indicating that teachers agreed that these four items had a negative influence on their attitude. Unavailability of L2 Arabic materials had the highest mean of 3.52. This was not surprising as the teachers mentioned *Arabic Between Your Hand* being the only content accessed via mobile devices and no Arabic language learning application or website mentioned in their current use

Table 4.12 Arabic specific

Statement	N	M	SD
Unavailability of Arabic language learning materials	150	3.52	1.34
Lack of support in Arabic mobile assisted language learning	150	3.52	1.40
Lack of training in Arabic mobile assisted language learning	150	3.48	1.40
Inferiority of Arabic language learning materials	150	3.32	1.42

5) strongly agree, (4) agree, (3) neutral, (2) disagree, (1) strongly disagree

The last factor was Internet specific considerations, refer to Table 4.13. The results indicated that teachers agreed that internet speed and reliability were unsatisfactory, even if they seemed to be satisfied with internet availability as the mean was just under 3.

Table 4.13 Internet specifics

Statement	N	M	SD
Internet connection speed	150	3.17	1.45
Internet connection reliability	150	3.13	1.37
Internet connection availability	150	2.84	1.45

5) strongly agree, (4) agree, (3) neutral, (2) disagree, (1) strongly disagree

In summary, the results of PCA showed three factors influencing the attitude of L2 Arabic teachers. Prior knowledge was the only factor that had a positive influence, while Arabic specific and Internet specific considerations had a negative influence.

A series of one-way ANOVA was run to explore the impact of age, teaching experience, and Institute on L2 Arabic teachers' attitude. A Bonferroni adjustment was used to avoid 'inflated Type 1 errors. Normal alpha value .05 was be divided by three, the number of dependent variables, giving an alpha level of .017. This new value, .017, was considered as the cut-off, so differences between groups needed a value less than .017 to be considered statistically significant.

4.2.7.1 Age

A one-way Welch ANOVA was conducted to determine whether there is a statistically significant difference between the means of the groups at the three factors or not based on their ages, refer to Table 4.14 for means and standard deviation. The participants were classified into four groups (Group 1: 26 to 30yrs; Group 2: 31 to 35yrs; Group 3: 36 to 40yrs; Group 4: 41yrs and above). There was a statistically significant difference at the $p < .017$ in Arabic specific for the four groups Welch's $F_{(3, 37)} = 4.1$, $p = .013$. Post hoc comparisons, using the Games-Howell post hoc procedure as equal variances

not assumed, indicated that teachers 40+ years had a significantly lower average score (M = 3.22, SD = 1.02) than teachers from 31 to 35 years (M = 3.94, SD = 1.16). There was no statistically significant difference at the $p < .017$ in prior knowledge for the four group Welch's $F (3, 45) = 3.2, p = .47.$ and Internet specifics for the four groups $F (3, 40) = 2.9, p = .04.$

Table 4.14 Mean and Standard Deviations based on age

How old are you?		Prior knowledge	Arabic specific	Internet specific
From 26 to 30 years	M	1.83	3.21	3.33
	SD	0.19	1.55	1.06
From 31 to 35 years	M	1.91	3.94	3.11
	SD	0.14	1.16	1.06
From 36 to 40 years	M	1.90	4.00	3.62
	SD	0.16	1.43	1.31
More than 40 years	M	1.86	3.22	2.82
	SD	0.27	1.02	1.23

4.2.7.2 Teaching Experience

A one-way ANOVA was used to determine whether there is a statistically significant difference between the means of groups at the three factors or not based on their teaching experience, refer to Table 4.15 for means and standard deviation. The participants were divided into four groups (Group 1: less than a year; Group 2: 1 to 5yrs; Group 3: 6 to 10yrs; Group 4: more than 10yrs). There was no statistically significant difference at the $p < .017$ in prior knowledge for the four groups Welch's $F (4, 29) = 4.8, p = .06,$ Arabic specific for the four groups Welch's $F (4, 34) = 4.1, p = .03,$ and Internet specific for the four groups Welch's $F (4, 29) = 4.1, p = .11.$

Table 4.15 Mean and Standard Deviations based on Institute

How many years have you taught Arabic?		Prior knowledge	Arabic specific	Internet specific
Less than one year	M	1.97	3.00	2.67
	SD	0.08	1.02	1.19
From 01 to 05 years	M	1.90	3.88	3.44
	SD	0.16	1.31	1.15
From 06 to 10 years	M	1.84	3.13	2.83
	SD	0.26	1.23	1.33
From 11 to 15 years	M	1.96	3.25	3.05
	SD	0.09	0.77	0.79
More than 15 years	M	1.83	3.39	2.83
	SD	0.29	1.11	1.28

4.2.7.3 Institute

A one-way Welch ANOVA was conducted to determine whether there is a statistically significant difference between the means of groups at the three factors or not based on L2 Arabic teachers' universities. Refer to Table 4.16 for means and standard deviation. The participants were classified into seven groups (Group 1: IMISU Institute; Group 2: KSU Institute; Group 3: PNU Institute; Group 4: UAU Institute; Group 5: KAU Institute; Group 6: IUM Institute; Group 7: QU Unite). There was a statistically significant difference at the $p < .017$ in Arabic specific Welch's $F_{(6, 52)} = 7.40$, $p = .001$ and Internet specific, Welch's $F_{(6, 47)} = 6.05$, $p = .001$. In prior knowledge, there was no significant difference at the $p < .017$ Welch's $F_{(6, 46)} = 1.40$, $p = .79$.

Post hoc comparisons, using the Games-Howell post hoc procedure, as equal variances were not assumed, but were conducted to determine which pairs of the seven universities groups mean differed significantly at the two factors.

In the Arabic specific factor, the results indicated that there were two statistically significant differences. First, teachers' group at IMISU Institute had a significantly lower

average score (M =3.07, SD = 1.20) than teachers' groups at UAU Institute (M = 4.08, SD = 0.82) and KAU Institute (M= 4.08, SD = 0.81). Second, QU Unite had a significantly lower average score (M =2.79, SD = 0.44) than teachers' groups at UAU Institute (M = 4.08, SD = 0.82), KAU Institute (M= 4.08, SD = 0.81) and PNU Institute (M= 3.96, SD = 1.28).

In regard to internet specific considerations, the results revealed that teachers' group at IMISU Institute had a significantly lower average score (M =2.54, SD = 1.00) than teachers' groups at KAU Institute (M= 3.78, SD = 0.84), IUM Institute (M= 3.62, SD = 1.06) and PNU Institute (M= 3.56, SD = 0.74).

Table 4.16 Mean and Standard Deviations based on Institute

Which Institute are you studying at?		Prior knowledge	Arabic specific	Internet specific
IMISU Institute	M	1.88	3.07	2.54
	SD	0.30	1.20	1.00
KSU Institute	M	1.90	3.33	2.90
	SD	0.13	1.56	1.60
PNU Institute	M	1.85	3.96	3.56
	SD	0.17	1.28	0.74
UAU Institute	M	1.83	4.08	2.61
	SD	0.39	0.82	1.44
KAU Institute	M	1.85	4.08	3.78
	SD	0.21	0.81	0.84
IUM Institute	M	1.91	3.50	3.62
	SD	0.13	0.97	1.06
QU Unite	M	1.83	2.79	2.61
	SD	0.24	0.44	1.28

In summary, PCA revealed three factors influencing L2 Arabic teachers' attitude. The three factors were prior knowledge, Arabic specific considerations, and Internet specific considerations. A series of one-way ANOVA conducted to explore the impact of age, teaching experience, and Institute on the three factors influence L2 Arabic teachers' attitude.

Results showed that age had an impact on Arabic specific, while the Institute had an impact on Arabic specific and Internet specific.

4.3 Results of Students

The students' questionnaire began with by two questions about the type of mobile devices, platforms and operating system followed by three open-ended questions about the current used of mobile applications, and contents. After this, 54 items were included to assess the following four scales:

4.3.1 Reliability

The students' questionnaire was designed based on four scales:

- Prior knowledge

- Mobile device usage in the classroom

- Attitude toward using mobile devices

- Factors influence attitude toward using mobile devices

Cronbach's Alpha of the four scales ranged .77 to .85 which indicated that the reliability of the scales was high, see Table 4.17, as Hinton et al. (2014), recommended to use thresholds for Cronbach's Alpha: $\alpha > .9$ – excellent reliability; $\alpha > .7$ to $.9$ – high reliability; $\alpha > 0.5$ to $.70$ – moderate reliability; and α 0.5 and below low reliability.

Table 4.17 Reliability Statistics

Scales	Cronbach's Alpha	N of Items
Prior knowledge	.85	9
MDs usage in the classroom	.77	10
Perception toward using MDs	.73	21
Obstacles of using MDs	.77	15

4.3.1.1 Demographics

The data were collected from 303 L2 Arabic learners at seven Saudi universities. There were from 81 nationalities. IUM Institute represented the highest number (N=110, 36%) followed by UAU (N=75, 25%). Most of the sample was represented by males (89%). The age bracket of 24 to 26 years was the most frequent in the sample (N=127, 42%) followed by 21 to 23 years (N=112, 37%). The Level of the Arabic language was generally between Level 04 (N=139, 46%) and Level 3 (N=109, 36%), see Table B1 and B2 in Appendix B for personal information and L2 learner's nationalities.

4.3.2 Mobile devices and platforms

Three types of mobile devices were investigated to address which mobile devices and platforms do L2 Arabic learners, and their teachers currently use, refer to Table 4.18. The results showed that a smartphone was the mobile device most frequently used by students. On the other hand, one-third of the students used laptops, while Tablet PCs were rarely used. 95.9% of all students used a mobile device irrespective of device type.

Table 4.18 Mobile devices used by L2 Arabic students

Question	Number	Percentage
Smartphone (iPhone or similar)		
Yes	276	91
No	27	9
Tablet PC (iPad or similar)		
Yes	45	15
No	258	85
Laptop		
Yes	106	35
No	197	65
No device		
Yes	12	4
No	291	96

Regarding the platforms and operating system used by students, Windows was the most common operating system for laptops (33.5%) while Android was the most used platform for smartphone (78.5%) followed by IOS (21.5%).

4.3.3 Current use of mobile devices

Three open-ended questions were asked relating to how L2 Arabic learners and their teachers currently use their mobile devices. The first question asked what lifestyle mobile app was used the most. The second was what mobile app was used the most to support Arabic teaching. The third focussed on what content was used the most to support Arabic teaching.

In the student's context, WhatsApp was the most used application (82%) followed by Facebook (56%), then YouTube (48%). Other apps, such as Twitter, Instagram and Snapchat, were less used. In Arabic language learning, the 'Almaany' dictionary was the most used application (85%) followed by YouTube (46%). Surprisingly, L2 Arabic learners and their teachers did not mention any Arabic language learning application. In L2 contents, PDF Books was the most used L2 learning contents accessed by students (51%), followed by audio files (7%). *Arabic Between Your Hands* was the most popular PDF book mentioned (29%) followed by *Al-Ajrumiyyah* (12%), *Jami' Ad-durus Al-Arabiah* (5%) and *Awdah al-Masalik* (5%).

4.3.4 Principal Components Analysis

PCA was run on a 54-item questionnaire that measures attitudes of L2 Arabic learners toward MALL and factors influence their attitude to refine and reduce the scales' items of attitudes of L2 Arabic teachers toward MALL to a smaller number of coherent subscales.

The suitability of PCA was assessed before analysis. Inspection of the correlation matrix showed that all variables had at least one correlation coefficient greater than 0.3. The overall Kaiser-Meyer-Olkin (KMO) measure was 0.83, exceeding the recommended value of .6 (Kaiser, 1970, 1974). Bartlett's Test of Sphericity was statistically significant ($p < .005$), indicating that the data was likely factorisable.

PCA revealed five components that had eigenvalues more significant than one and which explained 19.3%, 16.11%, 11.97%, 10.13% and 5.7% of the total variance, respectively. The five-component solution explained 63.37% of the total variance, refer to Table 4.19. A Varimax rotation was employed to aid interpretability. The rotated solution revealed a simple structure (Thurstone, 1947).

Table 4.19 Total Variance Explained by initial Eigenvalue and Rotation

	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
1	4.073	19.396	19.396	4.073	19.396	19.396	3.622
2	3.383	16.11	35.507	3.383	16.11	35.507	3.444
3	2.515	11.975	47.481	2.515	11.975	47.481	2.824
4	2.127	10.13	57.611	2.127	10.13	57.611	1.948
5	1.211	5.767	63.378	1.211	5.767	**63.378**	1.471

Extraction Method: Principal Component Analysis.

The five components were showing several strong loadings and all variables loading substantially on only one component, refer to Table 4.20. The interpretation of the data was consistent with the attitude toward MALL. The questionnaire was designed to measure with strong loadings of Prior knowledge items on Component 1, Classroom usage items on Component 2, Benefits MDs items on Component 3, internet specifics items on Component 4 and Arabic specific items on Component 5. Component loadings and the rotated solution are presented in Table 4.20. For variables to be labelled as a factor, it should have at least

three variables (Tabachnick & Fidell, 2007). However, "a factor with two variables is only considered reliable when the variables are highly correlated with each another r > .70" (Yong & Pearce, 2013, p. 80).

Table 4.20 Pattern Matrix

Items	Component				
	1	2	3	4	5
Access a social networking site on an MD	0.74				
Download a mobile application on an MD	0.73				
Set an alert/alarm for a potential due date on an MD	0.71				
Find the definition of a word I do not know on an MD	0.71				
Post a comment to a blog or respond to a post on an MD	0.70				
Translate a sentence into another language on an MD	0.70				
Download a podcast on an MD	0.66				
Used your MD to look up something that you did not know during class		0.92			
Taken pictures or video with your MD that you used for an assignment		0.92			
Engaged in social networking on your MD		0.92			
written notes on your MD to remind yourself of an assignment		0.90			
ML will bring new opportunities for learning			0.80		
ML will improve communication between students and teachers			0.75		
ML will be a flexible method of language learning as it can be done anytime, anywhere			0.75		
ML can be an effective method of learning as it can give immediate support			0.73		
Students should be taught how to use MDs for Arabic language learning			0.68		
Internet connection speed				0.82	
Internet connection availability				0.79	
Internet connection reliability				0.75	
Quality of Arabic language learning materials					0.86
Availability of Arabic language learning materials					0.81

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
a Rotation converged in 5 iterations.

Items on Component 2 (Classroom Usage) added an extra aspect of students' current use of mobile devices which addresses the second research question. Items on Component 3 (Benefits of MDs) addresses the third research question on what the attitudes of L2 Arabic learners and their teachers are towards MALL. Items on Component 1 (Prior Knowledge),

Component 3 (Internet Specifics), and Component 4 (Arabic specific) addressed the fourth

research question about what factors influence the attitudes of L2 Arabic learners and their

teachers towards MALL

Table 4.21 Five extracted components

component name	No items	Loading range
Prior knowledge	7	0.66 to 0.74
Classroom usage	4	0.90 to 0.92
Benefits MDs	5	0.68 to 0.81
Internet specific	3	0.75 to 0.82
Arabic specific	2	0.81 to 0.86

4.3.4.1   Reliability of the extracted themes

Cronbach's Alpha of the five extracted components ranged 0.7 to 0.83 which

indicated that the reliability of the scales was high, refer to Table 4.22, as Hinton et al.

(2014), recommended to use thresholds for Cronbach's Alpha: $\alpha > .9$ – excellent reliability;

$\alpha > .7$ to $.90$ – high reliability; $\alpha > .5$ to $.70$ – moderate reliability; and α $.5$ and below low

reliability.

Table 4.22 Cronbach's alpha for the five components

Theme	Loading range
Prior knowledge	.83
Classroom usage	.92
Benefits MDs	.79
Internet specific	.71
Arabic specific	.70

4.3.4.2   Normality of Data

In subsection 4.2.5.2, normal distribution concept was explained and discussed

along with justifying analysis test selection. For the values of skewness and kurtosis for

students' questionnaire, refer to Appendix B3, B4, B5.

4.3.5 Classroom usage

In addition to the three open-ended questions used to explore the current use of mobile devices in a student's lifestyle, their Arabic language learning, and access to L2 Arabic content, see Section 2.4, a scale was used to investigate more in-depth the use of mobile devices in the classroom. After PCA was run, it revealed five components, as shown in Table 4.20. Component 2 with four items used to explore the students use of mobile devices in the classroom.

The results showed that the use of mobile devices was widespread among students, refer to Table 4.23. Most of that use was positive, with the most frequent use of mobile devices in the classroom by students was to look up something they did not know during class, followed by taking pictures or video for an assignment. However, they still engaged in social networking in their day to day lives.

Table 4.23 Use of mobile devices in the classroom

No	Statement	N	YES	%
1	Used your MD to look up something that you did not know during class	303	251	83
2	Taken picture or video with your MD that you used for an assignment	303	245	81
3	Engaged in social networking on your MD	303	242	80
4	written notes on your MD to remind yourself of an assignment	303	227	75

As the participating students in this study were of different ages, from different universities, and various levels of the Arabic language, it was beneficial to explore the impact of these three independent variables on the use of mobile devices in the classroom. One-way analysis of variance (ANOVA) was used to explore the impact of the three independent variables on the dependent variable, the use of mobile devices in the classroom, Alpha value is .05. Hence, differences between groups need value less than .05 to be considered statistically significant.

4.3.5.1 Age

A one-way ANOVA was used to explore the impact of age on classroom usage, refer to Table 4.24. The participants were divided into four groups (Group 1: 18 to 20yrs; Group 2: 21 to 23yrs; Group 3: 24 to 26yrs; Group 4: more than 26yrs). There were no statistically significant differences between group means at the $p < .05$ on classroom usage $F(3,488) = 0.93$, $p = 0.43$.

Table 4.24 Mean and Standard Deviations of age groups

How old are you?		Classroom usage
From 18 to 20 Y	M	1.2
	SD	0.3
From 21 to 23 Y	M	1.2
	SD	0.3
From 24 to 26 Y	M	1.2
	SD	0.3
More than 26 Y	M	1.2
	SD	0.3

4.3.5.2 Level of the Arabic language

A one-way Welch ANOVA was used to explore the impact of the level of Arabic language on classroom usage, refer to Table 4.25. The participants were divided into three groups (Group 1: Level 2; Group 2: Level 3; Group 3: Level 4). There was a statistically significant between group means at the $p < .05$ on classroom usage Welch's $F(2,239) = 6.548$, $p = .002$.

Post hoc comparisons, using the Games-Howell post hoc procedure as equal variances were not assumed, were conducted to determine which pairs of the level of Arabic language groups means differed significantly, as can be seen in Table 4.25. These results indicated that level three had a significantly higher average score (M = 1.26, SD = 0.30) than students' level two (M = 1.18, SD = 0.25), and students' level four (M = 1.16, SD = 0.24.

Table 4.25 Mean and Standard Deviations of Arabic language level groups

Which level are you studying at?		Classroom usage
level 2	M	1.18
	SD	0.25
level 3	M	1.26
	SD	0.30
level 4	M	1.16
	SD	0.24

(1) Yes, (2) No

4.3.5.3 Institute

A one-way Welch ANOVA was used to determine whether there was a statistically significant difference between the means of groups at on classroom usage or not based on their universities, see Table 4.26. The participants were divided into seven groups (Group 1: IMISU Institute; Group 2: KSU Institute; Group 3: PNU Institute; Group 4: UAU Institute; Group 5: KAU Institute; Group 6: IUM Institute; Group 7: QU Unite). There was a statistically significant difference between group means at the $p < .05$ on classroom usage Welch's $F(6,105) = 4.263$, $p = .001$.

Post hoc comparisons, using the Games-Howell post hoc procedure as equal variances were not assumed, were conducted to determine which pairs of the level of Arabic language groups means differed significantly. These results indicated that IUM Institute had a significantly higher average score (M = 1.27, SD = 0.29) than students IMISU Institute (M = 1.14, SD = 0.21), PNU Institute (M = 1.12, SD = 0.17), and UAU Institute (M = 1.15, SD = 0.23)

Table 4.26 Mean and Standard Deviations of Arabic language level groups

Which Institute are you studying at?		Classroom usage
IMISU Institute	M	1.14
	SD	0.21
KSU Institute	M	1.15
	SD	0.29
PNU Institute	M	1.12
	SD	0.17
UAU Institute	M	1.15
	SD	0.23
KAU Institute	M	1.14
	SD	0.20
IUM Institute	M	1.27
	SD	0.29
QU Unite	M	1.24
	SD	0.28

In summary, the level of Arabic language and Institute impacted on the classroom usage between students while age had no impact.

4.3.6 Attitude of L2 Arabic learners toward MALL

After the PCA was run, Component 3, Benefits of MDs, was used to assess the attitude of L2 Arabic teachers toward MALL, which was the third research question, see Table 4.27. PCA did not reveal any drawbacks of MDs items which can be seen as a positive.

Most students strongly agreed to stated benefits of using MDs in L2 Arabic learning such as MALL will bring new opportunities and MALL will be an effective method for immediate support.

Table 4.27 Attitude toward using mobile learning

No	Statement	M	SD
1	MALL will bring new opportunities for learning	4.1	0.97
2	MALL will improve communication between students and teachers	4.0	1.05
3	MALL will be a flexible method of LL as it can be done anytime, anywhere	4.1	0.96
4	MALL can be an effective method of learning as it can give immediate support	4.0	1.04
5	Students should be taught how to use MDs for Arabic language learning	4.3	0.88

(5) strongly agree, (4) agree, (3) neutral, (2) disagree, (1) strongly disagree

It was beneficial to explore the impact of three independent variables - age, university and skill level - on the attitude of L2 Arabic learners. As the attitude of L2 Arabic learners toward MALL had one dependant's variable, titled benefits of MDs, one-way analysis of variance (ANOVA) used to explore the impact of independent variables on the dependent variable. The alpha value is .05, so differences between groups need value less than .05 to be considered statistically significant.

4.3.6.1 Age

A one-way ANOVA was used to explore the impact of age on the benefits of MDs, refer to Table 4.28. The participants were divided into four groups (Group 1: 18 to 20yrs; Group 2: 21 to 23yrs; Group 3: 24 to 26yrs; Group 4: more than 26yrs). There was no statistically significant difference between group means on the benefits of MDs F (3,488) = .57, p = .64.

Table 4.28 Mean and Standard Deviations of age groups

How old are you?		Benefits MDs
From 18 to 20 Y	M	4.1
	SD	0.8
From 21 to 23 Y	M	4.1
	SD	0.7
From 24 to 26 Y	M	4.1
	SD	0.7
More than 26 Y	M	4.2
	SD	0.7

4.3.7 Level of the Arabic language

A one-way Welch ANOVA was used to explore the impact of the level of Arabic language on benefits of MDs, refer to Table 4.29. The participants were divided into three groups (Group 1: Level 2; Group 2: Level 3; Group 3: Level 4). There was no statistically significant difference between group means on benefits of MDs $F(2,220) = 0.797$, $p = .452$.

Table 4.29 Mean and Standard Deviations of Arabic language level groups

Which level are you studying at?		Benefits MDs
Level 2	M	4.08
	SD	0.98
Level 3	M	4.18
	SD	0.62
Level 4	M	4.11
	SD	0.69

4.3.7.1 Institute

A one-way Welch ANOVA was also used to determine whether there is a statistically significant difference between the means of groups at benefits of MDs or not based on their universities. The participants were divided into seven groups (Group 1: IMISU Institute; Group 2: KSU Institute; Group 3: PNU Institute; Group 4: UAU Institute; Group 5: KAU Institute; Group 6: IUM Institute; Group 7: QU Unite). See Table 4.30 for means and standard deviation. There was a statistically significant difference at the $p < .05$ in benefits of MDs for the seven groups $F(6,101) = 4.811$, $p = .01$.

Post hoc comparisons, using the Games-Howell post hoc procedure as equal variances not assumed, indicated that students at QU Unite had a significantly higher average score (M = 4.45, SD = 0.47) students at KSU Institute (M = 3.96, SD = 1.00) and students at IUM Institute (M = 4.06, SD = 0.62).

Table 4.30 Mean and Standard Deviations of Arabic language level groups

Which Institute are you studying at?		Benefits MDs
IMISU Institute	M	3.98
	SD	1.03
KSU Institute	M	3.96
	SD	1.00
PNU Institute	M	4.16
	SD	0.93
UAU Institute	M	4.24
	SD	0.60
KAU Institute	M	4.09
	SD	0.43
IUM Institute	M	4.06
	SD	0.62
QU Unite	M	4.45
	SD	0.47

4.3.8 Factors influencing the attitude of L2 Arabic learners toward MALL

PCA revealed that three factors are influencing the attitude of L2 Arabic students towards MALL:

- Prior knowledge

- Internet specifics

- Arabic specific.

As the fourth research question of this study was to find out the factors influencing the attitude of L2 Arabic toward MALL, these three factors were analysed descriptively,

using means, standard deviation and percentages, and inferentially, using series of one-way ANOVA to explore the impact of age, level of the Arabic language, and Institute on L2 Arabic students' attitude.

The first factor analysed was prior knowledge, refer to Table 4.31. The results indicated that the ability to access a social network was the most frequently reported element of prior knowledge among students. This is consistent with their current use of MALL findings where WhatsApp, Facebook and YouTube were the most used applications in their lifestyle and their Arabic language learning. Overall, the results showed that the prior knowledge of students was high and positive as the percentages of the items 79% and above.

Table 4.31 Prior knowledge

No	Statement	N	YES	%
1	Download a mobile application on an MD	303	261	86
2	Access a social networking site on an MD	303	255	84
3	Find the definition of a word I do not know on an MD	303	255	84
4	Translate a sentence into another language on an MD	303	248	82
5	Set an alert/alarm for a potential due date on an MD	303	245	81
6	Download a podcast on an MD	303	239	79
7	Post a comment to a blog or respond to a post on an MD	303	233	77

The second factor analysed was the Arabic specific. It had two items which focused on unavailability and inferiority of Arabic materials, as can be seen in Table 4.32. Generally, the means of both items were > 3, indicating that students agreed that these both items had a negative influence on their attitude. The inferiority of L2 Arabic materials had the highest mean of 3.10.

Table 4.32 Arabic specific

Statement	N	M	SD
Inferiority of Arabic language learning materials	303	3.10	1.16
Unavailability of Arabic language learning materials	303	3.0	1.23

5) strongly agree, (4) agree, (3) neutral, (2) disagree, (1) strongly disagree

The last factor analysed was Internet specific, see table 4.33. The result indicated that students agreed that internet reliability, availability, and speed were unsatisfied and had a negative impact on their attitude toward MALL.

Table 4.33 Internet specifics

Statement	N	M	SD
Internet connection reliability	303	3.40	1.20
Internet connection availability	303	3.29	1.34
Internet connection speed	303	3.20	1.32

5) strongly agree, (4) agree, (3) neutral, (2) disagree, (1) strongly disagree

In summary, the results of the PCA showed three factors influencing the attitude of L2 Arabic students:

- Prior knowledge
- Arabic specific
- Internet specific.

Prior knowledge was the only factor that had a positive influence, while Arabic specific and Internet-specific had negative influences on their attitude toward MALL.

A series of one-way ANOVA was run to explore the impact of age, level of the Arabic language, and Institute on three factors that influence L2 Arabic students' attitude. Bonferroni adjustment was used to avoid inflated Type 1 errors. Normal alpha value .05 was divided by three, the number of dependent variables, giving an alpha level of .017. This

new value, .017, was being considered as the cut-off, so differences between groups need value less than .017 to be considered statistically significant.

4.3.8.1 Age

A one-way ANOVA was used to explore the impact of age on prior knowledge, Arabic specific, and Internet specific. The participants were divided into four groups (Group 1: 18 to 20yrs; Group 2: 21 to 23yrs; Group 3: 24 to 26yrs; Group 4: more than 26yrs), refer to Table 4.34. There was no statistically significant difference between group means on the three factors at the $p < .017$ level. Firstly, prior knowledge $F(3, 488) = 0.61$, $p = .061$. Secondly, Arabic specific $F(3,488) = 1.03$, $p = 0.38$. Thirdly, Internet specific, $F(3, 488) = 0.77$, $p = .051$.

Table 4.34 Mean and Standard Deviations of age groups

How old are you?		Prior knowledge	Technology specific	Arabic specific
From 18 to 20 Y	M	1.1	3.3	2.9
	SD	0.3	1.0	1.0
From 21 to 23 Y	M	1.2	3.3	2.9
	SD	0.3	1.1	1.0
From 24 to 26 Y	M	1.2	3.3	3.0
	SD	0.3	1.0	1.1
More than 26 Y	M	1.2	3.5	3.2
	SD	0.3	1.0	1.0

4.3.8.2 Level of the Arabic language

A one-way Welch ANOVA was used to explore the impact of the level of Arabic language on prior knowledge, Arabic specific, and Internet specific. The participants were divided into three groups (Group 1: Level 2; Group 2: Level 3; Group 3: Level 4). There was no statistically significant difference between group means at the $p < .017$ on prior knowledge Welch's $F(2,238) = 4.693$, $p = .02$, Internet specific, $F(2, 236) = 0.491$, $p = .613$. Arabic specific $F(2,251) = 0.297$, $p = .743$.

Table 4.35 Mean and Standard Deviations of Arabic language level groups

Which level are you studying at?		Prior knowledge	Internet specific	Arabic specific
Level 2	M	1.26	3.20	3.03
	SD	0.29	1.09	0.94
Level 3	M	1.18	3.32	2.94
	SD	0.25	0.99	1.01
Level 4	M	1.18	3.32	2.99
	SD	0.28	1.00	1.05

4.3.8.3 Institute

A one-way Welch ANOVA was used to determine whether there is a statistically significant difference between the means of groups on prior knowledge, Arabic specific, and Internet specific or not based on their universities. The participants were divided into seven groups (Group 1: IMISU Institute; Group 2: KSU Institute; Group 3: PNU Institute; Group 4: UAU Institute; Group 5: KAU Institute; Group 6: IUM Institute; Group 7: QU Unite). There were a statistically significant between group means at two factors the $p < .017$. Prior knowledge Welch's $F (6,136) = 21.846$, $p = .01$, Arabic specific $F (6,103) = 3.952$, $p = .01$. No statistically significant difference between group means at the $p < .017$ on Internet specific, $F (6, 103) = 11.061$, $p = .018$. See Table 4.36 for means and standard deviation

Post hoc comparisons, using the Games-Howell post hoc procedure as equal variances were not assumed, were conducted to determine which pairs of the Institute groups means differed significantly. These results indicated that KAU Institute had a significantly lower average score on the prior knowledge (M = 1.01, SD = 0.04) than the other six universities. On Arabic specific, results indicated that UAU Institute had a significantly higher average (M= 3.32, SD=0.97) than PNU Institute (M= 2.67, SD=0.78), IUM Institute (M=2.89, SD=0.98), and QU Unite (M= 2.65, SD= 1.02), refer to Table 4.36.

Table 4.36 Mean and Standard Deviations of Arabic language level groups

Which Institute are you studying at?		Prior knowledge	Internet specific	Arabic specific
IMISU Institute	M	1.24	3.52	3.07
	SD	0.29	1.02	1.22
KSU Institute	M	1.18	3.15	3.00
	SD	0.27	1.05	1.00
PNU Institute	M	1.23	2.54	2.67
	SD	0.29	1.04	0.78
UAU Institute	M	1.17	3.17	3.32
	SD	0.25	0.93	0.97
KAU Institute	M	1.01	3.17	2.91
	SD	0.04	0.74	0.71
IUM Institute	M	1.20	3.26	2.89
	SD	0.30	1.02	0.98
QU Unite	M	1.11	4.04	2.65
	SD	0.22	0.74	1.02

4.3.9 Summary

Using mobile devices was popular among L2 Arabic teachers. YouTube and WhatsApp were the most used applications for L2 Arabic learning. None of the participants mentioned applications which teach the Arabic language. Teachers showed a positive attitude towards using MDs in L2 Arabic learning. PCA revealed that three factors influenced the attitude of L2 Arabic teachers. Prior knowledge was the only factor that had a positive influence, while Arabic specific and Internet specific had a negative influence**.**

In the student context, mobile devices were used widely. Regarding mobile applications, WhatsApp and YouTube were the most used. None of L2 Arabic learners mentioned applications which teach the Arabic language. In classrooms, many L2 Arabic learners used their mobile devices for various learning activities. Learners had a positive attitude towards MDs in their Arabic language learning. PCA showed that three factors influenced the attitude of L2 Arabic students. Prior knowledge was the only factor that had a positive influence, while Arabic specific and Internet specific had negative influences on L2 learners' attitude toward MALL.

Chapter 5

Qualitative Data Analysis

5.1 Introduction

This chapter presents the results of the qualitative analysis, in order to explain the results of the quantitative analysis presented in Chapter 4 and gain a greater understanding of the attitude of L2 Arabic learners and their teachers toward MALL. As this study used a mixed-methods sequential explanatory research design, the results from the quantitative data in Phase one were used to inform the qualitative results data collection in Phase two. Quantitative data also helped develop further interview questions to explain the results of the quantitative analysis in greater depth.

This chapter begins by explaining the analysis processes and presentation of the qualitative data. It has been divided into two sections:

- Section One: Teachers' interview results
- Section Two: Student interview results.

5.2 Qualitative data analysis process

The qualitative data were collected through semi-structured telephone interviews and then analysed using ATLAS.ti 8 software. The participants' responses, transcribed from audio interviews into Microsoft Word, were imported to ATLAS.ti 8. A theoretical thematic analysis approach was used to analyse these qualitative data. In the theoretical thematic analysis, data analysis was driven by the research questions or analyst's focus (Maguire & Delahunt, 2017). Although a theoretical thematic analysis approach was used, the

researcher was open to new themes that may have emerged from the interview analysis. However, no new themes emerged.

In this study, qualitative data analysis was directed by research questions, while data findings directed the quantitative data. The quantitative analysis used descriptive analysis for two questions and principal component analysis (PCA) for three questions. This approach identified nine subthemes for teachers and ten subthemes for students, which were gathered from the questionnaire. These subthemes created four main themes, refer to Table 5.1.

Table 5.1 Themes and subthemes revealed by quantitative analysis

Themes	Subthemes	
	Teachers	Students
Type of MD and platforms	Type of MDs Type of platform	Type of MDs Type of platform
Current use of mobile devices	MDs applications MDs content	MDs applications MDs in classroom MDs content
Attitude towards MALL	Benefits MDs Drawbacks MDs	Benefits MDs Drawbacks MDs
Factors influencing attitude	Prior knowledge Arabic MALL Internet specification	Prior knowledge Arabic MALL Internet specification

These themes yielded results where the interviews could provide additional explanations about L2 Arabic students and their teachers toward MALL. For example, quantitative data revealed that both L2 Arabic teachers and learners were using Android devices more so than iOS devices, see Table 4.2. During the interviews, participants were

asked to explain their selections criteria in order to understand the popularity of Android devices.

The researcher followed Braun and Clarke's (2006) six phases of thematic analysis, see Table 5.2, which offered a clear and usable framework for undertaking thematic analysis and is perhaps the most influential approach used in the social sciences (Maguire & Delahunt, 2017).

Table 5.2 Braun & Clarke's six phases of thematic analysis

Step	Action	Step	Action
1	Familiarisation with the data	4	Reviewing themes
2	Coding	5	Defining and naming themes
3	Searching for themes	6	Writing up

5.3 Presenting qualitative data

Qualitative data can be arranged and presented in many ways (Chenail, 1995). In this study, qualitative data are presented sequentially by the research questions. As this study had four research questions, qualitative data findings are presented by:

- Types of mobile devices and platforms (RQ1)

- Current uses of mobile devices (RQ2)

- Attitudes towards MALL (RQ3)

- Factors influencing attitude (RQ4)

The theoretical thematic analysis approach identified eleven subthemes, refer to Table 5.3. The subthemes created four themes, which were connected to the study research questions.

Table 5.3 Summary of themes and subthemes for L2 Arabic teachers and learners

RQ	Theme	Subthemes	Subthemes
RQ 1	Type of MDs and platforms	Financial Technical Security	Financial Technical Security
RQ 2	Current use of mobile devices	App availability App content Institute policy	App availability App content Institute policy
RQ 3	Attitude towards MALL	Benefits of MDs Drawbacks of MDs	Benefits of MDs Drawbacks of MDs
RQ 4	Factors influencing attitude	Prior knowledge Arabic MALL Internet specification	Prior knowledge Arabic MALL Internet specification

As this study used a mixed-methods sequential explanatory research design, each of the four themes was initially informed by the quantitative findings and began with a summary of the quantitative findings. Qualitative data were used to explain the quantitative findings and to get a deeper understating of the attitude of L2 Arabic learners and their teachers toward MALL.

5.4 Teacher interview results (Section One)

5.4.1 Demographics

Fourteen L2 Arabic teachers from the seven universities participated in this study. The majority were male (N=11).

Table 5.4 Demographic descriptors of participants

Institute	Number	Gender	
		Male	Female
IMISU Institute	2	2	-
KSU Institute	2	1	1
PNU Institute	2	-	2
UAU Institute	2	2	-
KAU Institute	2	2	-
IUM Institute	2	2	-
QU Unite	2	2	-
Total	14	11	3

5.4.2 Mobile devices and platforms

The first research question of this study was what type of mobile devices and platforms L2 Arabic learners and their teachers were currently using. Quantitative analysis revealed that smartphone devices and laptops were used by the vast majority of L2 Arabic teachers (95% & 88%), while only less than half (49%) of the L2 Arabic teachers used tablet devices, refer to Table 4.2. Windows was the most common operating system for laptops (69%), while Android (53%) was the most used platform for smartphones, followed by IOS (47%).

To investigate why the majority of L2 Arabic teachers chose to use Android smartphone devices and Windows laptops, they were asked to explain their selection criteria. The L2 Arabic teachers identified different reasons for choosing mobile devices, platform, or operating system. These reasons were categorised into three subthemes:

- Financial

- Technical

- Security

5.4.2.1 Financial

The financial reasons mentioned by L2 Arabic teachers in their interviews included the price of the device, repair cost, and the cost of applications. Most teachers indicated that the iPhone device is more expensive than Android devices by far.

<div dir="rtl">

الفرق بين سعر معظم أجهزة الأندرويد وبين جهاز الآيفون كبير هنا في السعودية، فقد أشتري جهازين تقريباً بسعر جهاز آيفون واحد!! على سبيل المثال جوالي من شركة هواوي بي ٩ وسعره عندما اشتريته أقل من سعر الآيفون بـ ١١٠٠ ريال، وليس هناك ميزة تقنية في الآيفون تستحق دفع هذا الفرق!! (م. م ع.١).

</div>

The price gap between Android devices in general and the iPhone is huge in Saudi Arabia. I can get two Android devices for the price of one iPhone! For instance, my current smartphone is Huawei P9. When I bought it, it was cheaper than the iPhone by 1,100 SR, and I don't think that there is a technical advantage in the iPhone worth that price gap (T.KA.1).

In addition to the purchase price, other teachers mentioned the repair parts cost played a role in choosing their mobile devices:

<div dir="rtl">

تجربتي مع جهاز إصلاح شاشة جهاز الآيفون جعلتني أبتعد عن شرائه. عندما انكسرت شاشة الجوال كان سعر الشاشة البديلة الأصلية مكلفةً؛ لذا اشتريت شاشة درجة ثانية لكن لم تعمل البصمة بعد التحديث، وأصبحت بعض زوايا الشاشة لا تستجيب بشكل جيد. فأبل لا تعمل أجهزتها بشكل جيد مع منتجات طرف ثالث ومنتجاتها غالية على خلاف أجهزة الشركات الأخرى (م. أ ق. ١)

</div>

My experience with fixing my previous iPhone's screen makes me not want to buy the iPhone anymore. When my iPhone's screen broke, the price of a

new screen was too expensive. So, I bought a screen from a third party, but

the fingerprint did not work once I updated my iPhone's software and some

screen's corners did not work properly. Although Apple devices did not

accept parts from third parties like other devices, Apple parts are too

expensive (T.UM.1)

The cost of mobile applications was another reason for some L2 Arabic teachers to

select Android devices rather than iOS devices. They indicated that iOS had paid apps that

are free on Android.

<div dir="rtl">

إحدى أسباب عدم اختياري جوال الآيفون أو أجهزة أبل بصفة عامة هي أنها تتطلب باستمرار دفع
مبالغ إضافية لبعض التطبيقات المجانية للأجهزة الأخرى. كذلك التطبيقات ذات الرسوم تكون
برسوم أغلى لنسخة آي أو إس (م. إ م ٢.).

</div>

One of my reasons for not selecting an iOS device is that iPhone and Apple

devices, in general, require paying extra money for some applications that are

free for other devices. It also has a higher price for paid apps (T.IM.2).

Android smartphones were widely used by L2 Arabic teachers due to their low cost

when compared to iOS devices. The iPhone 11 Pro is priced at SR5,899 (AU$ 2,564) in

Jarir, a national retailer in Saudi Arabia, while Huawei P30 Pro is SR2,069 (AU$ 899).

5.4.2.2 Technical

Teachers who had Apple devices, particularly laptops, indicated that they faced

difficulties using their Apple devices at their universities, such as connecting them to

projectors and smartboards.

أنا مستخدم للماك من سنوات، وعندما حاولت استخدامه في الفصل وجدت صعوبة في توصيل جهازي بوصلات جهاز العرض في الصف، وبالسبورة الذكية؛ لعدم توافق الوصلات ومنافذ الجهاز واشتريت بعض الأسلاك والمحولات من حسابي (م. إم.١).

I have been a Mac user for years. When I tried to use it in my classroom, I found it difficult to connect my device to the classroom's projector and smartboard as the device's output and cables are different. I had to buy my own cables and some adaptors out of my pocket (T.IM.2)

Some universities provided free Windows laptops for teachers, while the IT departments only provide support for Windows laptops.

الجامعة تقدم أجهزة ديل محمولة مجاناً، وإذا قررت استخدام جهازي الماك بوك برو فأكون مجبوراً لمواجهة كل الصعوبات التقنية بنفسي لأن الدعم الفني لن يقدم الدعم سوى لأجهزة ويندوز لذا أستخدم ويندوز في الجامعة فقط (م. إم.١)

My university provides free Dell laptops. If I decide to use my MacBook Pro, I have to face all technical challenges by myself as the IT support department will provide support for Windows devices only. (T.IM.1)

Universities were also found orientate away from Apple devices. Some universities provided free Windows laptops and it was the only operating system supported by IT departments. This might be for some financial reasons.

5.4.2.3 Security

Some teachers stated that privacy and security was a critical factor in choosing their devices. They believed that the iPhone was more secure than Android

أعتقد أن نظام الآيفون أكثر أماناً من أجهزة الأندرويد بحسب متابعتي للأخبار التقنية. فمثلاً قرأت قبل مدة أن قوقل اكتشفت عدداً كبيراً من التطبيقات المنتشرة في متجر قوقل بلاي تقوم بانتهاك

الخصوصية وجمع البيانات بدون إذن من المستخدم وقامت بحذفها على الرغم من أن بعضها

حصل على نسب تحميل عالية (م. إ س. ٢)

I believe that iOS is more secure than Android. This is based on my

continuous reading of technical reports. For instance, a while ago, I read that

Google discovered many apps in Google Play violated privacy policy and

collected data with no permission from users. Even though some of these

apps had reached high downloads, Google removed them (T.IS.2).

Some teachers believed that the iOS platform and Macintosh operating system are

highly secure. Some teachers indicated that Apple devices did not need anti-virus

programmes or applications comparing to Android or Windows devices.

5.4.2.4 Summary

Three reasons explained why the majority of L2 Arabic teachers chose to use

Android smartphone devices and Windows laptops. The three seasons were Financial

Technical and Security.

5.4.3 Current use of mobile devices

Three open-ended questions were used in the quantitative phase to investigate how

L2 Arabic teachers were currently using their mobile devices for daily life and Arabic

learning. The first question asked what lifestyle mobile app they used the most. The second

question focussed on what mobile app was used the most to support Arabic teaching. The

third question focussed on what content was used the most to support Arabic teaching.

Quantitative data revealed that WhatsApp was shown to be the most used lifestyle

mobile app (87%), followed by YouTube (78%). In Arabic language learning, YouTube

was the most used application (62%), followed by a Dictionary app (55%), see Section

4.2.4. Surprisingly, although there are 19 applications which taught Arabic language (Heil et al., 2016), as well as a mobile application called 'Interactive Arabic' launched by King Saud University, included in this study, none of the participating teachers mentioned using them.

When discussing L2 Arabic learning materials, PDF books (55%) were the most accessed L2 Arabic learning materials by teachers, followed by audio files (7%). *Arabic Between Your Hands* was the only PDF book mentioned by L2 Arabic teachers (65%).

5.4.3.1 Mobile Application

To investigate why L2 Arabic teachers did not mention any app that taught Arabic, teachers were asked how they used some social media apps, such as YouTube in their Arabic language teaching. They were also asked if they had heard about other applications that taught Arabic. From this questioning, three subthemes emerged from the teachers' interviews explaining why they were not using apps that taught Arabic in their Arabic teaching. These subthemes were:

- Lack of apps

- Lack of content within the available apps

- Institution policy.

5.4.3.1.1 Lack of apps

The vast majority of L2 Arabic teachers believed that the number of applications which taught Arabic is minimal on app stores. As a result, they tended to use some social apps for learning, such as YouTube.

Applications that teach Arabic are very limited on app stores, so I often use

social media apps for learning. For example, I use YouTube for listing skills.

So, I put a video from a news channel followed by some questions to assess

their understating (T.K.S.1).

WhatsApp was another example of using a social media app for learning. Most of

the L2 Arabic teachers at the seven universities were using WhatsApp widely. For instance,

every Arabic language class had a WhatsApp group. These groups were used by L2 Arabic

teachers to send and receive tasks, as well as sharing PDF learning materials with students.

في هذا الفصل الدراسي أدرس شعباً من مستويات مختلفة؛ لذا أنشأت لكل شعبة مجموعة على الواتس أب وأضفت الطلاب فيها، وعبر هذه المجموعة أرسل وأستقبل الواجبات والبحوث القصيرة بصيغة بي دي إف، وأجيب على الاستفسارات عبر مجموعات الواتس أب (م.م.س.٢)

In this semester, I am teaching classes at different levels. So, I created a

WhatsApp group for each class and added the students to the groups.

Through these WhatsApp groups, I send and receive short assignments and

tasks in PDF format, and I answer questions via WhatsApp (T.K.S.2)

Whilst WhatsApp was employed as a learning management app, most of the Arabic

language institutes were using it as the primary communication channel. For example,

admission departments created a group for students and another for teachers. A student was

added to the students' group once he had enrolled and removed once he graduated. All

announcements, such as examination timetable and key dates, were also sent to those

groups.

في الحقيقة الواتس أب هو وسيلة التواصل الأولى بيننا كأعضاء تدريس وبين الطلاب في معهدنا. لدينا مجموعة واتس أب خاصة بجميع الطلاب وتحدث باستمرار كل فصل دراسي لحذف المتخرجين وإضافة المستجدين إن وجد، وأي إعلان نريد أن نوصله إلى الطلاب نرسله عبر الواتس أب وهو الوسيلة الأسهل لانتشاره بين الطلاب (م.م.ع.١).

In fact, WhatsApp is the main communication way between us as teaching staff and students in our institute. We have a WhatsApp group for all students that constantly updated every semester to remove graduated students and add new students if any. Any announcement we want to be delivered to students; we use WhatsApp as the easiest way due to its widespread between students (T.K.A.1).

Most teachers indicated that there were few Arabic language mobile applications available to use. They did, however, use social media and instant messaging applications, such as WhatsApp and YouTube, widely. This might be increased by the use of Arabic language institutes for social media or instant messaging applications to communicate with both teachers and learners.

5.4.3.1.2 Limited content within the available apps

Many L2 Arabic teachers believed that applications which taught Arabic were limited to basic Arabic content, such as beginner vocabulary or bilingual dictionaries apps. Some of the L2 Arabic teachers indicated that they found during their search on app stores that most of the results were "very basic apps". They described "very basic apps" as any application which is designed primarily for native Arabic children and teaches students the Arabic Alphabet and simple Arabic words.

منذ مدة بحثت في تطبيق قوقل بلاي عن تعليم العربية، وكانت النتائج في معظمها عبارة عن برامج مخصصة للأطفال، وتعليم الأحرف العربية، وبعض المفردات البسيطة. لا يبدو أن هذه التطبيقات

قام عليها متخصصون لغويون أو مؤسسات تعليمية، وأعتقد أن تطبيقات اللغة العربية قليلة للغاية مقارنة بتعليم اللغات الأخرى مثل اللغة الإنجليزية (م.إ.م.٢)

A while ago, I did a search on Google Play about learning Arabic. The results were kids' apps, Arabic Alphabet and some simple Arabic words. It did not seem that these applications were designed by linguistics or educational organisations. I believed that Arabic language applications are very limited in comparison to other languages applications, such as English language (T.IM.2).

They considered using bilingual language dictionaries, such as *Almaany*, as having several drawbacks, including the accuracy of translations.

القاموس ثنائي اللغة غالباً يسبب إشكالاً في فهم معنى المفردة، فالطالب عندما يستخدم القاموس بين لغته الأم ـ مثلاً الهندية ـ واللغة الهدف العربية يظهر له معنى غير دقيق؛ نظراً لسياق المفردة على سبيل المثال. وهذا يؤثر سلباً على تعلم الطالب؛ لذا نحث الطلاب على استقدام القاموس عربي – عربي حتى يطور مفرداته وإذا لم يعرف المعنى يسأل صديقه أو أستاذه (م.أ.ق.٢)

Bilingual language dictionary often causes an issue in understanding a word meaning. When a student uses a dictionary between his mother language, for instance the Indian language, and the target language Arabic, it is common for him to get inaccurate meanings. This will have a negative impact on students, so we encourage students to use Arabic – Arabic dictionary to improve their vocabulary. In case they did not understand the meaning of that word, he could ask a friend or his class teacher (T.U.Q.2)

Majority of L2 Arabic teachers believed that Arabic language applications had limited content. Most of these applications provide basic vocabulary and Alphabet designed for Arabic children.

5.4.3.1.3 Institute policy

As these seven L2 Arabic institutes belong to different universities, it was not surprising that there were aspects of their policies which were differences. One of these differences was their approach to L2 Arabic curriculums selection. Some of the seven L2 Arabic institutes designed their own curriculums while others relied on some independent L2 Arabic centres.

Some L2 Arabic teachers indicated that it is not allowed to use external curriculums.

العربية بين يديك، ونحن ملزمون باتباع توصيف المواد، السلسلة المتبعة عندنا في المعهد هي والسلسلة المقررة؛ لذا لا أستخدم أي تطبيقات سوى الأقراص المدمجة بسلسة العربية بين يديك (م. ج ق.٢).

In our institute, we use a book series called *Al Arabiyyah Bayna Yadayk*. We are obligated to follow the unit's description and the book series, so I do not use any applications except CDs attached to *Al Arabiyyah Bayna Yadayk* (T.QU.2).

L2 Arabic teachers believed that Arabic language institutes' policies were not encouraging nor allowed L2 Arabic teachers to use external learning recourses, such as mobile application or books, instead of the institute book series.

5.4.3.2 Arabic language materials

Many interviewees pointed out that Arabic learning materials were in limited supply. Most of them believed that bureaucracy and a lack of experts were the main reasons for the limited materials. The following is a representational example.

المحتوى العربي لتعليم اللغة العربية لغير العرب قليل وقديم. وهذا يعود لسببين رئيسيين -في نظري- هما قلة المختصين والبيروقراطية في الجامعات. في جامعتنا قمنا بتطوير وتحديث سلسلة

المعهد المؤلفة قبل عقدين تقريباً ومازالت تنتظر الموافقة على الطباعة لأكثر من ثلاث سنوات. (م.
ج.إ ٢)

Materials for learning Arabic by L2 Arabic learners are limited and outdated.
In my opinion, there are two main reasons behind this: bureaucracy at the
universities and a lack of experts. In our university, we have updated and
developed our series that was written two decades earlier. It is still waiting
for printing approval and has been for more than three years. (T.IM.2)

L2 Arabic teachers at some Arabic institutes, mainly old institutes that have
designed their own curriculums a long time ago faced challenges to update their learning
book series as a result of bureaucracy. In contrast, recent Arabic language institutes or units
relied on some independent L2 Arabic centres due to lack of experts.

5.4.3.3 Summary

L2 Arabic teachers' interviews revealed three subthemes as to why they were not
using any mobile apps to teach. The three subthemes were lack of apps available, limited
content within apps, and institutes policies. Regarding the lack of Arabic learning materials,
most of them believed that a lack of experts and bureaucracy were the main reasons for the
limited materials.

5.4.4 Attitude of L2 Arabic teachers towards MALL

To answer the third research question, two themes - Benefits and Drawbacks of
mobile devices - were used concurrently to assess the attitude of L2 Arabic teachers toward
MALL, see Table 4.1. Quantitative data showed that L2 Arabic teachers had a positive
attitude toward mobile assisted language learning, as in Table 4.7.

5.4.4.1 Benefits of Mobile Devices

The majority of L2 Arabic teachers strongly believed in the benefits of using mobile devices in L2 Arabic learning. They were asked to illustrate any advantage of using mobile devices in L2 Arabic learning not mentioned in the questionnaire if any. They were then asked to explain how they agreed with the benefits statements of using mobile devices to gain a better understanding. No new benefit emerged from the interviews.

The most common benefit of using mobile devices, as seen by the L2 Arabic teachers, was that using mobile devices brought new learning opportunities, see Table 4.7. The teachers were asked to explain or give examples of these new opportunities. Some said that mobile devices helped bridge the gaps between different learning styles among students.

استخدام التقانة في تعليم اللغة العربية وبالأخص الأجهزة المتنقلة مفيد جداً. الطلاب لديهم أنواع مختلفة من أساليب التعلم. ولدينا الأسلوب الأكثر شيوعاً هو المحاضرة، هذا الأسلوب يناسب فقط نوعاً واحد من أنواع تعليم عديدة. واستخدام التقنيات يسهل للمعلم التعامل مع طرق مختلفة. قبل عامين، كان لدينا في المعهد طالب من روسيا، مضى عليه سنة ولم يتقدم مستواه بشكل جيد كبقية الطلاب خصوصاً في النحو، جاء معلم شاب ويحب التقنية. وكان يصمم للطلاب بعض جوانب النحو على شكل مخططات ورسومات مع الأمثلة ويشاركها مع طلابه كصورة في مجموعات الواتس أب. تحسن مستوى هذا الطالب بشكل كبير في النحو، وأصبحنا نستخدم عمل هذا الزميل (م. إ.م.٢) مع الطلاب في قاعتنا

Using technologies in Arabic language learning, especially MDs, is very useful. We have students with different learning styles. The most common method at our institute is the lecture's method. This method will suit only one learning style out of many styles. Using technologies would help teachers to deal with different styles. Two years ago, we had a student from Russia. He studied for a year at our language institute. His Arabic language did not

improve as his friends, especially in syntax. A new teacher who loved

technologies joined us. He designed some aspect of Arabic language's syntax

in a diagram with examples and shared it with his students via WhatsApp as a

picture. The Russian student's language level improved dramatically in

syntax. We started using this with our college work with our students

(T.IM.2)

The second benefit of using mobile devices in L2 Arabic, as seen by L2 Arabic

teachers was that they could increase the flexibility of access to resources. Some L2 Arabic

teachers indicated that the current curriculums are considered outdated in some contexts and

required updating. They noted that mobile devices gave students a greater chance to look at

different types of learning materials that might be more authentic.

استخدام الأجهزة المتنقلة في تعليم اللغة العربية سهل على الطلاب والمعلمين الوصول للمحتوى.
على سبيل المثال ـ بما أن الإنترنت لدينا في الجامعة متوفر ـ أنا آحياناً عندما أجد في اليوتيوب أو
المواقع محتوى جميلاً جداً يناسب طلابي أشاركهم الرابط عبر مجموعة الواتس أب وأطلب منهم
الاطلاع عليه. يستطيع الطالب أن يطلع على المحتوى متى وجد الوقت المناسب له خلال يومه.
ومن خلال التجربة خلال فصلين دراسيين، وجدت الطلاب أكثر تفاعلاً مع هذه الطريقة من
الطريقة التقليدية وأعني حل التدريبات في الكتب المطبوعة (م. م ع. ٢).

Using mobile devices in L2 Arabic learning made access to recourses much

easier for students and teachers. For example, as the internet is available at

our university, I sometimes find very useful content on YouTube or other

websites which suit my students. So, I share the link with the students via

WhatsApp and ask them to look at it. Students can look at the content at their

best time during the day. After using this method for two semesters, I found

students more interactive with this method than the traditional way. I mean

answering practises in their printed books (T.KA.1).

The third benefit of using mobile devices was that MALL would be an effective method for immediate support. Most teachers indicated that students were able to get immediate support from their fellow peers and teachers in their WhatsApp group or via email.

الجوالات الذكية متوفرة تقريباً في أيدي جميع الطلاب والمعلمين، وتطبيق الواتس قناة التواصل الأكثر استخدام فيما بينهم في معهدنا، وفي الحقيقة أراه استخداماً موفقاً للتطبيق فعلى سبيل المثال يضع الطالب استفساراً حول المادة التي أدرسها في مجموعة الواتس أب ويتلقى الإجابات من عدد من زملائه وأحياناً كأستاذ أجيب على بعض الاستفسارات (م. إ م. ٢).

Smartphones are mostly at hand for every student and teacher. Also, WhatsApp is the most common method to communicate between students and teachers at our institute. Indeed, I believe it is a good usage of WhatsApp. For instance, a student can ask a question about the unit that I taught in our WhatsApp group and will receive answers from his colleagues, and I sometimes answer some questions (T.IM.2).

Most L2 Arabic teachers strongly believed that using mobile devices in the Arabic language has many benefits for L2 Arabic learning. Their beliefs were supported with some real experiences for new opportunities of learning Arabic and flexibility of access to learning resources.

5.4.4.2 Drawbacks of MDs

Most L2 Arabic teachers disagreed with statements in the questionnaire connected to the drawbacks of using mobile devices, such as MALL not being used because mobile devices are expensive, the technology is challenging to use, and there is a lack of interest, as in Table 4.7. In the interviews, they were asked to explain the reasons for their

disagreement. They were also asked to illustrate any disadvantages of using MDs in L2 Arabic learning not already mentioned in the questionnaire if any.

A new drawback of using mobile devices in L2 Arabic learning, illustrated by the majority of L2 Arabic teachers during interviews (64%), was that the apps used did not cover the four language skills (reading, writing, listening and speaking). They believed that mobile devices support mostly focused on listening and reading while writing and speaking are not supported.

في الغالب، تطبيقات الجوال واستخداماته تركز على دعم مهارات الإدخال مثل: الاستماع والقراءة، ومن السهل ـ نوعا ماـ أن تجد تطبيقات أو محتوى تساعد الطالب في هاتين المهارتين، لكنها في الجانب الآخر يصعب أن تجد ما يساعد على المحادثة أو الكتابة بدون المعلم (م. م ع .١)

In general, mobile applications and its usage focused on input skills such as listening and reading. It is easy to some extent to find mobile applications or materials to help students in these two skills. However, it is too hard to find something to help with writing or speaking with one teacher (T.KA.1)

Regarding the cost of mobile devices, most L2 Arabic teachers did not agree that it was a drawback for mobile devices in L2 Arabic learning (78%). They indicated that mobile technologies had become more affordable, with people having more options of smartphones and laptops with a variety of prices.

أتوقع أن سعر الأجهزة المتنقلة انخفض. شركات كثيرة دخلت إلى السوق واستطاعت تقديم الأجهزة المتنقلة بمختلف أنواعها بأسعار مقبولة. الشركات الكبرى كذلك بدأت تنافس على خفض أسعار أجهزتها وتوفير نسخ مخفضة. وأظنها في متناول الجميع (م، إ م، ٢)

I think that mobile devices prices have dropped. Many companies have

entered the market and provided mobile devices with fair prices. Also, large

companies began to reduce the cost of its devices or provide cheap versions. I
believe that mobile devices now are affordable. (T.IM.2)

When discussing the potential difficulties of using certain technology in L2 Arabic
learning, many L2 teachers indicated that using them had become part of their daily life
(85%). Some teachers mentioned that, to mitigate any issues, their university provided short
training courses for teachers, related to using a smartboard, blackboard, and/or some other
software.

في نظري، معظم الأساتذة يجيدون معظم استخدام التنقية الحديثة نظراً لاستخدامهم اليومي لها.
وجامعتنا كذلك تقدم دورات قصيرة للتدريب من حين لآخر أو عندما يتم إضافة وسيلة تعليم جديدة
في القاعات الدراسية؛ لذا لا أرى أن هذا الصعوبات التقنية تمثل جانباً سيئاً من جوانب استخدام
التقنية في تعليم اللغة العربية لغة ثانية (م، م س، ١)

In my opinion, most teachers can use new technologies as they use them in
their daily life. In addition, our university provides short training from time to
time, or when a new technology is added to the classrooms. So, I do not think
that difficulties in using new technologies can be seen as a drawback of using
MDs in L2 Arabic (T.KS.2)

Several teachers indicated that some of their students did have difficulty using
mobile technologies, but this was down to the competency of the student rather than the
technology itself.

لدينا في القاعة طلاب من بلدان مختلفة، ومستوى هؤلاء الطلاب في التعامل مع التقنية متفاوت،
فمثلاً مستوى الطلاب الإفريقيون في التقنية أقل بكثير من الطلاب الأوربيين غالباً، ويواجهون
(م. ج إ. ٢) على استخدام التقنيات المتنقلة صعوبة تمتد إلى أشهر قليلة حتى يتعرفوا

Our classrooms have students from different countries. Students' IT level is
varied. For instance, an African student's IT level is lower than that of

European students, so African often are facing some challenges for a few months till they know how to use mobile technologies (T.IS.2)

Regarding the lack of interest in using certain technology, many L2 Arabic teachers illustrated that they were interested in using mobile devices in their Arabic language teaching and were already using mobile technologies at their best.

جميع الأساتذة – في نظري – مهتمون بهذه التقنية واستخداماتها لأني أرى حرصهم على التسجيل في الدورات التدريبية في الجامعة. الأغلبية متقنون لأهم تطبيقاتها واستخداماتها ونحاول الاستفادة من تجارب بعضنا (م. م ع. ٢)

All teachers, in my opinion, are interested in these technologies and its usage. I can see their desire to enrol in training courses at our university. The majority are well informed about these technologies and their applications. We are benefiting from our experiences (T.KA.2)

The questionnaire included statements connected to the drawbacks of using mobile devices that most teachers disagreed with. In the interviews, L2 Arabic teachers explained their disagreement with the drawbacks of using mobile devices, including that they are expensive, the technology is challenging to use, and there is a lack of interest. They indicated that mobile devices had become more affordable, and they were using mobile technologies at their best. Some universities were offering short training courses which were appreciated by teachers.

5.4.5 Factors influencing the attitude of L2 Arabic teachers toward MALL

The quantitative data in phase one revealed that three factors were influencing the attitude of L2 Arabic teachers toward MALL. The three factors were prior knowledge, Arabic specific, and Internet specifications.

In the qualitative interviews, the participants were first asked to illustrate any factor influencing their attitude towards MALL, which was not already mentioned in the questionnaire. They were then asked to assess their prior knowledge by themselves and to what extent they felt they were well informed about the usage of mobile devices in L2 Arabic learning. Finally, teachers were asked to explain the impact these three factors had on their using mobile devices in Arabic language learning.

5.4.5.1 Prior knowledge

Quantitative data revealed that the vast majority of L2 Arabic teachers had good prior knowledge of using mobile devices, see Table 4.11. A high percentage of them were able to access a social networking site (96%), download mobile applications onto their mobile devices (94%), find the definition of a word they did not know (91%), and translate a sentence into another language using a mobile device (88%),

The interviewees used smartphones to access social media, translate a word or sentence, send emails, and upload a file. On laptops, they used Microsoft Office and internet browsers to download eBooks and files.

بالنسبة للجوال أستطيع استخدام برامج التواصل الاجتماعي، تحميل وحذف التطبيقات، إرسال الرسائل الإلكترونية، تحميل الملفات. وبالنسبة للمحمول فأستطيع استخدام برنامج الوورد والإكسل والبوربوينت. وأستطيع البحث في المواقع وتحميل الكتب والملفات. (م. م س ٢.)

In regard to my smartphone, I can use social media, download and delete

applications, send emails and upload files. On my laptop, I can use Word,

Excel, PowerPoint, search engines, download books and files (T.KS.2)

Several teachers indicated a high level of proficiency when using mobile devices.

These teachers were able to use them to design software and perform maintenance on their

devices.

<div dir="rtl">

أنا أجيد استخدام الأجهزة المتنقلة عدا البرمجة. أستطيع العمل على برامج الأوفيس، وبرامج
التصميم مثل إلستريتور لتصميم ملصقات وإنفو جرافيك، والعروض التقديمية، البحث في محركات
البحث وقواعد البيانات، وأستطيع حل معظم مشكلات الكمبيوتر وبعض الصيانة (م. إ م. ٢).

</div>

I can use mobile devices except programming. I can use Microsoft Office,

designing software, such as Illustrator, for designing posters and

infographics, and do research using search engine and database. I can solve

most of my mobile device's issues by myself and do some maintenance.

(T.IM.2)

L2 Arabic teachers' prior knowledge of using mobile devices was good. Many

teachers were able to use most of the mobile devices features such as downloading mobile

applications, translating sentences into another language and accessing social media. Some

L2 Arabic teachers had a higher level of using mobile devices as they were able to do some

maintenance and designing.

5.4.5.2 Arabic specific

Principal Component Analysis (PCA) revealed four items in Arabic specific:

- Unavailability of L2 Arabic materials

- Inferiority of L2 Arabic materials

- Lack of support in Arabic mobile learning

- Lack of training in Arabic mobile learning.

Most interviewees described the unavailability of L2 Arabic materials as the most significant factor impacting their attitude toward using mobile devices in Arabic language learning. They added that this factor required experts and group efforts to design quality language materials or applications for mobile devices. They also indicated that the inferiority of L2 Arabic materials was a result of a lack of experts and research centres.

استخدام التقنية في تعليم اللغة العربية لغة ثانية يواجه كثيراً من التحديات، منها ما يمكن للأستاذ أو الطالب تجاوزه بمفرده ومنها ما يحتاج إلى عمل مراكز بحثية أو مؤسسات أكاديمية. على سبيل المثال: الأستاذ أو الطالب يستطيع حل مشكلة عدم توفر الإنترنت أو التقليل منها نوعاً ما. في المقابل إيجاد تطبيق لغة شامل أو محتوى بجودة عالية يحتاج إلى عمل منظم وهذا في نظري الأصعب. ألاحظ الطلاب والأساتذة لديهم الأجهزة والمعرفة ولكن المحتوى الجيد قليل جداً (م. ج ق. ٢)

Using technologies in L2 Arabic learning faces many challenges. Some of these challenges teachers or students can untie or minimise to some extent by themselves. Other challenges need research centres or academic foundations. For example, teachers or students can unite unavailability of the internet to some extent, with mobile data or develop his skills. In contract, having a comprehensive learning application or good quality of L2 Arabic learning materials for mobile devices need organised work. I believed this is the hardest part. I can see students and teachers having mobile devices and good knowledge, but the content is very rare. (T.QU.2)

Another interviewee provided an example of how the unavailability L2 Arabic learning materials has been a big challenge at his university

لدينا معمل لغة جُهّز بعدد كبير من أجهزة الكمبيوتر. لم يستخدم هذا المعمل لمدة لعدم وجود محتوى. وتم تحديث أجهزة هذا المعمل مرتين ومازال بدون محتوى. (م. أم. ١)

We have a language learning lab which prepared with many desktops. The

lab had not been used as a result of the unavailability of content. The

desktops have been replaced with new twice and still no content. (T.UM.1)

Regarding a shortage of support and a lack of training in Arabic MALL,

interviewees confirmed the quantitative results that most L2 Arabic teachers have good

skills to use their mobile devices in their daily life, but needed support in using these same

devices in Arabic learning, especially at their university

نظراً لاتساع مساحة الجامعة هناك حاجة لتواجد مركز دعم تقني في المعهد أو قريبا منه لتفادي الصعوبات التي تواجهنا في المعهد من حين لآخر. على سبيل المثال: غالباً أحضر بعض العروض للطلاب مع بعض الروابط التي تحتوي مقاطع صوت. أحياناً لا تعمل السماعات أو الإنترنت. ووصول التقني يتطلب وقتاً. (م. ج ق. ١)

Due to our big university campus, there is a need for a technical support

centre in our institute, or close to it, to avoid difficulties that we are facing

from time to time. For example, I often prepare PowerPoints slides for

students with links to audio. Sometimes speakers or the internet did not work.

Technician arrival requires time. (T.QU.1)

Concerning the lack of training in Arabic MALL, many interviewees indicated their

need to know more about new online Arabic Language projects or new learning resources.

عدم معرفتي بالتطبيقات والمواقع التي سألتني عنها في بداية المقابلة مثل العربية التفاعلية والعربية عبر الإنترنت تؤكد حاجتنا للتدريب. الفكرة السائدة لدينا في المعهد أن المحتوى والتطبيقات قليلة جداً كما ذكرت لك سابقاً. ما زلت مقتنعاً بذلك ولكن قلة التدريب أيضاً ساعد في تصور الوضع بشكل أسوأ. (م. ج ن. ١)

My lack of knowledge of applications and websites, which you asked me

about at the beginning of the interview, confirms our need for training. The

prevailing idea in our institute that L2 Arabic materials and applications are

rare as I told you previously. I am still convinced about it, but it seems that

the lack of training made it worse. (T.NU.1)

In the quantitative phase, a series of one-way ANOVA revealed that there were two

statistically significant differences in Arabic MALL between L2 Arabic teachers. The first

difference was based on age, see Section 4.2.7.1. Teachers over the age of 40 had a

significantly lower average score in Arabic specific.

The second difference was based on the institute, see Section 4.3.7.3, where the

subject was being taught. In the Arabic specific factor, the results indicated that there were

two statistically significant differences. First, teachers at IMISU Institute had a significantly

lower average score than teachers UAU Institute. Second, QU Unite had a significantly

lower average score than teachers UAU Institute, KAU Institute and PNU Institute, refer to

Table 4.16.

Having a lower average score means less impact, so Arabic MALL had less impact

on teachers over the age of 40 years, and less impact on teachers' at IMISU Institute and QU

Unite.

The qualitative interviews reinforced the findings outlined. Interviews illustrated

that PDF books as L2 Arabic learning materials were considered satisfactory by teachers

over the age of 40 years.

الأجهزة المتنقلة مكنت المعلم من تحميل عدد من الكتب التي يحتاجها بصيغة بي دي إف كمواد
تعليمية. ويمكن مشاركة هذه الملفات مع الطلاب فيمكنهم قراءة الكتب في أي وقت وأي مكان بدون
الحاجة إلى الإنترنت، وهذا أمر جميل جداً (م. ج إ. ٢)

Mobile devices enable teachers to download a number of books needed in
PDF format as learning materials. They can share these files with their
students so they can read anywhere anytime with no internet. This is very
interesting (T.IU.2)

On the other side, the teachers in the study under the age of 40 years expected more
features from mobile devices and L2 Arabic learning materials. They were looking forward
to mobile applications or online course where students can practice and improve their
Arabic language skills. Most of these teachers based their views or expectations on their
experiences with learning the English language aboard.

عندما نتحدث عن مواد تعليمية للأجهزة المتنقلة ففهمي ينصرف إلى مواقع وتطبيقات لتعليم اللغة
العربية مماثلة لتلك في اللغة الإنجليزية. موقعاً أو تطبيقاً على الجوالات يساعد في تعليم جميع
المهارات اللغوية الأربع لمختلف المستويات. على سبيل المثال: نصوص لتطوير مهارة القراءة
وتليها بعض الأسئلة للفهم، وبعد الانتهاء الإجابة يتمكن الطالب من التحقق من صحة إجاباته.
ومحتوى مسموع كذلك. مثل هذا المحتوى يمكن الطالب من الاستفادة من وقته خارج المعهد
ويحصل على تقييم من الموقع ونسبة إنجاز لتحفيزه على المواصلة. وهذا ما نحتاجه في الحقيقة.
(م. ج إ. ٢)

When we talk about language learning materials for mobile devices, my
understanding would be websites or mobile applications for Arabic language
learning similar to websites and applications of the English language.
Websites or mobile applications to support four language skills for different
levels. For example, reading text followed by some questions to assess
understanding. Learners will be able to check their answers once submitted.

Audio content, etc. This kind of content would help students to benefit from their time outside the institute. Website or application that can give learners grade or progresses percentage would motivate learners. This is what we need really. (T.IM.2)

With the second difference, the teachers at Imam University and Al-Qassim University had a lower average score than other universities in Arabic MALL. The majority of teachers at Imam University (83%) and Al-Qassim University (80%) participated in the questionnaire were over the age of 40, so age may have involved in the two statistically significant differences in Arabic MALL between L2 Arabic teachers.

In summary, the vast majority of L2 Arabic teachers believed that Arabic specific factors had a negative impact on their attitude toward using mobile devices in L2 learning. The lack of availability of L2 Arabic materials was the biggest challenge. Arabic specific factors had less impact on teachers over the age of 40, as PDF books were satisfactory for them. Meanwhile, teachers under the age of 40 in the study were expecting more features from L2 Arabic learning materials, such as mobile applications or online course, where students could practice and improve their Arabic language skills.

5.4.5.3 Internet specific

The Internet specifications looked explicitly at:

- Internet availability
- Internet reliability
- Internet speed.

In the quantitative data collection, most L2 Arabic teachers were unsatisfied with internet speed and reliability. However, they were satisfied with internet availability, as

seen in Table 4.13. Interviewees in the qualitative collection confirmed they were satisfied

with internet availability at their universities. However, they indicated several issues with

internet reliability and internet speed.

Most of the teachers identified in the interviews that they were displeased with

internet speed. They believed that it was not fast enough for their needs. They sometimes

needed to wait several minutes to play an online video. As such, they had to minimise using

the internet during their classes to save time in the lesson

الإنترنت متوفر في الجامعة، والتغطية ممتازة. الإشكال في سرعة الإنترنت خصوصاً في بداية
الدوام الصباحي. عند تواجد عدد كبير من أعضاء هيئة التدريس والطلاب في الجامعة يصبح
الإنترنت بطيئاً. أحياناً عند محاولة تشغيل مقطع عبر الإنترنت للطلاب ننتظر دقائق حتى يتم
تشغيل المقطع لذا أحرص غالباً على تحميل المقاطع على جهازي المحمول للحفاظ على الوقت. (م.
ج ق. ٢).

The internet is available at our university, and its coverage is good. The main

issue is internet speed, especially in the mornings. When many staff and

students are at the university, the internet becomes very slow. Sometimes

playing a video on YouTube requires a few minutes to start. I often attempt to

download videos on my mobile device to save time. (T.QU.2)

The second issue with the internet was reliability. Some interviewees illustrated that

from time to time, they faced internet failure and websites did not open despite students

being connected to Wi-Fi. That said, internet reliability was mentioned less when compared

to internet speed.

في بعض الأحيان الإنترنت يخذل توقعاتنا ولا نستطيع فهم ما يحصل. على سبيل المثال يكون
الجهاز متصلاً بالإنترنت ويعمل لوقت ما وفجأة يتوقف الإنترنت عن الوصول للمواقع. والأسوأ

عندما يحدث انقطاع الاتصال عند تحميل بعض الملفات أو البرامج ذات الحجم الكبير. يلزم إعادة التحميل والانتظار مجدداً. (م. أ ق. ٢)

Sometimes the internet let our expectation down, and we cannot figure out

what happened. My laptop is connected to the internet and is working fine.

Suddenly, the internet stops working and cannot access websites. The worst is

when this disconnection occurs during downloading large files or software

and requires re-downloading and waiting again. (T.UQ.2)

In the quantitative phase, a series of one-way ANOVA revealed that teachers at IMISU Institute had a significantly lower average score in internet specifications (M =2.54, SD = 1.00) than teachers at KAU Institute, PNU Institute, and IUM Institute, as in Table 4.16. The low average score meant internet specification had less impact on the teachers at IMISU Institute. To investigate why the teachers at IMISU Institute had a significantly lower average score, L2 Arabic teachers at the seven universities were asked to provide more details about their situation, such as classroom environment, average internet speed, and their internet usage.

Interviewees from IMISU Institute indicated that using the internet for Arabic language learning at their institute was limited due to the language classroom environment. They indicated that language classrooms at IMISU Institute did not have smartboards, speakers or projectors to stream YouTube videos, audio or even use PowerPoints slides. However, they did share some files and links via WhatsApp with students. IMISU Institute IUM Institute and UAU Institute had similar classrooms environments. Conversely, at KSU Institute, PNU Institute, QU Unite, and KAU Institute, classrooms were equipped with new technologies including smartboards and projectors.

In relation to the internet, the learning environment at IMISU Institute was not equipped with the new technology, and there was a limited usage of the internet to share links via WhatsApp. This helps explain why the teachers at IMISU had a significantly lower average score in internet specifications than teachers at KAU Institute, PNU Institute, and IUM Institute, see Table 4.16.

5.5 Learners interview results (Section Two)

5.5.1 Demographics

Sixteen L2 Arabic learners from the seven universities participated in this study, refer to Table 5.5. There were 11 males and five females (N=11).

Table 5.5 Demographic descriptors of participants

Institute	Number	Gender	
		Male	Female
IMISU Institute	2	2	-
KSU Institute	2	1	2
PNU Institute	2	-	3
UAU Institute	2	2	-
KAU Institute	2	2	-
IUM Institute	2	2	-
QU Unite	2	2	-
Total	16	11	5

5.5.2 Mobile devices and platforms

The first research question of this study was what type of mobile devices and platforms L2 Arabic learners and their teachers currently used. Quantitative analysis revealed that smartphone devices were used by the vast majority of L2 Arabic learners (91%), while only less than half of the L2 Arabic learners used laptops (35%) and few

students used tablet devices (15%), as in Table 4.18. Macintosh was the most common operating system for laptops, while Android was the most used platform for smartphones, followed by IOS.

To investigate why many L2 Arabic learners chose to use these devices, they were asked in the interviews to explain their selection criteria. The L2 Arabic learners identified different reasons for choosing mobile devices, platform, or operating system, which were categorised into three subthemes:

- Financial

- Technical

- Security.

5.5.2.1 Financial

Several financial reasons mentioned by L2 Arabic learners in their interviews included the price of the device and the cost of apps. Most L2 Arabic learners indicated that the cost of buying mobile devices had the highest impact on their decision of MDs selection.

> المكافأة لا تمكنني من شراء جهاز بسعر مرتفع والجامعة لا توفر أجهزة للطلبة. سعر الآيفون
> الجديد يتطلب ادخار مبلغ المكافأة كاملاً لمدة تزيد عن ستة أشهر. هذا مستحيل بالنسبة لي. هناك
> أجهزة ذكية منخفضة السعر من الصين ويمكن أن تقوم بالعمل مثل الأجهزة الغالية. أعني تحميل
> التطبيقات وهي أهم شيء في امتلاك الجوال الذكي (ط. أ ق. ١)

My living allowance did not help to buy an expensive device, and my

university did not provide devices to the students. The price of an iPhone

requires saving my total living allowance for more than six months. This is

impossible for me. There are cheap smartphone devices from China which

can do the same job of expensive devices. I mean downloading applications is the most important thing about having a smartphone in my view. (S.UM.1)

Some L2 Arabic learners indicated that mobile applications were another reason to choose Android devices.

هناك بعض التطبيقات المجانية على نظام الأندرويد فقط. على سبيل المثال أذكر أني أبلغت صاحبي من كندا عن تطبيق للمساعدة في معرفة الطريق (ملاحة) ولأن جواله آيفون ٨ لابد أن يدفع ليستخدم التطبيق. وهناك تطبيقات أخرى. (ط. ج ق. ١)

There are some free applications only available on Android. For example, I remember that I advised my friend from Canada to use a navigation app. Because his mobile is iPhone 8, he has to pay to use the application, and there are similar applications. (S.QU.1)

The cost involved in using mobile devices, including devices price and paid applications, were the main two financial reasons indicated by L2 Arabic learners in this study. These two reasons played a role in selecting Android mobile devices.

5.5.2.2 Technical

L2 Arabic learners with Android devices, especially smartphones, indicated that they believed that Android devices were easy to use.

في وجهة نظري أن نظام الأندرويد أسهل من استخدام أجهزة الآيفون. على سبيل المثال: الوصول لشبكات الواي فاي. سحب الشاشة من الأعلى ومن ثم الضغط مطولة على أيقونة الواي فاي وينتقل مباشرة لقائمة الشبكات بشكل مختصر. (ط. م ع. ٢)

In my opinion, Android devices are easier to use than iPhones. For example, accessing Wi-Fi list can be done through a shortcut, by swiping down on the top edge of the screen and then pressing and holding on the Wi-Fi icon,

which will take you to the list of Wi-Fi. Such a shortcut is not available on

the iPhone. (S.KA.2)

Other learners indicated that Android devices could be personalised more than

iPhones.

إحدى أهم مميزات أندرويد في نظري – بعد السعر بالتأكيد ـ أنه يمكن أن أضع نافذة للتطبيقات
على شاشة الجوال. على سبيل المثال يمكن أن أضع نافذة للتقويم أو تطبيق المهام ولا أحتاج أن أفتح
الجوال كل مرة لمراجعة المهام. (ط. م ع. ٢)

One of the best advantages of Android, in my opinion, after the price of

course, is widgets on the home screen. For example, I can add a calendar

widget or task widget on the home screen, so I don't need to open my

smartphone every time to check the tasks. (S.KA.2)

Android devices were the most used mobile devices by L2 Arabic learners. Many

L2 Arabic learners indicated two technical reasons: ease of use and personalisation features.

5.5.2.3 Security

Although using a laptop was not popular with some L2 Arabic learners, Macintosh

was the most used operating system (33.5%). Learners who owned a Macintosh is more

secure, performance is better, and they last longer.

اخترت جهاز ماك بوك برو لأنه أكثر أماناً. جهازي الماك معي منذ سنوات وما زال يعمل جيداً. لم
يصبح بطيء ولا أحتاج لعمل فورمات على خلاف جهازي الويندوز سابقاً (ط، م ع، ١)

I have chosen the MacBook as a laptop because it's more secure. My

MacBook Pro has been with me for years. It still works great. Doesn't slow

down and I did not have to format it at all. While my previous windows

laptop was the opposite. (S.KA.1)

Security and performance were reasons why L2 Arabic learners chose Macintosh laptops over Windows laptops.

5.5.3 Current use of mobile devices

Three aspects of using mobile devices were included in the questionnaire and the follow-up interviews to get a better understanding of current L2 Arabic learners' mobile use. These aspects were mobile applications, Arabic language materials, and using mobile devices in the classroom.

5.5.3.1 Mobile applications

Quantitative data revealed that the most used application by students was WhatsApp (82%) followed by Facebook (56%), and YouTube (48%). In Arabic language learning, the most used application by L2 Arabic learners was *Almaany* dictionary (85%) followed by YouTube (46%), see Section 4.3.3. Although there are 19 applications which taught Arabic language (Heil et al., 2016), including a mobile application called *Interactive Arabic* launched by King Saud University, included in this study none of the participated learners reported using any of these applications.

To investigate why L2 Arabic learners did not list any applications which taught Arabic, learners were asked in the interviews how they used some social media apps, such as YouTube, to learn Arabic. Moreover, they were asked if they had heard about other applications that taught Arabic. Three subthemes emerged from L2 Arabic learners' interviews explaining why they were not using applications which taught Arabic in their Arabic learning. These subthemes were lack of apps, limited content of the apps that did exist, and institution policy.

5.5.3.1.1 Lack of apps availability

Most L2 Arabic learners believed that the number of applications which taught Arabic is insignificant in app stores. As a result, they tended to use some social apps, such as YouTube, for learning.

<div dir="rtl">

أستخدم اليوتيوب غالباً لمساعدتي في تعلم اللغة العربية لأن التطبيقات المناسبة غير متوفرة. بعض الطلاب الذين تخرجوا في المعهد قاموا بعمل قناة على اليوتيوب لتعليم اللغة العربية خصوصاً النحو. يشرحون الدروس باللغة العربية وأحياناً يوجد مفردات أو عبارات إنجليزية للمساعدة. (ط. ج إ. ٢)

</div>

I often use YouTube to help me in Arabic language learning because there are no useful applications. Some graduate students from our institute launched their own channels on YouTube to teach the Arabic language, especially syntax. Their lessons are in the Arabic language, and sometimes they use English vocabulary or phrases for assistance (S.IM.2)

WhatsApp was another common application used by L2 Arabic learners. Learners indicated that they used WhatsApp groups to share knowledge, such as Arabic learning materials in a PDF format. Some of these groups included students from different universities within Saudi Arabia, or outside Saudi Arabia such as Egypt, and at different language levels. The Arabic language is the most used in this group, while English is used rarely.

<div dir="rtl">

لدينا مجموعة في الواتس أب مع بعض الزملاء لمشاركة المصادر والإجابة على الأسئلة. هذه المجموعة لها عدة سنوات وفيها طلاب من مستويات متقدمة وبعضهم تخرج. هي مفيدة جداً لنا ليست فقط للغة العربية فقط بل حتى لمعرفة نظام الجامعة كذلك. (ط. ج إ. ٢)

</div>

We have a WhatsApp group with some friends to share recourses and answer questions. This group has existed for a few years. It includes graduate

students or those at an advanced level. It's very useful not only for learning

the Arabic language but to help with a better understanding of the university

system. (S.IM.2)

Another student disclosed how they used WhatsApp to support their learning:

<div dir="rtl">
مجموعتنا في الواتس أب تضم عدد من الطلاب من جامعات مختلفة في السعودية ومن خارج
السعودية أيضاً. لدينا بعض الأعضاء يدرسون في مصر. نتشارك المصادر وهذا مفيد. في
السعودية غالباً الجامعات تستخدم كتبها التي ألفها أساتذتها وهي لم تحدث غالباً، وبعض الجامعات
يستخدمون العربية بين يديك. في مصر لديهم مصادر مختلفة وأحياناً نجدها مفيدة لنا. (ط. م ع. ١)
</div>

Our WhatsApp group included a number of students from different

universities in Saudi or outside Saudi. We have some members studying in

Egypt. We share resources which are useful. In Saudi universities, most of

them use their books that wrote by their teachers. These books are not

updated generally. Other Saudi universities use *Al Arabiyyah Bayna Yadayk.*

In Egypt, they have different resources which we found useful sometimes.

(S.KA.1)

L2 Arabic learners indicated that there were a limited number of applications that

taught Arabic available in app stores. They were using social media and instant messaging

applications to assist them in their Arabic language learning. L2 Arabic learners commonly

used WhatsApp to share learning materials files and watched Arabic channel on YouTube.

5.5.3.1.2 Limited content within apps

Many L2 Arabic learners indicated that they found very few applications which

taught Arabic on Google Play and App Store. Those that were available were limited to

straightforward Arabic content, such as beginner vocabulary or bilingual dictionaries apps.

Some of the L2 Arabic learners indicated that they could not find any Arabic apps during their search on the App Store or Google Play that provided rich content for different learning levels. Most of the results were applications designed for Arabic children to learn the Arabic Alphabet and basic words.

<div dir="rtl">

اللغة العربية هي اللغة الثانية التي أتعلمها بعد الإنجليزية. لا يوجد برنامج على الإنترنت أو تطبيق على الأجهزة لممارسة ما نتعلمه في المعهد خارج القاعة. في اللغة الإنجليزية كان هناك مواقع يمكن أن نكمل التدريبات لزيادة الفهم، وكذلك القراءة والاستماع. في العربية بحثت ولم أجد في التطبيقات شيء مفيد. (ط. ج ق. ١)

</div>

The Arabic language is the second language that I am learning after the English language. There is no online programme or application for mobile devices to practice what we have learned at our language institute classes. In the English language, there was a website where we can do more exercises, reading, and listening. In the Arabic language, I have tried, but I did not find any useful application. (S.QU.1)

Most L2 Arabic learners mentioned that finding mobile applications that taught the Arabic language for multi learning levels was not easy. Most of their search findings were applications designed for Arabic children.

5.5.3.1.3 Institute policy

Some L2 Arabic learners indicated that their institutes contributed to their lack of knowledge about Arabic language applications and online programme. They explained that teachers never mentioned or recommended any applications or online resources to help their Arabic language learning. None of the institutes provided training or support for using technologies in Arabic language learning.

أساتذتنا لا يستخدمون أي تطبيق في تعليم اللغة العربية. يستخدمون فقط الكتب المطبوعة. كذلك لا

يرشدوننا إلى أي تطبيق أو برنامج على الإنترنت لمساعدتنا. بعض الأساتذة يقول إنه لا يعرف أي

تطبيق جيد لينصحنا به. (ط. ج إ. ٢)

Our teachers are not using any application in Arabic language learning. They

are using printed books only. In addition, they are not recommending any

application or online programme to help us. Some teachers said they do not

know any good app to recommend. (S.IM.2)

Several L2 Arabic learners expected support from their institutes and teachers in

using mobile devices in their Arabic language learning. However, the institutes did not

provide any training or support, and teachers did not recommend or mention any Arabic

language applications for the learners.

5.5.3.2   Arabic language materials

Many L2 Arabic learners indicated in the questionnaire that they used mobile

devices to download PDF books on their mobile devices (51%), see Section 4.3.3. *Arabic

Between Your Hands* was the most popular PDF book mentioned (29%) followed by *Al-

Ajrumiyyah* (12%), *Jami' Ad-durus Al-Arabiah* (5%) and *Awdah al-Masalik* (5%). These

PDF books teach the Arabic language at different levels. *Arabic Between Your Hands* is

explicitly designed for L2 Arabic learners. However, *Awdah al-Masalik* is an advanced

Arabic book used usually to teach Arabic language syntax at Arabic language colleges. No

generic Arabic books such as stories, novels or poetry were mentioned.

In the subsequent interviews, most of the interviewees indicated that there were

minimal L2 Arabic learning materials available to them. Some of these also noted that they

did not know of any Arabic online websites where they could download general PDFs

books. Some beginner learners disclosed that they relied on "non-Arabic materials" as an introduction or guide to learning Arabic. They described "non-Arabic materials" as books written in other languages, such as English.

في بداية تعلمي للعربية كنت أعتمد على كتب غير عربية لمساعدتي في فهم قواعد العربية فهماً جيداً. كانت كتباً مفيدة جداً. المؤلفون غير عرب، وقد مروا بمرحلة التعلم وصعوباتها؛ لذا هي جيدة لنا. (ط. م س. ١)

At the beginning of learning Arabic, I was relying on non-Arabic books to help me fully understand Arabic grammar. These books were very useful. The authors of these books were non-Arabic. They went through the learning stages and its difficulties, so I think it was very good for us. (S.KS.1)

However, some interviewees already knew and used *The Comprehensive Library,* which contains more than 7,000 free Arabic E-books in more than 40 categories. Most of these books require a good understanding of the Arabic language. This library has a mobile application for both platforms, iOS and Android, and it can be downloaded on a laptop. The interviewees who knew about this site were at the final level of their Arabic courses at their institutes and were preparing to join colleges.

5.5.3.3   Mobile devices in the classroom

Quantitative data revealed that most L2 Arabic learners were using mobile devices in their classroom. The most common use was *to look up something they did not know during class*, followed *by taking pictures or video for an assignment* and then *being engaged in social networking*.

A learner indicated how using mobile devices in the classroom helped him:

في الفصل دائماً أستخدم الجوال للبحث عن معنى كلمة جديد. أنا لا أحب أن أسأل عن معنى كلمة أمام الطلاب. هو أمر محرج بالنسبة لي. بعض الطلاب درس العربية في بلده سنوات قبل القدوم للسعودية، أو أنه من أصل عربي ولكن عاش خارج بلده؛ لذا لديهم مفردات كثيرة جداً. (ط. م ع. ٢)

I always use my mobile device to find the meaning of new words. I do not like to ask in front of students. It is embarrassing for me. Some students studied Arabic for years in their countries before coming to Saudi, or they are originally from Arabic countries but lived abroad, so they know more words. (S.KA.2)

Another learner added:

الأساتذة غالباً يستخدمون سبورة القاعة خلال الدرس. ولا يوجد وقت كافي للكتابة قبل الدرس التالي. والأستاذ الجديد سيمسح السبورة ليبدأ درسه. فنصور السبورة ونرسلها لمجموعة القاعة في الواتس أب ونكتب في المنزل. (ط. ج إ. ٢)

Teachers often use the board during lessons. There is not enough time to write everything down before the next lesson. The next teachers would need to clean the board before he starts his lesson. So, we take pictures and share it with our class WhatsApp group and write at home. (S.IM.2)

One learner disclosed how they use applications:

أستخدم في جهازي اللوحي (التابلت) برنامج إفرنوت بدلاً عن الدفتر. أنشأت مجلداً لكل مادة. كل محاضرة لها ملاحظة خاصة تحت ملف المادة مؤرخة ومعنونة. تشمل أهم نقاط المحاضرة وبعض الصور للسبورة. في بعض الأحيان يضيق الوقت عن الكتابة فأسجل المصلوب بصوتي وأضيفه للملاحظة. في المنزل أكمل المطلوب. (ط. ج ق.٢)

I use the Evernote app on my tablet instead of a paper notebook. I create a

file for each unit. Each lecture has a note, under the unit's file titled and dated,

as well as the lecture's key points with some board pictures. Sometimes I do

not have enough time to write. So, I record notes or tasks and attach them to

the lecture's note. At home, I listen to the recording and do the task. (S.QU.2)

Using a mobile device in Arabic language classroom was popular between learners

in this study. Learners used their mobile devices for various purposes, such as finding new

words meaning or taking a picture of the classroom board.

5.5.4 Attitude of L2 Arabic learners towards MALL

The benefits of mobile devices were used to assess the attitude of L2 Arabic learners

toward MALL in order to answer the third research question (see Table 4.20). Quantitative

data showed that L2 Arabic learners had a positive attitude toward mobile assisted language

learning. Most of them believed that MALL would bring new opportunities, would improve

communication between students and teachers, could be a flexible method of language

learning that could be done anytime anywhere, and could be an effective method of learning

as it gave immediate support, refer to Table 4.27. The PCA did not reveal any drawback of

mobile devices items, which can be seen as a positive, refer to Table 4.20.

5.5.4.1 Benefits of MDs

The qualitative interviews revealed that the majority of L2 Arabic learners strongly

believed that using mobile devices in L2 Arabic learning was very useful. Learners were

asked to illustrate any advantage of using mobile devices in L2 Arabic learning not already

mentioned in the questionnaire. They were then asked to explain how they agreed with

statements regarding the benefits of using mobile devices to gain a better understanding. No new benefits emerged from the interviews.

The most common benefit of using mobile devices, as seen by the L2 learners, was that using them brought new learning opportunities. The learners were asked to explain or give examples of these new opportunities.

في معهدنا الأساتذة غالباً يستخدمون طريقة المحاضرة لشرح الدرس فهم يتحدثون ونحن نستمع أو يقرأ أحد الطلاب النص من الكتاب والأستاذ يعلّق على النص أو يذكر أمثلة للتوضيح وعند مرور كلمة جديدة لي قاموس الجوال يساعدني في إيجاد معنى الكلمة التي أريد بدون أن أقاطع الأستاذ للسؤال عن معنى الكلمة (ط. ج إ. ٢)

In my institute, teachers often use the lecture method to teach the lesson. So, they do the talking and we listen, or one of the students reads the text and teachers add comments or examples for clarification. When a new word for me comes up, my smartphone dictionary will help me to find the meaning without interrupting the teacher to ask them about the meaning. (S.IM.2)

The second common benefit of using mobile devices, as seen by L2 learners, was that using mobile devices improves communications between students and teachers.

قناة التواصل بيننا وبين الأساتذة هو برنامج الواتس أب. الأساتذة موجودون في مجموعة القاعة. يجيبون على الأسئلة غالباً وبعضهم يرسل صوراً (تصاميم) تلخص محتوى الدرس الذي درسناه. (ط. ج إ. ١)

WhatsApp is the main communication channel between our teachers and us. They are in our class groups on WhatsApp. They often answer questions, and some of them send some pictures (SmartArt Graphic) to summarise a lesson that we just learnt. (S.IM.1)

The third benefit of using mobile devices was that MALL would be a flexible method of learning as it could be done anytime, anywhere. Many learners indicated that their mobile devices helped them to extend their learning Arabic to anywhere.

لدي في الجوال عدد من القصص باللغة العربية بصيغة بي دي إف. أستخدمها لتحسين مهارة القراءة وزيادة المفردات. على سبيل المثال بعد العصر أذهب لنادي الطلاب لأن المكان هادئ ومناسب للقراءة ولا أحتاج لحمل القصص معي. (ط. إ م. ١)

There are many stories in the Arabic language available as PDFs on my mobile device. I use them to improve my reading skills and build my vocabulary. For example, I usually go to the student's club in the evenings as the place is quiet and suitable for reading, and I do not need to carry books with me. (S.IM.1)

Many L2 Arabic learners mentioned three benefits of using mobile devices. These benefits were that using mobile devices brought new learning opportunities, improved communications between students and teachers, and would be a flexible method of learning as it could be done anytime, anywhere.

5.5.5 Factors influencing the attitude of L2 Arabic learners toward MALL

The quantitative data in Phase One revealed that three factors were influencing the attitude of L2 Arabic learners toward MALL. The three factors were:

- Prior knowledge
- Arabic MALL
- Internet specifications.

In the qualitative phase, the interviewees were asked first to illustrate any factors influencing their attitude toward MALL, which was not already mentioned in the questionnaire. They were then asked to assess their prior knowledge by themselves and to what extent they felt well informed about mobile devices usage in L2 Arabic learning. Finally, they were asked to explain the impact of these three factors on their using mobile devices in Arabic language learning at their universities.

5.5.5.1 Prior knowledge

The quantitative data revealed that the vast majority of L2 Arabic learners had good prior knowledge of using mobile devices, refer to Table 4.31. A high percentage of them (86%) were able to download mobile applications, access a social networking site on a mobile device (84%), find the definition of a word they did not know on a mobile device (84%), set the alarm for a potential due date on a mobile device (81%), download a podcast (79%), and post a comment to a blog or respond to a post on a mobile device (77%).

During the interviews, many learners confirmed that they are using mobile devices in most of their daily life activities including their Arabic language learning without any difficulties

استخداماتي للجوال كثيرة. في تعلم اللغة العربية ترجمة المفردات والجمل وقراءة الكتب هي الأكثر. الدخول إلى وسائل التواصل الاجتماعي مثل واتس أب وتوتير وفيس بوك. أيضاً استخدام الكاميرا لتصوير – سكانر ـ للمستندات المهمة وحفظها في قوقل درايف. (ط. ج س. ٢)

I use my mobile device in many ways. In Arabic language learning,

translating words or sentences and reading books are the most frequent use.

In addition, I use my mobile device to log in to social media applications such

as WhatsApp, Twitter, Facebook. I also use it to take pictures of some

documents, scanning and save it to my Google Drive. (S.IS.2)

The vast majority of L2 Arabic learners confirmed that they knew how to use their mobile device to download mobile applications, find the definition of a word, access social networking and post a comment to a blog. This reflects a good prior knowledge of using mobile devices.

5.5.5.2 Arabic specific

Arabic MALL was the second factor that was influenced by the attitude of L2 Arabic learners. This factor had two items: the lack of availability of L2 Arabic materials, and the inferiority of L2 Arabic materials, see Table 4.32. Generally, the L2 Arabic learners agreed that the inferiority of Arabic language learning materials was an obstacle for using mobile devices. They also saw the lack of availability of Arabic language learning materials another obstacle, refer to Table 4.32.

In the interviews, learners indicated this factor as the most significant, and it negatively impacted their attitude toward using mobile devices in Arabic language learning. Most interviewees indicated that inferiority of L2 Arabic materials and unavailability of L2 Arabic materials was the most challenging factors for them. They added that this shortcoming required expertise, professional skills, and group efforts to design quality language materials or applications for mobile devices and make it available in suitable digital format. Most of the learning materials available seem to have been produced through individual efforts. Consequently, the outcomes resulted in materials with a lack of resolution and clarity.

المصادر المتاحة لمتعلم اللغة العربية في المستويات الأولى قليلة جداً. وهي سلسلة المعهد الذي
يدرس فيه أو العربية بين يديك. عندما يتقدم مستوى الطالب مثلاً في المستوى الثالث أو الرابع
يمكنه أن يبدأ باستخدام كتب مخصصة للطلاب العرب مثل الأجرومية وغيرها ولكن الطالب
المبتدئ يواجه صعوبة حقيقة في إيجاد المراجع المناسبة له. (ط. ج ق. ١)

Available resources for L2 Arabic at lower levels is very limited. It includes

the institute's series where learner is studying or *Al Arabiyyah Bayna Yadayk.*

When a learner's language level improves, he could use books designed for

native Arabic learners such as Al ajrumiyyah and others, but beginner

learners are facing a real challenge to find a suitable resource. (S.UQ.1)

Arabic language learning materials for L2 learners were the biggest obstacle to
using mobile devices. L2 Arabic learners indicated that inferiority of L2 Arabic materials
and unavailability had negatively impacted their attitude toward using MDs in Arabic
language learning.

5.5.5.3   Internet specific

Internet specifications included three aspects of the internet, namely availability,
reliability, and speed. In the quantitative phase, most L2 Arabic learners were unsatisfied
with internet reliability (M = 3.40, SD = 1.20), availability (M = 3.29, SD = 1.34) and speed
(M = 3.20, SD = 1.32), see Table 4.33.

This dissatisfaction was reinforced during interviews. Some of the learners indicated
that they did not have access to the internet throughout their campus, and the internet was
only available at the language institute, colleges, or library. Participants living in student
accommodation reported that there was no internet connection available. Other learners
pointed out that the internet at their university was prolonged and had some restrictions. For
example, some social media applications or websites were unavailable during working
hours (9am – 2pm).

المدينة الجامعية كبيرة. والإنترنت متوفر في الكليات والمكتبة فقط. أما في سكن الطلاب فلا يوجد
فيه إنترنت، وهذا يجبر الطالب على شراء إنترنت خاص به للقيام ببعض المهام البسيطة. أما
تحميل الملفات أو البرامج فليزمنا الانتظار لليوم التالي لاستخدام الإنترنت في المعهد أو المكتبة،
ونتمنى أن يتاح الإنترنت في السكن قريباً. (ط. إ م. ١)

Our university campus is very large. The internet is only available at colleges
and the library. Student accommodation is not covered by the internet. This is
forcing students to buy their own internet to do some simple tasks. We must
wait till the next day to download large files or applications to use the internet
at the institute or library. We hope the internet would be available at our
accommodation soon. (S.IM.1)

Internet was unsatisfied for L2 Arabic learners in term of availability, reliability, and
speed. Some learners indicated that internet was not available at some locations at their
university such as student's accommodation. Others indicated that there were some
restrictions on some websites during certain hours.

5.5.6 Summary

In the interviews, participants identified three reasons behind the popularity of
Android devices among L2 Arabic learners and their teachers. The reasons were financial,
technical, and security. Of these, the financial reason was the most influential.

The current use of mobile devices by L2 Arabic learners and their teachers was
centred on using social media application such as WhatsApp and YouTube. Participants
stated that lack of apps, lack of the content within the available app and institution policy
were reasons for not using any Arabic mobile applications. Participants appeared to have

limited knowledge about mobile applications, online programmes or websites that were available for L2 Arabic learning.

Both L2 Arabic learners and their teachers showed a positive attitude toward using mobile devices in their Arabic language learning. The current use was centred around using social media application such as WhatsApp and YouTube. None of the participants mentioned any Arabic mobile application or website. They stated that mobile Arabic applications were limited on applications stores.

Three factors were influencing L2 Arabic learners and their teachers toward using mobile devices. The factors were prior knowledge, Arabic specific, and Internet specific. L2 Arabic learners and their teachers showed a good prior knowledge of using these mobile devices. However, they were not satisfied with the availability and quality of Arabic learning materials, nor the Internet in terms of speed, availability, reliability.

Chapter 6

Discussion

6.1 Introduction

This chapter discusses the main findings of the study, which aimed to gain a greater understanding of the attitude of L2 Arabic learners and their teachers toward mobile assisted language learning (MALL). In order to accumulate this understanding, an explanatory sequential mixed methods design was used to analyse the results obtained by the study. In an explanatory sequential design, quantitative data (numeric) is collected and analysed first to provide a general understanding of the research problem. Qualitative data (text) was also collected and analysed to explain or elaborate upon the results from the quantitative stage in more depth (Ivankova et al., 2006). As the study had four research questions, the findings of both L2 Arabic learners and their teachers was broken up into four sections:

- Which mobile devices, platforms, and operating systems do L2 Arabic learners and their teachers currently use? (RQ1)
- How do L2 Arabic learners and their teachers currently use their mobile devices? (RQ2)
- What are attitudes of L2 Arabic learners and their teachers toward MALL? (RQ3)
- What factors influence attitudes of L2 Arabic learners and their teachers toward MALL? (RQ4)

6.2 Mobile devices and platforms

One of the critical success factors for M-learning is mobile device ownership (Alrasheedi & Capretz, 2015). In terms of ownership, there are two ways of acquiring mobile technologies: a 'bring your own device' (BYOD) or an organisation provided device (OPD) (Handal et al., 2014). Naturally, each method has its own advantages. The BYOD enables ubiquity, familiarity, and an acceptable cost. Meanwhile, the OPD model can provide instant equity and security/institutional control over patterns of use (Reid & Pechenkina, 2016). As found in Reid and Pechenkina's study (2016), what they both have in common is that neither had a significant effect on how learners engaged with M-learning tasks.

Mobile device ownership is not always guaranteed. A study at an Australian regional university found that first-year students who studied on campus or were from non-English speaking families, were unlikely to own a mobile device (Farley et al., 2015). Anderson (2014) also noted that students from lower socioeconomic backgrounds were less likely to own smartphones. Al-Shehri (2012) indicated that the Arab world is a suitable and effective context of study for mobile learning due to the widespread use and ownership of mobile devices. In Saudi Arabia, which provides the context of this study, 93% of individuals aged between 12-65 years of age use a mobile phone (General Authority for Statistics, 2018).

In this study, it was interesting to find that 97% of L2 Arabic teachers and 96% of L2 Arabic learners owned a mobile device irrespective of device type, with some of them even having more than one device, as seen in Table 4.2 and Table 4.18. This widespread use of mobile devices in Saudi Arabia could potentially maximise the possibility of success for mobile language learning. However, only 35% of L2 Arabic learners owned a laptop,

while 15% of them owned a tablet. This needs to be taken into consideration when designing learning activities, as a smartphone might be useful for using the internet or using some applications, but it might not be the student's preference for compiling or submitting their essays (Reid & Pechenkina, 2016).

The study also found that L2 Arabic learners and their teachers used various mobile devices, platforms, and operating systems, see Sections 4.2.3 and 4.3.2. This variety of platforms and software has implications for the design and development of mobile language learning materials and applications. For instance, Farley et al. (2015) pointed out that different operating systems might manage files differently. Learning materials need to be provided as PDFs, .doc, .xls, or .ppt formats to be accessible, as many students use software packages that did not work with the Office Open XML formats, such as .docx, (Farley et al., 2015).

 In their study, Reid and Pechenkina (2016) indicated that a student's choice of the device was dependent on different factors, such as previous experience with technology, brand loyalty and preference of device or operating system. In this study, interviews revealed that the participants' device choice was dictated by three reasons: financial, technical, and security. Of these, the financial factor was the primary influencer for 79% of the L2 Arabic learners and 53% of their teachers to buy Android devices, refer to Sections 4.2.3 and 4.3.2. The financial factor included the price of the device, its repair parts, and the cost of applications.

Dependent on what kind of device it, there can be a significant difference in prices in Saudi Arabia. Currently, the iPhone 11 Pro price is SR 5,899 (AU$ 2,564) while the Huawei P30 Pro is less than half of the price at SR 2,069 (AU$ 899). Elsewhere, the price of Samsung Galaxy in Jarir, a national retailer in Saudi Arabia, the s20 plus 128 GB is SR

4,139 while iPhone 11 Pro Max 256 GB is SR 5,399. This is consistent with what a teacher interviewee indicated regarding price differences between iOS and Android devices in Saudi Arabia. He indicated that his Huawei P9 was cheaper than an iPhone by SR 1,100. However, he believed that the iPhone had no technical advantage that made it worth the extra cost.

For L2 Arabic learners with a limited living allowance of around 840 SR per month, this price gap between iOS devices and Android, which can range between SR 1,000 – 2,500, could make it more financially challenging to upgrade to a more advantageous device. This could explain why 79% of the L2 Arabic learners own an Android device. A learner interviewee indicated that buying an iPhone would require saving his total living allowance for more than six months, which was impossible for him. He also indicated that there were cheap smartphone devices from China which could do the 'simple jobs' just as well as expensive devices. He described a simple job as downloading applications, which was the most important thing for having a smartphone in his view, see Section 5.5.2.

In summary, smartphones were the most owned mobile device by L2 Arabic learners and their teachers. A small number of L2 Arabic learners owned a laptop and tablet devices which needs to be taken into consideration by developers when designing a mobile learning programme for the Arabic language, as smartphones might not be student's preference for some learning tasks. Various platforms and operating systems were used, so the format of materials needs to be considered to ensure they are accessible to all. The financial factor was the main reason for Android devices being used by most L2 Arabic learners and their teachers.

6.3 Current use of mobile devices

Mobile devices, such as smartphones, tablets, and laptops, are prevalent in our daily lives; whether we are at home, work, studying or at leisure (Roberts & Rees, 2014). Oblinger (2004) described learners as "accustomed to operating in a digital environment for communication, information gathering and analysis" and to be "always on" as they communicated with friends and peers via mobile phone, messaging, and email (p. 2). This was before Facebook (founded in 2004), YouTube (founded in 2005), Twitter (founded in 2006), and the first iPhone in 2007.

Due to the widespread use of mobile devices and applications, a large number of studies have reviewed the integration of mobile devices into learning and teaching (Fleischer, 2012; Hwang, Chu, Lin, & Tsai, 2011; Pullen et al. 2015). The most recent generation of mobile devices has offered language learners an opportunity for experiential learning, using authentic materials and increased interaction with a variety of self-chosen participants.

In this study, three open-ended questions were asked to discuss how L2 Arabic learners and their teachers used their mobile devices. The first question asked what lifestyle mobile app they used the most. The second question was what mobile app was used the most to support Arabic teaching. The third questions focussed on what content was used the most to support Arabic teaching. The following sections will discuss the three questions sequentially.

6.3.1 Lifestyle mobile app

WhatsApp, Facebook, and YouTube were the most used applications by L2 Arabic learners and their teachers, as indicated in Table 6.1. These findings are not surprising as,

according to Puri-Mirza (2019), 73% of people in Saudi Arabia use WhatsApp, 71% use YouTube, and 66% use Facebook. The popularity of instant messaging and social media applications between L2 Arabic learners in Saudi Arabia is consistent with findings among Arabic learners in Malaysia. Sahrir, Zainuddin, and Nasir (2016) found that 96% of Arabic learners were using WhatsApp while (94%) of the learners were using Facebook.

Table 6.1 Mobile App and contents used by L2 Arabic students and their teachers

Lifestyle mobile app	Learners	Teachers
WhatsApp	82%	87%
YouTube	48%	78%
Facebook	56%	-
Mobile app for Arabic learning		
Dictionary '*Almaany*'	85%	55%
YouTube	46%	62%
Learning Contents		
Arabic Between Your Hands	29%	65%
Al-Ajrumiyyah	12%	-

Interviews also revealed that L2 Arabic learners and their teachers used WhatsApp as a learning management system, see Section 5.4.3.1.1, with WhatsApp groups being the main communication channel to send and receive tasks. At some Arabic institutes included in this study, the admission departments of universities created one group for students and another for teachers. A student is added to the student group once he has enrolled and removed once he has graduated. All announcements regarding university life, such as exam timetables and key dates, were sent to these groups, refer to Section 5.5.3.1.1.

Social media applications, such as Facebook, Twitter, WhatsApp, and WeChat, have attracted millions of users around the world. These applications have been used by L2 learners and their teachers as language learning sites or as a learning management system.

Mompean and Fouz-González (2016) used Twitter as a learning tool with Spanish EFL students. They found using Twitter encouraged student participation which, in turn, and with instruction, had the beneficial effect of seeing their pronunciation of target words improve. Additionally, WeChat was used to help support Chinese second language learners. Nine discussion topics were assigned over the semester, and learners were asked to submit their recordings via WeChat platform. The results revealed that feedback provided through WeChat enhanced learner's speaking ability and enhanced their positivity (Xu & Peng, 2017).

Facebook groups were used as a learning management system and found satisfactory for students and were easy to implement (Wang et al., 2012). Students perceived the Facebook groups as a dynamic learning environment where they were encouraged to express themselves (Meishar-Tal et al., 2012). Students also had a positive attitude towards sharing information through WhatsApp groups, which they felt led to an improvement in their learning process (Cetinkaya, 2017; Luaran et al., 2016).

In this study, the use of WhatsApp as a learning management system was not considered an option at most Arabic language institutes. Its usage came about as a direct response to a lack of a learning management system. In Saudi Arabia, 90% of public universities using Blackboard as a virtual environment and learning management system (Aldiab et al., 2019). However, at most of the Arabic language institutes included in this study, L2 Arabic learners and their teachers did not have access to their university's learning management system, such as Blackboard. L2 Arabic learners would only gain access once they graduated from the Arabic language institute and enrolled at a university college. As such, L2 Arabic learners and their teachers used what was free and available to them in order to communicate and share information.

6.3.2 Mobile application for Arabic learning

Amongst L2 Arabic teachers, YouTube was the most used mobile application for teaching, followed by Almaany dictionary, and WhatsApp. Meanwhile, the Almaany dictionary was the most used application by L2 Arabic learners, followed by WhatsApp and YouTube. Surprisingly, not a single Arabic language application was mentioned by L2 Arabic learners and their teachers. Interviews highlighted three reasons to explain why participants did not use any application that taught Arabic in their teaching:

- Lack of available applications, see Section 5.4.3.1.1

- Limited content within available applications, refer to Section 5.4.3.1.2

- Institutional policy, see Section 5.4.3.1.3

The absence of available applications and limited relevant content was a common belief shared between L2 Arabic learners and their teachers during the study. The common belief was not based on practical research by individuals. Most of the learners mentioned that they got this impression from their teachers. Only one teacher and two learners indicated that they had tried themselves to search for Arabic language applications on applications stores.

There are many mobile applications and programmes that taught Arabic, including *Interactive Arabic* and *Arabic- Online*. *Interactive Arabic* was launched by King Saud University in Saudi Arabia and is available from Google Play and the App Store, and Saudi Electronic University launched *Arabic-Online website*. *Arabic-Online* is a program with 796 interactive videos, 6,320 pictures, 12,000 sound files, 10,067 exercises to help with language learning. The program is comprised of 16 levels, and achievement tests are indexed at the end of each stage (Arabic-Online, n.d.). Also, Al-Sarami (2017) did a survey study for L2 Arabic learning websites. Of 64 websites found,12 websites selected for Al-

Sarami's study. Al-Sarami concluded that listening skill was the most supported by the selected websites while writing was the less supported skill. Hisham (2019) evaluated 12 mobile language applications which taught Arabic as a second language and found that the best three mobile language applications for L2 Arabic were Rosetta Stone, Busuu, and Drops. Furthermore, Heil et al. (2016) indicated that there were indeed 19 applications which taught the Arabic language.

The researcher mentioned some Arabic language applications such as *Arabic Online* and *Interactive Arabic* during interviews to see if some participants had heard of these applications/programmes. None of the 16 L2 Arabic learners nor the 14 teachers who were interviewed indicated that they had heard of *Arabic Online*. One of the teachers did indicate he had heard of *Interactive Arabic* recently but had not tried it.

It was clear that there was little awareness amongst participants around what mobile applications and online programmes/websites were available for L2 Arabic learning. This lack of awareness appeared to affect, to some extent, the way that mobile devices were being used. In this study, participants were using WhatsApp, Facebook, and YouTube applications to support the Arabic language learning, or as a communication channel or learning management system, refer to Table 6.1. Participants pointed out that applications which taught Arabic were limited. Participants added that most of the results were applications which are designed primarily for native Arabic children and simply taught students the Arabic Alphabet and simple Arabic words.

One possible explanation of why L2 Arabic learners and their teachers believed that applications to teach Arabic are scarce is because they use the Arabic language function in Google Play and other app stores to search for Arabic language learning applications. So, the results would be limited to some basic Arabic applications. Applications such as *Rosetta*

Stone, *Busuu*, and *Drops* seemed not to appear in the results when the Arabic language function was used.

6.3.3 Arabic language materials

Quantitative data in this study revealed that PDF Books were the most used L2 learning content accessed by L2 Arabic learners (51%) and their teachers (55%), refer to Sections 4.2.4 and 4.3.3. 29% of L2 Arabic learners and 65% of their teachers mentioned *Arabic Between Your Hands*.

The interviews indicated that most L2 Arabic learners and their teachers believed that learning materials were limited, see Sections 5.4.3.2 and 5.5.3.2. This was a belief expressed by both L2 Arabic learners and their teachers which did not emerge from individual experience, as most of the interviewees did not investigate further, see Sections 5.4.3.2 and 5.5.3.2. The institutes' policies appeared to play a role here. Some teachers indicated that they were obligated to follow the unit's description and the book series selected by their institutes, refer to Section 5.4.3.1.3.

However, L2 Arabic learning materials were not limited in the focus institutions. King Abdullah Bin Abdulaziz International Center for The Arabic Language (KAICAL) created three databases/guidelines called Benaa 1, Benaa 2, and Benaa 3. Benaa 3 is a database specifically for L2 Arabic learning resources. This database contains 980 resources from over 200 publishers. L2 Arabic learning series designed by L2 Arabic institutes in Saudi Arabia, such as King Saud University series, King Abdulaziz University series, and Al-Imam Muhammed Bin Saud University, Islamic of Madinah University series, were available in PDF. Many other L2 Arabic learning series from all around the world, *Arabic Between Your Hands*, *Gateway to Arabic*, *Learn Arabic*, are also available as PDF. Despite

the number of resources available online, the fact that *Arabic Between Your Hands* was the only one mentioned by L2 Arabic teachers and the majority of their learners suggests that, like the applications, there is a distinct lack of knowledge about what is available. KAICAL has made great efforts to make all these materials available for L2 Arabic learners and their teachers through one website. Though, it appears that both learners and teachers of L2 Arabic from the institutions were unaware of that. This again highlights the importance of raising the awareness of what L2 Arabic applications, websites, and materials are available.

6.3.4 Mobile devices in the classroom

This section investigated the use of mobile devices by L2 Arabic learners in the classroom. PCA revealed four ways the students used their mobile devices in the classroom, as seen in Table 4.20. The results showed that the use of mobile devices was widespread among L2 Arabic learners, refer to Table 4.23. The most frequent use of mobile devices in the classroom was to look up something they did not know (83%), followed by taking pictures or video for an assignment (81%). However, they still engaged in social networking during their day to day lives (80%). Qualitative data revealed that L2 Arabic learners were using the classroom's board during lessons widely. Technology, such as projectors, PCs, and PowerPoint slides, were rarely used, refer to Section 5.5.3.3.

The extensive use of mobile devices by L2 Arabic learners during classes was consistent with other studies, including Anshari et al. (2017) and Kim et al. (2019). Roberts and Rees (2014) found that taking notes and accessing lectures slides were the main activities students spent time on during lectures. However, they also found that the primary use of a mobile phone in class was texting.

While Roberts and Rees' study (2014) reported that 38% of their subjects used laptops in class, 65% of L2 Arabic learners in this study did not have laptops. As such,

learners in this study used their smartphone devices to play the role of laptops. Also, L2 Arabic teachers used the classroom's board instead of other technology available, so learners took pictures of the board in place of PowerPoint slides. These were shared amongst the other students via their class WhatsApp group.

A one-way Welch ANOVA revealed that there was a statistically significant difference between the means of learners' groups at classroom usage based on their Arabic language level and based on their institutes, as found in Table 4.23. Level three learners had a significantly higher average score (M = 1.26, SD = 0.30) than Level two learners (M = 1.18, SD = 0.25), and that IUM Institute had a significantly higher average score (M = 1.27, SD = 0.29) than students IMISU Institute (M = 1.14, SD = 0.21), PNU Institute (M = 1.12, SD = 0.17), and UAU Institute (M = 1.15, SD = 0.23) refer to Table 4.25.

However, there was no significant difference between the means of learners' groups on classroom usage based on their age (See Table 4.24). These findings are not consistent with Abedalla's findings (2015b). Abedalla had three age ranges: 18-25, 26-34, and 35-44. 90% of the participants in the study were between 18-25, while only three participants were between 26-34, and one participant was between 35-44. So, most likely, the age of the learners was statistically significant due to most participants being aged between 18-25 years of age.

There are some possible reasons to explain why L2 Arabic learners at IUM Institute were using mobile devices in their classes more than learners at IMISU Institute and UAU Institute. The first reason was Internet availability and reliability at IUM Institute. L2 Arabic learners at UAU Institute had to go to a particular area at their institute to get an internet signal that was not available in their classrooms. Another possible reason for widespread mobile use was that many L2 Arabic learners at IMISU Institute and UAU

Institute were from an African background. As most African background learners had difficulty acquiring a smartphone back home, interviews indicated that they often owned their first one within a few months of arriving in Saudi Arabia (Kaliisa & Picard, 2017). Interviews also showed that L2 Arabic teachers at IUM Institute were using new technologies in their classes more than other Arabic language institutes generally. Although some Arabic institutes included in this study had separate labs mainly used for listing skill, other institutes had their technologies in the classroom. Some institutes were supporting their learners' listing skills via sharing audio files that used in laps, with their students via WhatsApp. Interviewees also indicated that institute policies were to some extent limiting their options with using mobile devices. These various policies explained why L2 Arabic learners at institutes, such as IUM Institute had a significantly higher average score (M = 1.27, SD = 0.29).

Interviews revealed that most L2 Arabic learners were enrolled in language Level Two upon arrival at their institute. During Level Two, their familiarity with the use of mobile devices in their classes increased as they were added to WhatsApp groups. They started using mobile devices more regularly in Level Three. This is consistent with previous studies, such as Abedalla (2015), where the correlation was found between the class level of learning Arabic and continued practice using the application. This may explain why Level 3 had a significantly higher average score than Level 2.

In summary, the current use of mobile devices was mostly focused on the use of social media and instant messaging applications by L2 Arabic learners and their teachers. Participants indicated three reasons why they were not using any application that taught Arabic in their teaching. The reasons were lack of available applications, limited content within available applications, and institutional policy. It was clear that there was little

awareness amongst participants around what mobile applications and online programmes/websites were available for L2 Arabic learning. There was a statistically significant difference between the means of learners' groups at classroom usage based on their Arabic language level and based on their institutes.

6.4 Attitude towards MALL

Using Principal Components Analysis (PCA), in this study, quantitative analysis revealed two components, named benefits of mobile devices and drawbacks of mobile devices, which combined used to assess the attitude of L2 Arabic learners and their teachers toward MALL, as found in Table 4.4 and Table 4.20. Most L2 Arabic learners and their teachers showed a positive attitude towards using mobile devices in learning and agreed with the noted benefits of using them in class. Such benefits included the new opportunities brought in by MALL, which would improve communication between students and teachers, refer to Table 4.7 and Table 4.27.

Qualitative data also showed that both L2 Arabic learners and teachers had a positive attitude towards using mobile devices in L2 Arabic learning. They believed that mobile devices had helped them with learning styles, extended Arabic language practises outside the classrooms, and improved communication between learners and teachers, see Sections 5.4.4 and 5.5.4. These findings are consistent with previous studies. Shadiev and Yang (2020) reviewed 398 articles published between 2014 and 2019 on technology-enhanced language learning and teaching. They found that the majority of the studies that they reviewed had positive results in using technology in supporting language learning. They also found that learners had better outcomes when their learning was supported by technology, which resulted in a positive attitude towards the technology used (Shadiev &

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Yang, 2020). Abdallah (2015b) found that using mobile applications while learning Arabic enhanced communication skills and L2 learners were satisfied with using mobile applications.

In this study, WhatsApp was the main channel for communication between L2 Arabic learners and their teachers, and this was satisfactory for the majority, see 6.3.1. Also, using mobile devices in this study enabled L2 Arabic learners and their teachers to access learning materials anytime anywhere, which demonstrates Kukulska-Hulme's (2020) view of mobile devices have the advantage of any time anywhere. One participant indicated that mobile devices enabled him, as a teacher, to download several PDF books which were needed as learning materials. He could then share these files with his learners, so they could read them anywhere anytime with no internet, refer to Section 5.4.5.2.

Learners were able to use instant messaging applications, such as WhatsApp and Telegram, to help them to overcome some of the challenges they were facing while learning Arabic at these institute in Saudi Arabia. One of these challenges was outdated Arabic learning materials. They used these applications to share and receive some learning materials with L2 Arabic learners from outside of Saudi Arabia, such as Egypt. To some extent, this application did not solve their challenges but increased their communications skills with learners which were a great way of using a real situation to practice the Arabic language, see Section 5.4.5.2.

A positive attitude toward mobile devices can improve learners' efficiency in language classes. Learners' efficiency has a direct relationship with attitude and motivation (Oroujlou & Vahedi, 2011). Many strategies were recommended to cultivate the right attitude toward language learning, such as encouraging students to personalise the classroom environment and connect language learning to students' interests outside of class

(Oroujlou & Vahedi, 2011). Personalising the classroom environment can lower anxiety in the classroom, which has a significant impact on language acquisition. In this study, mobile devices helped some learners to reduce their anxiety in the classroom when they wanted to ask about the meaning of a new word in front of students, refer to Section 5.5.3.3.

Another strategy recommended to help raise learners' efficiency in language learning within the classroom was to connect it with the learner's interest outside of classrooms (Oroujlou & Vahedi, 2011). Mobile devices can be linked to some learning activities that students are interested in, such as reading stories in Arabic, playing mobile games, listing to Arabic songs, and watching Arabic YouTube channels, to widen their perception on their language acquisition process. In this study, mobile devices helped many learners extend their learning of Arabic. Some interviewees indicated that they used their mobile devices to improve their reading skills and build their vocabulary of Arabic, see Section 5.5.4.1.

In summary, L2 Arabic learners and teachers had a positive attitude toward using mobile devices in Arabic language learning and teaching. Participants believed that using mobile devices in the Arabic language has many benefits. Of these, MALL bringing new learning opportunities was the most reported benefit followed by MALL being an effective means for immediate support. In this study, using mobile devices helped L2 Arabic learners to personalise the classroom environment and connect language learning to learners' interests outside of the classroom, which supposed to raise learners' efficiency.

6.5 Factors influencing the attitude toward MALL

PCA applied in this study revealed three factors influenced the attitude of L2 Arabic learners and their teachers toward using MALL:

- Prior knowledge

- Internet specific

- Arabic specific.

Prior knowledge was the only factor that had a positive influence on the attitude of both L2 Arabic learners and their teachers, while Arabic specific and internet specific considerations had a negative influence. The qualitative data analysis confirmed that both L2 Arabic learners and teachers had prior knowledge of using mobile devices. However, they were generally not satisfied with Arabic language materials, in terms of availability and quality, and internet availability, speed, and reliability.

6.5.1 Prior knowledge of using mobile devices

Previous experience with using mobile technologies is one of many factors that affect attitudes towards using them (Dündar & Akçayır, 2014; Ifenthaler & Schweinbenz, 2013). In this study, L2 Arabic learners and their teachers displayed positive prior knowledge toward using mobile devices, see Table 4.11 & 4.31. The results indicated that the ability to access a social network was the most frequently reported. This was consistent with their current use of MALL findings, where WhatsApp and YouTube were the most used applications in their lifestyle and their Arabic language learning. These findings were expected to some extent, due to the widespread use of mobile devices in Saudi Arabia (General Authority for Statistics, 2018), and the consistency with previous studies (Al-

Shehri, 2012; Alresheed & Leask, 2015). This prior knowledge of mobile devices is promising and important, as previous studies have reported that there is a positive relationship between digital literacy and adoption of new technology (Hasan & Ahmed, 2010; Potosky, 2002).

In this study, L2 Arabic learners and teachers had adapted the use of some mobile device applications, such as WhatsApp, into a management system to send and receive information, materials, and communicate with class groups. They also used YouTube to gain access to authentic materials. These activities can be seen as a reflection on their prior knowledge of using mobile devices and their willingness to adopt mobile devices in Arabic language learning.

A series of one-way ANOVA applied in this study revealed that there was no statistically significant difference between L2 Arabic learners or between their teachers in prior knowledge of using mobile devices based on age, refer to Table 4.14 and Table 4.34. O'Bannon and Thomas (2014) found that there were no significant differences in the findings for teachers who were less than 32 years old and those in the 33-49 bracket when it came to mobile phone ownership, support for the use of mobile devices, and perceptions toward the use of mobile devices features. However, they found that teachers over 50 significantly differed from teachers who were less than 32 years old and those in the 33-49 bracket.

There was also no statistically significant difference between L2 Arabic learners based on their Arabic levels or between their teachers in prior knowledge of using mobile devices based on teaching experience. However, there was a statistically significant difference between L2 Arabic learners' dependant on the institute they attended. L2 Arabic learners at KAU Institute had a significantly lower average score on prior knowledge than

the other six universities. Most of KAU Institute L2 Arabic learners in this study were from

Russia and surrounding countries, such as Kazakhstan. Interviews indicated that learners

had a good prior knowledge of using mobile devices. However, they were used to dealing

with different applications. For example, back in their home country, they were not using

WhatsApp, Facebook, and YouTube, which were much more prevalent in Saudi Arabia.

They were used to using VK, OK.ru, and Telegram applications. This is another example

where an L2 learner's background can affect his use of mobile devices.

6.5.2 Arabic specific

L2 Arabic learners and their teachers indicated that there was a lack of Arabic

language learning materials, and a lack of training and support in Arabic mobile assisted

language learning. They also indicated that this lack of materials and support had a negative

impact on their attitude towards using their mobile devices in Arabic learning. These

findings are congruent with previous studies where a lack of educational resources and

technical support had a negative impact on attitudes, while the availability of learning

resources and technical support had a positive impact on the attitude toward using mobile

devices (Khlaif, 2018; Ifenthaler & Schweinbenz, 2013, 2016).

The content of materials was the most influential factor in the potential success of

mobile learning, with learners and teachers wanting more satisfactory resource materials

(Alrasheedi & Capretz, 2015; Dündar & Akçayır, 2014). As mentioned earlier in the

chapter, see Sections 6.3.2 and 6.3.3, L2 Arabic learning materials, mobile applications, and

websites are freely available. However, there is a distinct lack of awareness about them.

Regarding the lack of support and training for using mobile devices in Arabic

language learning, L2 Arabic learners indicated that they felt that their teachers were not

supportive as they did not recommend any mobile applications or materials for mobile

learning, refer to Section 5.5.3.1.3. However, the truth of the matter was not that L2 Arabic teachers were not supportive of their learners, but rather, they were mostly unaware of freely available Arabic language learning materials and mobile applications. During the interviews, many teachers confirmed they had not heard of the Arabic mobile applications and online learning materials resources that were mentioned to them by the researcher, see Section 5.4.5.2.

It was clear that there was a lack of awareness of mobile applications and online programmes or websites which were available for L2 Arabic learning among learners and their teachers. This lack of awareness had affected and reduced, to some extent, the way that mobile devices were being used. Some teachers indicated that they had a language learning lab which was not used due to a lack of content, refer to Section 5.4.5.2. If teachers were aware of programmes such as *Arabic-Online* or *Interactive Arabic*, they could use their language learning lab. L2 Arabic learners and their teachers could register for free and use the learning materials on the lab's desktops or their mobile devices along with their Arabic language learners.

A series of one-way ANOVA applied in this study revealed that there were no significant statistical differences between L2 Arabic learners, based on their Arabic language level, refer to Table 4.35. Nor was there any difference between teachers who used mobile devices and their level of teaching experience, see Table 4.15. However, the institute did have an impact on Arabic specific learning for L2 Arabic learners, as seen in Table 4.36, while both institute and age had an impact on Arabic specific for L2 Arabic teachers, refer to Tables 4.14 and 4.16.

L2 Arabic teachers over the age of 40 had a significantly lower average score (M = 3.22, SD = 1.02) than teachers from 31 to 35 years (M = 3.94, SD = 1.16). Interviews

explained this is, as teachers over the age of 40 were more satisfied with PDF learning materials than teachers aged between 31-35, who preferred more interactive materials. This also explained why IMISU Institute, where the average age for a teacher is 41, had a significantly lower average score than teachers at UAU Institute and KAU Institute.

Moreover, L2 Arabic learners at UAU Institute had a significantly higher average (M= 3.32, SD=0.97) than PNU Institute (M= 2.67, SD=0.78), IUM Institute (M=2.89, SD=0.98), and QU Unite (M= 2.65, SD= 1.02), as can be found in Table 4.36). Some learners had contacts with friends at other language institutes in Saudi Arabia and compared themselves to others. Interviews showed L2 Arabic learners at UAU Institute were unsatisfied with their learning materials, internet availability and teacher support in mobile learning.

6.5.3 Internet specific

Internet access is an essential factor for success in mobile learning (Alzaza, 2011; Seliaman & Al-Turki, 2012b; Valk et al., 2010). In Saudi Arabia, nearly every university, college, and educational institute has free internet access (Alshahrani, 2016). However, L2 Arabic learners and their teachers were unsatisfied about the speed and reliability of the internet. Learners also showed dissatisfaction with the availability of the internet. The internet, in general, had a negative influence on the attitude of L2 Arabic learners and their teachers toward using mobile devices in Arabic language learning. These findings are congruent with the previous study (Mahande & Malago, 2019), so the internet deserves special attention to address these concerns.

Interviews explained why internet availability was satisfactory for teachers, but not for learners, refer to Table 4.13 and Table 4.33, respectively. Many interviewees indicated

that connecting to the internet at their universities required the use of university email. Most L2 Arabic learners did not get a university email account until they graduated from their Arabic language centre and enrolled in a university college. Some learners indicated that the internet was available at colleges, but not at university accommodation, see Section 5.5.5.3. Some teachers indicated that L2 Arabic learners had limited time to practise the Arabic language at their institute, so providing free internet at their accommodation would be useful and maximise the use of mobile devices. This, in turn, would demonstrate Kukulska-Hulme's view of regarding the advantages of mobile learning being "anytime anywhere". In addition, it would extend their learning outside their classrooms.

An ANOVA test was used in this study to explore the impact of three variables - age, institute, and level of Arabic language for students and teaching experience for teachers - on the earlier mentioned three factors: prior knowledge, Arabic specific, and Internet specific. A series of one-way ANOVA revealed that there was no significant statistical difference between L2 Arabic learners on internet specific based on age, Arabic language level, and institute, as can be seen in Table 4.34, Table 4.35, and Table 4.36. Moreover, there was no significant difference between L2 Arabic teachers based on age or teaching experience, refer to Table 4.15. However, L2 Arabic teachers at IMISU Institute had a significantly lower average score (M =2.54, SD = 1.00) than teachers' groups at KAU Institute (M= 3.78, SD = 0.84), IUM Institute (M= 3.62, SD = 1.06) and PNU Institute (M= 3.56, SD = 0.74), see Table 4.16. This was due to their use of the internet. Interviews revealed that L2 Arabic teachers at IMISU Institute were using the internet to download PDF books and sharing files via WhatsApp with their learners which saw as light use. Teachers at IUM Institute, PNU Institute, and KAU Institute were using the internet to play

YouTube videos in their classes which they found it slow and unreliable for usage that requires large bandwidth or faster download speeds.

6.6 Acceptance of Mobile Devices in L2 Arabic Learning and Teaching

It is essential to point out that this study did not initially set out to confirm the usefulness of applying a mobile devices model to the seven L2 Arabic institutes included in this study. However, the findings of this study interestingly aligned with the Technology Acceptance Model (TAM) final version with some adaptations (See Section 2.2.2). While several models are available to explain and predict technology acceptance, as presented in the Literature Review chapter, the results of this study were found to be most closely aligned with the TAM. This is an important finding to consider as Islam et al. (2014) claimed that some studies have set out to confirm the TAM rather than evaluating it, which they claim is why so many research studies have confirmed the TAM. In fact, the TAM model has received the most significant attention and has many supporters in the literature (Chuttur, 2009). More than 4,100 citations inside the Social Science Citation Index database in November 2013, and more than 17,600 identified by Google Scholar for Davis's article (Davis, 1989; Rondan-Cataluña et al., 2015). However, based on Popper's (1972) study, Islam et al. (2014, p. 166) explained that "there are no reasons to believe that a theory is scientific only because data - no matter how much of it there is - confirm it," and that it is possible to "find regularities in nature because of a mental habit that makes us jump to conclusions." As the current study did not set out to prove the efficacy of the TAM, it may serve to provide a more solid indication of its usefulness.

Within information system studies, the Technology Acceptance Model is widely used to help explain potential user's behavioural intentions to adopt and use technology, partially because of the technology availability and simplicity but at the same time, TAM is theoretically robust (King & He, 2006; Rondan-Cataluña et al., 2015). TAM uses the Theory of Reasoned Action (TRA) to model the interactions between these variables as a theoretical backdrop. In particular, TAM is based on two basic values, perceived utility (PU) and perceived ease of use (PEOU), as the factors that create Behavioural Intention which leads to Usage Behaviour (UB), refer to Figure 6.1 below.

TAM has been shown to be a useful model for predicting user acceptance. King and He (2006) performed a statistical meta-analysis of the technology acceptance model TAM using 88 published studies in different fields. The findings indicated that TAM is "a valid and robust model that has been widely used, but which potentially has wider applicability" (King & He, 2006, p. 740). This finding also confirmed by Rondan-Cataluña et al. (2015) as follows: "TAM has become well-established as a robust, powerful, and parsimonious model for predicting user acceptance" (p. 792).
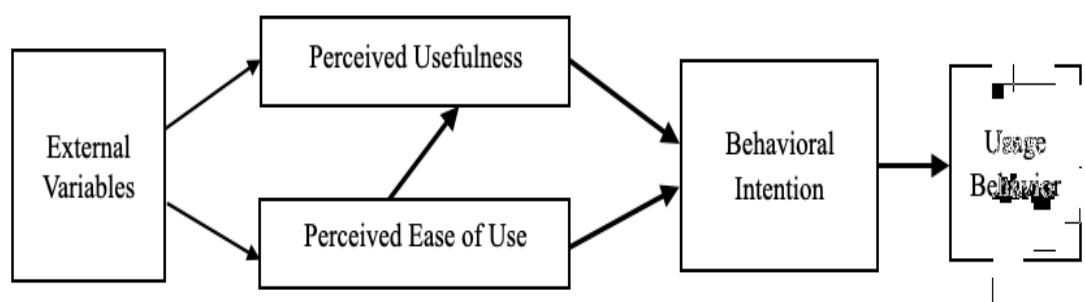
Figure 6.1 Final version Technology Acceptance Model (Venkatesh & Davis, 1996, p. 453)

Although TAM has been extensively researched around the world, it can still be adapted or extended to suit the setting (and in this case the findings) of a particular research

study (Abbasi et al., 2013). In this study, the results indicate that various factors influenced how L2 Arabic learners and their teachers use their mobile devices. These factors included:

- Prior knowledge of using mobile devices

- Attitude toward mobile devices

- Arabic specific

- Mobile device

- Internet

TAM, with its two factors, namely Perceived Usefulness and Perceived Ease of Use, cannot account for all the factors revealed by this study. For example, *prior knowledge of using mobile devices*, one factor which emerged in this study, can be included under Perceived Ease of Use. Similarly, *attitude toward mobile devices* can be incorporated under Perceived Usefulness. The other factors emerging in this study, which are *Arabic specific, Internet, and mobile device*, do not fit under either Perceived Usefulness or Perceived Ease of Use. For example, mobile device, as a factor, includes two items which are *mobile device availability* and *platform* (see Figure 6.3 below). A mobile device can be perceived as useful (Perceived Usefulness) and perceived as easy to use (Perceived Ease of Use) but might not be available due to the costs involved.

The final version of the TAM model has been adapted here to explain factors that influence L2 Arabic learners and their teachers' use of mobile devices, based on the findings of the current study. This adaptation includes adding a construct/factor called Facilitating Conditions (FC), see Figure 6.2 below. FC are defined as "the degree to which an individual believes that an organizational and technical infrastructure exists to support the use of the system" (Venkatesh et al., 2003, p. 453). FC, as a construct, has been added as an extension

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to the TAM adapted model to include some factors revealed by the current study, such as

mobile devices availability, Arabic language learning materials, and the Internet. These

findings are consistent with other studies conducted in developing countries. FC was found

to have an influence on individual Usage Behaviour (UB) towards using technologies

(AlAwadhi & Morris, 2008; Rehman et al., 2012).
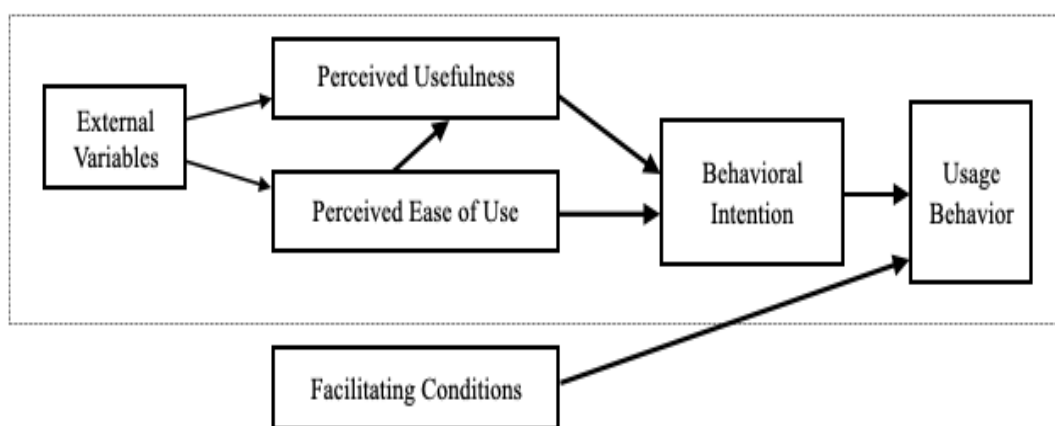
Figure 6.2 Adapted Acceptance Model for Mobile Learning in L2 Arabic

As shown in the Adapted Acceptant Model in Figure 6.2, Perceived Usefulness,

Perceived Ease of Use, and Facilitating Conditions influenced L2 Arabic learners and their

teachers' use of mobile devices:

In the following sections, the results revealed by this study will be mapped using the

three factors PU, PEOU and FC.

6.6.1 Perceived Usefulness

In this study, PCA revealed two components named 'benefits of mobile devices' and

'drawbacks of mobile devices, refer to Table 4.4 and Table 4.20. Most participants agreed

with the noted benefits of using mobile devices in Arabic language learning. Such benefits

included the new opportunities brought by using mobile devices, as well as improved

communication between students and teachers. Participants also believed that mobile devices helped them with learning styles, and extended Arabic language practises outside the classrooms, see Sections 5.4.4 and 5.5.4. These results indicate that L2 Arabic learners and their teachers had a positive PU toward using mobile devices.

6.6.2 Perceived Ease of Use

In this study, L2 Arabic learners and their teachers displayed good prior knowledge towards using mobile devices, refer to Table 4.11 and Table 4.31. The ability to download a mobile application, access a social network, and translate a new word or sentence into another language was high amongst participants. Also, participants indicated that they were using mobile devices regularly in their daily life activities. These results show that no extra effort seemed to be required by L2 Arabic learners and their teachers in using their mobile devices in Arabic learning. This aligns with the PEOU definition, where "the degree to which a person believes that using an IT will be free of effort" (Venkatesh & Bala, 2008, p. 275). This means that if participants can use their mobile devices for leisure, work and study there is a higher likelihood that the use of their mobile device for study will be more beneficial than just having device predominantly dedicated for study.

6.6.3 Facilitating Conditions

Participants in this study indicated that using mobile devices in Arabic learning was negatively influenced by two components. The components are Arabic MALL, including the availability and quality of learning materials, and the Internet in terms of availability, speed, and reliability, (see Table 4.32 and Table 4.33). L2 Arabic learners and their teachers indicated that there was a shortage of Arabic language learning materials. Participants are also unsatisfied with the speed and reliability of the Internet, (refer to Table 4.13 and Table

4.33). The results indicated that Facilitating Conditions have a negative influence on L2 Arabic learners and their teachers' mobile devices use.

6.6.4 Opportunities for MALL in L2 Arabic

The lecture is the most used method of teaching Arabic for L2 Arabic learners at the seven institutes included in this research (Elnaggar, 2019). In the lecture process, there is little collaboration and interaction between the teachers and the students, which has been seen as a disadvantage (Kaur, 2011).

MALL's simplest application, both technologically and pedagogically, is content delivery (Pegrum, 2014). Elnaggar (2019) conducted a study to investigate difficulties in learning Arabic for non-native speakers at the Islamic University in Medina in Saudi Arabia. Elnaggar (2019) found that L2 Arabic learners were not having enough practices in reading, listening, writing, and speaking. The study reported here found that mobile technologies, mainly smartphones, are widely available in L2 Arabic learners' hands, (see Table 4.18). In addition, many mobile applications and programmes that teach Arabic, including Interactive Arabic and Arabic-Online, were available. These devices and applications can play a role to help overcome some of the difficulties found in Elnaggar's (2019) study. For example, Arabic-Online, a program identified in the study, provides 796 interactive videos, 6,320 pictures, 12,000 sound files, and 10,067 exercises to help with language learning. This rich programme can be used to create more listening practice as an example for L2 Arabic learners.

Mobile technologies can be used to promote reading among L2 Arabic learners. King Abdullah Bin Abdulaziz International Center for The Arabic Language (KAICAL) created a database contains 980 resources from over 200 publishers in PDF format available for free. These resources include L2 Arabic learning series designed by L2 Arabic institutes

in Saudi Arabia and many other L2 Arabic learning series from all around the world. L2 Arabic learners would be able to select the most suitable L2 Arabic learning series for additional practice in the Arabic language.

> We have updated and developed our series that was written two decades earlier. It is still waiting for printing approval and has been for more than three years. (T.IM.2)

A student added:

> Our books are not updated generally. Other Saudi universities use Al Arabiyyah Bayna Yadayk. In Egypt, they have different resources which we found useful sometimes. (S.KA.1).

Social media websites and apps combining synchronous and asynchronous channels, facilitating sharing of textual updates and multimedia artefacts, preserving records of conversations and interactions and offering numerous feedback (Pegrum, 2014). This study found that WhatsApp is widely used by both L2 teachers and learners to communicate and share learning recourses. This involves learners interacting with teachers, peers, and other target language speakers, potentially supporting negotiation of meaning (from a communicative perspective) and identity exploration (from a sociocultural perspective) (Pegrum, 2014).

Mobile technology could help with some Arabic linguistic challenges. Diglossia in Arabic was found to be the most problematic difficulty faced by Malaysian learners of Arabic (Al-Faqara, 2015). Furthermore, Farghali (2000) indicated that L2 Arabic learners stated that they are unable to understand a dialogue with Arabic native speakers and they find themselves using language which is not appropriate for the context. In this study, it was found that L2 Arabic learners found it difficult to practice Arabic due to dialects, (See

(T.K.A.1) in 5.4.4.1). In addition, the majority of L2 Arabic learners and teachers in this study were found to be using social media apps such as Twitter and Facebook. These apps can be used to help address, to some extent, the gap between Modern Standard Arabic and dialects. On Twitter, there are many accounts which are focused on linking dialects daily used words to Lexicologist meaning. As an example, @almajma3 is an account managed by a professor in Arabic linguist at Islamic University in Medina and called '*The virtual academy of the language*'. A daily word is tweeted, and followers will reply with meanings in their dialects from across Arabic world.

6.6.5 Summary

In this study, the availability of mobile devices was high for both L2 Arabic learners and their teachers. This is a critical success factor for mobile learning. An Android smartphone was the most owned and used devices among L2 Arabic learners, mainly for financial reasons. The types of mobile devices used by the participants, as well as individual platforms, need to be taken into consideration by developers when designing mobile learning programmes and materials to ensure they are accessible to all.

The use of mobile devices by L2 Arabic learners and their teachers was centred on social media and instant messaging applications. In this study, participants indicated that Arabic mobile applications and Arabic learning materials were limited. However, there was little awareness among participants around what mobile applications and online programmes/websites were available for L2 Arabic learning.

Participants showed a positive attitude toward using mobile devices in L2 Arabic learning. Various factors are indicated to influence L2 Arabic learners and their teachers' attitude toward using mobile devices and their current use. Visual TAM model, see Figure

6.3 below, is adapted to explain factors that influence L2 Arabic learners and their teachers' use mobile devices based on the findings of the current study.

Acceptance Model for Mobile Learning in L2 Arabic

Adapted from Technology Acceptance Model, (Venkatesh & Davis, 1996, p. 453)

External Variables
- Age
- University
- Arabic Language Level (L)
- Teaching Experience (T)

Perceived Usefulness
Attitude Towards Mobile Device

Perceived Ease of Use
Prior Knowledge of Using Mobile Device

Behavioral Intention
Motivational Factors

Usage Behavior
Current Usage

Facilitating Conditions

Mobile Device
- Availability
- Platforms

Internet Specific
- Availability
- Reliability
- Connectivity

Arabic Specific
- Learning materials
- Mobile application
- Awareness

■ Technology Acceptance Model

■ The study findings (L = Learners, T = Teachers)

Figure 6.3 Visual model matching the study's findings with the TAM

Chapter 7

Conclusion

7.1 Introduction

This study contributes to the body of knowledge around mobile assisted language learning by creating a vital contribution to the field of teaching and learning Arabic as a second language. This study investigated the attitude of L2 Arabic Learners and their teachers toward using mobile devices in Arabic language learning.

Explanatory research has been used to investigate the attitude of L2 Arabic learners and their teachers toward using mobile devices for learning and teaching L2 Arabic at seven Arabic language institutes within Saudi Arabia. Furthermore, it aimed to discover what kind of mobile devices and platforms are currently being used, how are the devices being used, and for what purposes and why.

This chapter provides an outline of the study and the results gained from the data analysis. This chapter starts by addressing the research questions followed by the contribution of the study to the current literature. The implications of the findings and limitations of the study are then discussed. The chapter concludes with suggestions for future research.

7.2 Answers to the study's research questions

7.2.1 Mobile devices, platforms, and operating systems

Naismith et al.'s (2004) classification of mobile devices, see Section 2.2.3, was used in this study to identify mobile devices as either a smartphone, tablet pc, or laptop. Mobile devices use different platforms and operating systems that manage files differently, such as iOS, Android, and Windows. Including the device and its appropriate software/platform in this study, gives a broader view for developers when designing an M-learning programme, application, or learning materials for the Arabic language

In Phase 1 of this study, a paper-based questionnaire was used to determine what mobile devices, platforms, and operation systems were owned and used by L2 Arabic learners and their teachers. Results indicated that 97% of L2 Arabic teachers and 96% of their L2 Arabic learners owned a mobile device, irrespective of device type, with some of them even having more than one device, refer to Sections 4.2.3 and 4.3.2. Android was the most used smartphone platform for both L2 Arabic learners and their teachers. However, only 35% of L2 Arabic learners owned a laptop, and 15% of them owned a tablet, refer to Table 4.2 and Table 4.18.

As shown in Chapter 5, Phase 2 of the study used semi-structured interviews to elucidate the phase 1 results. Thematic analysis revealed that the participants' device choice was dictated by three reasons: financial, technical, and security. Of these, financial factors were the primary determinant for 79% of the L2 Arabic

learners and 53% of their teachers to buy an Android device, see Sections 5.4.2.1 and
5.5.2.1.

*RQ1. Which mobile devices, platforms, and operating systems do L2 Arabic
learners and their teachers currently use?*

The smartphone was the most owned and used device with L2 Arabic learners
and their teachers. Android was the most used platform, while Windows was the most
used operation system.

7.2.2 Current use of mobile devices

Three open-ended questions questionnaire were included to discuss how L2
Arabic learners and their teachers used their mobile devices. The first question asked
what lifestyle mobile app they used the most. The second question was what mobile
app was used the most to support Arabic teaching. The third question focussed on
what content was used the most to support Arabic teaching.

Phase 1 findings revealed that WhatsApp, Facebook, and YouTube were the
most used applications by L2 Arabic learners and their teachers for lifestyle, as seen
in Table 6.1. For Arabic language learning, YouTube (62%) was the most used
mobile application for teaching amongst L2 Arabic teachers, followed by Almaany
dictionary (55%). Meanwhile, the Almaany dictionary was the most used application
by L2 Arabic learners (85%), followed by YouTube (46%). L2 Arabic learners and
their teachers mentioned not a single Arabic language application.

In the Arabic classroom, L2 Arabic learners used their mobile devices for
various activates. Most of L2 Arabic learners reported that they used a mobile device

to look up something they did not know and take pictures or video for an assignment, as found in Table 4.23. Using mobile devices in the classroom were influenced by learner Arabic language level and institute. L2 Arabic learners and their teachers used WhatsApp as a learning management system, which was the main communication channel to send and receive tasks.

Regarding the content, PDF Books were the most used L2 learning content accessed by L2 Arabic learners (51%) and their teachers (55%). *Arabic Between Your Hands* was the most mentioned learning content used via mobile devices by L2 Arabic learners (29%) and their teachers (40%). Furthermore, most L2 Arabic learners and their teachers believed that Arabic language learning materials that could be accessed via mobile devices were limited.

In Phase 2, Chapter 5, interviews highlighted three reasons as to why teachers did not use any application that taught Arabic in their teaching. These reasons were:

- A lack of available applications
- A lack of relevant content within applications that were available
- Institutional policy.

In Chapter 6, these reasons were discussed, and it was concluded that there was an absence of awareness around what mobile applications and online programmes/websites were available for L2 Arabic learning as many mobile applications were available, see Section 6.3.2. This lack of awareness had affected the way that mobile devices were being used.

RQ2: How do second language Arabic learners and their teachers currently use their mobile devices?

The current use of mobile devices by L2 Arabic learners and their teachers was centred on social media and instant messaging applications such as YouTube and WhatsApp.

7.2.3 Attitude toward using mobile devices

In Phase 1, most L2 Arabic learners and teachers exhibited a positive attitude towards using mobile devices in learning and agreed with the noted benefits of using them in class. Such benefits included the new opportunities brought in by MALL, an effective method for delivering Arabic content to learners, and would improve communication between learners and teachers. Though, L2 Arabic learners and their teachers disagree to drawbacks of using mobile devices were indicated in the questionnaire as they did not see mobile devices are, for example, distraction or not interesting to be used, refer to Table 4.7 and Table 4.27.

Qualitative data collected in Phase 2, reinforced that both L2 Arabic learners and teachers had a positive attitude towards using mobile devices in L2 Arabic learning. They believed that mobile devices had helped them with learning styles, extended Arabic language practises outside the classrooms and improved communication between learners and teachers. They also indicated that using mobile devices can help Arabic language learners as they have limited time to practise Arabic outside their class. However, no drawbacks were indicated, see Sections, 5.4.4 and 5.5.4.

RQ3: What are the attitudes of L2 Arabic learners and their teachers toward MALL?

L2 Arabic learners and teachers showed a positive attitude towards using mobile devices in Arabic learning

7.2.4 Factors influencing attitudes toward using mobile devices

In Phase 1, a principal component analysis (PCA) was conducted, which revealed three factors that influence the attitude of L2 Arabic learners and their teachers toward MALL. The three factors were prior knowledge, Internet-specific considerations, and Arabic specific considerations.

The results showed that the prior knowledge of L2 Arabic learners and their teachers was high and had a positive influence on their attitude toward using mobile devices. However, the other two factors, Internet-specific considerations, and Arabic specific considerations had a negative influence on the attitude as both L2 Arabic learners and their teachers were not satisfied with the internet speed, or connectivity as well as quality and availability of Arabic language materials.

In Phase 2, the interviews revealed that a lack of materials and support had a negative impact on their attitude towards learning. However, they also confirmed that there was a lack of awareness about the type of mobile applications and online programmes/websites available for L2 Arabic learning amongst L2 Arabic learners and their teachers. Regarding the internet factor, interviewees indicated that connecting to the internet at their universities requires using university email. Most L2 Arabic learners did not get university emails until they graduated from their

Arabic language centre and enrol in a university college. Similarly, some learners indicated that the internet was available at colleges, but not at their university accommodation which limited their ability to continue their study after class whilst residing within their residential apartments.

RQ4: What factors influence attitudes of L2 Arabic learners and their teachers toward MALL?

Attitudes of L2 Arabic learners and their teachers toward using mobile devices were influenced positively by Perceived Usefulness (PU) and Perceived Ease of Use (PEOU) while influenced negatively by some Facilitating Conditions (FC).

7.3 Research Contribution to Knowledge

This study presents a contribution to the field of teaching and learning Arabic as a second language as this study investigates the attitude of second language learners of Arabic and their teachers toward using mobile devices in Arabic as a second language. It provides a comprehensive view in regard to using mobile devices for the learning and teaching of Arabic as a second language in Saudi Arabia. Participants came from more than 80 backgrounds, with L2 Arabic learners from different Arabic language level skills and Arabic language teachers from five native countries.

This study provides a solid foundation for encouraging the seven Arabic language institutes included in this study to promote and implement the use of mobile devices to enhance Arabic language learning and teaching practices. This encouragement is supported by many factors, such as the positive attitude of study

participants toward using mobile devices in their study alongside the widespread use of mobile devices, strong prior knowledge of using mobile devices, availability of internet connectivity and Arabic learning materials. These are keys factors for successful mobile learning. This study's findings provide a deep insight into how mobile devices currently being used by L2 Arabic learners and their teachers in Saudi Arabia and what challenges are existing that need to be taken into account to maximise the success of the implementation of using mobile devices in Arabic as a second language at these institutes.

These encouraging findings made by the study are supported by the "Transformation Program 2020" from the Ministry of Education in Saudi Arabia to cease using print books and replace them with digital books, refer to Section 1.3. This programme is part of the Saudi Arabia National Transformation Program, 2030 vison (*Saudi Vision 2030*, n.d.). The Ministry signed an agreement with Microsoft to integrate information technologies in all Saudi schools and universities. This agreement has many initiatives and training programs such as "Microsoft Innovative Educator" (Alharthi, 2016). The Ministry has also signed an agreement with K12 to benefit from its long experience, as well as a recognised company in designing digital school curriculums (Ministry of Education, 2016).

The study's findings enlighten decision makers at Saudi Arabian Universities which are considering the introduction of using mobile devices at their Arabic language institutes. As the findings of this study provide a broad view from second language learners and their teachers of the current use of mobile devices, including positive and negative factors that affect their attitude, it can assist decision makers to

conceive and develop precise policies and strategies for implementing using mobile devices in Arabic language learning by considering of the various factors explored in this study.

7.4 Research implications

The context of this study, Saudi Arabia, is very important to the field of teaching Arabic as a second language. Saudi Arabia has a leadership role in this field since the 1970s. Mecca, Riyadh and Medina, three Saudi cities, became the centre stages for brand new projects, research units, publications and talks for Arabic as a second language learning and teaching (Facchin, 2019). Since 2018, eight new Arabic language units were opened at eight Saudi universities. This will enhance the role of Saudi Arabia furthermore in this field.

Saudi Arabia is opening a new chapter of its history as a country and, while rich by the criteria of many developing countries, lacks the expertise of some developed world countries in a transaction with implementing new mobile technologies. Using mobile devices in L2 Arabic learning has been found in this study to be substantially acceptable to L2 Arabic learners and their teachers in Saudi Arabia at these seven institutions. However, there are still some barriers that need to be considered to maximise the success of M-learning.

This study provides an in-depth and comprehensive view of the current situation of using mobile devices between second language learners of Arabic and their teachers in Saudi Arabia. This including mobile devices availability, prior knowledge of using mobile devices, attitude toward using mobile devices, and factors

affecting their attitude toward using mobile devices. This study should be viewed as a torch that illuminates the route and direction the journey towards the successful introduction and implementation of using mobile devices in at Arabic language institutes in Saudi Arabia. However, there are still some barriers that need to be considered and will be discussed in the nest section.

7.4.1 Barriers to M-learning

The findings of this study confirmed that L2 Arabic learners and their teachers have a positive attitude toward using mobile devices in Arabic learning. Additionally, mobile devices were widely available, and both learners and their teachers had sound knowledge of using mobile devices. Despite all these factors, which are key for successful mobile learning implementation, this study revealed some barriers that need to be considered before moving forward to implement mobile learning at Arabic language institutes.

7.4.1.1 Lack of awareness

This study revealed the main barrier of using mobile devices to be a lack of awareness of mobile applications, online programmes or websites that were available for L2 Arabic learning among learners and their teachers. This lack of awareness appeared in the two phases of this study. In Phase 1, no Arabic applications, programs or websites were indicated in the open-ended question of the questionnaire, refer to Sections 4.2.4 and 4.3.3. In the second phase, the researcher mentioned some applications and online programmes for the participants, but they confirmed they have not heard of these applications or online programmes, see Sections 5.4.3.1 and 5.4.5.2.

This lack of awareness affected and reduced the way that mobile devices were being used. As a result, L2 Arabic learners and their teachers' use of mobile devices were focused on some dictionary applications such as Almaany or WhatsApp for communication. At the same time, there were many applications that taught Arabic language and had been evaluated and found useful (Hisham, 2019).

In another institute, teachers indicated that they have a language learning lab where desktops have been replaced with new desktops twice and still not being used as there is no content to be used in Arabic language learning. However, there is an online Arabic programmes launched by Saudi Electronic University and called *Arabic- Online*. The program is comprised of 16 levels, and achievement tests are indexed at the end of each stage (Arabic-Online, n.d.). Surprisingly, *Arabic- Online,* is used by 53 University worldwide such as in Indonesia, Germany, Denmark, Uganda. Nonetheless, some universities in Saudi Arabia have no content for their language learning labs.

Designing a list of L2 Arabic applications and websites would be very useful in mitigating this lack of awareness. The list should be updated regularly and made available to L2 Arabic learners and their teachers at every Arabic language institute. The list would also help L2 Arabic learners and their teachers maximise the benefits of the widespread use of mobile devices between them. As L2 Arabic learners and their teachers indicated a high priority of knowledge about using mobile devices, the need for lengthy or intensive training programmes to use mobile devices seems to be unnecessary.

Recommendation: Develop a list of L2 Language applications and websites to inform L2 Arabic Learners and their teachers of the resources available.

7.4.1.2 Traditional Methods of Teaching and Learning

A teacher-centred approach, which relied on the behaviourist learning theory, was the most used method of teaching in Arabic language institutes included in this study. In this approach, learners are passive while the teacher is responsible for transmitting knowledge to them (Brown, 2003). This method can be seen as the primary method of teaching in the Saudi education system at all learning level. This possibly develops as a result of Islamic teaching practises followed in Mosque, which is using this teaching method these days.

As a result of this teaching method's popularity at Arabic language institutes in Saudi Arabia, this study found that the second-most popular use of mobile devices in the Arabic language classroom was taking pictures of the classroom's whiteboard. L2 Arabic learners indicated, refer to Section 5.5.3.3, that they did not have enough time to write the notes or information written by their teachers before the next lesson begins with five minutes break in between.

A critical element of second language acquisition is learner autonomy which means "a situation in which the learner is totally responsible for all the decisions concerned with his [or her] learning and the implementation of those decisions"(Dickinson, 1993, p. 334). In this context, L2 Arabic learners are expected to enrol in university courses in different subjects where the teacher-centred approach is less used, particularly with international lecturers. L2 Arabic learners were also

from various backgrounds, and it should be noted that this teaching method is not suitable for every learner.

Mobile devices can assist L2 Arabic learners to find learning materials independently on the web and determine when, where and how to study the content. This, however, would not work with a teacher-centred approach, where content is chosen, and the teacher organises learning tasks. In contrast, mobile learning would work perfectly with a learner-centred approach, which relies on constructivist learning theory, where learner should be in social interaction while the role of the teacher is to guide the learner in the absorption and building of the information (Ozdamli, 2012).

Student-centricity promotes cooperative learning, strengthens problem-solving and decision-making skills, encourages analytical and critical thinking skills, but the role of the teacher in the classroom is not removed. This provides a classroom atmosphere in which the teacher stimulates active engagement assists learners to become academically successful (Serin, 2018). In this study, some learners had indicated that they were already using their mobile devices to find some materials independently as they were not satisfied with learning materials at their institutes for various reasons discussed in Chapter 6. For example, they used WhatsApp and Telegram groups to share Arabic language resources and learning materials from other Arabic language institutes inside or outside Saudi Arabia. However, their teachers were unable to participate in this task due to institutional policy, which will be discussed in the following section.

Recommendation: Encourage learner-centred approach and learner autonomy.

7.4.1.3 Institute Policy

Some teachers in this study had indicated that they were unable to use external learning materials in their Arabic language classroom or even recommend any Arabic learning resources, such as a mobile application or a website, for their learners. Instead, they had to use the printed learning series approved by their institute. They assumed the reason behind this was that their institute was trying to ensure equality exists between L2 learners, mainly when teaching a language skill is shared between more teachers at the same language level. However, some institutes were a bit flexible, as they allowed teachers to provide and use external learning materials to support their learners.

Using mobile devices in language learning can provide learners with an authenticity which is a critical prerequisite for effective learning (Shadiev et al., 2017). Mobile devices provide language learners with authentic materials using video and the internet as an example. These materials are natural, with context-rich linguistic and cultural situations that can reflect changes more effectively than printed sources. In this study, L2 Arabic learners and their teachers at some institutes indicated that their series was outdated, having been designed 20 years ago, and a new version had been waiting to be printed for more than three years.

Arabic language institutes can play a very important role by supporting their learners and teachers and in using mobile devices, that they already have in their hands with good knowledge of how to use it along with positive attitude toward it, by increasing the awareness of mobile applications, online programmes or websites that are available for L2 Arabic learning among L2 Arabic learners and their teachers.

Also, institutes should allow their teachers and learners to use external learning materials along with their leaning series to increase the authenticity of the Arabic language learning materials in the classroom.

Recommendation: Allow L2 Arabic learners and their teachers to use external learning materials along with the institute leaning series to increase the authenticity of the Arabic language learning materials in the classroom.

7.4.2 Financial aspects

Successful mobile learning implementation requires many factors, such as mobile devices availability and connectivity. Such factors have some financial aspect that needs to be considered. This study found that mobile devices were widespread between L2 Arabic learners and their teachers. Android devices were the most owned mobile devices, and participants indicated that their choices were based on financial reasons. In general terms, cheap mobile devices can handle the necessary tasks, but that needs be taken into account when mobile learning tasks are to be involved in Arabic language learning. In another example, most of the participants were unsatisfied about the connectivity of the internet at their university's campuses or student accommodations. It is logical to expect that they would not be able to buy personal internet for themselves easily, so ensuring that the availability of free, reliable internet is very important. Some Arabic mobile learning applications were not free and required subscription fees. Considering, the financial aspect would maximise the success of mobile learning implementation as this study found that had a significate impact on participants, mainly learners.

Recommendation: Improve internet availability and reliability. Institutions should consider paying subscription fees for paid Arabic mobile learning applications.

7.4.3 Acceptance of Mobile Devices in Arabic L2 Learning and Teaching

The findings of this study align with the Technology Acceptance Model (TAM), see Section 6.6. In this study, L2 Arabic learners and their teachers showed a positive attitude and high prior knowledge of using their mobile devices. They were able to download mobile applications, translate sentences into another language and send emails on their mobile device. Most of the participants strongly agreed, or simply agreed to statements of the benefits of using mobile devices while strongly disagreed or disagreed to statements of drawbacks of using mobile devices. These two factors, which are named in this study as "Prior Knowledge" and "Attitude toward mobile devices" can play the role of the TAM's Perceived Ease of Use (PEOU) and Perceived Usefulness (PU). However, some other factors revealed by this study required an extension to the final version of the TAM. Factor called Facilitating Conditions (FC) added to PEOU and PU, see Figure 6.3 Visual model matching the study's findings with the TAM. That being said, L2 Arabic learners and their teachers are ready to accept using mobile devices in their Arabic language learning.

7.5 Recommendations

- Develop a list of L2 Language applications and websites to inform L2 Arabic Learners and their teachers of the resources available. The absence of available applications and limited relevant content was common between L2 Arabic Learners and their teachers during the study. The common belief was not based on practical research by individuals. Most of the learners mentioned that they got this impression from their teachers. There are many mobile applications and programmes that taught Arabic, including *Interactive Arabic* and *Arabic- Online*. *Interactive Arabic,* See Section 6.3.2.

- Encourage a learner-centred approach and learner autonomy. In this study, mobile devices were widespread among L2 learners and their teachers, See Sections 4.2.3 and 4.3.2. This would work perfectly with a learner-centred approach, which relies on constructivist learning theory, where learners should be engaged in social interaction while the teacher's role is to guide learners in their development.

- Allow L2 Arabic Learners and their teachers to use external learning materials and the institute leaning series to increase the authenticity of the Arabic language learning materials in the classroom. Some L2 teachers indicated that their Arabic learning series are outdated
  We have updated and developed our series that was written two decades earlier. It is still waiting for printing approval and has been for more than three years (T.IM.2)

L2 Learners also indicated that they found external learning materials useful

Our books are not updated generally. Other Saudi universities use Al Arabiyyah Bayna Yadayk. In Egypt, they have different resources which we found useful sometimes (S.KA.1).

- Improve internet availability and reliability. Institutes in this study were not at the same level of internet availability and reliability, (See Table 4.13 and Table 4.33). L2 Arabic teachers at some institutes indicated difficulty to use internet

  In the mornings, when many staff and students are at the university, the internet becomes very slow. Sometimes playing a video on YouTube requires a few minutes to start. I often attempt to download videos on my mobile device to save time (T.QU.2)

  Learners also were not satisfied with the internet availability

  The internet is only available at colleges and the library. Students' accommodation is not covered by the internet. This is forcing students to buy their own internet to do some simple tasks. We must wait till the next day to download large files or applications to use the internet at the institute or library. We hope the internet would be available at our accommodation soon (S.IM.1)

- Institutions should consider paying subscription fees for paid Arabic mobile learning applications. Hisham (2019) evaluated L2 mobile language applications which taught Arabic as a second language. Hisham found that the best three mobile language applications for L2 Arabic were Rosetta Stone, Busuu, and Drop. Not all of these applications are free. For example, Rosetta

Stone has three subscription options: three months for $11.99 per month, 12 months for $9.99 per month or lifetime for $199. L2 Arabic Learners were facing some financial difficulties that had impacted their selections for mobile devices

There are some free applications only available on Android. For example, I remember that I advised my friend from Canada to use a navigation app. Because his mobile is iPhone 8, he has to pay to use the application, and there are similar applications. (S.QU.1)

- Consideration could be given to how educators in Saudi respond to the Western values that internet devices may introduce into the classroom, as this was deemed to be beyond the scope of this study. This may be a pertinent topic to study in more rural areas where traditional values are more common.

7.6 Limitations of the research

This research has certain limitations to be considered when reviewing the findings. First, the participants of this research were limited to L2 Arabic learners and their teachers. Further research may involve including administrators in the sample size, as they could explain some implementation issues around mobile learning at these universities, particularly with some deanships such as IT and electronic learning.

Most of the participants in this study were male for two reasons. First, as the context of this study is Arabic as a second language, factors such as gender, nationality and number of learners are varied from time to time. Second, some of the

universities included in this study did not provide Arabic courses for international females as higher education in Arabic countries do not provide gender equity. Therefore, gender, as a factor, was not used as an independent variable in the statistical tests to reduce this limitation.

The specific demographics of the learners who took part in this research, and their motivations for doing so, have not been examined as this was deemed to be beyond the scope of this research, and due to the fluctuating nature of student cohorts. However, consideration of demographics in relation to the data may have led to additional knowledge about influences on students' attitudes; therefore, it has been added to the recommendations in the next section.

Logistical difficulties were another limitation to this study as the researcher was based in Australia while the participants were in Saudi Arabia. Academic calendars were disparate between Australia and Saudi Arabia, and L2 Arabic learners were not allowed to stay in Saudi Arabia over summer. This made data collection very challenging as the participants were located at seven universities in five cities. These difficulties had no direct effect on the results; however, as would be the case with committed and thorough studies, ways of addressing the same should have been reflected on. Clarifying the answers or gaining further response on attitudes was not practicable because of logistical problems. Such issues were overcome by the use of phone calls, particularly during interviews. Nevertheless, it was not as suitable as the capability to adjust the study strategy to more detailed data collection opportunities by being present in the same country as the participants.

7.7 Suggestions for Future Research

While many studies have investigated the use of mobile technologies, the field of using mobile technologies in Arabic learning L2 is largely unexplored. Further work in needed to broaden awareness in this field in a rich 'developing' country, the Kingdom of Saudi Arabia that is very important to the field of teaching Arabic as a second language. Saudi Arabia has a leadership role in this field since the 1970s worldwide. With government policies to promote education through new technologies such as "Transformation Program 2020" from the Ministry of Education in Saudi Arabia to cease using print books and replace them with digital books", how mobile learning will be accepted and used in L2 Arabic learning at Saudi Universities needs more evaluating. Future study recommendations include:

- Repeating the research in L2 Arabic institutes or Arabic language institutes at other Saudi Universities. Since 2018, Saudi Arabia has opened new Arabic languages units to teach the Arabic language to non-native speakers at King Khalid University, Jouf University, Taif University, University of Tabuk, Jazan University, Albaha University, University of Bisha, and the University of Hail. Repeating the study would assist in validating and endorsing the results of this research or might add new understandings.

- Examining the adapted acceptance model and its application to studies similar to this one, which has compared the findings with the TAM final version (Venkatesh & Davis, 1996, p. 453). This study did not set out to confirm the acceptance of using mobile devices at the seven L2 Arabic institutes included in this study, however, the adapted model was driven by the findings of this study which correlate with the final version of the TAM. Further research

would validate the adapted acceptance model or add some adaptations to develop the model.

- Analysing the demographics of students and their specific motivations for studying, for example for work or for religious reasons. It is recommended to explore whether these have an impact on attitudes and willingness to use mobile technologies.

- Investigating the effectiveness of using mobile applications in L2 Arabic learning. This study has confirmed the widespread of mobile devices between L2 Arabic learners and their teachers, prior knowledge of using mobile devices, mobile applications availability and L2 Arabic learners and their teachers' positive attitude toward using mobile devices in Arabic language learning. Comparative study between traditional learning method with no mobile devices, a teacher-centred method which widely used at these institutions and student-centred method with integrated mobile applications.

7.8 Concluding remarks

This research study aimed to investigate the attitude of L2 Arabic learners, and their teachers at the seven Arabic language institutes currently use their mobile devices for learning and teaching Arabic. This provides a broad view of the existing situation at the Arabic language institutes in Saudi Arabia. This included what kind of mobile devices, platforms, and software is being used, how are the devices being currently used, and why.

This study used a sequential explanatory design, so the study was divided into two phases, the first phase was quantitative and offered a detailed overview using

questionnaires for Arabic language learners and their teachers at selected seven universities in Saudi Arabia, which will then direct the qualitative. In this phase, participants were asked several questions about what type of mobile devices they own, what mobile applications and materials they used for their Arabia language learning, their attitude toward using mobile devices in their Arabic learning, and what factors affect their attitude. This phase offered an overview of the states at the seven Arabic language institutes in term of mobile devices availability, current use of these devices, the attitude toward mobile devices, and factors affecting the attitude. Descriptive and inferential analysis was used, including principal component analysis (PCA) to refine and reduce the scales' items of this study to a smaller number of coherent subscales.

In Phase Two, semi-structured interviews were conducted to obtain a deep understanding and to explain the quantitative outcomes. Using theoretical thematic analysis, semi-structured interviews helped to answer the reasons behind selecting the type of mobile devices, or not mentioning any Arabic applications. After the statistical analysis in Phase One, using descriptive and inferential analysis, including one-way ANOVA, and thematic analysis to analysis the semi-structured interviews.

Although the internet and Arabic learning materials were available, participants were not satisfied with these two factors due to difficulties to connect to the internet and lack of awareness of materials available for their learners.

This study can conclude and confirm that:
- Mobile devices were widespread between learners and their teachers, and their prior knowledge of using mobile devices were good

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- L2 Arabic learners and their teachers have a positive attitude toward using mobile devices in Arabic language learning at these Arabic language institutes in Saudi Arabia

- L2 Arabic learners and their teachers are ready to accept using mobile devices in their Arabic language learning.

References

Abbasi, M. S., Shah, F., Doudpota, S. M., Channa, N., & Kandhro, S. (2013).
Theories and models of technology acceptance behaviour: A critical review of
literature. *Sindh University Research Journal*, *45*(1), 163–170.

Abdullahi, A., Rouyan, N. M., & Salwa, S. (2018). The application of web 2.0 tools
to determine receptive skills among malay learners of Arabic language at the
Universiti Sultan Zainul Abidin (UniSZA). *E-Academia Special Issue TeMIC*, 7,
1-7

Abedalla, R. W. (2015a). *Students' perceptions of the use of mobile applications
technology in learning Arabic as a second language*. Robert Morris University.

Abedalla, R. W. (2015b). The use of mobile assisted language learning applications in
learning Arabic. *Issues in Information Systems*, *16*(2), 63–73.

Abu Hamdeh, M., & Hamdan, A. (2010). Using analytical hierarchy process to
measure critical success factors of M-Learning. *Proceedings of the European,
Mediterranean and Middle Eastern Conference on Information Systems: Global
Information Systems Challenges in Management, EMCIS 2010*, 1–23.

Abubaker, H., Salah, K., Al-Muhairi, H., & Bentiba, A. (2015). Digital Arabic
content: Challenges and opportunities. *2015 International Conference on
Information and Communication Technology Research (ICTRC)*, 330–333.
https://doi.org/10.1109/ICTRC.2015.7156489

Aburezeq, I. M., & Ishtaiwa, F. F. (2013). The impact of WhatsApp on interaction in
an Arabic language teaching course. *International Journal of Arts & Sciences*,
6(3), 165.

Acharya, A. S., Prakash, A., Saxena, P., & Nigam, A. (2013). Sampling: Why and how of it? *Indian Journal of Medical Specialities*, *4*(2), 330–333. https://doi.org/10.7713/ijms.2013.0032

Achour, H., & Abdesslam, W. Ben. (2012). An evaluation of Arabic language learning websites. *International Conference on Education and E-Learning Innovations*, 1–6. https://doi.org/10.1109/ICEELI.2012.6360683

Ahmed, E. (2015). *Modern standard Arabic learners' views about the effect of portable technology on L2 learning proficiency in listening and reading at the Defense Language Institute Foreign Language Center*. Argosy University.

Ajzen, I. (1991). The Theory of Planned Behavior. *Organizational Behavior and Human Decision Processes*, *50*(2), 179–211.

Al-Busaidi, F. Y. (2015). Arabic in foreign language programmes: Difficulties and challenges. *Journal of Educational and Psychological Studies [JEPS]*, *9*(4), 701–717. https://doi.org/10.24200/jeps.vol9iss4pp701-717

Al-Fahad, F. N. (2009). Students' attitudes and perceptions towards the effectiveness of mobile learning in King Saud University, Saudi Arabia. *The Turkish Online Journal of Educational Technology*, *8*(2).

Al-Faqara, W. (2015). The linguistic challenges faced by Malaysian students in learning Arabic as a foreign language. *British Journal of Humanities and Social Sciences*, *13*(1), 202–207.

Al-Hujran, O., Al-Lozi, E., & Al-Debei, M. M. (2014). Get ready to mobile learning: Examining factors affecting college students' behavioral intentions to use m-learning in Saudi Arabia. *Jordan Journal of Business Administration*, *10*(1).

Al-Huri, I. (2015). Arabic Language: Historic and sociolinguistic characteristics. *English Literature and Language Review*, *1*(4), 28–36.

Al-Said, K. M. (2015). Students' perceptions of edmodo and mobile learning and
their real barriers towards them. *Turkish Online Journal of Educational
Technology*, *14*(2), 167–180.

Al-Sarami, A. (2017). معايير تقييم مواقع تعليم اللغة العربية لغير الناطقين بها على الشبكة العالمية في
ضوء المهارات اللغوية. *مجلة التخطيط والسياسة اللغوية*, *4*, 73–110.
https://kaica.org.sa/links/emags/takhteet_issue_04.pdf

Al-shehri, S. (2012). *Contextual language learning: The educational potential of
mobile technologies and social media*.

Al-Shehri, S. (2012). Contextual language learning: The educational potential of
mobile technologies and social media.(Doctoral Dissertation). *The University of
Queensland, Australia*.

Al-Sobh, M. A., Abu-Melhim, A.-R. H., & Bani-Hani, N. A. (2015). Diglossia as a
result of language variation in Arabic: Possible solutions in light of language
Planning. *Journal of Language Teaching and Research*, *6*(2), 274–279.
https://doi.org/10.17507/jltr.0602.05

Al-Sulaimani, A. A. (2010). The importance of teachers in integrating ict into science
teaching in intermediate schools in Saudi Arabia : A mixed methods study.
(Doctoral Dissertation). *RMIT University, Australia*.

Al-Turki, S. M. (2014). Assessment of information technology awareness and usage
in higher education in Saudi Arabia: Sample study in Jazan and King Faisal
University KSA. *International Journal of Advanced Research in IT and
Engineering*, *3*(9), 1–17.

Al Mulhim, E. (2014). The barriers to the use of ict in teaching in Saudi Arabia: A
review of literature. *Universal Journal of Educational Research*, *2*(6), 487–493.
https://doi.org/10.13189/ ujer.2014.020606

Al Musawi, A., Al Hashmi, A., Kazem, A. M., Al Busaidi, F., & Al Khaifi, S. (2016).
Perceptions of Arabic language teachers toward their use of technology at the
Omani basic education schools. *Education and Information Technologies*, *21*(1),
5–18. https://doi.org/10.1007/s10639-013-9305-5

AlAwadhi, S., & Morris, A. (2008). The use of the UTAUT model in the adoption of
E-government services in Kuwait. *Proceedings of the 41st Annual Hawaii
International Conference on System Sciences (HICSS 2008)*, 219–219.
https://doi.org/10.1109/HICSS.2008.452

Albalooshi, N., Mohamed, N., & Al-Jaroodi, J. (2011). The challenges of Arabic
language use on the internet. *2011 International Conference for Internet
Technology and Secured Transactions, ICITST 2011*, 378–382.

Albantani, A., Madkur, A., & Rozak, A. (2020). Social media in classroom: The use
of Facebook in foreign language learning. *Proceedings of the Proceedings of the
2nd International Conference on Quran and Hadith Studies Information
Technology and Media in Conjunction with the 1st International Conference on
Islam, Science and Technology, ICONQUHAS & ICONIST, Bandung, October
2-*, 1–9. https://doi.org/10.4108/eai.2-10-2018.2295511

Albion, P. R. (2001). Some factors in the development of self-efficacy beliefs for
computer use among teacher education students. *Journal of Technology and
Teacher Education*, *9*(3), 321–347. http://eprints.usq.edu.au/id/eprint/2694

Albugami, S., & Ahmed, V. (2015). Success factors for ICT implementation in Saudi
secondary schools: From the perspective of ICT directors, head teachers,
teachers and students. *International Journal of Education and Development
Using Information and Communication Technology*.

Aldiab, A., Chowdhury, H., Kootsookos, A., Alam, F., & Allhibi, H. (2019).

Utilization of learning management systems (LMSs) in higher education system:

A case review for Saudi Arabia. *Energy Procedia*.

https://doi.org/10.1016/j.egypro.2019.02.186

Alebaikan, R., & Troudi, S. (2010). Blended learning in Saudi universities:

Challenges and perspectives. *ALT-J*, *18*(1), 49–59.

https://doi.org/10.1080/09687761003657614

Alenezi, A. (2017). Technology leadership in Saudi schools. *Education and*

Information Technologies, *22*(3), 1121–1132. https://doi.org/10.1007/s10639-

016-9477-x

Alharthi, M. (2016). توقيع مذكرة تفاهم للتعاون التقني بين وزارة التعليم وشركة مايكروسوفت.

https://www.moe.gov.sa/ar/news/Pages/microsoftandmoemeet.aspx

Alhassan, R. (2016). Mobile learning as a method of ubiquitous learning: Students'

attitudes, readiness, and possible barriers to implementation in higher education.

Journal of Education and Learning, *5*(1), 176.

https://doi.org/10.5539/jel.v5n1p176

Ali, A., & Haque, M. (2017). Telecommunication sector of saudi arabia: internal and

external analysis. *Academy of Accounting and Financial Studies Journal*, *21*(3),

1–21.

Alkahtani, A. (2017). The challenges facing the integration of ict in teaching in Saudi

secondary schools. *International Journal of Education and Development Using*

Information and Communication Technology, *13*(1), 32–51.

Alkhalaf, S. (2015). Evaluating m-learning in Saudi Arabian higher education: A case

study. *ArXiv Preprint ArXiv:1510.03189*.

Alkhasawneh, S., & Alanazy, S. (2015). Adopt ICT among academic staff in Aljouf

University: Using UTAUT model. *Mediterranean Journal of Social Sciences*,

6(1), 490–494. https://doi.org/10.5901/mjss.2015.v6n1p490

Allam, M., & Elyas, T. (2016). Perceptions of using social media as an ELT tool
among EFL teachers in the Saudi context. *English Language Teaching*, 9(7), 1–
9.

Allam, M., Elyas, T., Bajnaid, A., & Rajab, H. (2017). Using Twitter as an ELT tool
in the Saudi EFL context. *International Journal of Linguistics*, 9(5), 41.
https://doi.org/10.5296/ijl.v9i5.11813

Allen, R., & Allouche, A. (1986). *Let's learn Arabic: A proficiency-based syllabus
for modern standard arabic*. University of Pennsylvania.

Alosh, M. (1997). *Learner, text, and context in foreign language acquisition: an
Arabic perspective*. Ohio State University National Foreign Language Resource
Center.

Alrasheedi, M., & Capretz, L. F. (2015). Determination of critical success factors
affecting mobile learning: A meta-analysis approach. *Turkish Online Journal of
Educational Technology*, 14(2), 41-51.

Alresheed, S., & Leask, M. (2015). Factors affecting computer-assisted language
learning in Saudi Arabia classrooms. *9th International Technology, Education
and Development (INTED) 2015 Conference*, 1–10.

Alshabeb, A., & Almaqrn, R. (2018). A study of EFL Saudi students' use of mobile
social media applications for learning. *Arab World English Journal*, 4(4), 214–
226. https://doi.org/10.24093/awej/call4.17

Alshahrani, H. A. (2016). A brief history of the Internet in Saudi Arabia. *TechTrends*,
60(1), 19–20. https://doi.org/10.1007/s11528-015-0012-5

Alsrhid, A. (2013). Difficulties face by foreign students in learning arbic language
programs for non-native speakers. *Journal of Education and Practice*, 4(2), 160–

170.

Alyami, R. H. (2014). Educational reform in the Kingdom of Saudi Arabia: Tatweer schools as a unit of development. *Literacy Information and Computer Education Journal*, *5*(2), 1515–1524. https://doi.org/10.20533/licej.2040.2589.2014.0202

Alzahrani, H. (2015). Examining the effectiveness of utilizing mobile technology in vocabulary development for language learners. *SSRN Electronic Journal*, *6*(3), 108–119. https://doi.org/10.2139/ssrn.2834731

Alzaza. (2011). Students' awareness and requirements of mobile learning services in the higher education environment. *American Journal of Economics and Business Administration*, *3*(1), 95–100. https://doi.org/10.3844/ajebasp.2011.95.100

Anderson, J. M. (2014). *The second digital divide: The effects of ethnicity and socioeconomic status on student technology access and use outside the school day*. Baker University.

Anderson, T., & Dron, J. (2012). Learning technology through three generations of technology enhanced distance education pedagogy. *European Journal of Open, Distance and e-Learning*, *15*(2), 1–14.

Andujar, A. (2016). Benefits of mobile instant messaging to develop ESL writing. *System*, *62*, 63–76. https://doi.org/10.1016/j.system.2016.07.004

Anshari, M., Almunawar, M. N., Shahrill, M., Wicaksono, D. K., & Huda, M. (2017). Smartphones usage in the classrooms: Learning aid or interference? *Education and Information Technologies*, *22*(6), 3063–3079. https://doi.org/10.1007/s10639-017-9572-7

Arabic-Online. (n.d.). *About Arabic Online Progam*. Retrieved November 11, 2019, from https://www.arabic-online.net/copy-of-about

Ariew, R., & Palmer, J. (2009). Developing hypertext reading materials for the

teaching of Arabic. In Chang, M., & Kuo, C. (Ed.), *Learning culture and language through ICTs: Methods for enhanced instruction* (pp. 58-71). IGI Global. http://doi:10.4018/978-1-60566-166-7.ch004

Armitage, C. J., & Conner, M. (2001). Efficacy of the Theory of Planned Behaviour: A meta-analytic review. *The British Journal of Social Psychology*, *40*(4), 471–499.

Ary, D., Jacobs, L. C., Sorensen, C., & Razavieh, A. (2010). *Introduction to research in education. Belmont, CA: Cengage Learning*. Inc.

Babbie, E. R. (2013). *The basics of social research*. Cengage learning.

Banerji, S., & Chowdhury, R. S. (2013). On IEEE 802.11: Wireless LAN technology. *International Journal of Mobile Network Communications & Telematics*, *3*(4), 45–64. https://doi.org/10.5121/ijmnct.2013.3405

Barreiro, P. L., & Albandoz, J. P. (2001). Population and sample. Sampling techniques. *Management Mathematics for European Schools*, *1*(1), 1–18.

Berg, J. (2011). *The IEEE 802.11 standardization its history, specifications, implementations, and future*. Technical Report GMU-TCOM-TR-8, George Mason University.

Blair, I. (2019). *Mobile app download and usage statistics 2019*. Buildfire. https://buildfire.com/app-statistics/

Blake, R. J. (2013). *Brave new digital classroom: Technology and foreign language learning*. Georgetown University Press.

Blanca, M. J., Alarcon, R., Arnau, J., Bono, R., & Bendayan, R. (2017). Non-normal data: Is ANOVA still a valid option? *Psicothema*, *29*(4), 552. https://doi.org/10.7334/psicothema2016.383

Block, D. (2004). Globalization, transnational communication and the Internet.

International Journal of Multicultural Societies, *6*(1), 13–28.

Boudhief, A., Maraoui, M., & Zrigui, M. (2013). Call system based on pedagogically indexed text. *Proceedings of 2013 Palestinian International Conference on Information and Communication Technology*, 14–21. https://doi.org/10.1109/PICICT.2013.13

Bowen, P., Rose, R., & Pilkington, A. (2017). Mixed methods-theory and practice. Sequential, explanatory approach. *International Journal of Quantitative and Qualitative Research Methods*, *5*(2), 10–27.

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, *3*(2), 77–101.

Braun, V., Clarke, V., & Gray, D. (2017). *Collecting qualitative data a practical guide to textual, media and virtual techniques*. Cambridge University Press.

Brown, K. L. (2003). From teacher-centered to learner-centered curriculum: Improving learning in diverse classrooms. *Education*, *124*(1), 49–54.

Burston, J. (2014). MALL: The pedagogical challenges. *Computer Assisted Language Learning, 27*(4), 344-357.

Carrie, S. (2019). *Duolingo's Arabic course is finally here – but why did it take so long?*. The National, ARTS & CULTURE. https://www.thenational.ae/arts-culture/books/duolingo-s-arabic-course-is-finally-here-but-why-did-it-take-so-long-1.887352

Cetinkaya, L. (2017). The impact of Whatsapp use on success in education process. *The International Review of Research in Open and Distributed Learning*, *18*(7). https://doi.org/10.19173/irrodl.v18i7.3279

Chan, J. (2019). *Top language apps worldwide for april 2019 by downloads*. SensorTower.

Chanchary, F. H., & Islam, S. (2011). *Mobile learning in Saudi Arabia–prospects and challenges* [Paper presentation]. International Arab Conference on Information Technology. Jordan: Zarqa University.

Chenail, R. J. (1995). Presenting qualitative data. *The Qualitative Report*, *2*(3), 1–9.

Christensen, L. B., Johnson, B., Turner, L. A., & Christensen, L. B. (2011). *Research methods, design, and analysis*. Pearson.

Chuttur, M. Y. (2009). Overview of the Technology Acceptance Model: Origins, developments and future directions. *Working Papers on Information Systems*, *9*(37), 9–37.

Clement, J. (2019, March 2). *Apple: most popular app store categories 2019*. Statista. https://www.statista.com/statistics/270291/popular-categories-in-the-app-store/

Clement, J. (2020a, February 9). *Countries with most Twitter users 2020.* Statista. https://www.statista.com/statistics/242606/number-of-active-twitter-users-in-selected-countries/

Clement, J. (2020b, March 5). *Global digital population 2020*. Statista. https://www.statista.com/statistics/617136/digital-population-worldwide/

Clement, J. (2020c, February 25). *Number of apps in leading app stores 2019*. Statista. https://www.statista.com/statistics/276623/number-of-apps-available-in-leading-app-stores/

Cohen, L., Manion, L., & Morrison, K. (2011). *Research methods in education* (7th ed). Routledge.

Cohen, L., Manion, L., & Morrison, K. (2013). *Research methods in education*. Routledge.

Connelly, L. M. (2008). Pilot studies. *Medsurg Nursing*, *17*(6), 411-2.

Conner, M., Gaston, G., Sheeran, P., & Germain, M. (2013). Some feelings are more

important: Cognitive attitudes, affective attitudes, anticipated affect, and blood donation. *Health Psychology*, *32*, 264–272

Cooney, G., & Keogh, K. A. (2007). Use of mobile phones for language learning and assessment for learning, a pilot project. *Proceedings of the 6th Annual International Conference on Mobile Learning, Melbourne, Australia.*

Corder, G. W., & Foreman, D. I. (2009). *Nonparametric statistics for non-statisticians : A step-by-step approach.* John Wiley & Sons.

Creswell, J. W. (2013). *Research design: Qualitative, quantitative, and mixed methods approaches*. SAGE.

Creswell, J. W. (2018). *Research design: qualitative, quantitative, and mixed methods approaches*. SAGE.

Creswell, J. W., Plano C. L., Gutmann, M. L., & Hanson, W. E. (2003). Advanced mixed methods research designs. In Tashakkori, A. Teddlie, C. (Eds.), *Handbook of Mixed Methods in Social and Behavioral Research* (pp. 209–240).

Creswell, J. W., & Plano, V. L. (2017). *Designing and conducting mixed methods research.* (Third ed.). SAGE.

Crompton, H. (2013). A historical overview of mobile learning: Toward learner-centered education. In Z. L. Berge, & L. Y. Muilenburg (Eds.), *Handbook of mobile learning* (pp. 3–14).

Darmi, R., & Albion, P. (2014). A review of integrating mobile phones for language learning. *International Association for Development of the Information Society*, 1–8.

Daud, W. W., Teck, W. K., & Ghani, M. T. (2018). A conceptual framework for mobile application in learning Arabic language proficiency. *The Journal of Social Sciences Research*, *SPI4*, 66–70. https://doi.org/10.32861/jssr.spi4.66.70

Davis, F. (1986). *A technology acceptance model for empirically testing new end-user information systems : Theory and results* [Doctoral dissertation, Massachusetts Institute of Technology]. Massachusetts Institute of Technology. http://hdl.handle.net/1721.1/15192

Davis, F. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly, 13,* 319–340.

Denzin, N. K., & Lincoln, Y. S. (2008). *Collecting and interpreting qualitative materials*. Sage.

Devi, L. P., Bimol, S., Saikia, M., & Singh, L. S. (2014). Cloud technology in higher teacher education institutions: A solution to ICT infraucture adoption problem. *International Journal of Advanced Studies in Computer Science and Engineering(IJASCSE)*, *3*(4), 28–33.

Dickinson, L. (1993). Talking shop: Aspects of autonomous learning: An interview with Leslie Dickinson. *ELT Journal*, *47*(4), 330–336. https://doi.org/10.1093/elt/47.4.330

Dörnyei, Z. (2003). *Questionnaires in second language research*. Lawrence Erlbaum Associates, Inc.

Dörnyei, Z. (2007). *Research methods in applied linguistics: Quantitative, qualitative, and mixed methodologies*. Oxford University Press.

Dron, J., & Anderson, T. (2014). *Teaching crowds: Learning and social media*. Athabasca University Press.

Duman, G., Orhon, G., & Gedik, N. (2015). Research trends in mobile assisted language learning from 2000 to 2012. *ReCALL*, *27*(2), 197–216. https://doi.org/10.1017/S0958344014000287

Dündar, H., & Akçayır, M. (2014). Implementing tablet PCs in schools: Students'

attitudes and opinions. *Computers in Human Behavior*, *32*, 40–46.
https://doi.org/10.1016/j.chb.2013.11.020

Durkawi, A. A., & Binmoeller, J. (2017). Intercultural communicative competency in
an age of globalization: Using technology in teaching the Arabic language as
culture. *The Language Scholar*, *1*,47-164.

Dwivedi, Y. K., Rana, N. P., Jeyaraj, A., Clement, M., & Williams, M. D. (2019). Re-
examining the unified theory of acceptance and use of technology (UTAUT):
Towards a revised theoretical model. *Information Systems Frontiers*, *21*(3), 719–
734. https://doi.org/10.1007/s10796-017-9774-y

Elaraby, M. (2016, October 4). *Telecoms in the kingdom of Saudi Arabia — An
Overview*. Mondaq. https://www.mondaq.com/saudiarabia/telecoms-mobile-
cable-communications/532718/telecoms-in-the-kingdom-of-saudi-arabia-an-
overview

Elnaggar, K. (2019). Difficulties in learning Arabic for non-native speakers Islamic
University in Medina. *International Journal of Research in Educational
Sciences*, *02*(04), 289–354. https://doi.org/10.29009/ijres.2.4.7

Erradi, A., Nahia, S., Almerekhi, H., & Al-kailani, L. (2012). ArabicTutor: A
multimedia m-learning platform for learning Arabic spelling and vocabulary.
*Proceedings of 2012 International Conference on Multimedia Computing and
Systems*, *Tangiers, Morocco*, 833–838.
https://doi.org/10.1109/ICMCS.2012.6320220

Etikan, I. , & Bala, K. (2017). Sampling and sampling methods. *Biometrics &
Biostatistics International Journal*, *5*(6), 215–217.
https://doi.org/10.15406/bbij.2017.05.00149

Facchin, A. (2019). *Teaching Arabic as a foreign language language origins,*

developments and current directions. Amsterdam University Press.

https://doi.org/10.5117/9789463720601

Fahmy, E. I., & Rifaat, N. M. (2010). Middle East information literacy awareness and

indigenous Arabic content challenges. *International Information & Library

Review*, *42*(2), 111–123. https://doi.org/10.1080/10572317.2010.10762853

Farley, H., Murphy, A., Johnson, C., Carter, B., Lane, M., Midgley, W., Hafeez-Baig,

A., Dekeyser, S., & Koronios, A. (2015). How do students use their mobile

devices to support learning? A case study from an Australian Regional

University. *Journal of Interactive Media in Education*, (1), 1-13.

https://doi.org/10.5334/jime.ar

Fattah, S. (2015). The effectiveness of using WhatsApp messenger as one of mobile

learning techniques to develop students' writing skills. *Journal of Education and

Practice*, *6*(32), 115–127.

Ferguson, C. A. (1959). Diglossia. *WORD*, *15*(2), 325–340.

https://doi.org/10.1080/00437956.1959.11659702

Ferris-Lehman, H. (2016, January 6). *The impact of mobile on social media*. Elevation

Marketing. https://www.elevationb2b.com/blog/the-impact-of-mobile-on-social-

media

Festinger, L. A. (1957). *Theory of cognitive dissonance*. Row and Peterson.

Fishbein, M. and Ajzen, I. (1975). *Belief, attitude, intention and behaviour: An

introduction to theory and research*. Addison-Wesley.

Fleischer, H. (2012). What is our current understanding of one-to-one computer

projects: A systematic narrative research review. *Educational Research Review*,

7(2), 107–122.

Foreign Service Institute. (2019). *Foreign language training - United States

Department of State. Foreign Service Institute. https://www.state.gov/foreign-language-training/

Ganapathy, M., Shuib, M., & Azizan, S. N. (2016). Malaysian ESL students' perceptions on the usability of a mobile application for grammar test: A case study of ESL undergraduates in Universiti Sains Malaysia. *3L The Southeast Asian Journal of English Language Studies*, *22*(1), 127–140. https://doi.org/10.17576/3L-2016-2201-10

Gangaiamaran, R., & Pasupathi, M. (2017). Review on use of mobile apps for language learning. *International Journal of Applied Engineering Research*, *12*(21), 11242–11251.

Gay, L. R., Mills, G. E., & Airasian, P. W. (1976). *Educational research: Competencies for analysis and application*. Merrill Columbus, OH.

Gay, L. R., Mills, G. E., & Airasian, P. W. (2012). *Educational research: Competencies for analysis and applications* (10th ed). Pearson.

Gayeski, D. (2002). *Learning Unplugged: Using Mobile Technologies for Organizational Training and Performance Improvement*. AMACOM

General Authority for Statistics. (2016). *Demographic survey*. Retrieved from https://www.stats.gov.sa/sites/default/files/en-demographic-research-2016_7.pdf

General Authority for Statistics. (2018). *ICT access and usage by households and individuals survey*. Retrieved from https://www.stats.gov.sa/en/952

George, D., & Mallery, P. (2010). *SPSS for windows step by step : A simple guide and reference, 17.0 update* (10th ed.). Boston. Allyn & Bacon.

Gerhart, N., Torres, R., & Negahban, A. (2017). Combatting fake news: An investigation of individuals' information verification behaviors on social networking sites. *AIS Social Computing,* 3976-3985

Ghani, M. T. A., Daud, W. A. A. W., & Sahrir, M. S. (2016). Employing websites in language learning for tourism purpose among arabic learners at the MARA Poly-Tech College (KPTM). In J. Luaran, J. Sardi, A. Aziz, & N. Alias (Eds.), *Envisioning the future of online learning* (pp. 23–30). Springer, Singapore. https://doi.org/10.1007/978-981-10-0954-9_3

Ghanizadeh, A., Razavi, A., & Jahedizadeh, S. (2015). Technology-enhanced language learning (TELL): A review of resources and upshots. *International Letters of Chemistry, Physics and Astronomy*, *54*, 73–87. https://doi.org/10.18052/www.scipress.com/ILCPA.54.73

Gharawi, M. A., & Bidin, A. (2016). Computer assisted language learning for learning Arabic as a second language in Malaysia: Teacher perceptions. *International Journal of Information and Education Technology*, *6*(8), 633–637. https://doi.org/10.7763/IJIET.2016.V6.764

Gillham, B. (2005). *Research interviewing: The range of techniques: A practical guide*. McGraw-Hill Education (UK).

Glass, G., Peckham, D., & Sanders, R. (1972). Consequences of failure to meet assumptions underlying the fixed effects analyses of variance and covariance. *Review of Educational Research*, *42*(3), 237–288. https://doi.org/10.3102/00346543042003237

Gon, S., & Rawekar, A. (2017). Effectivity of e-learning through Whatsapp as a teaching learning tool. *MVP Journal of Medical Sciences*, *4*(1), 19. https://doi.org/10.18311/mvpjms/0/v0/i0/8454

Goodhue, L., & Thompson, L. (1995). Task-technology fit and individual performance. *MIS Quarterly,19*(2), 213-236.

Granwal, L. (2018, October 20). Smartphone penetration rate as share of the

population in Australia from 2012 to 2022. *Statista.*

https://www.statista.com/statistics/321477/smartphone-user-penetration-in-

australia/

Groff, J. (2013). Technology-rich innovative learning environments. *OCED*

Innovative Learning Environment Project, 1–30.

Guba, E. (1981). Criteria for assessing the trustworthiness of naturalistic

inquiries. *Educational Communication and Technology, 29*(2), 75-91.

Guest, G., Namey, E. E., & Mitchell, M. L. (2013). *Collecting qualitative data: A*

field manual for applied research. SAGE.

https://doi.org/10.4135/9781506374680

Gunasekare, T. (2015). Mixed research method as the third research paradigm: A

Literature Review. *International Journal of Science and Research*, *4*(8), 361–

367.

Haddock, G., & Maio, G. R. (2008). Attitudes: Content, structure and functions. In H.

Miles., S. Wolfgang & J. Klaus (Eds.), *Introduction to social psychology: A*

European perspective (pp. 112–133). Blackwell Oxford.

Hadla, L.S., Hailat, T.M., & Al-Kabi, M.N. (2014). Evaluating Arabic to English

machine translation. *International Journal of Advanced Computer Science and*

Applications, 5(11), 68-73.

Hai, L. C., & Kazmi, S. H. (2015). Dynamic support of government in online

shopping. *Asian Social Science*, *11*(22), 1-9.

Hamed, A. (2012). The utilization of technology in teaching of the Arabic language in

secondary schools in Riyadh, Saudi Arabia. *Procedia - Social and Behavioral*

Sciences, *64*, 594–603. https://doi.org/10.1016/j.sbspro.2012.11.069

Handal, B., Ritter, R., & Marcovitz, D. (2014). Implementing large scale mobile

learning school programs: To BYOD or not to BYOD. In J. Viteli, & M.

Leikomaa (Eds.), *Proceedings of EdMedia 2014--World Conference on*

Educational Media and Technology (pp. 796-801). Association for the

Advancement of Computing in Education (AACE).

https://www.learntechlib.org/primary/p/147584/

Hasan, B., & Ahmed, M. U. (2010). A path analysis of the impact of application-

specific perceptions of computer self-efficacy and anxiety on technology

acceptance. *Journal of Organizational and End User Computing*, *22*(3), 82–95.

https://doi.org/10.4018/joeuc.2010070105

Hatch, E. M., & Lazaraton, A. (1991). *The research manual: Design and statistics for*

applied linguistics. Newbury House Publishers.

Haynes, S. N., Richard, D., & Kubany, E. S. (1995). Content validity in psychological

assessment: A functional approach to concepts and methods. *Psychological*

Assessment, *7*(3), 238–247.

Heil, C. R., Wu, J. S., Lee, J. J., & Schmidt, T. (2016). A review of mobilel language

learning applications: Trends, challenges, and opportunities. *The EuroCALL*

Review, *24*(2), 32–50. https://doi.org/10.4995/eurocall.2016.6402

Helles, R. (2013). Mobile communication and intermediality. *Mobile Media &*

Communication, *1*(1), 14–19. https://doi.org/10.1177/2050157912459496

Hinton, P. R., McMurray, I., & Brownlow, C. (2014). *SPSS explained.* Routledge.

Hisham, A. (2019). اكتساب العربية لغة ثانية بواسطة تطبيقات الجوال دراسة تقييمية لتخطيط أفضل.

التخطيط والسياسة اللغوية, *8*(4), 38–86. https://kaica.org.sa/site/page/30

Hojjati, S. N., & Khodakarami, M. (2016). Evaluation of factors affecting the

adoption of smart buildings using the technology acceptance

model. *International Journal of Advanced Networking and Applications*, *7*(6),

2936-2943.

Hwang, G. J., Chu, H. C., Lin, Y. S., & Tsai, C. C. (2011). A knowledge acquisition approach to developing mindtools for organizing and sharing differentiating knowledge in a ubiquitous learning environment. *Computers & Education*, *57*(1), 1368–1377.

Ifenthaler, D., & Schweinbenz, V. (2013). The acceptance of tablet-PCs in classroom instruction: The teachers' perspectives. *Computers in Human Behavior*, *29*(3), 525–534. https://doi.org/10.1016/j.chb.2012.11.004

Ifenthaler, D., & Schweinbenz, V. (2016). Students' acceptance of tablet PCs in the classroom. *Journal of Research on Technology in Education*, *48*(4), 306–321. https://doi.org/10.1080/15391523.2016.1215172

Iqbal, M. (2020). App download and usage statistics (2019). Retrieved from https://www.businessofapps.com/data/app-statistics/

Irving, T. B. (1957). How hard is Arabic? *The Modern Language Journal*, *41*(6), 289. https://doi.org/10.2307/321527

Isaac, S., & Michael, W. B. (1995). *Handbook in research and evaluation: A collection of principles, methods, and strategies useful in the planning, design, and evaluation of studies in education and the behavioral sciences* (3rd ed). EdITS Publishers.

Islam, A. N., Azad, N., Mäntymäki, M., & Islam, S. S. (2014, November). *TAM and e-learning adoption: A philosophical scrutiny of TAM, its limitations, and prescriptions for e-learning adoption research* [Paper presentation]. 13th Conference on e-Business, e-Services and e-Society, Sanya, China.

Ivankova, N. V, Creswell, J. W., & Stick, S. L. (2006). Using mixed-methods sequential explanatory design: From theory to practice. *Field Methods*, *18*(1), 3–

20. https://doi.org/10.1177/1525822X05282260

Jabak, O. (2019). Assessment of Arabic-English translation produced by Google Translate. *International Journal of Linguistics, Literature and Translation*, *2*(4), 238-247. https://doi.org/10.32996/ijllt.2019.2.4.24

Jabli, N., & Qahmash, A. (2013). The benefits and barriers of e-learning in higher education in Saudi Arabia. *Journal of Emerging Trends in Computing and Information Sciences*, *4*(1), 877–880.

Johnson, R. B., & Onwuegbuzie, A. J. (2004). Mixed methods research: A research paradigm whose time has come. *Educational Researcher*, *33 (7)*, 14–26.

Kaiser, H. F. (1970). A second generation little jiffy. *Psychometrika*, *35*(4), 401–415. https://doi.org/10.1007/BF02291817

Kaiser, H. F. (1974). An index of factorial simplicity. *Psychometrika*, *39*(1), 31–36. https://doi.org/10.1007/BF02291575

Kakihara, M., & Sorensen, C. (2002, January). Mobility: An extended perspective. *Proceedings of the 35th Annual Hawaii International Conference on System Sciences* (pp. 1756-1766). IEEE.

Kalhoro, Q., Chowdhry, L. ., Abbasi, T., & Abbasi, S. (2010, October 3-5). *M-learning -an innovative advancement of ICT in education* [Paper presentation]. 2010 4th International Conference on Distance Learning and Education, San Juan, PR, USA. https://doi.org/10.1109/ICDLE.2010.5606017

Kaliisa, R., & Picard, M. (2017). A systematic review on mobile learning in higher education: The African perspective. *Turkish Online Journal of Educational Technology*, *16*(1), 1–18.

Kamel, I., Eltalmas, A., & Abubaker, M. (2005). On searching Arabic records in electronic libraries. *International Cataloguing and Bibliographic Control, 34*(2), 23–26.

Kaur, G. (2011). Study and analysis of lecture model of teaching. *International Journal of Educational Planning & Administration*, *1*(1), 9–13.

Kaushik, V., & Walsh, C. A. (2019). Pragmatism as a research paradigm and its implications for social work research. *Social Sciences*, *8*(9), 255. https://doi.org/10.3390/socsci8090255

Keeves, J. P., & Darmawan, I. (2007). Issues in language learning. *International Education Journal*, *8*(2), 16–26.

Keselman, H. J., Huberty, C. J., Cribbie, R. A., Lowman, L. L., Lix, L. M., Donahue, B., Petoskey, M. D., Levin, J. R., Olejnik, S., Kowalchuk, R. K., & Keselman, J. C. (1998). Statistical practices of educational researchers: An analysis of their ANOVA, MANOVA, AND ANCOVA analyses. *Review of Educational Research, 68*(3), 350–386. https://doi.org/10.3102/00346543068003350

Khalaf, M. H. R. (2019). Responsive or adaptive educational mobile websites: The impact of different designs on students' preferences at Jouf University Saudi Arabia. *Turkish Online Journal of Educational Technology*, *18*(2), 82–92.

Khlaif, Z. N. (2018). Factors influencing teachers' attitudes toward mobile technology integration in k-12. *Technology, Knowledge and Learning*, *23*(1), 161–175. https://doi.org/10.1007/s10758-017-9311-6

Kim, I., Kim, R., Kim, H., Kim, D., Han, K., Lee, P. H., Mark, G., & Lee, U. (2019). Understanding smartphone usage in college classrooms: A long-term measurement study. *Computers & Education*, *141*, 1-16. https://doi.org/10.1016/j.compedu.2019.103611

King Abdulaziz City for Science and Technology. (2012). KACST "Science and Technology" exerts strenuous efforts to support and enrich the Arabic content on the internet. Retrieved from https://www.kacst.edu.sa/eng/about/news/Pages/news4011216-2784.aspx

King, W. R., & He, J. (2006). A meta-analysis of the technology acceptance model. *Information & Management*, *43*(6), 740–755. https://doi.org/10.1016/j.im.2006.05.003

Knapik, M. (2006). The qualitative research interview: Participants' responsive participation in knowledge making. *International Journal of Qualitative Methods*, *5*(3), 77–93. https://doi.org/10.1177/160940690600500308

Korstjens, I., & Moser, A. (2018). Series: Practical guidance to qualitative research. Part 4: Trustworthiness and publishing. *European Journal of General Practice*, *24*(1), 120–124. https://doi.org/10.1080/13814788.2017.1375092

Kukulska-Hulme, A. (2009). Will mobile learning change language learning? *ReCALL*, *21*(02), 157–165.

Kukulska-Hulme, A., Norris, L., & Donohue, J. (2015). *Mobile pedagogy for English language teaching: a guide for teachers*. British Council. http://englishagenda.britishcouncil.org/sites/ec/files/e485%20mobile%20pedagogy%20for%20elt_final_v2.pdf

Kukulska-Hulme, A. (2020). Mobile-assisted language learning. In C. A. Chapelle (Ed.), *The Encyclopedia of Applied Linguistics* (pp. 1–9). Wiley. https://doi.org/10.1002/9781405198431.wbeal0768.pub2

Kvale, S. (1996). *Interviews*. Thousands Oaks. Sage.

Lambert, R. D. (1992). *Foreign language planning in the United States*. National Foreign Language Center. https://files.eric.ed.gov/fulltext/ED355805.pdf

Larson-Hall, J. (2015). *A guide to doing statistics in second language research using SPSS and R*. Routledge.

Laurillard, D. (2005). E-learning in higher education. In P. Ashwin (Ed.), *Changing higher education* (pp. 87–100). Routledge.

Laurillard, D. (2007). Pedagogical forms of mobile learning: framing research questions. In N. Pachler (Ed.), *Mobile learning: towards a research agenda* (pp. 153–175). WLE Centre, Institute of Education.

Lee, Y., Kozar, K. A., & Larsen, K. R. T. (2003). The technology acceptance model: Past, present, and future. *Communications of the Association for Information Systems*, *12*(1), 752–780. https://doi.org/10.17705/1CAIS.01250

Leiner, B. M., Cerf, V. G., Clark, D. D., Kahn, R. E., Kleinrock, L., Lynch, D. C., Postel, J., Roberts, L. G., & Wolff, S. (2009). A brief history of the internet. *ACM SIGCOMM Computer Communication Review*, *39*(5), 22–31. https://doi.org/10.1145/1629607.1629613

Levy, M., & Stockwell, G. (2013). *CALL dimensions: Options and issues in computer-assisted language learning*. Routledge.

Li, Z., & Hegelheimer, V. (2013). Mobile-assisted grammar exercises: Effects on self-editing in l2 writing. *Language Learning and Technology*, *17*(3), 135–156.

Lodico, M. G., Spaulding, D. T., & Voegtle, K. H. (2010). *Methods in educational research: From theory to practice* (2nd ed.). John Wiley & Sons.

Luaran, J., Jain, J., & Abd Rahman, N. (2016). The use of WhatsApp group in class-related information sharing through academic discussion. *International Journal on E-Learning and Higher Education*, *4*, 176–194.

Luisa Sevillano-García, M., & Vázquez-Cano, E. (2015). The impact of digital mobile devices in higher education. *Journal of Educational Technology & Society*,

18(1), 106–118. https://doi.org/10.2307/jeductechsoci.18.1.106

MacCallum, K., Day, S., Skelton, D., & Verhaart, M. (2017). Mobile affordances and learning theories in supporting and enhancing learning. *International Journal of Mobile and Blended Learning*, 9(2), 61-73.

Mackey, A., & Gass, S. M. (2015). *Second language research: Methodology and design* (2nd ed.). Routledge.

Maguire, M., & Delahunt, B. (2017). Doing a thematic analysis: A practical, step-by-step guide for learning and teaching scholars. *The All Ireland Journal of Teaching and Learning in Higher Education*, *9*(3), 3351-33514. http://ojs.aishe.org/index.php/aishe-j/article/view/335

Mahande, R., & Malago, J. (2019). An e-learning acceptance evaluation through UTAUT model in a postgraduate program. *The Journal of Educators Online*, *16*. https://doi.org/10.9743/JEO.2019.16.2.7

Maniar, N. (2007). M-learning to teach university students. In C. Montgomerie, & J. Seale (Eds.), *Proceedings of ED-MEDIA 2007--World Conference on Educational Multimedia, Hypermedia & Telecommunications* (pp. 881-887). Association for the Advancement of Computing in Education (AACE). https://www.learntechlib.org/primary/p/25485/

Marshall, B., Cardon, P., Poddar, A., & Fontenot, R. (2013). Does sample size matter in qualitative research?: A review of qualitative interviews in is research. *Journal of Computer Information Systems*, *54*(1), 11–22. https://doi.org/10.1080/08874417.2013.11645667

Maryska, M., Doucek, P., & Kunstova, R. (2012). The importance of ICT sector and ICT university education for the economic development. *Procedia - Social and Behavioral Sciences*, *55*, 1060–1068.

https://doi.org/10.1016/j.sbspro.2012.09.598

McEachan, R. R. C., Conner, M., Taylor, N. J., & Lawton, R. J. (2011). Prospective prediction of health-related behaviours with the theory of planned behaviour: A meta-analysis. *Health psychology review*, *5*(2), 97-144.

McGregor, S. L. T., & Murnane, J. A. (2010). Paradigm, methodology and method: intellectual integrity in consumer scholarship. *International Journal of Consumer Studies*, *34*(4), 419–427. https://doi.org/10.1111/j.1470-6431.2010.00883.x

Meishar-Tal, H., Kurtz, G., & Pieterse, E. (2012). Facebook groups as LMS: A case study. *The International Review of Research in Open and Distributed Learning*, *13*, 33–48. https://doi.org/10.19173/irrodl.v13i4.1294

Mercier, E. M., & Higgins, S. E. (2013). Collaborative learning with multi-touch technology: Developing adaptive expertise. *Learning and Instruction*, *25*, 13–23. https://doi.org/10.1016/j.learninstruc.2012.10.004

Ministry of Education. (2016). شركة مع تفاهم مذكرة توقع التعليم *K12* الأميركية. Ministry of Education. https://www.moe.gov.sa/ar/mediacenter/MOEnews/Pages/k12-singtuare.aspx

Moate, K. M., Chukwuere, J. E., & Mavhungu, M. B. (2017). The impact of wireless fidelity on students' academic performance in a developing economy. *Proceedings of the 31st International Academic Conference, London*, 139–155. https://doi.org/10.20472/IAC.2017.031.032

Mohammed, M. (2018). Challenges of learning English as a foreign language (EFL) by non-native learners. *International Journal of Social Science and Economic Research*, *3*(4), 1381–1400.

Mompean, J. A., & Fouz-González, J. (2016). Twitter-based EFL pronunciation instruction. *Language Learning and Technology*, *20*(1), 166–190.

Moore, M. G., & Kearsley, G. (2012). *Distance education : A systems view of online learning* (3rd ed.). Wadsworth Cengage Learning.

Muho, A., & Kurani, A. (2014). The role of interaction in second language acquisition. *European Scientific Journal, 16*, 44–54.

Naar, I. (2020, February 23). Saudi Arabia ranks third globally in deployment of 5G technology: Ministry. *Al Arabiya English*. https://english.alarabiya.net/en/business/technology/2020/02/23/Saudi-Arabia-ranks-third-globally-in-deployment-of-5G-technology-Ministry

Nair, U. (2013). A brief introduction to current e-learning systems. *Third Degree: The Working Papers of Doctoral Seminar Series*, *1*(1), 15–17.

Naismith, Laura, Sharples, M., Vavoula, G., & Lonsdale, P. (2004). *Literature review in mobile technologies and learning* (Report No. 11). Futurelab. https://www.nfer.ac.uk/publications/futl15/futl15.pdf

Napitupulu, E. E. (2017). Analysing the teaching and learning of mathematical reasoning skills in secondary school. *Journal of Asian Social Science*, *13*(02), 167-173.

Nassuora, A. B. (2012). Students acceptance of mobile learning for higher education in Saudi Arabia. *American Academic & Scholarly Research Journal*, *4*(2), 1–9.

Newman, I., & Benz, C. R. (1998). *Qualitative-quantitative research methodology: Exploring the interactive continuum*. Southern Illinois University Press.

Nielsen, H. L. (2009). Second language teaching. In K. Versteegh, M. Eid, A. Elgibali, M. Woidich, & A.Zaborski (Eds.), *Encyclopedia of Arabic Language and Linguistics* (pp. 146–156). Brill.

Niño, A. (2015). Language learners perceptions and experiences on the use of mobile applications for independent language learning in higher education. *IAFOR*

Journal of Education, 73–84.

Norman, G. (2010). Likert scales, levels of measurement and the "laws" of statistics. *Advances in Health Sciences Education*, *15*(5), 625–632.

O'Bannon, B. W., & Thomas, K. (2014). Teacher perceptions of using mobile phones in the classroom: Age matters! *Computers & Education*, *74*, 15–25. https://doi.org/10.1016/j.compedu.2014.01.006

O'Dea, S. (2019, May 15). Smartphone penetration worldwide 2014-2021. *Statista*. https://www.statista.com/statistics/203734/global-smartphone-penetration-per-capita-since-2005/

Oliver, R. L. (1980). A cognitive model for the antecedents and consequences of satisfaction. *Journal of Marketing Research, 17*, 460- 469.

O'Malley, C., Vavoula, G., Glew, J. P., Taylor, J., O'Malley, Sharples, M., Lefrere, P., Lonsdale, P., Naismith, L., & Waycott, J. (2005). *Guidelines for learning teaching tutoring in a mobile environment*. https://hal.archives-ouvertes.fr/hal-00696244/document

Ogata, H., Yin, C., El-Bishouty, M. M., & Yano, Y. (2010). Computer supported ubiquitous learning environment for vocabulary learning. *International Journal of Learning Technology*, *5*(1), 5–24.

Oppong, S. H. (2013). The problem of sampling in qualitative research. *Asian Journal of Management Sciences and Education*, *2*(2), 202–210.

Oroujlou, N., & Vahedi, M. (2011). Motivation, attitude, and language learning. *Procedia - Social and Behavioral Sciences*, *29*, 994–1000. https://doi.org/10.1016/j.sbspro.2011.11.333

Ouzts, D. T., & Palombo, M. J. (2004). Technology in higher education: A study of perceptions of college professors. *TechTrends: Linking Research and Practice to*

Improve Learning, *48*(5), 19–24.

Owens, J. (2006). *A Linguistic History of Arabic* (pp. 34–78). Oxford University

Press. https://doi.org/10.1093/acprof:oso/9780199290826.003.0002

Ozdamli, F. (2012). Pedagogical framework of m-learning. *Procedia - Social and

Behavioral Sciences*, *31*, 927–931. https://doi.org/10.1016/j.sbspro.2011.12.171

Özdoğan, K. M., Başoğlu, N., & Erçetin, G. (2012). *Exploring major determinants of

mobile learning adoption* [Paper presentation]. 2012 Proceedings of Portland

International Center for Management of Engineering and Technology:

Technology Management for Emerging Technologies, Vancouver, BC, Canada.

Pachler, N., Bachmair, B., & Cook, J. (2010). *Mobile learning: Structures, agency,

practices*. Springer US. https://doi.org/10.1007/978-1-4419-0585-7

Palalas, A., & Hoven, D. (2016). Emerging pedagogies for MALL. In A. Palalas &

M. Ally (Eds.), *The international handbook of mobile-assisted language

learning* (pp. 44–85). China Central Radio & TV University Press.

Palinkas, L. A., Horwitz, S. M., Green, C. A., Wisdom, J. P., Duan, N., & Hoagwood,

K. (2015). Purposeful sampling for qualitative data collection and analysis in

mixed method implementation research. *Administration and Policy in Mental

Health and Mental Health Services Research*, *42*, 533-544.

https://doi.org/10.1007/s10488-013-0528-y

Pallant, J. F. (2016). *SPSS survival manual: A step by step guide to data analysis

using IBM SPSS* (6th ed.). Allen & Unwin

Palmer, J. (2008). Arabic diglossia: Student perceptions of spoken Arabic after living

in the Arabic-speaking world. *Journal of Second Language Acquisition and

Teaching*, *15*, 81–95.

Pandey, R., Ashraf, J., & Verma, M. R. (2012). Proportional allocation stratum

weight for population units under external impact attributed to binomial functions in successive strata. *International Journal of Mathematics Sciences and Applications*, *2*(3), 867–872.

Park, Y. (2011). A pedagogical framework for mobile learning: Categorizing educational applications of mobile technologies into four types. *The International Review of Research in Open and Distributed Learning*, *12*(2), 78–102. https://doi.org/10.19173/irrodl.v12i2.791

Parsons, D. (2014). A mobile learning overview by timeline and mind map. *International Journal of Mobile and Blended Learning*, *6*(4), 1–21. https://doi.org/10.4018/ijmbl.2014100101

Pegrum, M. (2014). *Mobile learning: Languages, literacies and cultures* (1st ed.). Palgrave Macmillan UK. https://doi.org/10.1057/9781137309815

Pegrum, M. (2016). Three agendas for MALL. In A. Palalas & M. Ally (Eds.), *The International Handbook of Mobile-Assisted Language Learning* (pp. 86–112). China Central Radio & TV University Press Co.

Persson, V., & Nouri, J. (2018). A systematic review of second language learning with mobile technologies. *International Journal of Emerging Technologies in Learning*, *13*(02), 188–210. https://doi.org/10.3991/ijet.v13i02.8094

Pollara, P. C. (2011). *Mobile learning in higher education: A glimpse and a comparison of student and faculty readiness, attitudes and perceptions* (Publication No. 2349) [Doctoral dissertation, Louisiana State University] LSU Digital Commons.

Popper, K. (1972). *Conjectures and refutations: The growth of scientific knowledge.*Routledge & Kegan Paul.

Potosky, D. (2002). A field study of computer efficacy beliefs as an outcome of

training: The role of computer playfulness, computer knowledge, and performance during training. *Computers in Human Behavior*, *18*(3), 241–255. https://doi.org/10.1016/S0747-5632(01)00050-4

Qu, Q., Li, B., Yang, M., Yan, Z., Yang, A., Deng, D., & Chen, K. (2019). Survey and performance evaluation of the upcoming next generation WLANs standard - IEEE 802.11ax. *Mobile Networks and Applications*, *24*(5), 1461–1474. https://doi.org/10.1007/s11036-019-01277-9

Rahimi, M., & Miri, S. S. (2014). The impact of mobile dictionary use on language learning. *Procedia - Social and Behavioral Sciences*, *98*, 1469–1474. https://doi.org/10.1016/j.sbspro.2014.03.567

Rahimi, M., & Soleymani, E. (2015). The impact of mobile learning on listening anxiety and listening comprehension. *English Language Teaching*, *8*(10), 152.

Rahimi, N. M., Norul-Azmi, N.-A., Normeza, W., & Baharudin, H. (2015). Students' feedback towards using Facebook in learning Arabic language. *Asian Social Science*, *11*(28), 170. https://doi.org/10.5539/ass.v11n28p170

Rao, P. S. (2019). The role of English as a global language. *Research Journal of English, 4*(1), 65-79.

Redkin, O., & Bernikova, O. (2014). ICT and a new approach to Arabic learning. *Proceedings International Multidisciplinary Scientific Conference on Social Sciences & Arts, 1*(3), 375–382. https://doi.org/10.5593/sgemsocial2014/b13/s3.050

Rehman, M., Esichaikul, V., & Kamal, M. (2012). Factors influencing e-government adoption in Pakistan. *Transforming Government: People, process and policy*, *6*(3), 258–282. https://doi.org/10.1108/17506161211251263

Reid, D., & Pechenkina, E. (2016). *Bring your own device or prescribed mobile technology? Investigating student device preferences for mobile learning* [Paper

presentation]. Proceedings mLearn 15th World Conference on Mobile and

Contextual Learning, Sydney, Australia.

Roberts, N., & Rees, M. (2014). Student use of mobile devices in university lectures. *Australasian Journal of Educational Technology, 30*(4), 414-426.

Robles, H., Guerrero, J., LLinas, H., & Montero, P. (2019). Online teacher-students interactions using WhatsApp in a law course. *Journal of Information Technology Education: Research*, *18*, 231–252. https://doi.org/10.28945/4321

Rogers, Y., Connelly, K., Hazlewood, W., & Tedesco, L. (2010). Enhancing learning: A study of how mobile devices can facilitate sensemaking. *Personal and Ubiquitous Computing*, *14*(2), 111–124.

Rogers, E.M. (1995). *Diffusion of Innovations* (4th ed.), The Free Press, New York, NY.

Rondan-Cataluña, F. J., Arenas-Gaitán, J., & Ramírez-Correa, P. E. (2015). A comparison of the different versions of popular technology acceptance models. *Kybernetes*, *44*(5), 788–805. https://doi.org/10.1108/K-09-2014-0184

Rosell-Aguilar, F. (2016) User evaluation of language learning mobile applications: A case study with learners of Spanish. In P. Agnieszka, & A. Mohamed (Eds.) *The International Handbook of Mobile-Assisted Language Learning* (pp. 454–581).

Roser, M., Ritchie, H., & Ortiz-Ospina, E. (2015, July 14). *Internet*. Our World in Data. https://ourworldindata.org/internet

Ruane, J. M. (2005). *Essentials of research methods : A guide to social science research*. John Wiley and Sons Ltd.

Ryding, C., & Allen, R. (2013). *Teaching and learning Arabic as a foreign language: A guide for teachers*. Georgetown University Press.

Sahrir, M. S., & Yusri, G. (2012). Online vocabulary games for teaching and learning

Arabic. *GEMA Online Journal of Language Studies, 12*(3), 961–977.

Sahrir, M. S., Zainuddin, N., & Nasir, M. S. (2016). Learning preference among Arabic language learners via mobile learning management system platform (mobile LMS) using i-Taleem. *International Journal of Current Research in Life Sciences*, *5*(1), 509-514

Saiegh-Haddad, E., & Henkin-Roitfarb, R. (2014). The structure of Arabic language and orthography. In E. Saiegh-Haddad, & R. Joshi (Eds.), *Handbook of Arabic literacy. Literacy studies* (pp. 3–28). Springer. https://doi.org/10.1007/978-94-017-8545-7_1

Sakhr Software - About Sakhr. (n.d.). Retrieved April 21, 2020, from http://www.sakhr.com/index.php/en/about-sakhr/overview

Samaradiwakara, G., & Gunawardena, C. G. (2014). Comparison of existing technology acceptance theories and models to suggest a well improved theory/model. *International Technical Sciences Journal*, *1*(1), 21–36.

Sarwar, M., & Soomro, T. R. (2013). Impact of smart phones on society. *European Journal of Scientific Research*, *98*(2), 216–226.

Saudi Vision 2030. (n.d.). Retrieved May 18, 2020, from https://vision2030.gov.sa/en

Schwandt, T. A. ., Lincoln, Y. S. ., & Guba, E. G. . (2007). Judging interpretations: But is it rigorous? Trustworthiness and authenticity in naturalistic evaluation. *New Directions for Evaluation*, *2007*(114), 11–25. http://10.0.3.234/ev.223

Seliaman, M. E., & Al-Turki, M. S. (2012). Mobile learning adoption in Saudi Arabia. *World Academy of Science, Engineering and Technology*, *69*, 293–391.

Serin, H. (2018). A comparison of teacher-centered and student-centered approaches in educational settings. *International Journal of Social Sciences & Educational Studies*, *5*(1), 164–167. https://doi.org/10.23918/ijsses.v5i1p164

Shaalan, K., & Talhami, H. (2006). Arabic error feedback in an online Arabic learning system. *Advances in Natural Language Processing, Research in Computing Science Journal*, *18*, 203–212.

Shadiev, R., Hwang, W. Y., & Huang, Y. M. (2017). Review of research on mobile language learning in authentic environments. *Computer Assisted Language Learning*, *30*(3–4), 284–303. https://doi.org/10.1080/09588221.2017.1308383

Shadiev, R., & Yang, M. (2020). Review of studies on technology-enhanced language learning and teaching. *Sustainability*, *12*(2), 524. https://doi.org/10.3390/su12020524

Shafika, I. (2012). Mobile learning for teachers in Africa and the Middle East: Exploring the potential of mobile technologies to support teachers and improve practice. UNESCO. https://unesdoc.unesco.org/ark:/48223/pf0000216358

Sheeran, P., Gollwitzer, P. M., & Bargh, J. A. (2013). Nonconscious processes and health. *Health Psychology*, 32, 460–473

Shehab, R., & Zeki, A. (2015). Web assisted language learning system for enhancing Arabic language learning using cognates. *Jurnal Teknologi*, *77*(19) 107-112. https://doi.org/10.11113/jt.v77.6538

Shenton, A. K. (2004). Strategies for ensuring trustworthiness in qualitative research projects. *Education for Information*, *22*(2), 63–75.

Shorman, S., & Al-Shoqran, M. (2019). Analytical study to review of Arabic language learning using internet websites. *International Journal of Computer Science and Information Technology*, *11*(02), 37–44. https://doi.org/10.5121/ijcsit.2019.11204

Shudong, W., & Higgins, M. (2006). Limitations of mobile phone learning. *The JALT CALL Journal*, *2*(1), 3–14.

Shuib, A. H. I., Aziz, N. A., Daud, N. M., & Hasan, H. (2014, November 17-18). *CART — An Arabic teaching-learning tool for non-native Arabic speakers* [Paper presentation]. The 5th International Conference on Information and Communication Technology for The Muslim World, Kuching, Malaysia. https://doi.org/10.1109/ICT4M.2014.7020585

Sieny, M. (2017). دور المملكة العربية السعودية في نشر اللغة العربية وتطوير أساليب تعليمها. *التخطيط والسياسة اللغوية*, *4*, 8–25.

Stevens, P. B. (2006). Is Spanish really so easy? Is Arabic really so hard?: Perceived difficulty in learning Arabic as a second language. In K. Wahba, Z. Taha & L. England (Eds.), *Handbook for Arabic Language Teaching Professionals in the 21st Century* (pp. 35–63). Routledge. https://doi.org/10.4324/9780203824757.ch4

Stuckey, H. (2013). Three types of interviews: Qualitative research methods in social health. *Journal of Social Health and Diabetes*, *01*(02), 56–59. https://doi.org/10.4103/2321-0656.115294

Sung, Y. T., Chang, K. E., & Liu, T. C. (2016). The effects of integrating mobile devices with teaching and learning on students' learning performance: A meta-analysis and research synthesis. *Computers & Education*, *94*, 252–275.

Tabachnick, B. G., & Fidell, L. S. (2007). *Using multivariate statistics* (5th ed.). Allyn & Bacon/Pearson Education.

Taherdoost, H. (2018). A review of technology acceptance and adoption models and theories. *Procedia Manufacturing*, *22*, 960–967. https://doi.org/https://doi.org/10.1016/j.promfg.2018.03.137

Taufiqurrochman, R. (2019). The use of Arabic electronic dictionaries in the industrial revolution era 4.0. *EasyChair Preprint*, 753.

Tavangarian, D., Leypold, M. E., Nölting, K., Röser, M., & Voigt, D. (2004). Is e-Learning the solution for individual learning? *Electronic Journal of E-Learning*, *2*(2), 273–280.

Tayan, B. M. (2017). The Saudi tatweer education reforms: Implications of neoliberal thought to Saudi education policy. *International Education Studies*, *10*(5), 61–71. https://doi.org/10.5539/ies.v10n5p61

Taylor, S., & Todd, P. A. (1995). Understanding information technology usage: A test of competing models. *Information Systems Research*, *6*(2), 144–176. http://www.jstor.org/stable/23011007

Teddlie, C., & Tashakkori, A. (2009). *Foundations of mixed methods research : Integrating quantitative and qualitative approaches in the social and behavioral sciences.* Sage Publications.

Thankaooan, J. (2017). *Saudi smartphone penetration exceeds global average*. Tahawultech. https://www.tahawultech.com/news/saudi-smartphone-penetration-exceeds-global-average/

Thompson, R. L., Higgins, C. A., & Howell, J. M. (1991). Personal computing: Toward a conceptual model of utilization. *MIS Quarterly, 15*(1), 125-143.

Thorne, S. L., Black, R. W., & Sykes, J. M. (2009). Second language use, socialization, and learning in internet interest communities and online gaming. *The Modern Language Journal*, *93*(1), 802–821.

Toumi, H. (2017). Saudi schools to go digital by 2020. *GULF NEWS*. http://gulfnews.com/news/gulf/saudi-arabia/saudi-schools-to-go-digital-by-2020-1.2002790

Traxler, J. (2007). Defining, discussing and evaluating mobile learning: The moving finger writes and having writ... . *The International Review of Research in Open*

and Distributed Learning, *8*(2), 1–12.Tr

Traxler, J. (2005). Defining mobile learning. *IADIS International Conference Mobile Learning*, 261–266.

Valk, J.-H., Rashid, A. T., & Elder, L. (2010). Using mobile phones to improve educational outcomes: An analysis of evidence from Asia. *The International Review of Research in Open and Distributed Learning*, *11*(1), 117. https://doi.org/10.19173/irrodl.v11i1.794

van't Hooft, M. (2013). The potential of mobile technologies to connect teaching and learning inside and outside of the classroom. In *Emerging Technologies for the Classroom* (pp. 175–186). Springer New York. https://doi.org/10.1007/978-1-4614-4696-5_12

Vaughan, G. M., & Hogg, M. A. (2010). *Essentials of social psychology* (M. A. Hogg 1954- (Ed.)). Pearson.

Venkatesh, V., Morris, M., Davis, G., & Davis. F. (2003). User acceptance of information technology: Toward a unified view. *MIS Quarterly*, *27*(3), 425–478. https://doi.org/10.2307/30036540

Venkatesh, V., Thong, J. Y., & Xu, X. (2012). Consumer acceptance and use of information technology: Extending the Unified Theory of Acceptance and Use of Technology. *MIS Quarterly*, *36*(1), 157. https://doi.org/10.2307/41410412

Venkatesh, V., & Bala, H. (2008). Technology Acceptance Model 3 and a research agenda on interventions. *Decision Sciences*, *39*(2), 273–315. http://10.0.4.87/j.1540-5915.2008.00192.x

Venkatesh, V., & Davis, F. D. (1996). A model of the antecedents of perceived ease of use: Development and test. *Decision Sciences*, *27*(3), 451–481. https://doi.org/10.1111/j.1540-5915.1996.tb00860.x

Venkatesh, V., Thong, J., & Xu, X. (2016). Unified Theory of Acceptance and Use of Technology: A synthesis and the road ahead. *Journal of the Association for Information Systems*, *17*(5), 328–376. https://doi.org/10.17705/1jais.00428

Viberg, O., & Grönlund, Å. (2012). *Mobile assisted language learning : A literature review* [Conference presentation]. 11th World Conference on Mobile and Contextual Learning, Helsinki, Finland. http://urn.kb.se/resolve?urn=urn:nbn:se:du-10659

Walliman, N. (2006). *Social Research Methods*. London, SAGE Publications. https://doi.org/10.4135/9781849209939

Wang, Q., Woo, H. L., Quek, C. L., Yang, Y., & Liu, M. (2012). Using the Facebook group as a learning management system: An exploratory study. *British Journal of Educational Technology*, *43*(3), 428–438. https://doi.org/10.1111/j.1467-8535.2011.01195.x

Wang W., Zhong S., Zhang Z., Lv S., Wang L. (2009). Empirical Research and Design of M-Learning System for College English. In M. Chang, R. Kuo, G. Kinshuk, & M. Hirose (Eds.), *Learning by Playing. Game-based Education System Design and Development*: *Vol. 5670*. Springer, Berlin, Heidelberg. https://doi.org/10.1007/978-3-642-03364-3_65

Warschauer, M. (2002). Languages.com: The internet and linguistic pluralism. In I. Silicon (Ed.), *Communication, innovation and education in the electronic age* (pp. 62–74). Routledge.

Weber, A. S. (2018). *Saudi Arabia*. In A. Weber & S. Hamlaoui (Eds.), *E-learning in the Middle East and North Africa (MENA) region* (pp. 355–381). Springer International Publishing. https://doi.org/10.1007/978-3-319-68999- 9_16

West, M. (2012). *Mobile learning for teachers: Global themes*. UNESCO Working

Paper Series on Mobile Learning, 1–21.

https://unesdoc.unesco.org/ark:/48223/pf0000216452

Wihidayat, E. S., Utami, Y. D., & Budianto, A. (2018, October 26-28). Learn Arabic Language App, mobile based application for self-directed learning [Paper presentation]. 2018 4th International Conference on Education and Technology (ICET), Malang, Indonesia. https://doi.org/10.1109/ICEAT.2018.8693934

Wu, Y. (2012). Remedial learning. In N. M. Seel (Ed.) *Encyclopedia of the sciences of learning* (pp. 2816–2819). Springer. https://doi.org/10.1007/978-1-4419-1428-6_1632

Xu, Q., & Peng, H. (2017). Investigating mobile-assisted oral feedback in teaching Chinese as a second language. *Computer Assisted Language Learning, 30*(3– 4), 173–182. https://doi.org/10.1080/09588221.2017.1297836

Yamane, T. (1973). *Statistics: An introductory analysis* (3d ed.). Harper & Row.

Yong, A. G., & Pearce, S. (2013). A beginner's guide to factor analysis: Focusing on exploratory factor analysis. *Tutorials in Quantitative Methods for Psychology*, *9*(2), 79–94.

Zawati, S. N., & Muhanna, M. A. (2014, August 4-8). *Arabic mobile applications: Challenges of interaction design and development* [Paper presentation]. 2014 International Wireless Communications and Mobile Computing Conference (IWCMC), Nicosia, Cyprus. https://doi.org/10.1109/IWCMC.2014.6906345

Zhao, Y., & Zhu, Q. (2010). Influence factors of Technology Acceptance Model in mobile learning. *2010 Fourth International Conference on Genetic and Evolutionary Computing*, 542–545. https://doi.org/10.1109/ICGEC.2010.139

البشير, أ. ع., السعيد, ص. ع., & الظفيري, ف. م. (2019). درجة توظيف معلمي ومعلمات اللغة العربية والد

ا رسات الاجتماعية والتربية الإسلامية لخدمات أجهزة التعلّم النقّالة في عمليتي التعلّم والتعليم بدولة

الكويت (Arabic). *Utilizing Mobile Learning Devices by Arabic Language, Social Studies and Islamic Education Teachers in Teaching and Learning in Kuwait. (English)*, *46*(1), 305–320. https://login.ezproxy.utas.edu.au/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=eue&AN=138763818&site=eds-live

Appendix A

Quantitative data collection

Table A1

Personal information for L2 Arabic teachers

Question	Number	Percentage
Nationality		
Saudi	96	64
Non-Saudi	54	36
Gender		
Male	112	75
Female	38	25
Age		
From 26 to 30 years	14	9
From 31 to 35 years	24	16
From 36 to 40 years	26	17
More than 40 years	86	58
Years of teaching Arabic		
Less than one year	6	4
From 01 to 05 years	50	34
From 06 to 10 years	39	26
From 11 to 15 years	14	9
More than 15 years	41	27
Institute		
IMISU Institute	23	15
KSU Institute	20	13
PNU Institute	18	12
UAU Institute	31	21
KAU Institute	10	7
IUM Institute	37	25
QU Unite	11	7

Table A2

Normality assessment (Age)

Age		Prior knowledge	MDs Benefits	Arabic specific	Internet specific	MDs Drawback
From 26 to 30 years	Kurtosis	3.40	-1.19	-1.92	.73	-1.06
	Skewness	-.95	.05	.04	-.49	.49
From 31 to 35 years	Kurtosis	.34	-.68	1.55	-.83	-1.14
	Skewness	-1.29	-.12	-1.33	.05	.26
From 36 to 40 years	Kurtosis	2.51	-.39	.153	-.83	-1.00
	Skewness	-1.69	-.71	-1.27	-.52	-.15
More than 40 years	Kurtosis	5.22	1.50	-.24	-1.00	.16
	Skewness	-2.42	-1.39	-.48	.16	.73

Table A3

Normality assessment (Experience)

Experience		Prior knowledge	MDs Benefits	Arabic specific	Internet specific	MDs Drawback
Less than one year	Kurtosis	6.0	-1.87	-1.87	-1.87	-1.87
	Skewness	-2.44	-.81	-.52	.00	.32
From 1 to 5 Years	Kurtosis	2.75	-.90	.09	-.55	-.48
	Skewness	-1.74	-.12	-1.10	-.39	.22
From 6 to 10 Years	Kurtosis	3.46	-.72	-.65	-1.00	-.58
	Skewness	-1.92	-.67	-.05	.37	.59
From 11 to 15 Years	Kurtosis	.501	2.20	3.39	-.75	2.38
	Skewness	-1.56	-168	-.25	-.59	.69
More than 15 Years	Kurtosis	3.90	1.90	-.49	.190	-.67
	Skewness	-2.17	-1.54	-.68	-1.06	.54

Table A4

Normality assessment (Institute)

Institute		Prior knowledge	MDs Benefits	Arabic specific	Internet specific	MDs Drawback
IMISU Institute	Kurtosis	5.59	.54	-1.15	.20	-.39
	Skewness	-2.63	-1.22	-.20	.56	.70
KSU Institute	Kurtosis	-.04	-1.39	-1.33	-1.48	-1.08
	Skewness	-.95	-.26	-.43	.25	-.55
PNU Institute	Kurtosis	.56	-.16	-.28	.67	-.91
	Skewness	-.99	-.31	-.99	-.16	.35
UAU Institute	Kurtosis	2.64	1.33	-1.19	-.86	-.16
	Skewness	-2.05	-1.47	-.87	.60	.58
KAU Institute	Kurtosis	.12	.00	-1.60	.06	-.26
	Skewness	-1.14	-1.14	-.12	-.45	.73
IUM Institute	Kurtosis	.26	1.42	1.77	-.72	-.17
	Skewness	-1.11	-1.25	-1.02	-.53	.18
QU Unite	Kurtosis	-.20	-1.06	-.15	-0.88	-.98
	Skewness	-1.14	-.77	-1.03	.50	.37

Appendix B

Table B1

Nationality of L2 Arabic students

N	Nationality	Frequency	N	Nationality	Frequency
1	China	14	42	Iran	3
2	Thailand	11	43	Tanzania	3
3	Philippines	9	44	Guinea Bissau	3
4	Indonesia	9	45	Kazakhstan	3
5	Bangladesh	8	46	Malawi	3
6	Pakistan	8	47	Belgium	2
7	Comoros	7	48	Niger	2
8	Sierra Leone	7	49	Gabon	2
9	Russia	7	50	Turkestan	2
10	UK	7	51	Kenya	2
11	Nigeria	7	52	Netherlands	2
12	Cambodia	7	53	Bosnia	2
13	France	7	54	Uzbekistan	2
14	Malaysia	7	55	Serbia	2
15	Ethiopia	7	56	Angola	2
16	Conakry	6	57	Liberia	1
17	Afghanistan	6	58	Uganda	1
18	Gambia	6	59	Kosovo	1
19	Ghana	6	60	Iraq	1
20	USA	6	61	Mauritius	1
21	Turkey	5	62	Central African	1
22	Kyrgyzstan	5	63	Democratic Congo	1
23	India	5	64	Australia	1
24	Rwanda	5	65	Portugal	1
25	Cote devoir	5	66	New Zealand	1
26	Benin	5	67	Macedonia	1
27	Congo	5	68	Vietnam	1
28	Afghanistan	5	69	Madagascar	1
29	Sir Lanka	5	62	Mozambique	1
30	Cameroon	5	71	Saudi Arabia	1
31	Nepali	5	72	Nepal	1
32	Myanmar	4	73	Senegal	1
33	Somalia	4	74	Canada	1
34	Togo	4	75	East Turkestan	1
35	Burkina Faso	4	76	Georgia	1
36	Chad	4	77	Chechnya	1
37	Guinea	4	78	Not mentioned	1
38	Azerbaijan	3	79	Maldives	1
39	Mali	3	80	Burundi	1
40	Germany	3	81	Brazil	1
41	Tajikistan	3			

Table B2

Personal information for L2 Arabic learners

Question	Number	Percentage
Gender		
Male	270	89
Female	33	11
Age		
From 18 to 20 years	21	7
From 21 to 23 years	112	37
From 24 to 26 years	128	42
More than 26 years	42	14
Years of teaching Arabic		
Level 02	58	19
Level 03	109	36
Level 04	136	45
Institute		
IMISU Institute	21	7
KSU Institute	34	10
PNU Institute	10	3
UAU Institute	75	25
KAU Institute	25	8
IUM Institute	110	38
QU Unite	28	9

Table B3

Normality assessment (Age)

Age		Prior knowledge	Classroom usage	MDs Benefits	Internet specific	Arabic specific
From 18 to 20 Years	Kurtosis	3.39	0.83	2.94	-0.88	-0.58
	Skewness	2.02	1.30	-1.26	-0.32	0.18
From 21 to 23 Years	Kurtosis	1.64	1.17	2.24	-0.60	-0.56
	Skewness	1.65	1.38	-1.25	-0.42	0.06
From 24 to 26 Years	Kurtosis	0.73	0.36	1.58	-0.49	-0.70
	Skewness	1.30	1.08	2.67	-0.17	0.22
More than 26 Years	Kurtosis	0.84	4.01	1.13	-1.02	-0.55
	Skewness	1.37	2.06	-1.09	0.14	0.00

Table B4

Normality assessment (Level)

Level		Prior knowledge	Classroom usage	MDs Benefits	Internet specific	Arabic specific
Level 2	Kurtosis	-.485	2.252	.949	-.585	-0.360
	Skewness	.828	1.599	-1.294	-.362	.165
Level 3	Kurtosis	2.421	-.058	.716	-0.686	-0.565
	Skewness	1.751	.962	-.866	-0.112	0.149
Level 4	Kurtosis	1.386	1.828	3.099	-0.581	.131
	Skewness	1.588	1.526	-.248	-0.268	-.744

Table B5

Normality assessment (Institute)

Institute		Prior knowledge	Classroom usage	MDs Benefits	Internet specific	Arabic specific
IMISU Institute	Kurtosis	.112	2.03	1.24	-0.82	-1.02
	Skewness	1.08	1.60	-.132	-0.31	-0.01
KSU Institute	Kurtosis	.868	2.95	1.04	-0.30	-0.07
	Skewness	1.39	1.97	-1.20	0.62	-0.14
PNU Institute	Kurtosis	1.52	.194	1.43	-0.27	-0.28
	Skewness	1.50	1.10	-.1.49	0.469	0.62
UAU Institute	Kurtosis	.82	1.90	0.26	-0.64	-0.76
	Skewness	1.39	1.56	0.26	0.13	-0.22
KAU Institute	Kurtosis	16	-.54	0.12	-1.31	-1.11
	Skewness	4	1.04	0.71	-0.43	0.37
IUM Institute	Kurtosis	.62	.13	0.34	-0.58	0.31
	Skewness	1.33	.98	-0.56	-0.24	-0.24
QU Unite	Kurtosis	7.11	-.04	-043	-0.83	0.07
	Skewness	2.55	.95	-0.66	-0.37	0.54

Appendix C

Student Survey

1. What is your nationality?

2. What is your mother language?

3. What is your gender?

   o Male
   o Female

4. How old are you?

   o 18 - 20
   o 21 - 23
   o 24 - 26
   o 27+

5. Which level are you studying at?

   o Leve 1
   o Leve 2
   o Leve 3
   o Leve 4

6. Which university are you studying at?

   o Imam Muhammad ibn Saud Islamic University
   o King Saud University
   o King Abdulaziz University
   o Umm Al Qura University
   o Islamic University of Madinah
   o Princess Nourah Bint Abdul Rahman University
   o Qassim University

7. I own the following mobile technologies (mark all that apply).

   o   Smartphone (including iPhone or similar)
   o   Tablet PC (including an iPad or similar)
   o   Laptop
   o   None of the above

8. My smartphone / Tablet PC platform (mark all that apply).

   o   Android (e.g. Galaxy, HTC, Lenovo, LG)
   o   iOS (iPhone, iPad)
   o   Windows
   o   Macintosh

9. Please list the most used mobile applications in your lifestyle

   (Please write NONE if you do not use any)

10. Please list the most used applications to support your Arabic language learning

    (Please write NONE if you do not use any)

11. Have you ever used your mobile device to access second language learner's Arabic's content?

    o   Yes (Please give examples below)
    o   No

12. I know how to:

Check that apply

- o Access the Internet from a mobile device

- o Download a mobile application on a mobile device

- o Download a podcast on a mobile device

- o Find the definition of a word I don't know on a mobile device

- o Set an alert/alarm for a potential due date on a mobile device

- o Translate a sentence into another language on a mobile device

- o Access a social networking site on a mobile device

- o Send an email on a mobile device

- o Post a comment to a blog or respond to a post on a mobile device

13. Have you ever:

Check (X) that apply

Downloaded an application that helped you learn something new	
Used your mobile device to look up something that you did not know or did not understand during class	
Engaged in social networking on your mobile device -written notes on your mobile device to remind yourself of an assignment	
Set an alarm or reminder on your mobile device to help you remember that an assignment was due, or a test was coming up	
Taken pictures or video with your mobile device that you used for an assignment	
Read an article or assignment on your mobile device	
Used your mobile device as a study tool	
Used chat apps in Arabic in a conscious attempt to improve your Arabic (What's Up, Telegram etc.)	

14. Please answer the following questions using mobile devices in your Arabic language learning using the scale below:

5 4 3 2 1
Strongly Agree ————————→ Strongly Disagree

Statement	Strongly Agree 5	Agree 4	Neutral 3	Disagree 2	Strongly Disagree 1
Students should be taught how to appropriately use mobile devices for Arabic language learning					
Students should be able to use mobile devices as learning tools in the classroom					
Students would be more motivated to learn Arabic language if they could use mobile devices					
I am well informed about the possibilities offered by mobile devices to support my Arabic learning					
My teachers have given me sufficient instruction in how to use mobile devices to assist my Arabic language learning					
Mobile devices are effective tools for delivering Arabic learning content to students					
Mobile platform diversity makes the use of mobile devices complicated					
Learning through mobile devices will help me to utilize my time productively					
My present knowledge of MALL affects my attitude towards its use in Arabic language learning					
The screen size of mobile devices affects how it is used as a learning tool for reading & writing					
Mobile learning can be an effective method of learning as it can give immediate support					
Mobile learning will bring new opportunities for learning					
Mobile learning will be a more flexible method of language learning as it can be done anytime, anywhere					
Mobile learning will improve communication between student and teacher					
I do not have enough time to use my mobile device to support my Arabic language learning					
The use of mobile devices can increase flexibility of access to resources like YouTube					
I would you prefer to have digital textbooks					
Mobile learning cannot be used because mobile devices are expensive					
Teachers should be responsible for helping students to use mobile devices as a tool for Arabic learning					
I think the use of mobile devices in class is a distraction					
Mobile learning cannot be used for language learning due to poor internet connections in my city					

15. What do you see as the biggest obstacles to the use of mobile devices in your Arabic learning?

5 4 3 2 1
Strongly Agree ————————————→ Strongly Disagree

Statement	5	4	3	2	1
My lack of time					
My lack of money					
My lack of interest					
My difficulties in using technology					
My teachers' attitudes					
Screen Size of my device					
Battery life of my device					
Internet connection availability					
Internet connection speed					
Internet connection reliability					
My level of Arabic language					
Availability of Arabic language learning materials					
Quality of Arabic language learning materials					
Lack of training in Arabic mobile assisted language learning					
Luck of support in Arabic mobile assisted language learning					
My institute's policy					

16. Feel free to use this space to add any comments you would like to share about using your mobile device to support your Arabic language learning?

Teachers Survey

1. What is your nationality?

2. What is your gender?
    - o Male
    - o Female

3. How old are you?
    - o 20 - 30
    - o 31 - 40
    - o 41 - 50
    - o 50+

4. How long have you been teaching Arabic?
    - o Less than 1 year
    - o 1 - 5 years
    - o 6 - 10 years
    - o 11-15 years
    - o + 15 years

5. Which university are you studying at?
    - o Imam Muhammad ibn Saud Islamic University
    - o King Saud University
    - o King Abdulaziz University
    - o Umm Al Qura University
    - o Islamic University of Madinah
    - o Princess Nourah Bint Abdul Rahman University
    - o Qassim University

6. I own the following mobile technologies (mark all that apply).
    - o Smartphone (including iPhone or similar)
    - o Tablet PC (including an iPad or similar)
    - o Laptop
    - o None of the above

7. My smartphone / Tablet PC platform (mark all that apply).
    - o Android (e.g. Galaxy, HTC, Lenovo, LG)
    - o iOS (iPhone, iPad)
    - o Windows
    - o Macintosh

8. Please list the most used mobile applications in your lifestyle
(Please write NONE if you do not use any)

```


```

9. Please list the most used applications to support your Arabic language teaching
(Please write NONE if you do not use any)

```


```

10. Have you ever used your mobile device to access second language learner's Arabic's content?

- o   Yes (Please give examples below)

- o   No

```


```

11. I know how to:

Check that apply

- o   Access the Internet from a mobile device

- o   Download a mobile application on a mobile device

- o   Download a podcast on a mobile device

- o   Find the definition of a word I don't know on a mobile device

- o   Set an alert/alarm for a potential due date on a mobile device

- o   Translate a sentence into another language on a mobile device

- o   Access a social networking site on a mobile device

- o   Send an email on a mobile device

- o   Post a comment to a blog or respond to a post on a mobile device

12. Please answer the following questions using mobile devices in your Arabic language learning using the scale below:

5 4 3 2 1

Strongly Agree ⟶ Strongly

Statement	Strongly Agree 5	Agree 4	Neutral 3	Disagree 2	Strongly Disagree 1
Students should be taught how to appropriately use mobile devices for Arabic language learning					
Students should be able to use mobile devices as learning tools in the classroom					
Students would be more motivated to learn Arabic language if they could use mobile devices					
I am well informed about the possibilities offered by mobile devices to support my Arabic learning					
My teachers have given me sufficient instruction in how to use mobile devices to assist my Arabic language learning					
Mobile devices are effective tools for delivering Arabic learning content to students					
Mobile platform diversity makes the use of mobile devices complicated					
Learning through mobile devices will help me to utilize my time productively					
My present knowledge of MALL affects my attitude towards its use in Arabic language learning					
The screen size of mobile devices affects how it is used as a learning tool for reading & writing					
Mobile learning can be an effective method of learning as it can give immediate support					
Mobile learning will bring new opportunities for learning					
Mobile learning will be a more flexible method of language learning as it can be done anytime, anywhere					
Mobile learning will improve communication between student and teacher					
I do not have enough time to use my mobile device to support my Arabic language learning					
The use of mobile devices can increase flexibility of access to resources like YouTube					
I would you prefer to have digital textbooks					
Mobile learning cannot be used because mobile devices are expensive					
Teachers should be responsible for helping students to use mobile devices as a tool for Arabic learning					
I think the use of mobile devices in class is a distraction					
Mobile learning cannot be used for language learning due to poor internet connections in my city					

13. What do you see as the biggest obstacles to the use of mobile devices in your Arabic learning?

Strongly Agree $\xrightarrow{\text{5 4 3 2 1}}$ Strongly Disagree

Statement	5	4	3	2	1
My lack of time					
My lack of money					
My lack of interest					
My difficulties in using technology					
My students' attitudes					
Screen Size of my device					
Battery life of my device					
Internet connection availability					
Internet connection speed					
Internet connection reliability					
Availability of Arabic language learning materials					
Quality of Arabic language learning materials					
Lack of training in Arabic mobile assisted language learning					
Luck of support in Arabic mobile assisted language learning					
My institute's policy					

14. Feel free to use this space to add any comments you would like to share about using your mobile device to support your Arabic language learning?

Consent form for interview participants
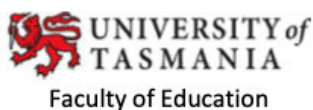
UNIVERSITY of TASMANIA
Faculty of Education

Newnham Drive,
Locked Bag 1351, Launceston TAS7250
http://www.utas.edu.au/education
T: +61 3 6324 3999

Attitudes of Second Language Learners of Arabic and their Teachers to MALL

CONSENT FORM FOR INTERVIEW PARTICIPANTS

1. I have read and understand the 'Information Sheet' for this project and agree to take part in the research study named above.

2. The nature and possible effects of the study have been explained to me.

3. I understand that if I participate in this study, it will involve one 20-30 minute interview with the researcher to talk about my experience of using mobile devices in Arabic language learning.

4. I understand that the interview will be audio taped for transcription purposes and to ensure accuracy. I will be offered the opportunity to review/amend/redact transcripts of my interview as appropriate.

5. I understand that all research data will be securely stored on the University of Tasmania premises for a duration of 5 years, after which the data will be destroyed.

6. I agree that any questions that I have asked have been answered to my satisfaction.

7. I understand that the results of the study will be published without naming participants.

8. I understand that the risk of participation is therefore minimal. While it is possible that the information provided will make me identifiable (despite privacy and confidentiality measures being taken by the investigators), the nature of the information being provided should not pose any foreseeable risk to me.

9. I understand that participation is voluntary and that I may withdraw at any time. Data I have supplied to date may be withdrawn from the research before September 30, 2018.

Name of Participant:

Signature: Date:

Statement by Investigator

☐ I have explained the project & the implications of participation in it to this volunteer and I believe that the consent is informed and that he/she understands the implications of participation

If the Investigator has not had an opportunity to talk to participants prior to them participating, the following must be ticked.
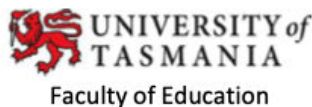
☐ The participant has received the Information Sheet where my details have been provided so participants have the opportunity to contact me prior to consenting to participate in this project.

Name of investigator _____

Signature of investigator _____ Date _____

Student Interview
Participant information sheet

UNIVERSITY *of* **TASMANIA**
Faculty of Education

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Attitudes of Second Language Learners of Arabic and their Teachers to MALL

student Interview

PARTICIPANT INFORMATION SHEET

Invitation

You are invited to participate in a research study which aims to achieve a greater understanding of how second language learner of Arabic and their teachers currently use their mobile devices for learning Arabic. This study is being conducted by Ahmed Al-Qarni from the Faculty of Education, University of Tasmania. This PhD project is under the supervision of Dr Andy Bown, Dr Jennifer Master and Dr Darren Pullen of Faculty of Education, University of Tasmania.

What is the purpose of this study?

The aim of this research study is to achieve a greater understanding of how second language learner of Arabic and their teachers at Saudi universities currently use their MDs for learning Arabic. Additionally, it aims to discover what kind of mobile devices and software are being used, how are the devices being currently used presently, and why?

Why have I been invited to participate in this study?

You have been invited to participate in this study because you are a second language student of Arabic in Saudi Arabia.

What will I be asked to do?

Participating in this phase of the study will involve you being interviewed about your attitude about the use of mobile devices in Arabic language learning and how second language learner of Arabic and their teachers currently use their mobile devices for learning Arabic. The interview will take around 20-30 minutes, will be conducted one-on-one with the researcher at your convenience either at your Arabic language institute, or in a café or other location conveniently located for you, depending on your preference. The interview will be audio recorded for transcription and accuracy purposes. You will be offered the opportunity to review/amend/redact transcripts of your interview as appropriate.

Are there any possible benefits from participation in this study?

This study appears to be the first study that investigate the attitude of second language learner of Arabic and their teachers. It is expected that the study can inform the design of future Arabic second language MALL and draw attention to the need for further research on Arabic mobile assisted language leaning. By participating in this study your experience and knowledge will help ensure quality of this study which subsequently maximises reliability

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and validity of this study. Participants who completed their questionnaires will receive a list of useful links and Arabic language learning applications.

Are there any possible risks from participation in this study?

All interview participants will be given pseudonyms and reassured of confidentiality and anonymity in any publications resulting from this work without first obtaining their explicit consent.

What if I change my mind during or after the study?

While we would be pleased to have you participate, this is a voluntary study and we respect your right to decline. There will be no consequences if you decide not to participate. If you decide to discontinue participation, you may do so and needn't providing an explanation. You may choose to have the data you have provided withdrawn before 30 September 2018.

What will happen to the information when this study is over?

All information will be treated in a confidential manner, and your name will not be used in any publication arising out of the research. All hardcopy research documentation will be kept in a locked cabinet and all electronic research documentation will be stored in a password-protected confidential folder on the UTAS server for a duration of five years, after which the data will be destroyed.

What if I have questions about this study?

If you would like to discuss any aspect of this study, please contact Ahmed Al-Qarni, by email (Ahmed.alqarni@utas.edu.au) at any time.

This study has been approved by the Tasmanian Social Science Human Research Ethics Committee (Reference Number). If you have concerns or complaints about the conduct of this study you should contact the Executive Officer of the HREC (Tasmania) Network on (03) 6226 7479 or email human.ethics@utas.edu.au.
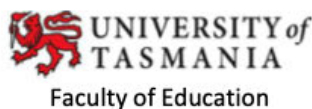
Thank you for taking the time to consider this study.

This information sheet is for you to keep.

Kind Regards,

Teacher Interview
Participant information sheet

UNIVERSITY of TASMANIA

Faculty of Education

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http://www.utas.edu.au/education
T: +61 3 6324 3999

Attitudes of Second Language Learners of Arabic and their Teachers to MALL

teacher Interview

PARTICIPANT INFORMATION SHEET

Invitation

You are invited to participate in a research study which aims to achieve a greater understanding of how second language learner of Arabic and their teachers currently use their mobile devices for learning Arabic. This study is being conducted by Ahmed Al-Qarni from the Faculty of Education, University of Tasmania. This PhD project is under the supervision of Dr Andy Bown, Dr Jennifer Master and Dr Darren Pullen of Faculty of Education, University of Tasmania.

What is the purpose of this study?

The aim of this research study is to achieve a greater understanding of how second language learner of Arabic and their teachers at Saudi universities currently use their MDs for learning Arabic. Additionally, it aims to discover what kind of mobile devices and software are being used, how are the devices being currently used presently, and why?

Why have I been invited to participate in this study?

You have been invited to participate in this study because you are a second language teacher of Arabic in Saudi Arabia.

What will I be asked to do?

Participating in this phase of the study will involve you being interviewed about your attitude about the use of mobile devices in Arabic language learning and how second language learner of Arabic and their teachers currently use their mobile devices for learning Arabic. The interview will take around 20-30 minutes, will be conducted one-on-one with the researcher at your convenience either at your Arabic language institute, or in a café or other location conveniently located for you, depending on your preference. The interview will be audio recorded for transcription and accuracy purposes. You will be offered the opportunity to review/amend/redact transcripts of your interview as appropriate.

Are there any possible benefits from participation in this study?

This study appears to be the first study that investigate the attitude of second language learner of Arabic and their teachers. It is expected that the study can inform the design of future Arabic second language MALL and draw attention to the need for further research on Arabic mobile assisted language leaning. By participating in this study your experience and knowledge will help ensure quality of this study which subsequently maximises reliability

and validity of this study. Participants who completed their questionnaires will received a list of useful links and Arabic language learning applications.

Are there any possible risks from participation in this study?

All interview participants will be given pseudonyms and reassured of confidentiality and anonymity in any publications resulting from this work without first obtaining their explicit consent.

What if I change my mind during or after the study?

While we would be pleased to have you participate, this is a voluntary study and we respect your right to decline. There will be no consequences if you decide not to participate. If you decide to discontinue participation, you may do so and needn't providing an explanation. You may choose to have the data you have provided withdrawn before 30 September 2018.

What will happen to the information when this study is over?

All information will be treated in a confidential manner, and your name will not be used in any publication arising out of the research. All hardcopy research documentation will be kept in a locked cabinet and all electronic research documentation will be stored in a password protected confidential folder on the UTAS server for a duration of five years, after which the data will be destroyed.

What if I have questions about this study?

If you would like to discuss any aspect of this study, please contact Ahmed Al-Qarni, by email (Ahmed.alqarni@utas.edu.au) at any time.

This study has been approved by the Tasmanian Social Science Human Research Ethics Committee (Reference Number). If you have concerns or complaints about the conduct of this study you should contact the Executive Officer of the HREC (Tasmania) Network on (03) 6226 7479 or email human.ethics@utas.edu.au.

Thank you for taking the time to consider this study.

This information sheet is for you to keep.

Kind Regards,

Consent form for questionnaire participants

UNIVERSITY *of* **TASMANIA**

Faculty of Education

Attitudes of Second Language Learners of Arabic and their Teachers to MALL

CONSENT FORM FOR QUESTIONNAIRE PARTICIPANTS

1. I have read and understand the 'Information Sheet' for this project and agree to take part in the research study named above.

2. The nature and possible effects of the study have been explained to me.

3. I understand that if I participate in this study, it will take 10-15 minutes to complete the questionnaire's questions about my experience of using mobile devices in Arabic language learning.

4. I understand that all research data will be securely stored on the University of Tasmania premises for a duration of 5 years, after which the data will be destroyed.

5. I agree that any questions that I have asked have been answered to my satisfaction.

6. I understand that the results of the study will be published without naming participants.

7. I understand that the risk of participation is therefore minimal. While it is possible that the information provided will make me identifiable (despite privacy and confidentiality measures being taken by the investigators), the nature of the information being provided should not pose any foreseeable risk to me.

8. I understand that participation is voluntary and that I may withdraw, before submitting my questionnaire as all questionnaire data is anonymous, without providing an explanation.

☐ Agree

☐ Disagree

Appendix D

Ethics approval and permission letters

Social Science Ethics Officer
Private Bag 01 Hobart
Tasmania 7001 Australia
Tel: (03) 6226 2763
Fax: (03) 6226 7148
Katherine.Shaw@utas.edu.au

HUMAN RESEARCH ETHICS COMMITTEE (TASMANIA) NETWORK

06 October 2017

Dr Andy Bown
School of Education
University of Tasmania

Student Researcher: Ahmed Alqarni

Sent via email

Dear Dr Bown

Re: MINIMAL RISK ETHICS APPLICATION APPROVAL
Ethics Ref: **H0016893 - Attitudes of Second Language Learners of Arabic and their Teachers to MALL**

We are pleased to advise that acting on a mandate from the Tasmania Social Sciences HREC, the Chair of the committee considered and approved the above project on 06 October 2017.

This approval constitutes ethical clearance by the Tasmania Social Sciences Human Research Ethics Committee. The decision and authority to commence the associated research may be dependent on factors beyond the remit of the ethics review process. For example, your research may need ethics clearance from other organisations or review by your research governance coordinator or Head of Department. It is your responsibility to find out if the approval of other bodies or authorities is required. It is recommended that the proposed research should not commence until you have satisfied these requirements.

Please note that this approval is for four years and is conditional upon receipt of an annual Progress Report. Ethics approval for this project will lapse if a Progress Report is not submitted.

The following conditions apply to this approval. Failure to abide by these conditions may result in suspension or discontinuation of approval.

1. It is the responsibility of the Chief Investigator to ensure that all investigators are aware of the terms of approval, to ensure the project is conducted as approved by the Ethics Committee, and to notify the Committee if any investigators are added to, or cease involvement with, the project.

A PARTNERSHIP PROGRAM IN CONJUNCTION WITH THE DEPARTMENT OF HEALTH AND HUMAN SERVICES

2. Complaints: If any complaints are received or ethical issues arise during the course of the project, investigators should advise the Executive Officer of the Ethics Committee on 03 6226 7479 or human.ethics@utas.edu.au.

3. Incidents or adverse effects: Investigators should notify the Ethics Committee immediately of any serious or unexpected adverse effects on participants or unforeseen events affecting the ethical acceptability of the project.

4. Amendments to Project: Modifications to the project must not proceed until approval is obtained from the Ethics Committee. Please submit an Amendment Form (available on our website) to notify the Ethics Committee of the proposed modifications.

5. Annual Report: Continued approval for this project is dependent on the submission of a Progress Report by the anniversary date of your approval. You will be sent a courtesy reminder closer to this date. **Failure to submit a Progress Report will mean that ethics approval for this project will lapse.**

6. Final Report: A Final Report and a copy of any published material arising from the project, either in full or abstract, must be provided at the end of the project.

Yours sincerely

Katherine Shaw
Executive Officer
Tasmania Social Sciences HREC

A PARTNERSHIP PROGRAM IN CONJUNCTION WITH THE DEPARTMENT OF HEALTH AND HUMAN SERVICES

Kingdom Of Saudi Arabia
Ministry Of Education
Islamic University Of madinah
Institute Of Teaching Arabic
To Non Native Speakers

PERMISSION TO CONDUCT RESEARCH :الموضوع

بسـم اللـة الرحمن الرحيـم

المملكة العربية السعودية
وزارة التعليم
الجامعة الاسلامية بالمدينة المنورة
معهد تعليم اللغة العربية لغير الناطقين بها
مكتب العميد

PERMISSION TO CONDUCT RESEARCH

To Whom May It Concern

This letter is to confirm that we have no objections to **AHMED ABDULLAH ALQARNI** conducting empirical research at The Institute of Teaching Arabic at The Islamic University of al-Madinah al-Munawarah.

We are aware that the research forms part of his PhD studies at the University of Tasmania and will involve an investigation of the attitudes of second language learners of Arabic and their teachers to mobile-assisted language learning.

This permission is conditional to Ahmed Abdullah alqarni after receiving ethics clearance to conduct his research from the University of Tasmania.

Dean of the institute

Dr. Abdulrāhman Essa Alhazmi

الرقم : ....   التاريخ: / / ١٤هـ   المرفقات : ....

المدينة المنورة : ص.ب : (١٧٠) ، فاكس (٠١٤٨٤٧٣٦٨٠) ، البريد الالكتروني : Iu@iu.cdu.sa ، الهاتف (٠١٤٨٤٧٣٦٨٠/٤٠٣)
Medina – P.O.BOX: 170, Tel (0148473680 /403) , Fax(0148473680) , Email:Iu@iu.cdu.sa

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جامعة الأميرة نورة بنت عبدالرحمن

وكالة الجامعة الدراسات العليا والبحث العلمي

المملكة العربية السعودية
وزارة التعليم
جامعة الأميرة نورة بنت عبدالرحمن
(٤٨)
عمادة البحث العلمي

PERMISSION TO CONDUCT RESEARCH

To Whom May It Concern

This letter is to confirm that we have no objections to **AHMED ABDULLAH ALQARNI** conducting empirical research at The Institute of Teaching Arabic at Princess Nourah Bint Abdulrahman University.

We are aware that the research forms part of his PhD studies at the University of Tasmania and will involve an investigation of the attitudes of Second Language Learners of Arabic and their teachers to mobile-assisted language learning.

This permission is conditional on Ahmed receiving ethics clearance to conduct his research from the University of Tasmania.

Dean of the institute

Dr.

10 / 5 / 2017

المملكة العربية السعودية
وزارة التعليم
جامعة الأميرة نورة بنت عبدالرحمن
عمادة البحث العلمي

نموذج خطاب – رقم (012508-F66)

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KINGDOM OF SAUDI ARABIA

Ministry of Education

KING ABDULAZIZ UNIVERSITY

Arabic Language Institute to Speakers
of Other Languages

مكتب العميد
Dean's Office

التاريخ : 2017/5/11

المرفقات :

الرقـــم :

المملكة العربية السعودية
وزارة التعليم
جامعة الملك عبد العزيز
معهد اللغة العربية للناطقين بغيرها

PERMISSION TO CONDUCT RESEARCH

To Whom May It Concern

This letter is to confirm that we have no objections to *AHMED ABDULLAH ALQARNI* conducting empirical research at The Institute of Teaching Arabic at King Abdulaziz University.

We are aware that the research forms part of his PhD studies at the University of Tasmania and will involve an investigation of the attitudes of Second Language Learners of Arabic and their teachers to mobile-assisted language learning.

This permission is conditional on Ahmed receiving ethics clearance to conduct his research from the University of Tasmania.

Dean of the institute

Dr. Yasser Mohammed Babteen

KINGDOM OF SAUDI ARABIA
Ministry of Education
Al-Imam Muhammad Ibn Saud
Islamic University
The Institute of Teaching Arabic
In Riyadh

المملكة العربيّة السعوديّة
وزارة التعليم
جامعة الإمام محمد بن سعود الإسلامية
معهد تعليم اللغة العربية بالرياض

Encl. Doc. : —————— : المشفوعات Date : —————— : التاريخ No. : —————— : الرقم

Subject : .... : الموضوع

PERMISSION TO CONDUCT RESEARCH

To Whom May It Concern

This letter is to confirm that we have no objections to *AHMED ABDULLAH ALQARNI* conducting empirical research at The Institute of Teaching Arabic at Al-Imam university.

We are aware that the research forms part of his PhD studies at the University of Tasmania and will involve an investigation of the attitudes of Second Language Learners of Arabic and their teachers to mobile-assisted language learning.

This permission is conditional on Ahmed receiving ethics clearance to conduct his research from the University of Tasmania.

Dean of the institute

Dr.

جامعة الملك سعود (034)
هاتف 3155 467 11 966+
فاكس 2767 467 11 966+

المملكة العربية السعودية
ص. ب 4274 الرياض 11491
www.ksu.edu.sa

جامعة
الملك سعود
King Saud University

معهد اللغويات العربية
مكتب العميد

PERMISSION TO CONDUCT RESEARCH

To Whom May It Concern

This letter is to confirm that we have no objections to **AHMED ABDULLAH ALQARNI** conducting empirical research at The Institute of Teaching Arabic at king Saud university.

We are aware that the research forms part of his PhD studies at the University of Tasmania and will involve an investigation of the attitudes of Second Language Learners of Arabic and their teachers to mobile-assisted language learning.

This permission is conditional on Ahmed receiving ethics clearance to conduct his research from the University of Tasmania.

Dean of the institut

Dr. Saad M. Al-Gahtani

المملكة العربية السعودية
وزارة التعليم
جامعة أم القرى
(٠٣١)

PERMISSION TO CONDUCT RESEARCH

To Whom May It Concern

This letter is to confirm that we have no objections to **AHMED ABDULLAH ALQARNI** conducting empirical research at The Institute of Teaching Arabic at Umm Al-Qura University.

We are aware that the research forms part of his PhD studies at the University of Tasmania and will involve an investigation of the attitudes of Second Language Learners of Arabic and their teachers to mobile-assisted language learning.

This permission is conditional on Ahmed receiving ethics clearance to conduct his research from the University of Tasmania.

Dean of the institute 2017

Dr. Arif Shajan Alosaime

16   5

Kingdom of Saudi Arabia
Ministry of Higher Education
Qassim University
VICE PRESIDENT'S OFFICE
College of Arabic Language & Social Studies

المملكة العربية السعودية
وزارة التعليم العالي
جامعة القصيم
كلية اللغة العربية والدراسات الاجتماعية

No: ———— Date: ———— Attachments: ———— ———— : المرفقات ———— : التاريخ ———— : الرقـــم

PERMISSION TO CONDUCT RESEARCH

To The- University of Tasmania

This letter is to confirm that we have no objections to *AHMED ABDULLAH ALQARNI* conducting empirical research at The Unit of Arabic Language for Non Arabic Speakers at Qassim University.

We are aware that the research forms part of his PhD studies at the University of Tasmania and will involve an investigation of the attitudes of Second Language Learners of Arabic and their teachers to mobile-assisted language learning.

This permission is conditional on Ahmed receiving ethics clearance to conduct his research from the University of Tasmania.

Dean of the Deanship of Research Studies

Dr. Mohammed Saleh Al-Shtaiwi

P.O.Box: 6611 - Buraidah: - Tel:(06) 3220271 - Fax:(06) 3220112   (٠٦) ٣٢٢٠١١٢ فاكس: – (٠٦) ٣٢٢٠٢٧١ هاتف: – بريدة: ٦٦١١ ص.ب:

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Appendix E

Certificate of Translation

I, Dr. Adel Alharthi, hereby certify that the translation of the attached questionnaire is adequate and accurate to the best of my ability. I further certify that I am competent in both Arabic and English to render and certify such translation.

Dr. Adel Alharthi

Assistant Professor

Translation and Interpreting Studies

FHEA

Department of Foreign Languages, Head.

Taif University

Email: ad.alharthi@tu.edu.sa

Foreign Languages Department