STUDENTS' PERCEPTIONS OF THE USE OF MOBILE APPLICATIONS TECHNOLOGY IN LEARNING ARABIC AS A SECOND LANGUAGE

By

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ABSTRACT

As of 2015, Arabic is one of the strategic languages today. Due to the current state of the Arab homeland politics and recent events of instability in that region, it has become crucial for Americans to learn more about Arab culture and to learn the Arabic language. Arabic is not an easy language to learn for non-native speakers because of its syntactic complexity, lexical sophistication, and variety of scripts and dialects. There is also a lack of literature on the use of mobile applications (apps) technology in learning Arabic; therefore, the researcher chose to focus on the Arabic language in the current study. Mobile technologies have inspired people and educators to use them not only in communications, but also in teaching. Therefore, this study examined students' use of mobile assisted language learning (MALL) apps technology as a supplemental tool to improve their Arabic learning. This study also identified students' perceptions toward the use of MALL apps in the learning of Arabic as a second language. A mixed-method research approach was used to examine the research problem. A questionnaire was used to collect both quantitative and qualitative data. The participants were male and female college students who were recruited from different majors of study from three universities in the state of Pennsylvania, United States. Some of the participants were studying Arabic online and the others were studying Arabic in the classroom. The findings were positive as the majority of the participants liked to use MALL apps in learning Arabic. MALL apps were very helpful and convenient for the participants. The participants reported that MALL apps helped them to improve their speaking proficiency and to improve their Arabic learning skills. The participants were also able to connect with other participants in the class and others beyond the classroom. MALL apps also assisted the participants in comparing their own language and culture with the Arabic language and culture.

DEDICATION

إطلبوا العِلمَ مِنَ المَهدِ إلى اللحدِ

"Seek knowledge from cradle to grave!"

—Traditional Arabic Saying

With love, I dedicate my dissertation work to my loving parents who live overseas. They are present with me all the time with their words of prayer and support. A special feeling of love and gratitude to my beautiful wife, Basmah, whose words of encouragement ring in my ears and who has never left my side. I also dedicate this work to my little princesses, my daughters Leanne and Miriam, who fill my life with happiness while I am working on my research.

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ACRONYMS AND ABBREVIATIONS

Symbol	Definition
ACTFL	American Council on the Teaching of Foreign Languages
ALL	Arabic Language Learning
ANOVA	Analysis of Variance
Apps	Applications
CAI	Computer-Assisted Instruction or Computer-Aid Instruction
CAL	Computer Assisted Learning
CALL	Computer Assisted Language Learning
CIA	Central Intelligence Agency
CITI	Collaborative Institutional Training Initiative
CLT	Communicative Language Teaching
CMC	Computer-Mediated Communication
CmL	Collaborative m-Learning
DL	Distance Learning
D2L	Desire to Learn
DLI	Defense Language Institute
DLPT5	Defense Language Proficiency Test 5
DNI	Director of National Intelligence
E	Ease of Use
EFL	English as Foreign Language
E-learning	Electronic learning
Five Cs	Communication, Cultures, Connections, Comparisons, and Communities

FSI	Foreign Service Institute
GPA	Grade Point Average
ICALL	Intelligent Computer Assisted Language Learning
ILR	Interagency Language Roundtable
IRB	Institutional Review Board
IT	Information Technology
L1	First Language Acquisition
L2	Second Language Acquisition
LOTEs	Languages other than English
LT	Language Technology
MA	Master's Degree
MALL	Mobile Assisted Language Learning
MAALL	Mobile Applications for Arabic Language Learning
M-Learning	Mobile Learning
MLA	Modern Language Association of America
MLL	Mobile Language Learning
MSA	Modern Standard Arabic
NASILP	National Association of Self-Instructional Language Programs
NSFLEP	National Standards in Foreign Language Education Project
NSFLL	National Standards for Foreign Language Learning
NSLI	National Security Language Initiative
PC	Personal Computer
PDA	Personal Digital Assistants

PEU	Perceived Ease of Use
PU	Perceived Usefulness
QUAL	Qualitative
QUAN	Quantitative
RMU	Robert Morris University
SMS	Short Message Service
SPSS	Statistical Package for the Social Science
TAM	Technology Acceptance Model
TESOL	Teachers of English to Speakers of Other Languages
TRA	Theory of Reasoned Action
U	Usefulness
UAE	United Arab Emirates
US	United States
UK	United Kingdom
USE	Usefulness, Satisfaction, and Ease of Use
UTAUT	United Theory of Acceptance and Use of Technology
VC	Virtual Classroom
VGA	Video Graphics Array

CHAPTER 1: INTRODUCTION

Language learning via mobile learning applications (apps) provides flexible on-demand access to learning resources without time and device restrictions (Zervas & Sampson, 2014). Although many learning techniques have been developed for several languages—such as English, Spanish, German, French, Chinese, and Japanese—Arabic has fewer techniques available to enhance learners' communication abilities. Despite the availability of several language learning mobile apps to improve communication in Arabic, the actual use of mobile assisted language learning (MALL) apps technology in teaching and learning Arabic inside and outside the classroom has not yet been explored by researchers. Several studies, such as Al-Fahad (2009); Jaradat (2014); Kim et al. (2013); Liu, Navarrete, Maradiegue, & Wivagg (2014); Muhanna & Abu-Al-Sha'r (2009); and Small (2014), show that students look favorably upon the use of mobile technology in learning. Thus, the researcher of this study investigated the students' perception toward the use of such technology in learning Arabic. This research attempts to fill in the gap in literature on the use of mobile apps technology to aid the learning of Arabic.

Mobile Technology and Language Learning

To date, learning a new language is a key discipline that benefitted from mobile learning (Kukulska-Hulme, 2015). The students do not need to sit in a classroom, as MALL is an ideal solution to language learning barriers in terms of time and location (Miangah & Nezarat, 2012). However, learning a second language is still a universal source of anxiety (Suleiman, 2014). Therefore, a well-planned pedagogical method is needed in order to overcome the learner's anxiety.

The United States government designated Arabic as a strategic language in 2006. President George W. Bush said in January, 2006:

> Learning a language—somebody else's language—is a kind gesture. It's a gesture of interest. It really is a fundamental way to reach out to somebody and say, I care about you. I want you to know that I'm interested not only in how you talk but also in how you live. (Spellings & Oldham, 2008, p. 1)

Thus, the Department of Education launched language initiatives for "engaging foreign governments and peoples, especially in critical world regions, and for promoting understanding, conveying respect for other cultures, and encouraging reform" (Spellings & Oldham, 2008, p. 1). Because of the current state of politics in the Arab world following the Arab Spring, it has become crucial to learn more about this culture, history, and language. Arabic is known for its syntactic complexity, lexical sophistication, and variety of scripts and dialects. Because of the language barriers, unstable political situation in the Arab world, language characteristics, and lack of literature on using mobile apps technology to enhance the learning of Arabic, the researcher chose to focus on Arabic in the current study.

Mobile devices have a strong grip on people and society (Padley, 2012). Mobile apps technology is one of those technologies that have a strong impact on people. Mobile apps technology is defined as:

> A type of application software designed to run on a mobile device, such as a smartphone or tablet computer. Mobile applications frequently serve to provide users with similar services to those accessed on PCs [personal computers]. Apps are generally small, individual software units with limited function. This use of software has been popularized by Apple Inc. and its App Store, which sells thousands of applications for the iPhone, iPad and iPod Touch. A mobile application also may be known as an app, Web app, online app, iPhone app or smartphone app. (Techopedia, 2013, p. 1)

Many mobile apps were developed to enhance communication and second language learning because of the increasing interest in learning foreign languages. Several studies, such as Corlett et al. (2005), Kennedy & Levy (2008), Stockwell (2007), and Todd & Tepsuriwong (2008), showed that students had a strong motivation for learning languages via MALL apps.

Moreover, mobile technologies have inspired people and educators to use them not only in communications, but also in teaching. Therefore, this study examined students' use of MALL apps technology as supplemental tools to improve their Arabic learning and to identify their perceptions toward the use of MALL apps in learning Arabic as a second language. This is an exploratory study, and it is pragmatic in its philosophical approach. A mixed-method research design was used to examine the research problem. This study is primarily quantitative, but it also includes qualitative data due to the small number of participants and also to strengthen and support the quantitative data set. A mixture of quantitative and qualitative data collection and analysis was used to take advantage of the strengths, minimize the weaknesses of both approaches, and also to determine comprehensive results from the findings (Creswell, 2009). The study supports its theoretical framework by adapting the model described in the Five Standards for Foreign Language Learning in the 21st Century (NSFLEP, 2006), a model that consists of Five C's (Communication, Cultures, Connections, Comparisons, and Communities). This model is explained fully as part of the literature review in Chapter Two.

Background of the Study

Zimmerman (1989) said, "Learning is not something that happens to students; it is something that happens by students" (p. 21). In recent years, technology played a vital role in empowering students to take charge of their learning. Similarly, the emergence of mobile technologies attracted the interest of educators. Several other studies—such as Al-Fahad (2009), Baleghizadeh & Oladrostam (2010), and Cavus & Ibrahim (2009)—showed that mobile technologies were effective in learning. As cited by Kukulska-Hulme & Shield (2008), Facer (2004) claimed that "mobile technologies were a familiar part of the lives of most teachers and students" (p.1). Despite the increased use of mobile technologies, Kukulska-Hulme & Shield

(2008) stated that their use in the education industry is slow because educators are not aware of "how best to use these tools to support various kinds of learning" (p. 1).

Brown (2001) stated that, in 2000, educators in the United States of America (USA) and the United Kingdom (UK) suggested using mobile devices in teaching and learning practices. However, this use only occurred in trials and laboratory settings, which meant that the learning process was not truly mobile (Brown, 2001). In August 2004, mobile devices were actively used in more authentic teaching and learning practices when Duke University gave out iPods to a class of its freshman students for free (Belanger, 2005). In recent years, mobile technologies, specifically MALL technology, were increasingly integrated into the foreign-language curriculum in secondary and higher education settings (Abdous et al., 2009).

Mobile devices have become part of our lives and they have become ubiquitous within our society as necessary tools to facilitate socio-cultural opportunities for learning (Beres, 2011; Naismith et al., 2004; Pachler et al., 2009). Over time, mobile technology has changed our culture. For example, we see that receiving a phone call at dinnertime is now often considered to be communication and not interruption (Pinchot et al., 2010). As of 2015, we live in a huge world that is becoming a small village because of the technology. Because of the increasing technical aspects of communicative mobile technology, Paullet et al. (2011) stated that "people are staying 'plugged-in' and connected to what has become an 'always on' world" (p. 141).

Several studies on learning innovation revealed that high school or college students commonly use mobile devices for communicative and education purposes (Bomhold, 2013; Cavus & Ibrahim, 2009; Croy, 2012; Lim et al., 2011; Paullet et al., 2010). In his several studies on mobile technologies, Kukulska-Hulme (2006) indicated that mobile technologies have the advantage of "anywhere and anytime," which supported the idea of adapting MALL in

educational contexts to engage students' learning abilities. However, it has to be known that mobile technologies are only supplemental and instructional tools for enhancing communication and improving language instructions; they are not to replace the role of the instructor. Mobile technologies are very important to facilitate the learning process, but their effectiveness depends on the existence of a successful instructor who has good pedagogical knowledge and effective teaching practices (Korkmaz, 2010). Chinnery (2006) also argued that mobile technologies are very useful in language learning but that they cannot function as replacement for the classroom instructor. Thus, this study aimed to examine students' use of MALL apps technologies as supplemental tools to improve their Arabic language learning (ALL) and to identify the students' perceptions toward using mobile apps technologies in enhancing the learning of Arabic as a second language.

Statement of the Problem

Students may face several challenges when it comes to learning a new foreign language. Educators may understand how learning a foreign language can be frustrating for people who do not speak that language, but they may not know how to end this frustration. In an effort to reduce this frustration, technology is used in learning methods in most foreign language classrooms. Selfe (1999) explained the importance of technological literacy and the impact of using computer skills and other technology tools to enhance education productivity and high levels of learning performance. Although many learning techniques have been developed for several languages, such as English, Spanish, German, French, Chinese, and Japanese (Gamper & Knapp, 2002), Arabic has fewer techniques available for enhancing learners' communication abilities.

Despite the availability of several language learning mobile apps to enhance communication and improve the learning of Arabic, the actual use of MALL apps technology in

teaching and learning the Arabic language inside and outside the classroom has not been yet examined by researchers.

Mobile devices that can be used to support mobile assisted language learning include such portable lightweight devices as iPods, iPads, smartphones, tablets, GPS tools, laptop computers, MP3 or MP4 players, video tapes, multimedia players, e-game tools, e-organizers, e-books, CDs, DVDs, and personal digital assistants (PDAs) (Abas et al., 2010; Almasri, 2013; Ogata et al., 2010; Valarmathi, 2011). However, for the purpose of this study, the researcher focused only on the use of smartphones and iPads as the mobile devices to be used to enhance communication inside and outside the Arabic classroom settings. These portable mobile technologies have a variety of advantages for both educators and learners, such as low cost, small size, and ease of use. Students can also access the materials for language learning and interact with their instructors and classmates at any time and from anywhere (Ally & Tsinakos, 2014; Cristol & Gimbert, 2014; Huang et al., 2012; Parsons, 2014; Tai, 2012; Thornton & Houser, 2005).

Mobile technology became one of the most important areas of research in teaching and learning (Ally & Prieto-Blázquez, 2014). Pachler et al. (2010) stated that the capacity of mobile technologies attracted many users in the education and learning industry. The increasing use of mobile tools also empowers learners to seek contexts for learning culture. In order to implement MALL apps technologies in and beyond the classroom learning environment, educators need to understand how to use MALL apps and how to use mobile learning (m-Learning) in their teaching practices (Kukulska-Hulme & Shield, 2008).

Thus, this research attempted to fill the gap in the literature relating to the use of mobile apps technology to enhance the learning of Arabic. The computer is not the only technological

tool that we may use to facilitate the process of enhancing language learning, to better the methods of learning employed in the classroom, and to improve students' learning skills; MALL apps technology can also be used to enhance the learning of Arabic.

The Purpose of the Study

The purpose of this study was to examine students' use of MALL apps technologies as supplemental tools to improve their Arabic learning and to identify their perceptions toward the use of MALL apps in the learning of Arabic as a second language.

Research Questions

This study attempted to answer the following research questions:

RQ1: What are students' perceptions about the use of MALL apps in learning Arabic as a second language?

Sub-questions:

a) How does the use of MALL apps technology impact the learning of Arabic by non-native speaking students?
b) How do the following characteristics impact students' perceptions of MALL apps in learning Arabic: student's age, frequency of using mobile apps, level of mastery of Arabic, educational level, purpose for learning Arabic, and out-of-class communicative tasks scores using mobile apps for learning Arabic in class and outside of class?
c) What are the factors that influence the students' desire to continue or discontinue using MALL apps technology in learning Arabic as a second language?
d) What are the differences and similarities of online and on-ground students' perceptions of the use of MALL apps in learning Arabic?

RQ2: Do students prefer learning with or without the use of MALL apps as a supplementary

tool, and why?

RQ3: In what ways do the homework assignments using MALL apps assist the students' learning about the Arabic language and culture?

Significance of the Study

Research about the perceptions of using MALL apps for learning Arabic is limited and indirect, although MALL methods are currently identifiable and employed in language instruction in several other world languages. Therefore, the present study will be among the efforts to continue research into this field.

This study examined the use of mobile apps technology in enhancing the learning of Arabic as a modern language. The results of the study might be of great value to communication software developers, app programmers, mobile technology providers, school administrators, language educators, learners, and textbook writers. Moreover, Arabic teachers might find this study helpful as they seek to improve or modify the teaching methods they use in order to gain the best results from the learning process. Investors might also find this study helpful to invest and develop more mobile apps technologies for language learning purposes.

Document Overview

This dissertation consists of five chapters. The first chapter gives an introduction and background of the study. It also includes three main research questions and four sub-questions. It discusses the problem statement, the significance, and the purpose of the study.

Chapter Two begins with a brief introduction and an overview of technology and language learning. Then, it discusses electronic learning (E-learning), Computer-Mediated Communication (CMC), online vs. on-ground classes, Computer Assisted Language Learning method (CALL) and Intelligent Computer-Assisted Language Learning (ICALL), mobile

learning (m-Learning), and the movement to the Mobile Assisted Language Learning (MALL) approach to learning other foreign languages. It also presents a brief discussion on the Arabic language and culture. This theoretical chapter also briefly discusses the American Council on the Teaching of Foreign Languages (ACTFL). This chapter also reviews the reason for using the term "modern" instead of "foreign" to refer to languages other than English. In this chapter, the researcher also reviews other studies and mobile learning models, but the five standards for foreign language learning in the 21st century model (NSFLEP, 2006) was adapted to support the theoretical framework of this study. This chapter ends with a review of other studies on mobile applications and the learners' perceptions toward the use of MALL apps in enhancing communication and language learning.

Chapter Three describes the research methodology that was employed. It includes a discussion of the methods of collecting and analyzing the data. Research population and recruiting techniques are also explained. This chapter also discusses ethics, the Institutional Review Board (IRB), and pilot study procedures.

Chapter Four presents a review of the research results and a discussion of the results in regard to each of the research questions addressed by the study.

Chapter Five summarizes the findings, notes the limitations of the study, and ends with conclusions and recommendations for further research.

Additionally, provided in the appendices are a list of key terms definitions (see Appendix I), questionnaire and consent form, Institutional Review Board (IRB) approval, American Council on the Teaching of Foreign Languages (ACTFL) and Interagency Language Roundtable (ILR) assessment standards, Arabic alphabet, qualitative data codebook, and ways of sharing mobile apps with students.

CHAPTER 2: LITERATURE REVIEW

Introduction

Although there is literature on mobile assisted language learning (MALL), there is a lack of experimental studies on the use of MALL applications (apps) technology, specifically in teaching and learning Arabic at either K-12 or the university level. Therefore, the author of this work is interested in examining students' use of MALL apps technology as a supplemental tool to improve their Arabic language learning and identifying the students' perceptions toward using mobile apps technologies in enhancing the learning of Arabic as a second language.

This chapter provides a historical overview about the use of technology in the context of language learning. A literature review of Electronic Learning (e-learning), Computer-Mediated Communication (CMC), Online vs. On-ground courses, Mobile Learning (m-Learning), and then the movement from Computer Assisted Language Learning method (CALL) to the Mobile Assisted Language Learning (MALL) approach will be reviewed in this chapter. Because there is not much information about the use of MALL in learning Arabic, this chapter includes related literature on MALL practices in general, together with other related studies that provide evidence of the use of MALL and other methods, such as CALL, CMC and Intelligent Computer-Assisted Language Learning (ICALL) in learning.

This theoretical chapter presents a brief discussion about the Arabic language and culture. It also discusses briefly the American Council on the Teaching of Foreign Languages (ACTFL). The researcher of this study explains the reason for using the term "modern" instead of "foreign" to refer to languages other than English. This chapter ends with studies on mobile apps and the learners' perceptions toward the use of MALL apps for enhancing communication and language learning.

A Brief Historical Overview of Technology and Language Learning

Traditional face-to-face education, providing the students with the learning materials inside the classroom, differs from the modern method, which focuses on technology for the purpose of effective and interactive learning (Sawsaa et al., 2012; Shinagawa, 2012). Over the past 20 years, literature in the United States (US) shows there is a positive link between technology and classroom education. Several institutions adopted new approaches to communication and information technology (IT) to increase the learner's essential knowledge and to promote meaningful and effective learning (Clary et al., 2013). In recent years, mobile technologies have supported the communication pedagogy because communication is considered a "central pillar" in learning world languages (Tai, 2012).

The world we live in has been changed in one way or another by information and communication technologies (Dutta, 2012). Thus, in the field of technology, research shows that information is a relative and valuable thing to the person who uses or requires it, and it can be either explicit or implicit. However, information and communication are two different interrelated processes in which we exchange information when we communicate (Debons, 2008). The advent of the Internet has made it easier to communicate with others and to get work done with less effort from anywhere and at anytime. Internet technology can support and facilitate interaction between language teachers and learners (Shaalan, 2003).

The usage of technological tools in language learning and teaching practices has increased in recent years. Throughout history, second language acquisition approaches have been developed, and technology has been increasingly used in language teaching and learning practices (Warschaur & Meskill, 2000). For example, with the Grammar Translation method, teachers used old technology, such as overhead projectors and early software computer programs

to elaborate on "grammatical minutiae," and asked the learners to translate the sentences from the second language (L2) to the first language (L1). To use more technology in learning, the Audio Lingual method emerged in the 1970s to replace the Grammar Translation method. In this method, educators depended on the use of audio-taped materials and audio labs for language learning practices, such as repetition (Saville-Troike, 2006). However, this method fell out of favor in the late 1970s because it did not enhance the learner's communicative practices (Baleghizadeh & Oladrostam, 2010). In the early 1990s, the demand for learning a second language increased. Therefore, educators moved to focus on the communicative language teaching (CLT) approach by involving technology in language teaching to enable the teachers and learners to better interact with each other in the foreign language (Richards, 2006).

This study is primarily concerned with how mobile apps can assist students in learning Arabic. As a new pedagogical strategy of learning, Kukulska-Hulme and Traxler (2005) introduced the term "m-teaching" or "m-instruction," which they defined as the "facilitation and support of mobile learning" (p. 25). The use of "m-teaching" not only integrates mobile activities in a course syllabus, but also encourages the learners to use mobile learning strategies to achieve their goals (Beres, 2011).

What is Electronic Learning (e-learning)?

This section discusses electronic learning (e-learning). Naidu (2006) defines e-learning as:

> Commonly referred to the intentional use of networked information and communications technology in teaching and learning. A number of other terms are also used to describe this mode of teaching and learning. They include *online learning*, *virtual learning*, *distributed learning*, *network* and *web-based learning*. Fundamentally, they all refer to educational processes that utilize information and communications technology to mediate asynchronous as well as synchronous learning and teaching activities. (p. 1)

Although it is said that e-learning modes started during the same timeframe as online learning in the 1980s, the origin of e-learning is still not certain (Moore et al., 2011). The content of e-learning includes the use of CD-ROMs, the Internet, Intranet, audio- and videotape, satellite broadcast, and interactive TV (Moore et al., 2011). E-learning activity is represented by a number of modalities, which are shown in Figure 2.1. According to e-learning modalities, individuals and groups can work either online or offline (Naidu, 2006).

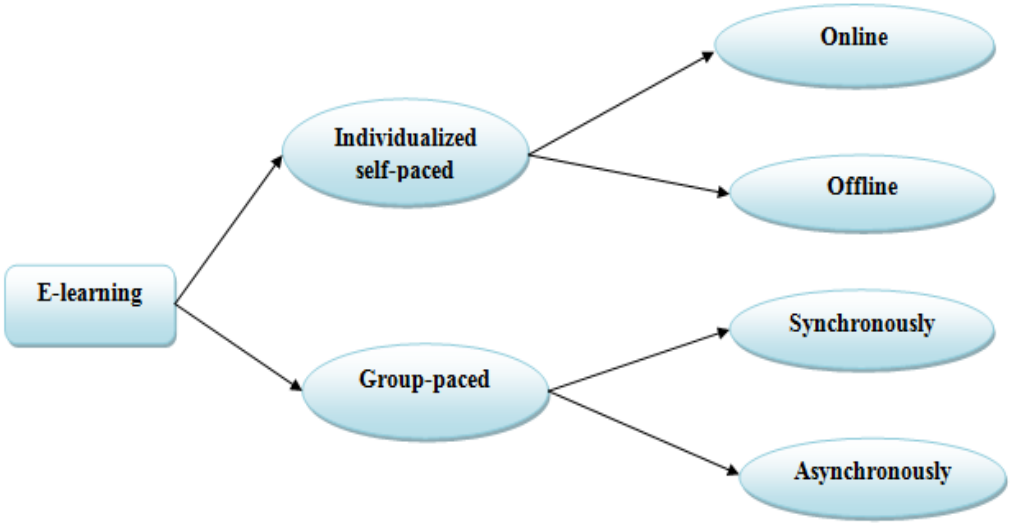

Figure 2.1. E-learning Modalities (Adapted from Naidu, 2006)

In terms of e-learning, there is a difference between an online virtual classroom (VC) and distance learning (DL). VC refers to the Blackboard Collaborate technology. Blackboard Collaborate technology "delivers an open, education-focused online collaboration platform that provides a wide spectrum of collaboration: web conferencing, mobile collaboration, instant messaging, voice authoring, and seamless integrations" (Blackboard Inc., 2013, para. 2). In the VC, the instructor and learners join the online session at the same fixed time as if they were in a real classroom. The instructor uses a microphone to speak, a camera to see the learners and to be seen by the learners, and the white board to write or share videos, files, and presentations. The

researcher taught his online classes in the VC mode. Figure 2.2 shows an interaction in the online virtual classroom (VC).

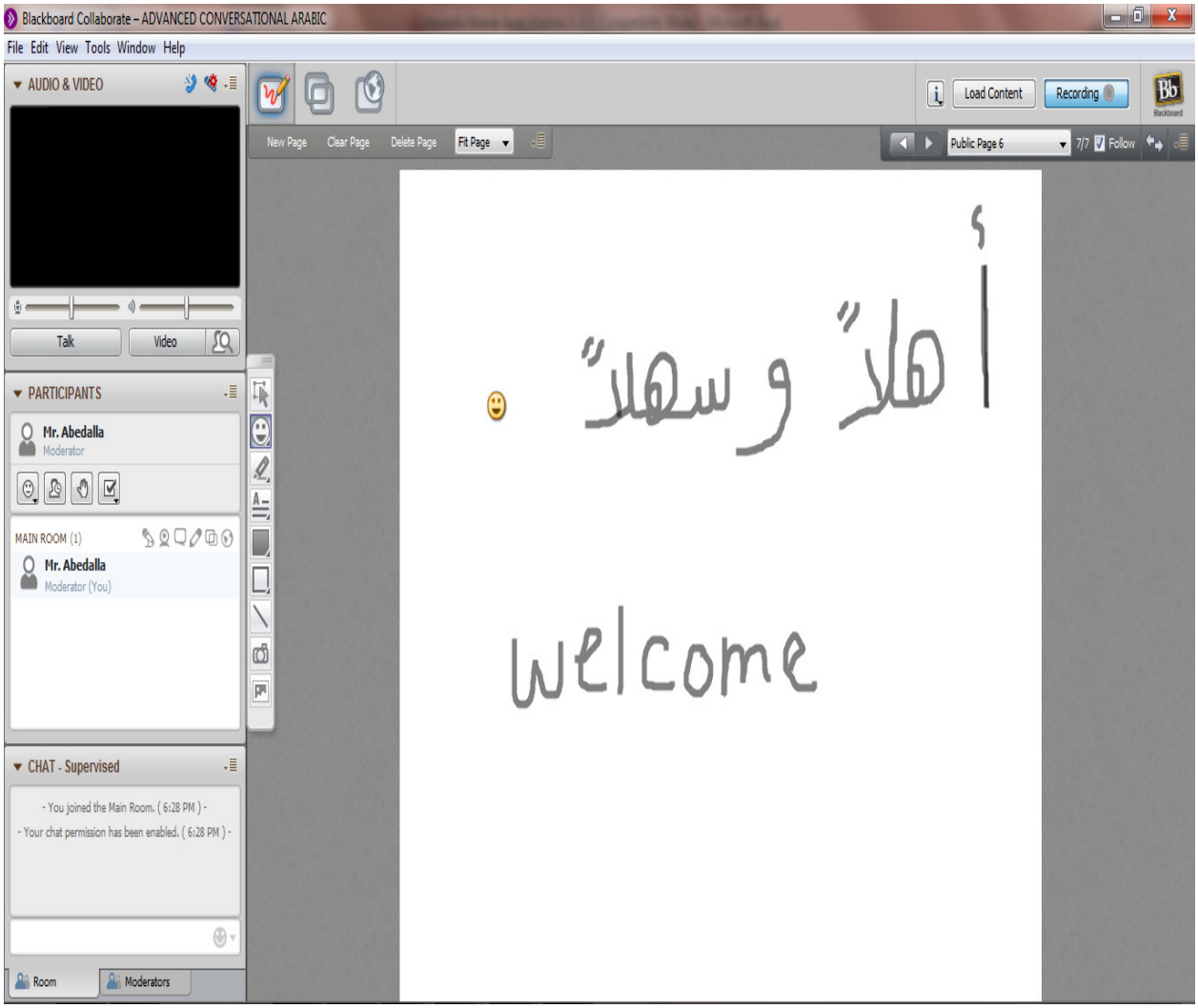

Figure 2.2. Arabic Online Virtual Classroom (VC)

In contrast, Rouse (2005) defines DL as:

> A formalized teaching and learning system specifically designed to be carried out remotely by using electronic communication. Because distance learning is less expensive to support and is not constrained by geographic considerations, it offers opportunities in situations where traditional education has difficulty operating. Students with scheduling or distance problems can benefit, as can employees, because distance education can be more flexible in terms of time and can be delivered virtually anywhere. (para. 1)

Using mobile devices to support DL has three rationales. First, distance learners can log

in from any location in the world. Second, they can use small affordable devices to communicate with the institution and with other learners. Third, they can learn in isolation (Adedoja et al., 2013). Several studies, such as Green (2002), Campbell (2004), and Hooper et al. (2009), revealed that mobile devices help in increasing communication and interaction and also enhance the quality of learning and distance education (Adedoja et al., 2013).

Computer-Mediated Communication (CMC)

In the education industry, e-learning forms can be applications, programs, electronic objects, and websites that the learners can use for learning (Moore et al., 2011). E-learning is considered a new "buzzword." E-learning is popular because the class materials are delivered via the Internet and the learners collaborate with one another and their instructor using computer-mediated communication (CMC) (Borin, 2002). CMC is defined "as any communicative transaction that takes place by way of a computer, whether online or offline" (McQuail, 2005, p. 552). Examples of CMC are emails, chat or text messages, audio or video recordings, and bulletin boards. CMC has received recognition for creating an environment for collaborative learning and for improving a learner's oral communication (Abrams, 2003).

CMC can be used in both synchronous and asynchronous learning. Synchronous communication tools "enable real-time communication and collaboration in a same time-different place mode" (Kaplan & Ashley, 2003, para, 1). An example of synchronous communication is video conferencing (Kaplan & Ashley, 2003). In contrast, asynchronous learning tools "enable communication and collaboration over a period of time through a different time-different place mode" (Kaplan & Ashley, 2003, para, 2). An example of asynchronous communication is sending an email (Kaplan & Ashley, 2003).

Online Vs. On-ground Learning

Mobile technology can be integrated in both distance learning and traditional classroom settings (Motiwalla, 2007). Ury et al. (2005) define an online course as "a course delivery method that is provided in an asynchronous mode through Internet technologies" (p. 2). On the other hand, an on-ground course is defined as "a traditional classroom delivery model used in typical residence programs in higher education. This is a synchronous method of instruction where students attend regularly scheduled classes in campus or satellite (off-campus) meeting rooms" (Ury et al., 2005, p. 2).

Several studies, such as Ali and Elfessi (2004), Benson et al. (2005), Brown (2002), McLaren (2004), Stansfield et al. (2004), Ury et al. (2005), and Whitney (2006), examined the differences between online and face-to-face learning. These studies found that there were no significant differences between online and on-ground students.

Another study was conducted by Yatrakis and Simon (2002) in which they surveyed 397 students who enrolled in courses available in both online and on-ground formats. The findings revealed that the students who enrolled in the online courses performed well. Other authors, such as Redding and Rotzien (2001) and House et al. (2007), stated that the online courses were more effective and more convenient than the on-ground courses. In contrast, Gifford (1998) stated that online courses require more time of preparation.

Successful learning can happen in both online and on-ground courses (Abedalla et al., 2014). Learning effectiveness refers to those "learners who complete an online program and receive educations that represent the distinctive quality of the institution. The goal is that online learning is at least equivalent to learning through the institution's other delivery modes, in particular through its traditional face-to-face, classroom-based instruction" (Sloan Consortium,

cited by Swan, 2003, p. 1).

Computer-Assisted Language Learning (CALL)

Computer-Assisted Language Learning (CALL) is defined as "the search for and the study of applications of the computer in language teaching and learning" (Levy, 1997, p. 1). CALL is a field within applied linguistics and second language acquisition (L2). It refers to the method of using the computer as a supplemental technological tool to facilitate language teaching and learning (Egbert, 2005). CALL is also known as "computer-assisted instruction (CAI), computer-aid instruction (CAI), or computer-aided language learning" (Shaalan, 2005, p. 107). Computer-assisted learning (CAL) is also a form of CALL. The forms of CALL materials are CD-ROMs and Internet-delivered courseware. In 1997-1998, CD-ROMs represented 0% of the National Association of Self-Instructional Language Programs (NASILP) instructional materials. It was only 1% in 1998-1999 and 14% in 1999-2000. The remaining 86% were textbooks with accompanying audiocassettes (Dunkel et al., 2002). A study conducted by Korkmaz (2010) showed that "the origins of computer assisted learning (CAL) and computer assisted language learning (CALL) can be traced back to the 1950s when large, unmovable mainframe computers were used as technological instructional tools" (p. 11).

Intelligent Computer-Assisted Language Learning (ICALL). In addition to CALL, there is a system called *Intelligent Computer-Assisted Language Learning* (Intelligent CALL, or ICALL), which is defined

> in a number of ways, but one understanding of the term is that of CALL incorporating language technology (LT); for example, analyzing language learners' language production, in order to provide the learners with more flexible—indeed, more 'intelligent'—feedback and guidance in their language learning process. (Borin, 2002, p. 61)

A 2005 study was conducted by Shaalan to propose an Arabic ICALL system

architecture for learning Arabic at primary schools. This ICALL system includes four components: "user interface, course material, sentence analysis, and feedback" (Shaalan, 2005, p. 86). Educators and learners used CALL for language learning, including Arabic.

What is Mobile Learning (m-Learning)?

Sharples et al. (2007) define mobile learning (m-Learning) as a "process of coming to know through conversations across multiple contexts among people and personal interactive technologies" (p. 225). Mobile devices were invented in 1973, and no one thought at that time that they would be used someday in language learning tasks (Miangah & Nezarat, 2012). The field of m-Learning is experiencing rapid evolution (Valarmathi, 2011). The term "mobile" is associated with "on-the-move" (Church & Oliver, 2011). Mobile refers to a thing that is not fixed, but portable and easy to carry by the carrier wherever he or she moves. The term "mobile" has several meanings that refer to communication devices, to the devices that deliver training and learning, and to the move from online or computer-based learning to the mobile learning strategies (Brown et al., 2014).

The principle of m-Learning is "anytime, anywhere" (Kukulska-Hulme & Shield, 2008). M-Learning has several characteristics, such as being "personalized," "spontaneous," "informal," "ubiquitous," and "situating of instructional activities", in addition to its "permanency," "accessibility," "immediacy," and "interactivity" (Miangah & Nezarat, 2012; Ogata Mobile & Yano, 2005). Mobile devices notably change "human-computer interaction, communication, and learning activities" (Liaw et al., 2010, p. 446). Mobile devices can also "support language learners in noticing and recording noticed features 'on the spot', to help them develop their second language system" (Kukulska-Hulme & Bull, 2008, p. 12). The good thing about mobile devices is that they increase efficiency and decrease costs for academic institutions. The students

can use their mobile devices to complete their assignments, such as language conversation recording, without making a trip to the computer lab to use a desktop computer. Learners can use mobile devices to learn in their own community so that they can tutor and help each other in the learning process. "The learner is mobile and is at the center of the learning, and the technology allows the learner to learn in any context" (Ally & Prieto- Blázquez, 2014, p. 145). Schools might think to develop mobile labs with limited funding as they are user-friendly and not costly (Gilgen, 2004). "As in other technology-enhanced language learning milieu, mobile learning environments might be face-to-face, distance, or online; further, they may be self-paced or calendar-based" (Chinnery, 2006, p. 9). Mobile technologies could ease and simplify the process of learning. They could also support learning by extending the time and space limitations of the traditional classroom (Jaradat, 2014).

Mobile Learning Advantages. Mobile technologies have several advantages for educators and learners. One of the advantages is that the use of mobile devices is less expensive than having a computer lab for learning language purposes. The other advantage is that the mobile technologies convey information and services ubiquitously (Younus, 2014). They are also portable, light, and convenient for learners to use outside the classroom practices and to facilitate remote participation (Barker et al., 2005; Godwin-Jones, 2008; Huang et al., 2012; Kukulska-Hulme, 2006; Miangah & Nezarat, 2012). Several other studies, such as (Cavus & Ibrahim, 2008; Chen, & Tsai, 2009; Nguyen & Pham, 2011; Ogata et al., 2004; Osman & Chung, 2010; Yang & Chen, 2012), showed that the use of technology and mobile learning systems is helpful for language learning.

In 2015, today's generation is fortunate to have such small mobile devices in their pockets that can handle many tasks easily and quickly at any time and from anywhere. Mobile

apps are developed for everybody. There are several mobile learning apps for parents who are interested in raising their kids with many languages. These apps make learning fun (Shockoe, 2014). Research shows that the use of mobile apps technology improves the students' learning and makes the learning fun, challenging, effective, collaborative, and creative (Khaddage, Lattemann, & Bray, 2011; Steel, 2012). A study conducted by Rossing et al. (2012) showed that the use of mobile devices was favorable for the students. In this study, many students used the words "fun" and "interesting" when they shared their learning experience with mobile learning. This study also emphasized the importance of designing activities with clear instructions and student roles so that the students would not lose focus. In addition, the elements of learning quality include: satisfaction, engagement, positive affects, enjoyment, concentration, and motivation with cooperative learning activities (Shengmei, 2014).

Moreover, the learners can also study "manageable chunks of information in any place on their own time" (Chinnery, 2006, p. 13). In regard to the access of information technology, Bomhold (2013) states that the "millennial" generation has a different view than their parents and grandparents because they have had more access to the Internet, computers, video games, and cell phones. The millennial generation, also known as Generation Y, refers to the children who were born between 1982 and 2000. They represent a generational cohort, distinct from their parents' generation, and their immediate predecessors, Generation X (Howe and Strauss, 2003).

Mobile Learning Challenges. Despite its advantages, mobile technologies also have challenges, such as small screen sizes, limited audiovisual quality, limited presentation of graphics, one-finger data entry, and limited power (Albers & Kim, 2001; Bayyurt, Ercetin, & Karatas, 2014; Chinnery, 2006; Liu, Navarrete, Maradiegue, & Wivagg, 2014; Valarmathi, 2011). Another challenge is that a "computer is better than a mobile phone for handling various

types of information such as visual, sound, and textual information" (Yamaguchi, 2005, p. 57).

The Movement to Mobile Technology

Mobile technologies have inspired people and educators to use them not only in communication, but also in teaching and learning practices. There is a shift from teacher-centered learning to student-centered learning via mobile learning (Miangah & Nezarat, 2012). However, using mobile apps technology to learn Arabic inside and beyond classroom settings has not yet been investigated. Therefore, the first goal of this study is to examine students' use of MALL apps technologies as supplemental tools to improve their Arabic language learning. The second goal of this study is to identify the students' perceptions toward using mobile apps technologies in enhancing the learning of Arabic as a second language.

The movement to mobile technology happened due to the several advantages of the mobile technologies for educators and learners, which were already discussed above. Kukulska-Hulme (2005) said "mobile learning is now moving beyond short-term, small-scale pilot projects and is ready to tackle issues of scale, sustainability, accessibility, evaluation, cost effectiveness and quality in the mainstream of education and training" (pp. 3-4). Additionally, a study conducted by Mukhtar et al. (2013) showed that computers were widely used in language learning education. However, there are issues with computer usage, as they require "training, hardware/software development, etc. Computers are becoming smaller, cheaper, media-rich, and more ubiquitous" (p. 83). New effective technological tools, such as smartphones, iPads, and tablets are powerful, "readily-available" devices in the teachers' and learners' hands (Mukhtar et al., 2013). Another study was conducted by Godwin-Jones (2008) about the emerging technologies and how "mobile-computing" is lighter, faster, and smarter. In this study, he said, "We are moving into a new era of mobile computing, one that promises greater variety in

applications, highly improved usability, and speedier networking" (p. 3). Mobile devices are powerful and easy to use. They become more ubiquitous than traditional PCs and laptops (Tillmann, Moskal, & Halleux, 2014). As a result of such research and studies, educators have moved to use mobile technologies in learning.

Mobile Assisted Language Learning (MALL). Mobile assisted language learning (MALL) is a newly emerging approach in learning modern languages. The term MALL is a subset of both mobile learning (m-Learning) and computer assisted language learning (CALL). It "describes an approach to language learning that is assisted or enhanced through the use of a handheld mobile device" (Valarmathi, 2011, p. 2). It refers to the use of mobile technologies as supplemental tools to enhance language learning (Viberg & Grönlund, 2012). Baleghizadeh and Oladrostam (2010) indicated that MALL is a branch of technology, which enhances the process of learning in many forms including "face-to-face" and "distant or on-line modes" (p. 4).

Although there have been recent studies, such as Almasri (2013), Bomhold (2013), Church & Oliver (2011), Kondo (2012), and Kukulska-Hulme (2009), that discussed the use of mobile technologies in higher education, educators did not examine the use of such technologies in the Arabic classroom and beyond the classroom learning environment. Throughout recent years, academia and the mobile world have paved a new path for language learning. In 2015, one can see that the majority of college students use their smartphones (iPhones, Androids, etc.) or mobile technologies (iPads, iPods, etc.) both inside and outside the classroom.

Because we live in a digital age where mobile usability continues to increase, the subscription rates of mobile phone users increased to 96% globally, 128% in developed countries, and 89% in developing countries (Sanou, 2013). Based on the World Bank Group Report of 2013, the mobile cellular telephone subscriptions are 98% per 100 people in the US,

which means that almost all citizens of the US have a mobile cellular telephone. In the academic arena, Ducate and Lomicka (2013) predicted that the expected rate of college students to have smartphones would be 91.4% by the year 2016. Croy (2012) stated that "one third of American high school students own an iPhone" (para. 1).

A recent study by Bishop and Huselid (2013) showed that 82% of college students use their mobile devices for college related tasks, 68% of students use their mobile devices to visit their colleges' websites, and 43% use their devices for web browsing. Kukulska-Hulme and Shield (2008) conducted a study on the use of MALL in informal and formal learning. MALL differs from CALL in that MALL is more personal, portable, and easy to use, while CALL users cannot use mobile apps (Ducate & Lomicka, 2013). Another study conducted by Thornton and Houser (2005) on Japanese university students showed that a majority of the participants liked to have the learning materials loaded on their cell phones, as they are reliable and easy to use. Kondo et al. (2012) implemented a model, "The Test of English for International Communication" (TOEIC), to explore ways of incorporating MALL practices to improve students' scores on the TOEIC Listening and Reading Tests. This model was student-based learning and not teacher-led teaching materials.

Moreover, Baleghizadeh and Oladrostam (2010) investigated how mobile phones improved the grammatical accuracy of Iranian English as Foreign Language (EFL) learners while they spoke English. Another study concluded that mobile phones have a significant impact on students wherein they enhanced their confidence in both listening and speaking the Indonesian language (MALL Research Project Report, 2009). Alemi et al. (2012) investigated the effectiveness of Short Message Service (SMS) on Iranian university students' vocabulary learning retention (p. 99). Lan et al. (2007) examined how mobile peer-assisted learning supports

the English reading program. Moreover, studies like Al-Aamri (2011), Kolb (2011), and Zhang et al. (2011) examined how cell phones are effective in education and classroom learning. The cell phones became "mini-computers; no longer simply classroom distractions, they are now powerful classroom tools" (Kolb, 2011, p. 48). A recent study conducted by Tu and Sujo-Montes (2015) revealed that "rather than seeing students' mobile devices as a distraction, perhaps teachers can transform devices into learning devices and learning tools" (p. 271). As a result of reviewing such studies, the researcher wanted to see if the use of MALL apps technologies could improve the students' learning of Arabic language.

Arabic Language and Culture

This section discusses Arabic language and culture. Modern Standard Arabic (MSA) is the official language used by Arabs.

> Modern Standard Arabic (MSA) is the variety of Arabic most widely used in print media, official documents, correspondence, education, and as a liturgical language. It is essentially a modern variant of Classical Arabic, the language of the Quran. Standard Arabic is not acquired as a mother tongue, but rather it is learned as a second language at school and through exposure to formal broadcast programs, such as the daily news, religious practice, and print media. Because it is not acquired as a native language, the number of speakers of the language is difficult to determine, and degrees of proficiency range widely, from the ability to follow news broadcasts but no reading, writing, or speaking skills, to the ability to speak and write the language with a minimum of grammatical errors. The geographical center of the language can be said to encompass the northernmost part of Africa from Mauritania to Egypt, the Levant, the Arabian Peninsula, and Iraq. It is estimated that some 165,000,000 people throughout the Islamic world have some knowledge of Standard Arabic. (UCLA Language Materials Project, 1992, para. 1)

Arabic is among the six most spoken languages worldwide because it is considered the mother and official language of 23 countries. Arabic is also the language of Islam and is understood by over one billion Muslims around the world (Ariew & Palmer, 2009; Kaye, 1987).

Although several modern languages, such as German, Latin, French, and Spanish, were

taught in the US, Arabic has not been a popular language. There were only a few Arabic programs in the US. However, the interest in learning the Arabic language and the culture has increased recently because of the Arab Spring revolutions and the unstable political situations in other Arabic countries. In fact, the interest in the Arabic language increased since the first gulf war, Desert Storm, in the 1990s. Later, Arabic started to be one of the languages on demand during the U.S.-led Iraq War in 2003 (Jacob & Abedalla, 2013). A study by Welles in 2004 stated that "enrollments in Arabic were relatively stable during the 1980s; however, since 1995 they have shown rapid growth, particularly between 1998 and 2002, almost doubling (from 5,505 to 10,584)" (Ariew & Palmer, 2009, p. 59).

Students' enrollments in Arabic programs also increased to 23,974 in 2006 (Ariew & Palmer, 2009). As one of the less commonly taught languages, Arabic was implemented by most of the schools to be offered in their linguistics and modern languages departments. Arabic is one of the Semitic languages (i.e., Hebrew or Amharic), which is "rich in its morphology and syntax" (Shaalan & Talhami, 2006, p. 203). Semitic language refers to a large Afro-Asiatic language family and was named by A. L. Schloezer in 1781 to refer to the languages spoken by people among the sons of Sem (Lipinski, 2001). Arabic preserved many of the features of the language predecessor, and the word "Arab" itself is derived from the Semitic root "nomad." In the Arabic language, the word "Arab" refers to those people who speak Arabic (i'rab) clearly, as contrasted with Ajam people who speak Farsi. Originally, Arabic was the language used by the itinerant tribes who lived in the desert of the Arabian Peninsula (Nydell, 2012; Pimsleur Approach, 2013). Figure 2.3 shows the Semitic languages:

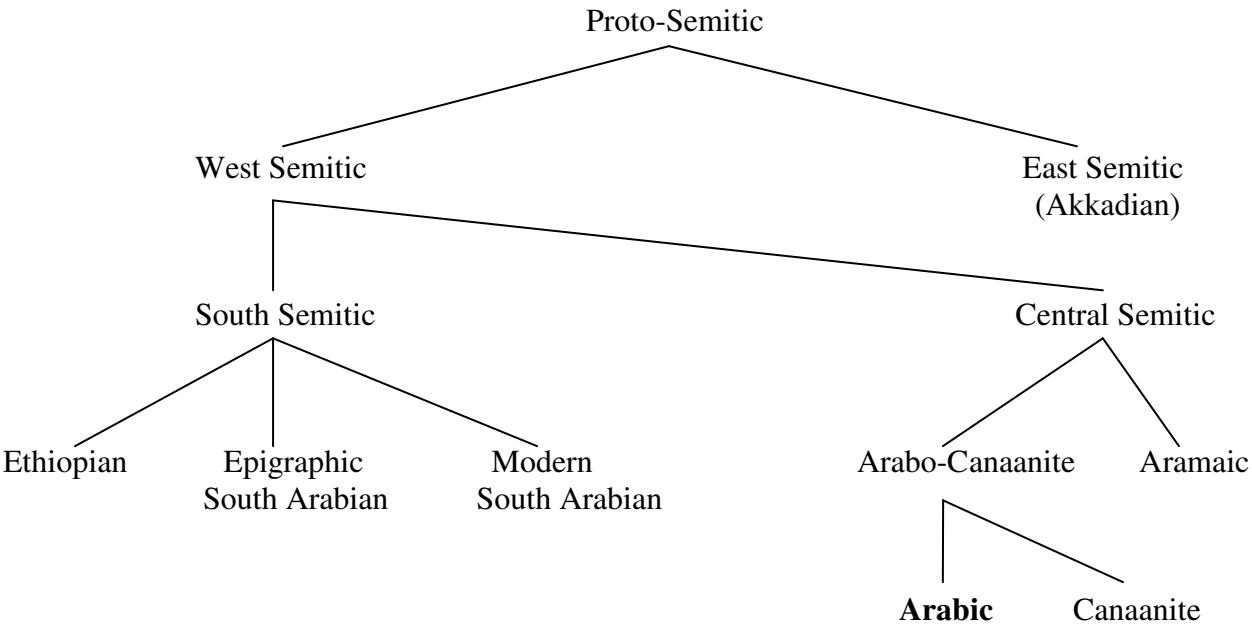

Figure 2.3. The Genealogy of the Semitic Languages (Adapted from Versteegh, 2014, p. 15)

Arabic is characterized in terms of "diglossia" (Versteegh, 2014).

> Diglossia refers to the distinction between the two forms of a language such as Arabic, German, French and Greek, separating the formal 'outer' High form (e.g., Classical Arabic, Hochdeutsch, French) and the Low informal 'inner' form (e.g., Egyptian Arabic, Schwyzertutsch, Haitian Creole). (Wright, 2008, p. 264)

In another way, Arabic *diglossia* refers to the "two varieties of the same language side-by-side in a speech community" (Alosh, 1991, p.122). Thus, the two varieties of the Arabic language are the informal, "colloquial," and the formal, "fus-ha." Colloquial is the spoken dialect by the Arabic region, such as Gulf, Egyptian, Levantine, Moroccan, etc. Fus-ha is the formal standard and official language that Arabs can use in more formal contexts, such as newspapers, magazines, TV shows, official documents, and textbooks (Ariew & Palmer, 2009; Nydell, 2012).

As for the origin of the Arabic writing system, it descended from the Nabatean Aramaic script. As the Aramaic script requires a limited number of consonant letters for Arabic, the shapes of Arabic letters were extended by adding dots either above or below the letter to

distinguish between one letter from another (Daniels, 1996; Versteegh, 2014). Arabic has 28 letters in the alphabet: three long vowels (alif, waw, yaa) and 25 consonants that have different shapes in the initial, medial, final, and individual positions of the word (see Appendix F). There are short vowels indicated by optional diacritical markings, which are often not written. These markings are Dama, Kasra, and Fat-ha. The Arabic writing system is a cursive script from right to left. Six letters are non-connecters or one-way connectors, and 22 letters are connectors. Connectors are letters that can be connected with one another. The non-connecters or one-way connectors mean that the letters do not connect at all with other letters or do connect with one side depending on their position in the word (Brustad et al., 2010; Younes et al., 2013).

Additionally, Arabic culture is very rich and diverse. Moran, Harris, and Moran (2007) said that "in the past, many assumed that cultural differences were barriers that impeded communication and interaction. Today, effective global leaders believe that cultural differences, if well managed, are resources, not handicaps" (p. 43). It is worth mentioning that there are Arab subcultures within the main Arab culture. For example, the culture of Bedouins who live in the desert or rural cities differs from the culture of liberal Arabs who live in the city and behave like westerners. Geertz (1973) defined culture as "a system of inherited conceptions expressed in symbolic forms by means of which men communicate, perpetuate, and develop their knowledge about and attitudes toward life" (p. 89). It consists of the unwritten rules of the social environment. It is "the collective programming of the mind that distinguishes the members of one group or category of people from others" (Hofstede et al., 2010, p. 6). Even though the researcher is from the Iraqi Arab culture, he admits his lack of knowledge regarding the nuances of other Arabic regions and countries. One can live in a culture with the people from that culture, yet not understand the cultural norms of the community. Thus, there are a lot of stereotypes and

misconceptions about Arabs. For example: all men are "oil-rich Sheiks," all women are veiled, Arabs are uncivilized and live in the desert and ride camels, and all Arabs are Muslims (Office of the Deputy Chief of State for Intelligence, 2006). The emergence of technology and the increased number of Arabic learning programs in the US has helped western people to understand the Arabic culture without making a special trip to that Arab region or community. Every day, we can access a variety of authentic websites to obtain information about the Arab world and how Arabs live. In addition, learning the Arabic language and culture in western communities increases the awareness of people about Arab culture.

Moreover, the National Security Language Initiative (NSLI) was announced by President Bush in January 2006 to strengthen the teaching and learning of the critical languages. Arabic was one of those critical languages. Many programs and grants were implemented, such as a foreign language assistance program, teacher-to-teacher initiative to encourage the US nationals to learn the language and culture of the critical world regions. These national initiatives launched under the supervision of the four secretaries, state, education, defense, and the director of national intelligence (DNI), for the purpose of expanding the critical languages education all the way from kindergarten to the workforce (Spellings & Oldham, 2008).

Language Proficiency Guidelines

This section covers the guidelines of language proficiency. These guidelines are the Interagency Language Roundtable (ILR) and the American Council on the Teaching of Foreign Languages (ACTFL).

The Interagency Language Roundtable (ILR). ILR is defined as:

> An unfunded federal interagency organization established for the coordination and sharing of information about language-related activities at the federal level. It serves as the premier way for departments and agencies of the federal government to keep abreast of the progress and implementation of techniques and technology

> for language learning, language use, language testing and other language-related activities. (ILR, 2013, p. 1)

The contractors of the US government and federal secretaries followed the ILR guidelines to assess the languages of their educators and learners. Each year, the ILR team meets every month from September to June. In the early 1950s, the US had serious problems in recognizing foreign languages. Therefore, ILR arose in 1955 when Howard Sollenberger of the Foreign Service Institute (FSI), Clyde Sargent of the CIA Training Division, and James R. Frith, the Air Force Language Program and Dean of FSI's School of Language Studies together discussed the need for "coordination and communication in language training and testing among federal agencies" (ILR, 2013, para. 2). The ILR scale (see Appendix D) measures the learner's four skills—Speaking, Reading, Listening and Writing of language proficiency. These measures are based on the following levels of language proficiency: no proficiency, survival proficiency, minimal functional proficiency, minimal functional proficiency plus, limited functional proficiency, limited functional proficiency plus, general functional proficiency, general functional proficiency plus, full professional proficiency, and bilingual proficiency (Multilingual Solutions, 2014).

The American Council on the Teaching of Foreign Languages (ACTFL). ACTFL) describes itself as:

> A national membership organization of foreign language professionals dedicated to promoting and fostering the study of languages and cultures as an integral component of American education and society. ACTFL strives to provide effective leadership for the improvement of teaching and learning of languages at all levels of instruction and in all languages. Its membership of more than 12,000 language professionals includes elementary, secondary, and post-secondary teachers; administrators; specialists; supervisors; researchers, and others concerned with language education. ACTFL represents all languages and all levels of language instruction. (ACTFL, 2012, p. 3)

In 1986, ACTFL was derived from the ILR and began to be used in academia contexts, with the levels of 0-5 changing to Novice, Intermediate, Advanced, Superior, and Distinguished. In 2012, ACTFL had new guidelines for foreign language proficiency. Based on those guidelines, one can see that each level represents the learner's rate and ability of what he or she can or cannot do. At the novice level, the learner can communicate minimally in the second language, but at the intermediate level, the learner can say simple phrases and ask simple questions. At the advanced level, the learner can handle more complex utterances than at the intermediate level. A superior learner can use the language as well as a native speaker (ACTFL, 2012).

The Terms Foreign Language and Modern Language

Mastering a language other than the native language is very challenging in any society. To have a certain level of proficiency in a foreign language, the learners have to be equipped with the linguistic and cultural knowledge for that specific level. Proficiency is defined as "the ability to communicate in another language in a meaningful way" (Bobb & Gist, 2009, p. 4). Because of the increase of learning foreign languages in the US, there arose the question of using a term like "world languages" or "modern languages" instead of "foreign languages." Many language learning programs in the US use either "world languages" or "modern languages" because of the ways our national demographics have changed in the last 15 years (Bobb & Gist, 2009, p. 4). Recently, there was a debate on the use of the word "foreign" to refer to the teaching of languages other than English. The use of the word "foreign" becomes problematic within the US because languages such as Spanish, Italian, or Chinese taught in the US schools and universities are no longer foreign to Americans (e.g., Native American Languages, American Sign Language, Spanish, or French). Therefore, many US states started to replace the word

"foreign" with other terms such as "world languages," "modern or classical languages," "languages other than English (LOTEs)," "target languages," and "second languages" (NSFLEP, 2006, p. 27).

ACTFL stated that:

> The study of another language and culture gives students the powerful key to successful communication: knowing how, when, and why, to say what to whom. All the linguistic and social knowledge required for effective human-to-human interaction is encompassed in those ten words. (Bobb & Gist, 2009, p. 6)

Learning another language is beneficial for a students' education. Arabic is one of the languages in demand today (2015). The student's purpose in learning Arabic differs from one to the other. For example, one may want to work for the government or to find a rewarding career in the international business. Another may be interested in learning about the people and culture. Another may simply want to fulfill a graduation requirement as part of his/her major of study. These purposes may be an indicator as to why the number of students' enrolled in learning foreign languages have been increasing. A study was conducted by the Modern Language Association of America (MLA) in Fall 2006 about the number of students enrolled in languages other than English in higher education in the US. The results of the study showed that languages, such as Spanish, French, and German continue to grow. However, there has been a growing interest in other languages, such as Arabic, Chinese, and Korean (Ariew & Palmer, 2009; Bobb & Gist, 2009; Furman et al., 2007).

Theoretical Framework

Many theoretical perspectives have been developed to understand how users make decisions to use technology applications (Abu-Dalbouh, 2013). Literature shows a variety of theoretical models and frames, such as: Ali and Segaran's (2013) 3D talking-head Mobile Assisted Language Learning; Sharples, Mike, Taylor, and Vavoula's (2007) framework for

analyzing mobile learning; Liu's (2008) United Theory of Acceptance and Use of Technology (UTAUT); and Roger's (2003) Innovation Diffusion Theory to examine the four main elements of diffusion: innovation, time, communication channels, and social systems. Although literature shows that there is a variety of old and recent mobile learning studies, there is no literature currently about the use of mobile technology in learning Arabic.

However, the Five Standards for Foreign Language Learning in the 21st Century model (Five Cs: Communication, Cultures, Connections, Comparisons, Communities) (NSFLEP, 2006) was adapted to support the theoretical framework of this current study. The researcher adapted the Five Cs' definitions and also looked at their importance in learning any foreign language. He also wanted to see if the use of MALL apps could help students to communicate in Arabic, compare their own culture with Arab culture, and also connect them with other learners, family members, and different disciplines.

Five Cs Model. Rita Mae Brown (1944) said that "language is the road map of a culture. It tells you where its people come from and where they are going" (Community School of Davidson, 2013, para. 3). In 1996, National Standards for Foreign Language Learning (NSFLL) was published as a response to the US Department of Education to have a set of standards in American education. Such national standards have an important effect on teaching foreign languages (Scott, 2010). Therefore, the foreign language associations worked together to set basic national standards. According to the Standards for Foreign Language Learning in the 21st Century (NSFLEP, 2006), their theory was that language and communication are at the heart of human experience. The United States must educate students who are equipped linguistically and culturally to communicate successfully in a pluralistic society and abroad. This imperative envisions a future in which all students will develop and maintain proficiency in English and at

least one other language, modern or classical.

These national standards are grouped together into Five Cs categories, and quoted from the Standards for Foreign Language Learning in the 21st Century (NSFLEP, 2006, p. 9), as shown in the following tables:

Table 2.1 focuses on communication and how to help the students to communicate in a language other than English. Three standards are provided to help in achieving the goal of communication.

Table 2.1
Communication: Standards for Foreign Language Learning in the 21st Century (NSFLEP, 2006)

Category	Goal	Standards
Communication	Communicate in Languages Other Than English	*Standard 1*: Students engage in conversations, provide and obtain information, express feelings and emotions, and exchange opinions. *Standard 2*: Students understand and interpret written and spoken language on a variety of topics. *Standard 3*: Students present information, concepts, and ideas to an audience of listeners-readers on a variety of topics.

Table 2.2 focuses on cultures and how to help the students to obtain knowledge and understand other cultures. Two standards are provided to help in achieving the goal of cultures.

Table 2.2
Cultures: Standards for Foreign Language Learning in the 21st Century (NSFLEP, 2006)

Category	Goal	Standards
Cultures	Gain Knowledge and Understanding of Other Cultures	*Standard 1*: Students demonstrate an understanding of the relationship between the practices and perspectives of the culture studied. *Standard 2*: Students demonstrate an understanding of the relationship between the products and perspectives of the culture studied.

Table 2.3 focuses on connections and how to help the students to connect with other

disciplines and acquire more information about the foreign language. Two standards are provided to help in achieving the goal of connections.

Table 2.3
Connections: Standards for Foreign Language Learning in the 21st Century (NSFLEP, 2006)

Category	Goal	Standards
Connections	Connect with Other Disciplines and Acquire Information	*Standard 1*: Students reinforce and further their knowledge of other disciplines through the foreign language. *Standard 2*: Students acquire information and recognize the distinctive viewpoints that are only available through the foreign language and its cultures.

Table 2.4 focuses on the comparisons category in which the students can compare their native language and own culture with the foreign language and culture. Two standards are provided to help in achieving the goal of comparisons.

Table 2.4
Comparisons: Standards for Foreign Language Learning in the 21st Century (NSFLEP, 2006)

Category	Goal	Standards
Comparisons	Develop Insight into the Nature of Language and Culture	*Standard 1*: Students demonstrate understanding of the nature of language through comparisons of the language studied and their own. *Standard 2*: Students demonstrate understanding of the concept of culture through comparisons of the cultures studied and their own.

Table 2.5 focuses on the communities category in which the students can work with others in a multilingual environment at home and outside home. Two standards are provided to help in achieving the goal of communities.

Table 2.5
Communities: Standards for Foreign Language Learning in the 21st Century (NSFLEP, 2006)

Category	Goal	Standards
Communities	Participate in Multilingual Communities at Home & Around the World	*Standard 1*: Students use the language both within and beyond the school setting. *Standard 2*: Students show evidence of becoming life-long learners by using the language for personal enjoyment and enrichment.

All the above Five Cs form the backbone of foreign language learning. Figure 2.4 illustrates all the Five Cs model of foreign language learning in the 21st Century (NSFLEP, 2006). They are all connected and work together in one circle as each C arrow complements the others.

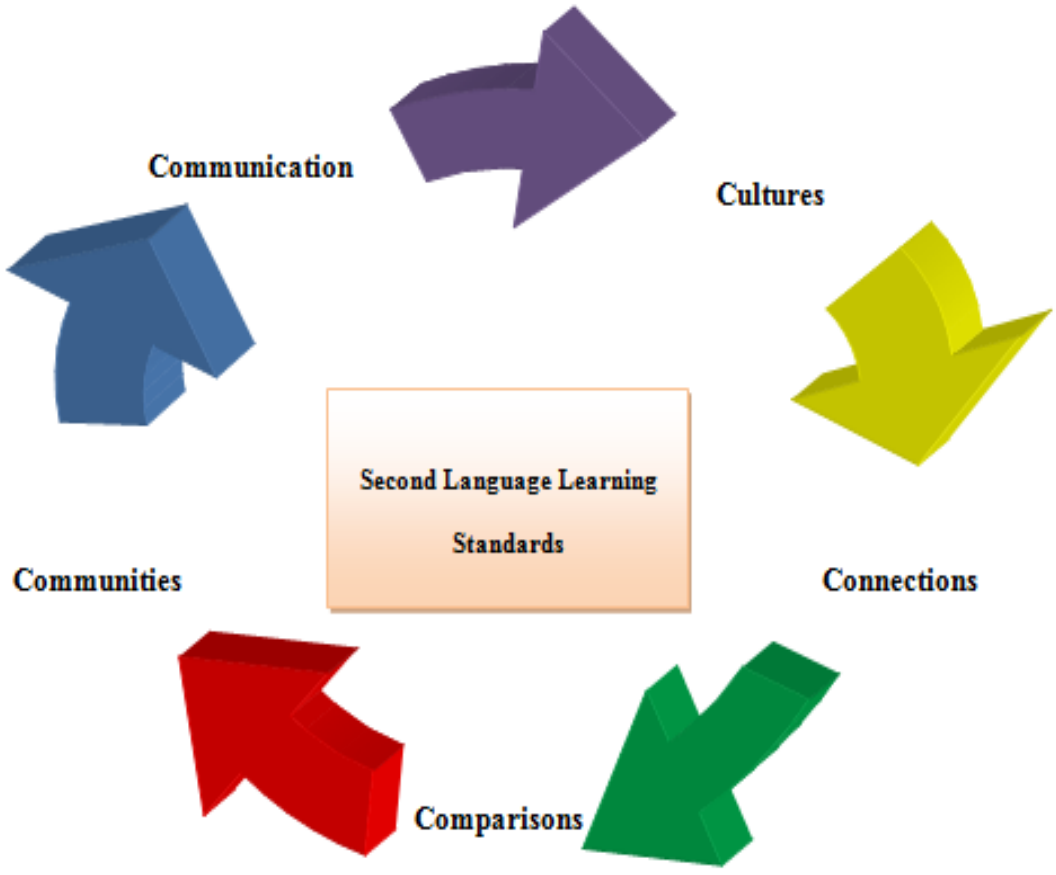

Figure 2.4. The Five Cs of Foreign Language Study (Adapted from NSFLEP, 2006: Standards for Foreign Language Learning in the 21st Century)

For the purpose of this study, the researcher also adopted some theoretical concepts from other studies, such as Almasri (2013), Huang & Lin (2007), and Morris & Dillon (1997), which used the Technology Acceptance Model (TAM). TAM was adapted from Fishbein and Ajzen's (1975) attitude paradigm, which measures beliefs, attitudes, and behavior. TAM was originated by Davis (1989) to focus on the usefulness and ease of using technology. From these studies, the researcher adapted their ideas of Usefulness, Satisfaction, and Ease of Use (USE) to measure the students' perceptions toward the use of mobile apps in learning Arabic.

TAM was based on the Theory of Reasoned Action (TRA) (Carvalho et al., 2012). TRA is "a general model which is concerned with individuals' intended behaviors" (Abu-Dalbouh, 2013, p. 765). According to TAM, users accept technology based on perceived usefulness (PU) and perceived ease of use (PEU) factors (Hung & Lin, 2007; Kallamarthodi & Vaithiyanathan, 2011). Usefulness is defined as "the degree to which an individual believes that using a particular system will enhance the task performance" (Abu-Dalbouh, 2013, p. 765). Ease of use is defined as "the degree to which an individual believes that using a particular system is free of physical and mental effort" (Abu-Dalbouh, 2013, p. 765). Users believe that the use of the technological tool (actual behavioral use) will improve their performance (i.e., PU) and will be effortless or require minimum effort (i.e., PEU). Both PU and PEU have a significant effect on a user's attitude toward the use of the system (Adedoja et al., 2013; Morris & Dillon, 1997).

Based on the studies that adapted TAM, some factors to be measured in this study about the students' perceptions toward the use of MALL apps in learning Arabic are usefulness (U), satisfaction (S), and ease of use (E). The USE factors can be affected by several external variables, such as the learner's level of education, the learner's gender, the learner's age, and the learner's knowledge of the target language (Burton-Jones & Hubona, 2005; Venkatesh & Morris,

2000; Venkatesh et al., 2012). These demographic factors are very important in learning a second language. For example, based on Chomsky's linguistic theory of language acquisition (1965), children are born with the inherent ability to acquire any human language. Learning a language at an early age is easier than at a later age. The brains of the younger people can absorb the target language quicker than those of older people. Wang, Wu, and Wang (2009) investigated whether there are differences in age and gender in the acceptance of m-Learning. Data were collected from 330 participants in Taiwan. The findings were that "age differences moderate the effects of effort expectancy and social influence on m-Learning use intension, and that gender differences moderate the effects of social influence and self-management of learning on m-Learning use intension" (Wang, Wu, & Wang, 2009, p. 92). A report conducted by Grunwald Associates LLC (2013) highlighted parents' perceptions and attitudes about the mobile generation. The report showed that the interest in mobile learning differs depending on the learner's age, grade level, and gender. Another study conducted by Byrne (2014) investigated "profiling mobile English language learners." Byrne surveyed 3,759 English as Foreign Language (EFL) learners. The participants were French, German, Italians, Japanese, Korean, Russian, Spanish, and Thai. They used an app that has over 500,000 downloads and 100,000 active users. The findings showed that there were differences in user's gender, age, first language (L1), and culture. The frequency of using mobile devices is another element that influences learning via mobile devices. A study conducted by DeWitt, Siraj, and Alias (2014) investigated the collaborative m-Learning (CmL) for 20 students in Malaysia. The findings showed that the frequency of interaction between students was high when it comes to text messaging and using wiki.

The other targeted factors for this study included: communication skills, knowledge about

culture, language and culture comparisons, and making connections with other people within their own community and other communities. Thus, all these activities are integrated with the Five Cs to fit the context of the current study. The student' perceptions toward the use of mobile apps technologies in learning Arabic were measured in both online and on-ground classes and compared to see if their perceptions were the same or different in learning the Arabic language and culture. The students' preference of using the traditional method (instructor uses much Arabic and little English and all supplemental materials and tools, but without including the MALL apps) or the traditional method with MALL apps was also measured.

Mobile Applications for Arabic Language Learning (MAALL)

The mobile apps marketplace is growing tremendously (Judge, Floyd, & Jeffs, 2014). Mobile app refers to any type of software that runs on mobile devices. Mobile apps make "life simpler and easier with just a click" (Almasri, 2013). Mobile apps as described in this study differ from web-based apps (Web Apps) in that they are independent applications and can be downloaded onto an iPhone, iPad, or any other mobile smart device (Shinagawa, 2012). Mobile apps were first observed in the early 2000s when they were implemented to help users control the flow of information and interaction through the use of handheld devices. Today (2015), we see government agencies, stores, music channels, programs, and many other organizations have their own apps available. Due to the widespread nature of the production and use of this technology, highly specialized mobile apps have become available, such as safety apps for construction workers (Li, 2015). Reinders (2014) indicated that people's interaction with one another increased recently based on "touch" function because many electronic products, such as smartphones, iPads, tablets, GPS system, etc., are "touch-based" interfaces. Based on the "touch-based" interface, there is a clear increase in the number of apps available either for free or to

purchase (Reinders, 2014). They also have the benefits of keeping individuals connected and oriented in real-time (BenMoussa, 2003).

Not surprisingly, educators were also interested in mobile apps (Godwin-Jones, 2011). Due to the benefits of mobile apps, MALL apps were developed to support the education industry. MALL apps provide many benefits to university learning because they are easy, convenient, efficient, flexible tools for collaboration, coordination, and communication (Khaddage, Lattemann, & Bray, 2011). According to Judge's study (2014), "Using Mobile Media Devices and Apps to Promote Young Children's Learning," Apple announced that its app market hit 40 billion app downloads in January, 2013, and the Android market passed the 700,000 mark in October, 2012.

There are a variety of apps available based on the purpose of the industry. Mobile apps attracted educators' interest because apps facilitate the process of teaching and learning (Hsu and Ching, 2013). This current research focuses on the education sector and, specifically, on improving the learning of Arabic from kindergarten to the workplace inside and outside the classroom. There are many apps for learning Arabic that available in the App Store or iTunes Store. The researcher used a small set of different learning apps in his classes for the purpose of this study, including: LearnOasis Arabic, The Complete Guide to Learn Arabic for Foreigners, Learn Arabic, OpenLanguage, DLI Arabic-MSA Headstart2 Military Phrases, WordPower Arabic Vocabulary, iLang Basic Arabic, Essentials, Arabic Translator, Arabic Flashcards, Lingo, Learn Arabic Deluxe, Memo Arabic, Arabic-English Dictionary, Arabic stories, Iqra, WordUp Arabic, Arabic in a month, Arabic Pocket Lingo, my Arabic words, SPEAKit.tv, Alphabet arabe, Arabindo, Arabic, Onboard Arabic, Mango Languages, Quizlet, and Letter Sketch Arabic. All these MALL apps help in supporting the learning of Arabic language for beginner level students.

They cover a variety of aspects and skills of language learning from alphabet to vocabulary and grammar acquisition, speaking, reading, writing, listening, and culture. Most of the apps are user-friendly, and they can be accessed at any time from anywhere on the globe. Mobile apps are very important for students who do not always have connectivity to access online learning materials. They can complete their learning activities offline (Ally, 2014). Apps provide flexible on-demand access for learning from any location (Zervas and Sampson, 2014).

Because there are many apps for language learning available, instructors and students of Arabic can search for the best ones that meet their learning styles and methods of teaching. If instructors do not like what is available in the App Store or iTunes Store or cannot find what they want to share, they can build their own mobile apps easily by using Infinite Monkeys' drag-and-drop mobile app maker at: http://www.infinitemonk.mobi; or using AppShed at: http://appshed.com. Mason, Cooper, Simon, and Wilks (2015) stated that Visual Studio Express for Windows Phone is a new variation that helps in developing apps on a Windows computer. They listed four web-based environments that can be used to develop apps. These are: App Inventor, TouchDevelop, LiveCode, and Xamarin Studio.

However, it is difficult for users to locate the relevant apps that match the learners' interest and goals. Thus, recommending apps becomes an urgent task (Liu, Kong, and Cen, 2015). O'Hare (2014) lists important criteria to be taken into consideration for selecting and developing apps. Apps have to be developed based on the learner's age, interest, and purpose of learning. There should not be too much information. Developers have to use different colors and shapes for interactive purposes. O'Hare (2014) also advises to avoid flashy introductions with a lot of animation. The introduction has to be short, relevant, and skippable. Games and puzzles have to be short. For example, there has to be a lot of audio language for naming the objects and

teaching letters and words.

A mobile device screen can be shared with learners whether the class is on-ground or online. In an on-ground class, MALL apps can be shared on the projector inside the classroom so all the learners can see without the need to use their mobile devices. In an online virtual class, MALL apps can be projected by using a document camera or AirServer. In other words, whether the instructor teaches online or on-ground, he or she can still use the MALL apps in Arabic language learning.

Moreover, in each school there is an information technology (IT) help desk to support the faculty and students with any questions related to technology. If instructors of Arabic have limited knowledge about technology or are not tech-savvy, they can seek their IT help desk to support them with ways to connect their mobile devices to the classroom projectors or Blackboard Collaborate so the students can see the apps. In addition, there are several ways presented by Kharbach (2012) to guide instructors in how to view mobile device screens on the projector or Blackboard Collaborate (virtual classroom). The researcher shared in Appendix H the ways of projecting the MALL apps in on-ground and online classes as a guide for other instructors, because it took him time to figure this out.

Students' Perceptions Toward Using Mobile Technology

In the Oxford dictionary of American English (2014) the term "perception" is defined as "the ability to see, hear, or become aware of something through the senses" (para. 1). A study was conducted by Muhanna and Abu-Al-Sha'r (2009) about "University Students' Attitudes Toward Cell Phone Learning Environment" in which they surveyed 30 undergraduate and 20 graduate Jordanian students. The findings of this study showed that the undergraduate students preferred the environment of learning using cell phones, but this method of learning was not

favorable to graduate students. This study also showed that the "cell phone has more influence on male students than on female students" (p. 1). Al-Fahad (2009) surveyed 186 undergraduate female students to measure their attitudes and perceptions about mobile learning. The study revealed that mobile learning is effective and could enhance the teaching and learning method.

"Students' Perception and Experiences of Mobile Learning" is another study conducted by Kim et al. (2013) to examine the students' perceptions about using mobile devices outside the classroom. In the Spring 2012 semester, the researchers surveyed 53 graduate students in the Teachers of English to Speakers of Other Languages (TESOL) master's degree program (MA) at one central US university. The findings indicated that mobile language learning (MLL) provided new learning experiences. Another study was conducted by Jaradat (2014) about students' attitudes and perceptions toward the use of m-Learning for learning French. Jaradat surveyed 36 undergraduate students from Princess Nora University, Riyadh, Saudi Arabia. The data were collected to address how mobile phones could be used in learning French grammar and vocabulary inside and outside the classroom. The findings showed that the use of m-Learning improved the students' performances inside and outside the classroom. Barbour et al. (2014) conducted a case study to explore students' perceptions of virtual school toward mobile learning. The data were collected via surveys and interviews of six students in the Winter 2011 semester. The findings of this study were that the students did not prefer the mobile learning. Barbour et al. (2014) indicated the reason of why the students' perceptions toward mobile learning were negative was probably due to the limitations of this study.

Several studies, such as Al-Aamri (2011), Almasri (2013), Beres's (2011), Clarke et al. (2008), Guenter et al. (2008), Nah et al. (2008), Orlikowski & Iacono (2001), and Rogers, et al. (2010), also researched and measured the impact of mobile technology on language learning

by examining the individuals' learning experiences, perceptions and attitudes toward the mobile technologies in the education industry. Several other studies, such as Corlet, Sharples, Bull, & Chan (2005), Kennedy & Levy (2008), Stockwell (2007), Todd & Tepsuriwong (2008), showed a strong motivation in students for learning languages via MALL. Despite such studies and others, the literature still lacks research investigating how MALL apps can transform Arabic learning into an effective tool for enhancing the learning of Arabic as a second language.

Because of this, the researcher examines in this study the use of mobile apps technology to enhance the learning of Modern Standard Arabic (MSA), and also identifies the Arabic language student's perceptions toward the use of MALL apps in learning Arabic. The next chapter describes the research methodology that was employed for this dissertation.

CHAPTER 3: METHODOLOGY

This chapter describes the research methodology that was employed for this dissertation. It includes a discussion of the methods of collecting and analyzing the data. The research population and recruiting techniques are also explained. This chapter also includes the ethical codes employed during this study, the Institutional Review Board (IRB) approval, and pilot study procedures.

The purpose of this study is to examine students' use of MALL apps technologies as supplemental tools to improve their Arabic learning and to identify their perceptions toward the use of MALL apps in the learning of Arabic as a second language.

Three main research questions and four sub-questions regarding the use of MALL apps as a supporting tool in enhancing the learning of Arabic as a modern language were generated to guide this study.

RQ1: What are students' perceptions about the use of MALL apps in learning Arabic as a second language?

Sub-questions:

a) How does the use of MALL apps technology impact the learning of Arabic by non-native speaking students?
b) How do the following characteristics impact students' perceptions of MALL apps in learning Arabic: student's age, frequency of using mobile apps, level of mastery of Arabic, educational level, purpose for learning Arabic, and out-of-class communicative tasks scores using mobile apps for learning Arabic in class and outside of class?
c) What are the factors that influence the students' desire to continue or discontinue using MALL apps technology in learning Arabic as a second language?

d) What are the differences and similarities of online and on-ground students' perceptions of the use of MALL apps in learning Arabic?

RQ2: Do students prefer learning with or without the use of MALL apps as a supplementary tool, and why?

RQ3: In what ways do the homework assignments using MALL apps assist the students' learning about the Arabic language and culture?

Research Design

This study is an exploratory study to better understand the phenomenon of learning Arabic via mobile technology and to explore the use of mobile apps technology in second language learning, and it follows a pragmatic philosophical approach (Bryman, 2013, Christensen, 2014). The goal of exploratory studies is to "investigate a relatively unknown research area and gain additional and new insights into the phenomena, explicate the main concepts and constructs, develop hypotheses about an existing behavior as a result of the research, and determine considerations for future research" (Christensen, 2014, p. 48). This study focuses on a certain group of non-native speakers of Arabic who took an Arabic class at their universities for multiple reasons, such as interest in learning the language and culture of the Arab world, future job purposes, or as a requirement to fulfill their majors and degrees. A mixed-method research approach, utilizing a blend of quantitative (QUAN) and qualitative (QUAL) data, was used to examine the research problem. Quantitative research is "a means for testing objective theories by examining the relationship among variables. These variables, in turn, can be measured, typically on instruments, so that numbered data can be analyzed using statistical procedures" (Creswell, 2009, p. 4). Qualitative research is defined as:

> A means for exploring and understanding the meaning individuals or groups ascribe to a social or human problem. The process of research involves emerging

> questions and procedures, data typically collected in the participant's setting, data analysis inductively building from particulars to general themes, and the researcher making interpretations of the meaning of the data. (Creswell, 2009, p. 4)

Creswell (2009) also defines the mixed method research approach as "an approach to inquiry that combines or associates both qualitative and quantitative forms" (p. 4). The mixed method research approach has been developed in the recent years and emerged as a "research paradigm" or "third paradigm" for research (Denscombe, 2008; Johnson, et al., 2007). Tashakkori and Teddlie (2003) stated that "the emergence of mixed methods as a third methodological movement in the social and behavioral sciences began during the 1980's" (p. 697).

This study is primarily a quantitative study, but it also includes qualitative data due to the small number of participants and also to strengthen and support the quantitative data set. The mixed method approach aids in determining comprehensive results from the findings. A study conducted by Curran (2013) about "institution-related, instructor-related, and student-related factors that influence satisfaction for online faculty at a for-profit institution" was done primarily through the use of quantitative study, but it also included qualitative data. In that study, the QUAN data were used to measure the research questions, and the QUAL data supported the study and provided greater depth of data for analysis. Moreover, Denscombe (2003) pointed out that a mixed method research approach is used to improve the accuracy of data and also to produce a complete picture for data. In addition, a new study conducted by Wang (2014) about the "collaboration factors and quality of learning experience on interactive mobile assisted social learning" followed a mixed-method research approach and surveyed 52 students at National Formosa University, Taiwan. In this study, Wang collected both QUAN and QUAL data (through the use of open-ended questions) within the same questionnaire for the purpose of

accessing students' learning experience with mobile apps in learning. The findings were significant because the students responded positively to sharing information via mobile apps. Therefore, for this dissertation, a questionnaire (see Appendix C) was used to collect both the QUAN and QUAL data. The data collection for this study took place in April 2014.

The research process began with the conducting of a literature review. Then, the researcher formed research questions. Mobile learning sessions were conducted by the researcher (who was also the instructor) for the participants, consisting of both in-class and out-of-class lessons. After each learning lesson, the researcher gave the participant homework to complete using MALL apps. The researcher provided the participants with feedback for their homework submissions. After the completion of all the learning sessions, the researcher asked the participants to complete a questionnaire that included both closed-ended and open-ended questions. The analysis of both QUAN and QUAL data was the next step. The process of the current research is depicted in Figure 3.1, and will be further explained in detail throughout the remainder of the chapter.

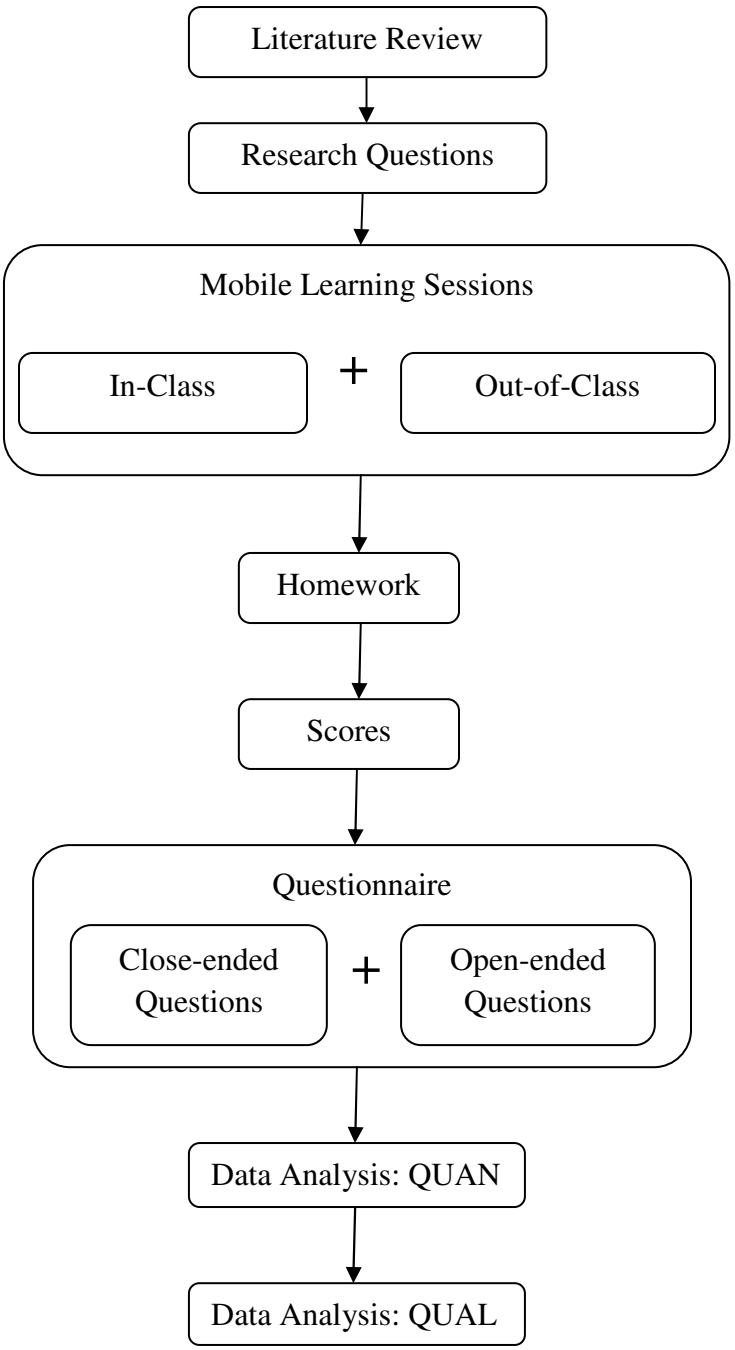

Figure 3.1. Research Process

The Researcher's Background

In the case of this study, the instructor and the researcher were the same person. The instructor earned his Master's degree in linguistics from the University of Al-Qadisiyah in Iraq.

He has 12 years of experience in teaching at the university level, three of which were spent teaching in Iraq prior to coming to the United States in 2005. He still currently teaches in the United States. The instructor is a Fulbright scholar and has also worked for the United Nations in Iraq. The instructor taught Arabic at the University of Pennsylvania, University of Pittsburgh, and La Roche College. Currently, he is teaching Modern Standard Arabic (MSA) at Pennsylvania Cyber Charter School, Slippery Rock University, Point Park University, California University of Pennsylvania, and Duquesne University. He worked for Carnegie Speech, Inc. as a language consultant and curriculum developer for Arabic and Iraqi Arabic. The instructor is also giving Arabic language instruction and culture training for government students and doing test review for the Department of Language Institute (DLI). The instructor has a Defense Language Proficiency Test 5 System (DLPT5) certificate in the Interagency Language Roundtable scale (ILR) and several other certificates in teaching from several American schools.

Population and Sample

The population of this study are those students who are studying Arabic as a second language. A small sample of non-native students was selected to represent the population. The students included 42 male and female college students. They were recruited from different majors of study from three universities in the state of Pennsylvania, United States. The Modern Languages departments at those universities offer Arabic programs, and the three universities were willing to participate in this study. This study followed a convenience sampling. Convenience sampling is a strategy in which "the researcher selects participants because they are willing and available to be studied" (Creswell, 2005, p. 149). According to Creswell (2013), the convenience sampling "saves time, money, and effort" (p. 158). This sampling strategy proved convenient because the researcher teaches Arabic at the three selected universities, and the

participants included those students who were currently studying Arabic as a modern language at those universities. All the participants were recruited from the elementary level of Arabic (Arabic 101 and Arabic 102). These two levels of Arabic represented the students' zero or low knowledge of Arabic. The participants were recruited from on-ground and online classes. Two classes were on-ground, and the other two classes were online. This means that there was one Arabic 101 on-ground class and one Arabic 101 online class. The case was the same with Arabic 102 classes. All participants were non-native speakers of Arabic. Both graduate and undergraduate students could participate in this study, but all participants had to be non-native speakers of Arabic. Native speakers and those in advanced levels of Arabic were not eligible to participate in this study. To identify if the participant was a native speaker or advanced, the researcher included a question as a filter to cover this variable in the questionnaire.

Table 3.1 illustrates the demographic information for the participants. This table lists the number of schools, number of classes, class format, Arabic class level, and the number of participants in each class and from each school.

Table 3.1
Participants' Demographic Information

Schools	Number of Classes	Class Format	Arabic Class Level	Number of Participants
School # 1	1	On-ground	Arabic 101	11
School # 2	1	On-ground	Arabic 102	12
School # 3	1	Online	Arabic 101	13
School # 3	1	Online	Arabic 102	6
Total	4	4	4	42

Ethics and Institutional Review Board (IRB) Approval

Ethics is defined "as a method, procedure, or perspective for deciding how to act and for analyzing complex problems and issues" (Resnik, 2011, para. 5). To avoid ethics violations and any risks that might affect the humans involved in this study, the researcher of this study

followed all the proper steps to avoid any immoral or ethical issues. He followed all the right policies and codes of conduct to keep everyone involved in the study secure and safe. Therefore, he took the Collaborative Institutional Training Initiative (CITI) training modules to be awarded the certificate to support his IRB application. Once his research proposal was approved, the researcher immediately started the IRB application process. Multiple separate IRB applications were submitted, as the participants in the study were from different schools. He started to collect his data once all IRB approvals and letters of support were obtained from all schools. Since Robert Morris University (RMU) is the institution of record for this research, the researcher included only the RMU IRB letter of approval, which was granted on March 19, 2014, under IRB number 140303 (see Appendix B). One of the schools' IRB members approved the study on April 6, 2014, which required the researcher to submit an addendum to the RMU IRB to include that school in the study. The addendum was approved on April 8, 2014.

Data Collection Procedure

Once the study was approved by the IRB, the researcher started to collect his data. The data were collected in April 2014. The researcher recruited 42 participants to collect both the QUAN and QUAL data set. As part of the recruitment procedure, the researcher first announced the research procedure and the reason he was conducting this study.

Before collecting the data from the participants, a consent form (see Appendix A) was read for the participants by the researcher. To obtain the participants' signatures and permission to survey them, a hard copy (paper-based) was handed to each participant in one of the on-ground classes (Arabic 102) by a third party to protect the confidentiality and keep the anonymity feature as the researcher and the instructor were the same. For the online classes (Arabic 101 and Arabic 102) and the other on-ground class (Arabic 101), the researcher used

QuestionPro as an online survey tool to collect his data. The reason that the participants from the other on-ground class received the online questionnaire and not the hard copy (paper-based) questionnaire was due to the school administrators' preference. The online questionnaire was administered via email. Participants were also told, once they notified the researcher, that they could absolutely be removed from the study if they wished to withdraw at any time without any reason or consequences.

All participants in all three schools, whether online or on-ground classes, received the same learning materials. The researcher taught six sessions using MALL apps technology in the classroom and beyond the classroom. During those six sessions of using MALL apps technology (see below in the data collection steps section), the participants engaged in mobile learning activities. To address the research questions, the researcher surveyed the participants immediately after the six sessions were completed to collect both the QUAN and QUAL data to gather their perceptions toward the use of mobile apps technology in learning Arabic.

Instrument. The researcher used a questionnaire (see Appendix C) to collect his data. The questionnaire was used in this study as an instrument because questionnaire surveys are widely used in educational and science research as a method to obtain data from the participants (Bowling, 1997; Scott & Usher, 1999). Questionnaire surveys are also a cost-effective method to collect accurate data in a standardized way. They give the participants the opportunity to express their views and opinions on issues that they may not feel comfortable to discuss in a face-to-face interview (Boulton, 1994).

The questionnaire was self-developed and based upon the Five Standards for Foreign Language Learning in the 21st Century (Five Cs model: Communication, Cultures, Connections, Comparisons, and Communities) (NSFLEP, 2006). With modification to meet the purpose of this

study, the researcher also adapted some questionnaire items from previous studies, such as Almasri (2013), Huang & Lin (2007), Morris & Dillon (1997), and Ducate & Lomicka (2013). The questionnaire consisted of 15 questions. Some questionnaire items were demographic information; others were open-ended questions, and others were scored on a five-point Likert-type scale (5 = strongly agree; 4 = agree; 3 = neutral; 2 = disagree; and 1 = strongly disagree). The questionnaire was conducted immediately after the sixth session of learning. Since the participants' level of proficiency in Arabic was not advanced, the questionnaire was given in English. The purpose of the questionnaire was twofold: to examine students' use of MALL apps technologies as supplemental tools to improve their Arabic language learning and to identify the students' perceptions toward using mobile apps technologies to enhance the learning of Arabic as a second language. The questionnaire was sent to 42 students, and 40 students completed it.

Due to the limited time available to the researcher, he collected his QUAN and QUAL data set from the same questionnaire and from the same participants. Questions 1-10 were used to collect the QUAN data, and questions 11-15 were used to collect the QUAL data. For the QUAN data, he included open-ended questions to collect the participants' learning experience using MALL apps in learning Arabic.

The questionnaire started with a welcome statement in which the researcher introduced himself, the title of his research, and the purpose of his study. The welcome statement also stated the estimated amount of time that it would take participants to complete the questionnaire, which was 10 minutes. This time was determined based on the feedback received from the pilot test participants. In the welcome statement, the researcher also stated that the questionnaire would be completely anonymous, and the participants' responses would be kept confidential and would not be disclosed in any way in the final completed project. The researcher also notified the

participants that their participation was voluntary and that there would not be any foreseeable risks related to their participation. In the welcome statement, the researcher also notified the participants that at the end of the study each participant would have the opportunity to enter into a drawing for a $20 Starbucks gift card. A total of four $20 Starbucks gift cards were given away to all four classes. The welcome statement also included the phone number for the Institutional Review Board (IRB) at RMU along with the researcher's contact information in case the participants had questions or concerns about the study. The welcome statement closed by thanking the participants for taking the time to fill out the questionnaire.

Pilot Test Study. The questionnaire (see Appendix C) was self-developed by the researcher. After the questionnaire was constructed, it was pilot tested in February 2014 for reliability and validity by 16 doctoral students from cohort 14 in the Information Systems and Communications program at RMU, Moon Township Campus, in the state of Pennsylvania, US.

The pilot study followed a convenience sampling strategy. The 16 participants were conveniently close to the researcher as they were his classmates in the doctoral program, and some of them were also interested in Arabic language and culture because they travelled to some regions in the Arab world for work purposes. The researcher handed the participants hard copies (paper-based) of the research questions, purpose, model, questionnaire, and consent form. The researcher also followed face validity to collect his classmates' feedback. Face validity is "a measure of how representative a research project is 'at face value,' and whether it appears to be a good project" (Shuttleworth, 2009, para. 1). The researcher asked the participants in the pilot test to provide feedback on the way the questions were designed and their effectiveness in answering the research questions. He also asked the participants to provide him with the amount of time they spent to complete the questionnaire so he could disclose that for the real participants in the

consent form and questionnaire. The pilot study participants indicated that some questions needed to be reworded to make them more clear and understandable for the real participants and also to avoid sensitive questions, such as asking about the gender, or the exact age. Thus, the gender question was eliminated from the questionnaire, and the age question was reworded. The researcher also received additional feedback from his research committee to adjust some of the questions and add a few more additional open-ended questions for the purpose of the research approach. The questionnaire is explained in detail in the instrument section below.

Reliability and Validity. Reliability is "about consistency; it is the expectation that there won't be different findings each time the measures are used, assuming that nothing has changed in what is being measured" (Nardi, 2006, p. 60). Validity is "about *accuracy* and whether the operationalization is correctly indicating what it's supposed to" (Nardi, 2006, p. 58). As stated above, the questionnaire (see Appendix C) was self-developed by the researcher. After constructing the questionnaire, it was pilot tested in February 2014 for reliability and validity. For reliability and validity purposes, the researcher also did a "member checking" whereas he asked one of his doctoral classmates from cohort 14 in the Information Systems and Communications program at RMU, Moon Township Campus in the state of Pennsylvania, U.S., to check for him the qualitative codebook and the coding procedure to see if he did it right, and also to see if the checker will come up with the same common themes when analyzing the survey's open-ended questions. Moreover, for the purpose of validity and reliability, the Arabic version of speaking scenarios was verified and reviewed by a third-party native speaker of Arabic who was a doctoral student and a faculty member at an American school in Pittsburgh, Pennsylvania in the U.S.

Mapping Research Questions to Questionnaire Items. The questionnaire was

developed to answer all the three main research questions and the four sub-questions. To address RQ1, "What are students' perceptions about the use of MALL apps in learning Arabic as a second language?" four sub-questions were developed. To answer the first sub-question (a) "How does the use of MALL apps technology impact the learning of Arabic by non-native speaking students?" a five-point Likert-type scale (5 = strongly agree; 4 = agree; 3 = neutral; 2 = disagree; and 1 = strongly disagree) was used to measure the 5Cs use in the mobile apps technology in learning Arabic as a second language. The following dimensions were used to measure this first sub-question: "Apps enhance my communication skills," "Apps help me to compare Arabic linguistics with my native language," "Using apps to learn Arabic helps me to connect with my peers and other majors of study," "Apps help me to use the language both within and beyond the class community," and "Apps help me understand the Arabic culture."

ANOVA was used to measure the above dependent variables from Q9 "Rate each statement below based on your experience using mobile apps for Arabic learning in class and outside of class" against the independent variable of Q7 "Select your Arabic class format" and Q10 "Which method of teaching did you prefer?" The ANOVA is used to test for differences of mean values (for Likert data) amongst groups (Pallant, 2013; Nardi, 2006). To answer the second sub-question (b) "How do the following characteristics impact students' perceptions of MALL apps in learning Arabic: student's age, frequency of using mobile apps, level of mastery of Arabic, educational level, purpose for learning Arabic, and out-of-class communicative tasks scores using mobile apps for learning Arabic in class and outside of class?" the following demographic dimensions of Q1-8 in the questionnaire were used: "Select your age range (18–25, 26–34, 35–44, 45–50, 51 and up)," "How often did you use mobile apps for learning Arabic during the three weeks? (Very frequently, Frequently, Occasionally, Rarely, Never)," "What is

your native language? (Arabic, English, Other [please specify] …)," "Why are you studying Arabic? (Required for degree graduation, For job related purposes, Interested in the language and culture, Other [please specify] …)," "Are you currently an undergraduate or graduate student? (Undergraduate, Graduate, Other [please specify] …)," "Select your Arabic class level (Beginner [Arabic 101], High Beginner [Arabic 102], Intermediate [Arabic 201], High Intermediate [Arabic 202], Advanced [Arabic 301], High Advanced [Arabic 302], Other [please specify] …)," "Select your Arabic class format (On-ground [In-class], Online)," and "What was your out-of-class communicative task final score (Task 3)? (Superior [A], Advanced [B], Intermediate [C], Novice [D], Other [please specify]...)."

Again, ANOVA was used to measure the rest of the Q9 dependent variables (which are listed below), except the variable "I will continue to use apps for Arabic learning even when the class ends," against the independent variables of Q1-8 in the questionnaire which are listed above. The following are the dependent variables from Q9: "I am satisfied with using mobile apps for Arabic learning," "Apps can be accessed at anywhere at any time, apps provide sufficient Arabic words and phrases," "Apps are affordable, apps are useful in learning Arabic," "I have fun using apps," "Apps help me to interact with my peers in class and outside of class," "Apps are user-friendly," "Apps are interesting," and "I very much enjoyed using the mobile apps in my Arabic class this semester."

To answer the third sub-question (c), "What are the factors that influence the students' desire to continue or discontinue using the MALL apps technology in learning Arabic as a second language?" a five-point Likert-type scale (5 = strongly agree; 4 = agree; 3 = neutral; 2 = disagree; and 1 = strongly disagree) was used to measure the perceived usefulness and perceived ease of use of the mobile apps technology in learning Arabic a second language. ANOVA was

used to measure the following dependent variable, "I will continue to use apps for Arabic learning even when the class ends," from Q9 against the independent variable from Q1-8.

To answer the fourth sub-question (d), "What are the differences and similarities of online and on-ground students' perceptions toward the use of MALL apps in learning Arabic?" ANOVA was used to measure all the dependent variables from Q9 (which are listed above) against the independent variable Q7 "Select your Arabic class format." Common themes of the participants' learning experience also emerged (Creswell, 2013; Bryman, 2013), and participants' quotes were also selected from the QUAL data to support in answering this sub-question. The following question was used to collect the QUAL data: "As an online or on-ground student, what has been your learning experience toward the use of mobile apps in learning Arabic?"

Table 3.2 links each sub-question of RQ1 with the method and data analyses that were used to answer each of the RQ1 sub-questions:

Table 3.2
Linking RQ1 with Method and Data Analysis

RQ#	Research Question	Method to Answer	Data Analysis
1	What are students' perceptions about the use of MALL apps in learning Arabic as a second language? *Sub-questions:*		
	a. How does the use of MALL apps technology impact the learning of Arabic of non-native speaking students?	QUAN	Frequencies and One-way ANOVA
	b. How do the following characteristics: student's age, frequency of using the mobile apps, Arabic level, educational level, purpose for learning Arabic, and out-of-class communicative tasks scores using mobile apps for learning Arabic in class and outside of class impact the students' perception about the use of MALL apps in learning Arabic as a second language?	QUAN	Frequencies and One-way ANOVA
	c. What are the factors that influence the students' desire to continue or discontinue using the MALL apps technology in learning Arabic as a second language?	QUAN	Frequencies and One-way ANOVA
	d. What are the differences and similarities of online and on-ground students' perceptions toward the use of MALL apps in learning Arabic?	Mixed (QUAN and QUAL)	Frequencies, One-way ANOVA, common themes and participants' quotes

To address RQ2, "Do students prefer learning with or without the use of MALL apps as a supplementary tool, and why?" Fisher's exact test was used to measure the following variable from Q10 "Which method of teaching did you prefer? (Instructor uses much Arabic & little English and all supplemental materials and tools, but *without* including the mobile apps; Instructor uses much Arabic & little English and all supplemental materials and tools, but *with* including the mobile apps)" against Q1-8. Fisher's exact test was used to produce counts between two categorical variables and allow for trend analysis with conditional probabilities to determine if these two variables are independent or related. Fisher's exact test is used to test whether there is a statistically significant relationship between certain variables (D'Souza, 2011; MathWorld, 2014).

Again, the researcher looked for common themes to share the participants' learning experience and then selected participants' quotes from the QUAL data to support answering this research question. The following question was used to collect the QUAL data: "Based on your answer to question 10, please state the reason behind your teaching preference."

Table 3.3 links RQ2 with the method and data analyses that were used to answer this question:

Table 3.3
Linking RQ2 with Method and Data Analysis

RQ #	Research Question	Method to Answer	Data Analysis
2	Do students prefer learning with or without the use of MALL apps as a supplementary tool, and why?	Mixed (QUAN and QUAL)	Frequencies, Fisher's exact test, and common themes

To address RQ3, "In what ways do the homework assignments using MALL apps assist the students' learning about the Arabic language and culture?" the following dimensions were used: "In what ways did the use of mobile apps help you to learn more about Arabic language and culture?" "Did you find the homework assignments using mobile apps assisted you in

learning Arabic language and culture? Why or why not?" and "Any additional comments you would like to share with the researcher about the use of mobile apps in learning Arabic language and culture."

Once again, the researcher used common themes and participants' quotes to support answering this research question.

Table 3.4 links RQ2 with the method and data analyses that were used to answer this question:

Table 3.4
Linking RQ3 with Method and Data Analysis

RQ #	Research Question	Method to Answer	Data Analysis
3	In what ways do the homework assignments using MALL apps assist the students' learning about the Arabic language and culture?	QUAL	Common themes and participants' quotes

All the above research questions and dimensions cover both the quantitative and qualitative phases of data collection and analysis.

Data Collection Steps. The instructor taught six sessions of Arabic language and culture, in which he encouraged the use of the MALL apps technology by students, both in-class and beyond the class time. He taught a total of four classes: two classes were on-ground classes and two were online. The instructor facilitated the sessions and encouraged the students to work together to learn Arabic. Locke et al. (2010) state that "teaching is the best way to learn and to test for learning" (p. 131). In the two on-ground classes, the instructor connected his iPad to the class projector to share the mobile apps he used for learning Arabic with the students. The instructor explained the content of the apps and practiced together with the students. He also provided additional information related to the Arabic language and culture that was not discussed in the apps. After the app presentation, the instructor provided in-class communication tasks and

asked the participants to work in groups to communicate with one another. For homework assignments, the instructor asked the participants to complete tasks outside of the classroom. The participants were given a due date to complete the tasks and asked to submit their responses on either Blackboard or to the instructor's email address within 48 hours of the day the assignment was given. The participants received feedback for the completion of their communicative tasks. The feedback was given based on the American Council on The Teaching of Foreign Languages (ACTFL) standards (see Appendix E).

As for the two online classes, the instructor shared his iPad screen and the apps in the virtual classroom through the use of AirServer software (AirServer, 2015). Then, he followed the same procedure followed in the on-ground classes of presenting the six sessions, providing in-class and out-of-class tasks and giving feedback.

In addition to what was said above, the materials covered in the six sessions were the same for both the on-ground and online classes. In both classes, the students did not need to have mobile devices while they were in the classroom because the instructor presented the course materials and shared his iPad screen with the students. However, the participants needed mobile devices to complete their homework and use practice materials beyond classroom time. The instructor asked the students who did not have smartphones or iPads to work with their peers who did have mobile devices. He also asked the students to download the free mobile apps that he used in class so they could practice beyond the class time. He also shared several other apps that the students could use at any time and from anywhere. With such apps, the students were also able to see the meaning and spelling of each new word or phrase. The instructor also gave the on-ground participants the option to record the session in case they did not have mobile devices or live close to their peers, in order to practice the communicative tasks beyond the

classroom. The online participants were not given the option to record the sessions because they were automatically recorded and archived for them on Blackboard to go back to anytime. With this, every participant had access to the apps materials covered in the on-ground and online classes.

The MALL apps used in learning, which were shared with the students inside the classroom, were listed in the literature review chapter, and they are provided again here for the reader's convenience: LearnOasis Arabic, The Complete Guide to Learn Arabic for Foreigners, Learn Arabic, OpenLanguage, DLI Arabic-MSA Headstart2 Military Phrases, WordPower Arabic Vocabulary, iLang Basic Arabic, Essentials, Arabic Translator, Arabic Flashcards, Lingo, Learn Arabic Deluxe, Memo Arabic, Arabic-English Dictionary, Arabic stories, Iqra, WordUp Arabic, Arabic in a month, Arabic Pocket Lingo, my Arabic words, SPEAKit.tv, Alphabet arabe, Arabindo, Arabic, Onboard Arabic, Mango Languages, Quizlet, and Letter Sketch Arabic.

Treatment and Tasks. The instructor presented a new topic for each session, and these topics were selected based on course concepts and significance to enhance the learners' communicative performance in Arabic. The instructor was always present in the classroom during both on-ground and online classes. In both on-ground and online modes, the instructor presented the material followed by communicative practice in the target language (Arabic).

A recent case study conducted by Sole et al. (2010) explored how the learners of a second language can have a better interaction in many different scenarios using mobile devices. Another study conducted by Kiernan & Aizawa (2004) examined the usefulness of mobile phones in second language learning. They argued that learning a second language can best be prompted through the use of tasks and activities. Saran et al. (2009) believed that in-class activities are not enough for effective language learning and that there have to be more language learning

opportunities given beyond the classroom activities. Learning activities help the students to link what they have learned in-class and beyond the classroom (Hwang & Shih, 2015). Another study conducted by Ogata et al. (2006) involved 13 foreign university students and two teachers. The students were given tasks that required them to use the Japanese language in real life situations (e.g., interview someone, gather information, and buy something). The results revealed that the use of mobile language learning outside classrooms was found to be useful and valuable. A recent study (Kukulska-Hulme, 2015) found that informal learning via mobile devices and educational apps plays a vital role in language learning beyond the traditional classroom.

For that rationale, several approaches for language learning, such as the mobile platform, need to be taken into consideration to facilitate the process of learning and to improve the learner's communication skills. Therefore, the instructor gave the students different scenarios and tasks, both inside and outside of the classroom, for Arabic language learning practice and also to support the goals of this study. The instructor explained the tasks and provided instructions on how to complete them to make it clear for the participants. The original scenarios were created by the researcher based on the topics discussed in the classroom and on the Five Cs standards of foreign language learning in the 21st century (NSFLEP, 2006). For the purposes of validity and reliability, the Arabic version of these scenarios was verified and reviewed by a third-party native speaker of Arabic who was a doctoral student and a faculty member at an American school in Pittsburgh, Pennsylvania in the U.S.

The instructor asked the participants to complete the tasks in pairs or individually, to accommodate personal scheduling needs, outside the classroom. He also asked the participants to use their mobile devices and the MALL apps recommended by the instructor to practice and complete the tasks assigned to them. The participants were provided a due date (48 hours) to

complete the tasks-learning scenarios and were asked to submit their work on Blackboard, D2L, or via email to the instructor's email address. Their performance was evaluated based on ACTFL standards. The participants received constructive feedback about their performance. The purpose of providing feedback to the learners was to guide them to which part they needed additional work. The samples of the inside and outside classroom scenarios provided by the instructor to the learners are summarized below:

In-Class Communicative Tasks. The instructor followed his normal style of teaching his Arabic sessions using the communicative approach strategy. Additionally, he used the MALL apps technology in both on-ground and online classes. After presenting each session, whether on-ground or online, the instructor asked the participants to work in small groups to complete different communicative tasks. The instructor navigated through the apps and asked the students to communicate in Arabic using the communicative approach and the phrases in the examined app. The instructor gave cultural insights about the presented scenario and shared his own real experience in the Arab region. The instructor also explained the vocabulary, as well as the grammatical and linguistic structures presented in the app. Examples of in-class tasks included using money, shopping, taking a taxi, going to the movie theater, telling time, meeting with a friend, dealing with the language barrier, and handling personal family information scenarios. Due to the limited time available to the researcher, he covered only a few topics. The instructors of Arabic can cover many other topics, including social, political, military, medical, and geographical scenarios.

Out-of-Class Communicative Tasks. Learning a language in-class is limited in time. Thus, mobile apps can maximize the effectiveness of the students' out-of-class learning (Steel, 2012). Learning beyond the classroom empowers the learners to acquire the language without the

presence of the instructor (Small, 2014; Stockwell, 2013). Based on the in-class presentations and topics described above, the participants were asked to complete only three communicative scenarios. These scenarios were the same for both the on-ground and online classes. These scenarios were given to the participants in both English and Arabic. The researcher designed the scenarios according to the Five Cs standards for foreign language learning in the 21st century (NSFLEP, 2006). The aim of these scenarios was to cover all the five skills of language learning: speaking, listening, reading, writing, and culture. These scenarios are explained in more detail below:

Arabic 101 Tasks- Learning Scenarios:

Scenario 1: *Where to* (Collaborative Task).

Imagine you are in Jordan and you want to go to Al-Isra University. Conduct a dialogue on how you are going to communicate with the taxi driver to go there. One of the speakers can be you and your classmate can be the Jordanian taxi driver. Record your response and submit it within 48 hours on Blackboard for your instructor's feedback.

تخيل وكأنك في الاردن وتريد الذهاب الى جامعة الاسراء. انشأ حواراً عن كيفية التحدث مع سائق سيارة الاجرة للذهاب الى هناك. احد المتحدين ممكن ان يكون انت و ممكن ان يكون زميلك سائق سيارة الاجرة الاردني. سجل اجابتك صوتيا وارسلها الى استاذك على اللوحة في غضون 48 ساعة لاعطاءك ملاحظاته.

Scenario 2: *Movie Night* (Collaborative Task).

Imagine you are in United Arab Emirates (UAE) as an exchange student and you live with a roommate from UAE. Your roommate asked you to go with him to the movie theater to watch a movie at a late time at night and you are not used to such country customs of Arabic culture. Conduct a dialogue on how you are going to handle this cultural custom with your roommate. One of the speakers can be you and your classmate can be the UAE student. Record your

response and submit it within 48 hours on Blackboard for your instructor's feedback.

تخيل وكأنك في دولة الامارات العربية المتحدة كطالب بديل وتسكن مع طالب اماراتي في نفس الغرفة. زميلك الاماراتي في نفس الغرفة طلب منك الذهاب معه الى السينما لمشاهده فلم الليلة وفي وقت متأخر من الليل وانت غير معتاد على مثل هذه العادات والثقافة العربية. انشأ حواراً عن كيف ستتصرف مع زميلك بخصوص هذه العادة الثقافية. . احد المتحدين ممكن ان يكون انت و ممكن ان يكون زميلك الطالب الاماراتي. سجل اجابتك صوتيا وارسلها الى استاذك على اللوحة في غضون 48 ساعة لاعطاءك ملاحظاته.

Scenario 3: *Meeting* (Collaborative Task).

Imagine you are in Lebanon and on the phone with your friend. You want to check with your friend if he or she is free tomorrow so you can meet with him or her. Conduct a dialogue on how you are going to ask if your friend is free to meet or not and what time. One of the speakers can be you and your classmate can be your friend from Lebanon. Record your response and submit it within 48 hours on Blackboard for your instructor's feedback.

تخيل وكأنك في لبنان وكنت على الهاتف مع صديقك او صديقتك وتريد ان تعرف ان كان او كانت عنده\عندها وقت يوم غد للقاء بك. انشأ حواراً عن كيف ستسأل اذا كان صديقك او صديقتك فارغاً غداً ام لا للقاء بك وفي اي وقت. احد المتحدين ممكن ان يكون انت و ممكن ان يكون زميلك، صديقك او صديقتك من لبنان. سجل اجابتك صوتيا وارسلها الى استاذك على اللوحة في غضون 48 ساعة لاعطاءك ملاحظاته.

Arabic 102 Tasks- Learning Scenarios:

Scenario 1: *Making a Purchase* (Collaborative Task).

Imagine you are in Qatar and want to buy gifts for your family. You have only US dollars and do not have the Qatari currency. How are you going to ask about the price, currency change, or if the item is expensive or inexpensive? Can you negotiate the price and how? Conduct a dialogue on how you are going to handle this situation in the Qatari market. One of the speakers can be you and your classmate can be the Qatari store owner. Record your response and submit it

within 48 hours on Blackboard for your instructor's feedback.

تخيل وكأنك في قطر وتريد ان تشتري هدايا الى عائلتك. انك تملك فقط نقود امريكية (دولارات) وليس عندك نقود قطرية. كيف ستسأل عن السعر وعن الصرافة واذا كانت السلعة غالية او رخيصة؟ هل تستطيع ان تساوم السعر وكيف؟ انشأ حواراً حول كيف أنت ستتعامل مع هذا الوضع في السوق القطري. احد المتحدين ممكن ان يكون انت و ممكن ان يكون زميلك، مالك المحل القطري. سجل اجابتك صوتيا وارسلها الى استاذك على اللوحة في غضون 48 ساعة لاعطاءك ملاحظاته.

Scenario 2: *Handling the Language Barrier* (Collaborative Task)

Imagine you are in Iraq and met with an Iraqi man who speaks only the Iraqi dialect. You have difficulty understanding the dialect and asked the man if he can speak MSA or English. What are you going to do and say? Conduct a dialogue on how you are going to handle this situation. One of the speakers can be you and your classmate can be the Iraqi man. Record your response and submit it within 48 hours on Blackboard for your instructor's feedback.

تخيل وكأنك في العراق وقد قابلت رجل عراقي يتحدث فقط اللهجة العراقية. انت تواجه صعوبة في فهم اللهجة وسألت الرجل ان كان يتحدث اللغة العربية الفصحى او الانجليزية. كيف ستتعامل مع الوضع وماذا ستقول؟ انشأ حواراً عن كيف ستتعامل مع هذا الوضع. احد المتحدين ممكن ان يكون انت و ممكن ان يكون زميلك، الرجل العراقي. سجل اجابتك صوتيا وارسلها الى استاذك على اللوحة في غضون 48 ساعة لاعطاءك ملاحظاته.

Scenario 3: *Obtaining Family Information* (Collaborative Task)

Imagine you are in Kuwait and met with a Kuwaiti woman. The woman asked several questions about yourself and family such as your name, where you are from, married or single, how many kids you have, and where you live, etc. How are you going to respond to such questions? Conduct a dialogue on how you are going to handle this situation. One of the speakers can be you and your classmate can be the Kuwaiti woman. Record your response and submit it within 48 hours on Blackboard for your instructor's feedback.

تخيل وكأنك في الكويت وقد قابلت امرأة كويتية. المرأة الكويتية سألتك مجموعة من الاسئلة عن نفسك وعن عائلتك: مثلا اسمك

ومن اين انت وهل انت متزوج او اعزب وكم طفل لديك واين تسكن، الخ..كيف ستجيب على هكذا اسئلة؟ انشأ حواراً عن كيف ستتعامل مع هذا الوضع. احد المتحدين ممكن ان يكون انت و ممكن ان يكون زميلك، المراة الكويتية. سجل اجابتك صوتيا وارسلها الى استاذك على اللوحة في غضون 48 ساعة لاعطاءك ملاحظاته.

Homework Assignments. Based on the example scenarios above and after each session whether on-ground or online, the participants were asked to work in small groups of two individuals to use their mobile devices to complete the number of the assigned communicative tasks-learning scenarios and record their speaking performance and email it to the instructor or submit it on Blackboard or D2L for feedback. The feedback was provided based on ACTFL standards. As mentioned above, the instructor gave the participants the option to complete the tasks either individually or in pairs outside the classroom because some participants told the researcher that they live far away from campus and could not stay late or come to campus beyond the class time.

Communicative Tasks Scoring. Instructors of Arabic can use either ACTFL assessment criteria (see Appendix E) or the Interagency Language Roundtable (ILR) standards (see Appendix D) to score the students' speaking proficiency. However, as an ILR scale certified test reviewer and ACTFL conference attendee, the researcher used ACTFL standards to score the students' levels of communication in Arabic. ACTFL assessment standards were not shared with the participants, and it was used only by the instructor to evaluate the students' speaking performance on the completed communicative tasks.

After conducting the six sessions of instruction using the MALL apps technology in learning Arabic, the instructor asked the participants to fill out a questionnaire to obtain their perceptions toward the use of MALL apps technology in learning Arabic as a second language. After collecting the data, the researcher cleaned up the data, coded both QUAN and QUAL data,

prepared them for analysis, and stored them in a password-protected file or under lock and key to protect confidentiality.

Reflexivity and Generalizability

Creswell (2013) defines reflexivity as "an approach in writing qualitative research in which the writer is conscious of the biases, values, and experience that he or she brings to a qualitative research study" (p. 300). In this study, the researcher brackets his biases from the study by not including his own teaching or learning experience. However, he taught classes of Arabic with the implementation of MALL apps as an additional source of learning for the students. Based on that teaching and learning method with MALL apps, the participants shared their own learning experience.

Generalizability is "the extension of research findings and conclusions from a study conducted on a sample population to the population at large" (Writing@CSU Guide, 2014, para. 2). The results of this study may not be generalizable because of the small number of participants. However, it can still provide valuable insights to instructors and students who are interested in teaching and learning Arabic. This study could be replicable for a larger population.

Data Triangulation

The researcher followed the triangulation techniques for the purpose of reliability and validity. Triangulation means that "researchers make use of this interpretive framework, investigators, and theories to provide corroborating evidence for validating the accuracy of their study" (Creswell, 2013, p. 302). This study is primarily a quantitative study, but it also includes qualitative data because of the small number of participants and because doing so makes the data set more valid and reliable. For the purpose of data triangulation, QUAL data supported the QUAN data as it provided more understanding to the QUAN data.

In the next chapter, the researcher presents a review of the research results and a discussion of the results in regard to each of the research questions addressed by the study.

CHAPTER 4: RESULTS

This chapter presents a review of the research results and a discussion of the results in regard to each of the research questions addressed by the study.

After data were collected online using QuestionPro, they were transferred to an Excel spreadsheet and saved in a secure and password-protected file. As for the data that were collected on-ground (in-class) by a third party using a hard copy survey, the researcher manually entered all the data word-for-word into the same Excel spreadsheet. After that step, the quantitative (QUAN) data were separated from the qualitative (QUAL) data and saved in a separate Excel spreadsheet. A codebook (see Appendix G: Quantitative Data Codebook) was created to describe all variables. The codebook also specified the types of data (ordinal, nominal, or interval) that were collected for each item in the questionnaire. The QUAN data were then properly coded and transferred into Statistical Package for the Social Science (SPSS Version 22) for analysis. SPSS is defined as:

> An integrated family of products that addresses the entire analytical process, from planning to data collection to analysis, reporting and deployment. With more than a dozen fully integrated modules to choose from, you can find the specialized capabilities you need to increase revenue, outperform competitors, conduct research and make better decisions. (IBM, n.d., para. 1)

As for the Excel file containing the QUAL data, it remained unchanged because the researcher analyzed the data manually and without using any software tools due to the small number of participants.

The main goal of this study was to examine students' use of MALL apps technologies as supplemental tools to improve their Arabic learning and to identify their perceptions toward the use of MALL apps in the learning of Arabic as a second language. As stated earlier, three main research questions and four sub-questions regarding the use of MALL apps as a supporting tool

to enhance the learning of Arabic as a modern language were generated to guide this study. These research questions will be analyzed in detail throughout the remainder of the chapter.

Quantitative and Qualitative Data Analysis

In the following sections, the results will be explained in detail, showing how they answered these research questions. The data analysis process was completed sequentially for the QUAN and QUAL data. This section reports the results from the questionnaire and examines how it answers both the qualitative and quantitative research questions.

Quantitative Data Analysis. SPSS software (Version 22) was used for the statistical analysis following Nardi's (2006) and Pallant's (2013) quantitative approach as these two authors provided a helpful, step-by-step guide to data analysis using SPSS. As explained above in the instrument section and to analyze the questionnaire (Q1-10), frequencies, ANOVA, and Fisher's exact test analyses were utilized in order to answer the quantitative research questions (RQ1.a, b., c., d. & RQ2.a). Frequencies (Q1-10) were used for looking at detailed information on the data and describing the results (Pallant, 2013; Nardi, 2006). ANOVA (Q9 against Q1-8) "dependent & independent variables" were used to test for differences of mean values amongst groups. Fisher's exact test (Q10 against Q1-8) was used to produce counts between two categorical variables and to allow for trend analysis with conditional probabilities to determine if these two variables are independent or related. Fisher's exact test was used to test whether there is a statistically significant relationship between these variables.

Qualitative Data Analysis. To answer the research questions (RQ2.b & RQ3), the qualitative data (Q11- 15 in the questionnaire) was analyzed based on Curran's (2013) model; Liu, Navarrete, Maradiegue, & Wivagg's (2014) model; Schram's (2006) model; and Creswell's (2013) qualitative approach techniques of sharing learning experience. Due to the small size of

participants and the few number of open-ended questions in the questionnaire, the researcher analyzed the QUAL data manually. The analysis of the QUAL data began with recurring readings of responses to each of the open-ended questions to get a better understanding of the data. This step is described by methodologists as an essential step for the researchers because it identifies the patterns in the data (Creswell, 2013). After this step, key statements were extracted for initial coding, then grouped together to create meaningful units and common themes (Curran, 2013; Liu, Navarrete, Maradiegue, Wivagg, 2014; Schram, 2006). For reliability and validity purposes, a second member checked the QUAL data. The researcher used a member-checking procedure because he was familiar with the phenomenon of teaching and wanted to reduce the element of bias in the coding process of the themes. Both the researcher and the member-checker agreed on the same common themes that emerged. The percentage agreement or inter-rater reliability for the emerged common themes was 100%. In summation, with QUAL data, each open-ended question was addressed separately to answer the qualitative research questions (RQ2.b & RQ3), and common themes emerged, and participants' quotations were selected to share the students' learning experience of using mobile apps in learning Arabic. Frequencies of common themes were also reported. The results and analyses will be reported in detail in the following sections.

Descriptive Analysis: Frequencies

Frequencies are used for looking at detailed information on data and describing the results (Nardi, 2006; Pallant, 2013). In the following sections, frequency tables will illustrate the data. As explained in Nardi's book (2006):

> A frequency table or distribution shows how often each response (a value) was given by the respondents to each item (a variable). Frequency tables are especially useful when a variable has a limited number of values, such as with nominal or ordinal measures. (Nardi, 2006, p. 128)

Demographic Information. The questionnaire was sent to 42 participants, but only 40 participants completed it (n = 40). The participants were male and female graduate and undergraduate college students. They were recruited from different majors of study from three universities in the state of Pennsylvania, United States. All participants were non-native speakers of Arabic. They were recruited from the elementary level of Arabic (Arabic 101 and Arabic 102). The participants were recruited from on-ground and online classes.

Table 4.1 illustrates the participants' age range percentage and sample age distribution. The following frequencies summarize the demographic data. The first question in the questionnaire asks the participants about their age range. The results, in Table 4.1, show that 90% of the participants' ages were between 18-25 years old. The lesser represented age groups are as follows: 7.5% for ages 26-34, 2.5% for ages 35-44, and 0.00% for ages 45 and up. Thirty-six respondents said their ages were between 18-25, three respondents were between 26-34 years old, and one was between 35-44 years old.

Table 4.1
Age Range

	Frequency	Percent	Valid Percent
18 – 25	36	90.0	90.0
26 – 34	3	7.5	7.5
35 – 44	1	2.5	2.5
Total	40	100.0	100.0

The second question in the questionnaire asks, "How often did you use mobile apps for learning Arabic during the three weeks?" The results indicated that the participants used the mobile apps at different frequencies: very frequently 12.5%; frequently 32.5%; occasionally 42.5%; rarely 12.5%; and never 0.00%. Five respondents said they used the mobile apps very frequently in learning, 13 respondents used them frequently, 17 respondents used them occasionally, and five rarely used them. Table 4.2 exemplifies the participants' frequency of

using the apps:

Table 4.2
Frequency of using the mobile apps

	Frequency	Percent	Valid Percent
Very frequently	5	12.5	12.5
Frequently	13	32.5	32.5
Occasionally	17	42.5	42.5
Rarely	5	12.5	12.5
Total	40	100.0	100.0

With regard to the participants' native language, the results revealed that the participants were 100.0% native speakers of English. The mean was 2.00, median 2.00, and variance 0.00. The fourth question in the questionnaire asks the participants why they were studying Arabic. The results revealed that 15.0% (six students) were required to study Arabic for graduation, 25.0% (10 students) studied it for job-related purposes, 50.0% (20 students) were interested in the language and culture, and 10.0% (four students) studied it for other reasons (such as religious reasons, a military career path, or leaving the question unanswered). Table 4.3 illustrates the percentage of the participants' reasons why they were studying Arabic:

Table 4.3
Reason for studying Arabic

	Frequency	Percent	Valid Percent
Required for degree graduation	6	15.0	15.0
For job related purposes	10	25.0	25.0
Interested in the language and culture	20	50.0	50.0
Other	4	10.0	10.0
Total	40	100.0	100.0

The next question in the questionnaire asks the participants if they were undergraduate or graduate students. The results showed that 95.0% (38 students) were undergraduate students and 5.0% (two students) were graduate students.

The results also reported that 57.5% (23 participants) were beginners in Arabic 101 and 42.5% (17 respondents) were high beginners in Arabic 102. As for the intermediate (Arabic

201), the high intermediate (Arabic 202), the advanced (Arabic 301), and the high advanced (Arabic 302) classes, the participants were 0.00%.

As for the format of the beginner and high beginner classes, 55.0% (22 students) were on-ground (in-class) students and 45.0% (18 students) were online students. As a result, the mean was calculated as 1.45, the median as 1.00, and the variance as 0.254.

The students were given three speaking tasks to complete, but only the third one was taken into consideration to see if there were any improvements in the students' performance. As for the participants' final scores for their out-of-class communicative task 3, the results showed that 62.5% (25 respondents) were Superior (A), 10.0% (four respondents) were Advanced (B), 2.5% (one respondent) was Intermediate (C), 15.0% (six respondents) were Novice (D), and 10.0% (four respondents) were other. The students in the other category were either not sure about their scores or did not understand the question; therefore, they left it blank. Table 4.4 illustrates the percentage of the participants' task 3 scores:

Table 4.4
Task 3 Score

	Frequency	Percent	Valid Percent
Superior (A)	25	62.5	62.5
Advanced (B)	4	10.0	10.0
Intermediate (C)	1	2.5	2.5
Novice (D)	6	15.0	15.0
Other	4	10.0	10.0
Total	40	100.0	100.0

Participants' Learning Experience Using Mobile Apps for Learning Arabic in Class and Outside of Class. The following frequencies summarize the participants' learning experience using mobile apps for learning Arabic in class and outside of class. Participants' learning experience was collected by using a five-point Likert-type scale (5 = strongly agree; 4 = agree; 3 = neutral; 2 = disagree; and 1 = strongly disagree). Question nine in the questionnaire asks the participants to rate each statement below based on their experience using mobile apps

for Arabic learning in class and outside of class. The results are illustrated below in detail in numbers and tables.

a. I am satisfied with using mobile apps for Arabic learning

The results showed that 37.5% (15 participants) strongly agreed, 42.5% (17 participants) agreed, 15.0% (six responses) were neutral, 5.0% (two participants) disagreed, and 0.00% strongly disagreed with the statement "I am satisfied with using mobile apps for Arabic learning." The results revealed that the majority of high responses was between strongly agree and agree. Table 4.5 exemplifies the percentage of the participants' satisfaction of using mobile apps for learning Arabic:

Table 4.5
I am satisfied with using mobile apps for Arabic learning

	Frequency	Percent	Valid Percent
Strongly Agree	15	37.5	37.5
Agree	17	42.5	42.5
Neutral	6	15.0	15.0
Disagree	2	5.0	5.0
Total	40	100.0	100.0

b. Apps can be accessed at anywhere at anytime

Table 4.6 exhibits that 50.0% (20 participants) strongly agreed, 35.0% (14 participants) agreed, 7.5% (three participants) were neutral, 5.0% (two participants) disagreed, and 2.5% (one participant) strongly disagreed with the statement "Apps can be accessed at anywhere at any time." The majority of high responses was between strongly agree and agree.

Table 4.6
Apps can be accessed at anywhere at any time

	Frequency	Percent	Valid Percent
Strongly Agree	20	50.0	50.0
Agree	14	35.0	35.0
Neutral	3	7.5	7.5
Disagree	2	5.0	5.0
Strongly Disagree	1	2.5	2.5
Total	40	100.0	100.0

c. Apps provide sufficient Arabic words and phrases

The results showed that 32.5% (13 participants) strongly agreed, 60.0% (24 participants) agreed, 2.5% (one response) was neutral, 5.0% (two participants) disagreed, and 0.00% (none of the participants) strongly disagreed with the statement "Apps provide sufficient Arabic words and phrases." The highest number of responses was between strongly agree and agree. Table 4.7 exhibits the percentage of the participants' responses:

Table 4.7
Apps provide sufficient Arabic words and phrases

	Frequency	Percent	Valid Percent
Strongly Agree	13	32.5	32.5
Agree	24	60.0	60.0
Neutral	1	2.5	2.5
Disagree	2	5.0	5.0
Strongly Disagree	0	0	0
Total	40	100.0	100.0

d. Apps are affordable

The results demonstrated that 35.0% (14 participants) strongly agreed, 45.0% (18 participants) agreed, 17.5% (seven participants) were neutral, 2.5% (one participant) disagreed, and 0.00% strongly disagreed with the statement "Apps are affordable." The results revealed that the majority of responses was between strongly agree and agree. Table 4.8 illustrates the percentage of the participants' responses:

Table 4.8
Apps are affordable

	Frequency	Percent	Valid Percent
Strongly Agree	14	32.5	32.5
Agree	18	45.0	45.0
Neutral	7	17.5	17.5
Disagree	1	2.5	2.5
Strongly Disagree	0	0	0
Total	40	100.0	100.0

e. Apps are useful in learning Arabic

The results showed that 47.5% (19 participants) strongly agreed, 42.5% (17 participants)

agreed, 7.5% (three participants) were neutral, 2.5% (one participant) disagreed, and 0.00% (none of the participants) strongly disagreed with the statement "Apps are useful in learning Arabic." The highest number of responses was between strongly agree and agree. Table 4.9 illustrates the percentage of the participants' responses:

Table 4.9
Apps are useful in learning Arabic

	Frequency	Percent	Valid Percent
Strongly Agree	19	47.5	47.5
Agree	17	42.5	42.5
Neutral	3	7.5	7.5
Disagree	1	2.5	2.5
Strongly Disagree	0	0	0
Total	40	100.0	100.0

f. I have fun using apps

When participants were given the statement "I have fun using apps," results illustrated that 35.0% (14 participants) strongly agreed, 35.0% (14 participants) agreed, 25.0% (10 participants) were neutral, 5.0% (two participants) disagreed, and 0.00% (none of the participants) strongly disagreed. The highest number of responses was between strongly agree and agree. Table 4.10 exemplifies the participants' responses percentage:

Table 4.10
I have fun using apps

	Frequency	Percent	Valid Percent
Strongly Agree	14	35.0	35.0
Agree	14	35.0	35.0
Neutral	10	25.0	25.0
Disagree	2	5.0	5.0
Strongly Disagree	0	0	0
Total	40	100.0	100.0

g. Apps help me to interact with my peers in class and outside of class

The results showed that 10.0% (four participants) strongly agreed, 22.5% (nine participants) agreed, 50.0% (20 participants) were neutral, 15.0% (six participants) disagreed,

and 2.5% (one participant) strongly disagreed with the statement "Apps help me to interact with my peers in class and outside of class." The highest number of students' responses was between agree and neutral. Table 4.11 shows evidence of the percentage of the participants' responses:

Table 4.11
Apps help me to interact with my peers in class and outside of class

	Frequency	Percent	Valid Percent
Strongly Agree	4	10.0	10.0
Agree	9	22.5	22.5
Neutral	20	50.0	50.0
Disagree	6	15.0	15.0
Strongly Disagree	1	2.5	2.5
Total	40	100.0	100.0

h. Apps are user-friendly

The results revealed that 30.0% (12 participants) strongly agreed, 57.5% (23 participants) agreed, 10.0% (four participants) were neutral, 2.5% (one participant) disagreed, and 0.00% (none of the participants) strongly disagreed with the statement "Apps are user-friendly." The majority of participants' responses was between strongly agree and agree. Table 4.12 illustrates the percentage of the participants' responses:

Table 4.12
Apps are user-friendly

	Frequency	Percent	Valid Percent
Strongly Agree	12	30.0	30.0
Agree	23	57.5	57.5
Neutral	4	10.0	10.0
Disagree	1	2.5	2.5
Strongly Disagree	0	0	0
Total	40	100.0	100.0

i. Apps are interesting

The results revealed that 27.5% (11 participants) strongly agreed, 55.0% (22 participants) agreed, 15.0% (six participants) were neutral, 2.5% (one participant) disagreed, and 0.00% (no one) strongly disagreed with the statement "Apps are interesting." The majority of students' responses was between strongly agree and agree. Table 4.13 illustrates the percentage of the

participants' responses:

Table 4.13
Apps are interesting

	Frequency	Percent	Valid Percent
Strongly Agree	11	27.5	27.5
Agree	22	55.0	55.0
Neutral	6	15.0	15.0
Disagree	1	2.5	2.5
Strongly Disagree	0	0	0
Total	40	100.0	100.0

j. I very much enjoyed using the mobile apps in my Arabic class this semester

The results showed that 30.0% (12 participants) strongly agreed, 37.0% (15 participants) agreed, 25.0% (10 participants) were neutral, 7.5% (three participants) disagreed, and 0.00% (no one) strongly disagreed with the statement "I very much enjoyed using the mobile apps in my Arabic class this semester." The majority of students' responses was between strongly agree and agree. Table 4.14 exhibits the percentage of the participants' responses:

Table 4.14
I very much enjoyed using the mobile apps in my Arabic class this semester

	Frequency	Percent	Valid Percent
Strongly Agree	12	30.0	30.0
Agree	15	37.5	37.5
Neutral	10	25.0	25.0
Disagree	3	7.5	7.5
Strongly Disagree	0	0	0
Total	40	100.0	100.0

k. I will continue to use apps for Arabic learning even when the class ends

The results showed that 45.0% (18 participants) strongly agreed, 30.0% (12 participants) agreed, 20.0% (eight participants) were neutral, 2.5% (one participant) disagreed, and 2.5% (one participant) strongly disagreed with the statement "I will continue to use apps for Arabic learning even when the class ends." The highest number of students' responses was between strongly agree and agree. Table 4.15 illustrates the percentage of the participants' responses:

Table 4.15
I will continue to use apps for Arabic learning even when the class ends

	Frequency	Percent	Valid Percent
Strongly Agree	18	45.0	45.0
Agree	12	30.0	30.0
Neutral	8	20.0	20.0
Disagree	1	2.5	2.5
Strongly Disagree	1	2.5	2.5
Total	40	100.0	100.0

l. Apps enhance my communication skills

The results revealed that 42.5% (17 participants) strongly agreed, 35.0% (14 participants) agreed, 22.5% (nine participants) were neutral, and 0.00% (no one) disagreed or strongly disagreed with the statement "Apps enhance my communication skills." The majority of students' responses was between strongly agree and agree. Table 4.16 illustrates the percentage of the participants' responses:

Table 4.16
Apps enhance my communication skills

	Frequency	Percent	Valid Percent
Strongly Agree	17	42.5	42.5
Agree	14	35.0	35.0
Neutral	9	22.5	22.5
Disagree	0	0	0
Strongly Disagree	0	0	0
Total	40	100.0	100.0

m. Apps help me to compare Arabic linguistics with my native language

The results revealed that 32.0% (13 participants) strongly agreed, 50.0% (20 participants) agreed, 15.0% (six participants) were neutral, 2.5% (one participant) disagreed, and 0.00% (no one) strongly disagreed with the statement "Apps help me to compare Arabic linguistics with my native language." The highest number of students' responses was between strongly agree and agree. Table 4.17 illustrates the percentage of the participants' responses:

Table 4.17
Apps help me to compare Arabic linguistics with my native language

	Frequency	Percent	Valid Percent
Strongly Agree	13	32.5	32.5
Agree	20	50.0	50.0
Neutral	6	15.0	15.0
Disagree	1	2.5	2.5
Strongly Disagree	0	0	0
Total	40	100.0	100.0

n. Using apps to learn Arabic helps me to connect with my peers and other majors of study

The results showed that 12.5% (five participants) strongly agreed, 27.5% (11 participants) agreed, 47.5% (19 participants) were neutral, 12.5% (five participants) disagreed, and 0.00% (no one) strongly disagreed with the statement "Using apps to learn Arabic helps me to connect with my peers and other majors of study." The majority of students' responses was agree and neutral. Table 4.18 exemplifies the percentage of the participants' responses:

Table 4.18
Using apps to learn Arabic helps me to connect with my peers and other majors of study

	Frequency	Percent	Valid Percent
Strongly Agree	5	12.5	12.5
Agree	11	27.5	27.5
Neutral	19	47.5	47.5
Disagree	5	12.5	12.5
Strongly Disagree	0	0	0
Total	40	100.0	100.0

o. Apps help me to use the language both within and beyond the class community

The results revealed that 22.5% (nine participants) strongly agreed, 47.5% (19 participants) agreed, 25.0% (10 participants) were neutral, 2.5% (one participant) disagreed, and 2.5% (one participant) strongly disagreed with the statement "Apps help me to use the language both within and beyond the class community." The highest number of students' responses was strongly agree, agree and neutral. Table 4.19 illustrates the percentage of the participants' responses:

Table 4.19
Apps help me to use the language both within and beyond the class community

	Frequency	Percent	Valid Percent
Strongly Agree	9	22.5	22.5
Agree	19	47.5	47.5
Neutral	10	25.0	25.0
Disagree	1	2.5	2.5
Strongly Disagree	1	2.5	2.5
Total	40	100.0	100.0

p. Apps help me understand the Arabic culture

The results showed that 17.5% (seven participants) strongly agreed, 50.0% (20 participants) agreed, 20.0% (eight participants) were neutral, 10.0% (four participants) disagreed, and 0.00% (no one) strongly disagreed with the statement "Apps help me understand the Arabic culture." The missing data consisted of 2.5% because one participant did not respond to this question. The majority of students' responses was between strongly agree, agree and neutral. Table 4.20 displays the percentage of the participants' responses:

Table 4.20
Apps help me understand the Arabic culture

	Frequency	Percent	Valid Percent
Strongly Agree	7	17.5	17.9
Agree	20	50.0	51.3
Neutral	8	20.0	20.5
Disagree	4	10.0	10.3
Strongly Disagree	0	0	0
Total	39	97.5	100.0
Missing data	1	2.5	
Total	40	100.0	

Participants' Teaching Method Preference. The following frequencies summarize the participants' teaching method preference. Question 10 in the questionnaire asks the participants which method of teaching they prefer: if the instructor uses much Arabic and little English and all supplemental materials and tools, but *without* including the mobile apps, or if the instructor uses much Arabic and little English and all supplemental materials and tools, but *with* including

the mobile apps. The results showed that 17.5% (seven participants) preferred the method of teaching *without* using the mobile apps in learning, but 80.0% (32 participants) preferred the method of teaching *with* using the mobile apps in learning. The missing data consisted of 2.5% because one participant did not respond to this question. The results revealed that the majority of participants preferred the method of teaching *with* using the mobile apps in learning. Table 4.21 illustrates the percentage of the participants' responses:

Table 4.21
"Without mobile apps" and "With mobile apps"

	Frequency	Percent	Valid Percent
Method without mobile apps	7	17.5	17.9
Method with mobile apps	32	80.0	82.1
Total	39	97.5	100.0
Missing data	1	2.5	
Total	40	100.0	

Answering Research Questions (RQs)

Next, the results will be presented for each research question.

Answering RQ1:

To answer RQ1, "What are students' perceptions about the use of MALL apps in learning Arabic as a second language?", four sub-questions were developed.

RQ1: Sub-question (a):

To answer the first sub-question (a), "How does the use of MALL apps technology impact the learning of Arabic by non-native speaking students?", a five-point Likert-type scale (5 = strongly agree; 4 = agree; 3 = neutral; 2 = disagree; and 1 = strongly disagree) was used to measure the use of 5Cs (communication, comparisons, connections, communities, and cultures) in the mobile apps technology in learning Arabic. The following dependent variables from Q9 "Rate each statement below based on your experience using mobile apps for Arabic learning in class and outside of class" were used to measure this first sub-question: "Apps enhance my

communication skills," "Apps help me to compare Arabic linguistics with my native language," "Using apps to learn Arabic helps me to connect with my peers and other majors of study," "Apps help me to use the language both within and beyond the class community," and "Apps help me understand the Arabic culture."

One-way analysis of variance (ANOVA) test was used to measure the above dependent variables from Q9 "Rate each statement below based on your experience using mobile apps for Arabic learning in class and outside of class" versus the independent variable of Q7 "Select your Arabic class format" and Q10 "Which method of teaching did you prefer?" The one-way ANOVA was used to test for differences of mean values for Likert data amongst groups (Pallant, 2013; Nardi, 2006). One-way ANOVA was used to look at whether there are statistically significant differences in the use of MALL apps technology in the learning of Arabic by non-native speaking students according to the 5Cs model.

Communication

Apps enhance my communication skills. A one-way ANOVA was done using the variable "communication" versus Q7 "Arabic class format" and Q10 "Which method of teaching you prefer." The results showed that there was no statistically significant difference between these variables. For "Arabic class format," the sig. was 0.247, and it was 0.231 for "Which method of teaching you prefer." If the *p*-value is less than 0.05 (p-value < 0.05), the results can be considered statistically significant. Both sig. numbers were larger than the *p*-value 0.05. Since there was no statistically significant difference between these variables, no further analysis was needed because the statistically non-significant results indicated a lack of association between the variables above (see Appendix J).

Summary: Communication. The results showed that the majority of students' responses

were between strongly agree and agree that MALL apps enhanced their communication skills. There was also no statistically significant difference between "communication" as one of the 5Cs for foreign language learning with the variables Q7 "Arabic class format" and Q10 "Which method of teaching you prefer." The results revealed that there was no association between these variables. The participants' abilities to communicate in Arabic were not associated with the class format, whether online or on-ground. It was also not linked with the participants' preference of which method they liked, whether with mobile apps or without them.

Comparisons

Apps help me to compare Arabic linguistics with my native language. A one-way ANOVA was also done using the dependent variable "comparisons" versus Q7 "Arabic class format" and Q10 "Which method of teaching you prefer." The results revealed that there was no statistically significant difference between these variables. For "Arabic class format," the sig. was 0.739, and it was 0.556 for "Which method of teaching you prefer." Both sig. numbers were larger than the *p*-value 0.05. Because there was no statistically significant difference between these variables, no further analysis was necessary here because the non-significant results specified a lack of relationship between the variables (see Appendix J).

Summary: Comparisons. When asked to evaluate the statement "Apps help me to compare Arabic linguistics with my native language," the high number of students' responses was between strongly agree and agree. The results also showed that there was no statistically significant difference between the standard "comparisons" as one of the 5Cs for foreign language learning with the variables Q7 "Arabic class format" and Q10 "Which method of teaching you prefer." This means that there was no association between these variables. These variables are not related. Comparing the participants' native language and culture with Arabic was not

associated with the class format, whether online or on-ground. It was also not associated with the method of teaching preference, whether with mobile apps or without them.

Connections

Using apps to learn Arabic helps me to connect with my peers and other majors of study. Again, one-way ANOVA was also done using the dependent variable "connections" versus Q7 "Arabic class format" and Q10 "Which method of teaching you prefer." The results revealed that there was no statistically significant difference between the dependent variable "connections" and the independent variable "Which method of teaching you prefer." For "Arabic class format," the sig. was 0.429, but it was 0.053 for "Which method of teaching you prefer." Accordingly, the sig. value was 0.429 for "Arabic class format," which was larger than the *p*-value 0.05. The sig. value was 0.053 for "Which method of teaching you prefer," which was close to the *p*-value (see Appendix J).

Summary: Connections. The results showed that the majority of the students preferred the method of teaching in which the instructor used much Arabic and little English and all supplemental materials and tools, including mobile apps. Five participants strongly agreed, 11 agreed, 19 were neutral, and five disagreed that the mobile apps method helped them to get connected with their peers and other majors of study. This means that the majority of students' responses were between agree and neutral. The results also revealed that there was no statistically significant difference between the standard "connections" as one of the 5Cs for foreign language learning and the variables Q7 "Arabic class format" and Q10 "Which method of teaching you prefer." The results showed that there was no association between these variables. These variables are not related. Connecting the participants with their peers, who were studying Arabic, along with other majors of study, was not associated with the class format,

whether online or on-ground. It was not also associated with the method of teaching preference, whether with mobile apps or without them.

Communities

Apps help me to use the language both within and beyond the class community. Once again, one-way ANOVA was done using the dependent variable "communities" versus Q7 "Arabic class format" and Q10 "Which method of teaching you prefer." The results revealed that there was no statistically significant difference between these variables. For "Arabic class format," the sig. was 0.508, and it was 0.101 for "Which method of teaching you prefer." Both of these sig. values were larger than the *p*-value 0.05. Due to the statistically non-significant difference between the variables Q7 "Arabic class format" and Q10 "Which method of teaching you prefer," no additional analysis is required on this because the statistically non-significant results indicate there was no relation between the variables (see Appendix J).

Summary: Communities. When asked to evaluate the statement "Apps help me to use the language both within and beyond the class community," the results showed that the high number of students' responses was between strongly agree, agree and neutral. The results also showed that there was no statistically significant difference between the standard "communities" and the variables Q7 "Arabic class format" and Q10 "Which method of teaching you prefer." The results showed there was no association between these variables. Whether the class is online or on-ground, or even if the method of teaching was with or without the use of mobile apps, these variables are not related, and they lack connection.

Cultures

Apps help me understand the Arabic culture. Once more, one-way ANOVA was also used to compare the dependent variable "cultures" versus Q7 "Arabic class format" and Q10

"Which method of teaching you prefer." The results clarified that there was also no statistically significant difference between these variables. The sig. was 0.083 for "Arabic class format" and 0.473 for "Which method of teaching you prefer." Both of these numbers were larger than the *p*-value 0.05. As there was no statistically significant difference between these variables, no more analysis was needed because the statistically non-significant results indicated a lack of association between the variables (see Appendix J).

Summary: Cultures. When asked to evaluate the statement "Apps help me understand the Arabic culture," the majority of students' responses were between strongly agree, agree and neutral. The results also showed that there was no statistically significant difference between the standard "cultures" and the variables Q7 "Arabic class format" and Q10 "Which method of teaching you prefer." Whether the class is online or on-ground, or even if the method of teaching was with or without the use of mobile apps, the results showed there was no association between these variables.

Summary: RQ1. Sub-question (a). RQ1. Sub-question (a) was addressed by conducting a one-way ANOVA of one of the 5Cs as dependent variables (communication, comparisons, connections, communities, and cultures) versus Q7 "Arabic class format" and Q10 "Which method of teaching you prefer." The results showed that the majority of students' responses were between strongly agree, and agree that MALL apps helped them to enhance their communication skills. The apps also helped them to compare Arabic linguistics with their native language. Using MALL apps to learn Arabic also helped the participants to be connected with their classmates and other majors of study. MALL apps also helped the students to use the language both within and beyond the class community and also to better understand the Arabic culture. In addition, the results showed that there was no statistically significant difference between the 5Cs as dependent

variables and Q7 "Arabic class format" and Q10 "Which method of teaching you prefer." variables. This means that the statistically non-significant results indicated a lack of association between those variables.

RQ1: Sub-question (b):

To answer the second sub-question (b) "How do the following characteristics impact students' perceptions of MALL apps in learning Arabic: student's age, frequency of using mobile apps, level of mastery of Arabic, educational level, purpose for learning Arabic, and out-of-class communicative tasks scores using mobile apps for learning Arabic in class and outside of class? ," the following demographic dimensions of Q1-8 (except Q7: "Select your Arabic class format") in the questionnaire were used: "Select your age range (18 – 25, 26 – 34, 35 – 44, 45 – 50, 51 and up)," "How often did you use mobile apps for learning Arabic during the three weeks? (Very Frequently, Frequently, Occasionally, Rarely, Never)," "What is your native language? (Arabic, English, Other [please specify] …)," "Why are you studying Arabic? (Required for degree graduation, For job related purposes, Interested in the language and culture, Other [please specify] …)," "Are you currently an undergraduate or graduate student? (Undergraduate, Graduate, Other [please specify] …)," "Select your Arabic class level (Beginner [Arabic 101], High Beginner [Arabic 102], Intermediate [Arabic 201], High Intermediate [Arabic 202], Advanced [Arabic 301], High Advanced [Arabic 302], Other [please specify] …)," and "What was your out-of-class communicative tasks final scores (Task 3)? (Superior [A], Advanced [B], Intermediate [C], Novice [D], Other [please specify]...)."

Again, ANOVA was used to measure the rest of Q9 "Rate each statement below based on your experience using mobile apps for Arabic learning in class and outside of class" dependent variables (which are listed below) except the variable "I will continue to use apps for Arabic

learning even when the class ends" against the independent variables of Q1-8 in the questionnaire, which are listed above. The following are the dependent variables from Q9: "I am satisfied with using mobile apps for Arabic learning," "Apps can be accessed at anywhere at any time," "Apps provide sufficient Arabic words and phrases," "Apps are affordable," "Apps are useful in learning Arabic," "I have fun using apps," "Apps help me to interact with my peers in class and outside of class," "Apps are user-friendly," "Apps are interesting," and "I very much enjoyed using the mobile apps in my Arabic class this semester."

The one-way ANOVA was used to examine whether there were statistically significant differences in learning Arabic using mobile apps in class and outside the class among the following characteristics: student's age, frequency of using the mobile apps, Arabic level, educational level, purpose for learning Arabic, and out-of-class communicative task 3 score. A one-way ANOVA was also used to see if these characteristics impacted the students' perceptions on the use of MALL apps in learning Arabic as a second language.

Satisfaction. Table 4.22 exhibits the *p*-value for the variable "satisfaction."

Table 4.22
RQ1: Sub-question b: Satisfaction

Dependent Variable	Independent Variable	*P*-value (Sig.)
I am satisfied with using mobile apps for Arabic learning	Age range	.007*
	Frequency of using the mobile apps	.000*
	Native language	.**
	Arabic level	.744
	Educational level	.920
	Purpose for learning Arabic	.138
	Task 3 score	.309

*Note. *There was a statistically significant difference. **The p-value was not calculated.*

Since there was a statistically significant difference between the dependent variable "I am satisfied with using mobile apps for Arabic learning" and the independent variables "age range" and "frequency of using the mobile apps," further analysis was needed to test for differences of mean values amongst groups. Therefore, Bonferroni post-hoc test was used to compare the

differences of mean values. Pallant (2013) states that "post-hoc comparisons (also known as *a posteriori*) are used when you want to conduct a whole set of comparisons, exploring the differences between each of the groups or conditions in your study" (p. 217). Bonferroni was used to judge the statistical significance. This statistically significant difference was probably detected due to the majority of young users of technology who participated in the study. They could also have had the energy to use the mobile apps as many times as they wanted. Repetition and frequency of using the mobile apps could have lead to the students' satisfaction with the apps.

The results showed that the 37.5% (15 participants) strongly agreed, 42.5% (17 participants) agreed, 15.0% (six participants) were neutral, 5.0% (two participants) disagreed, and 0.00% strongly disagreed with the statement "I am satisfied with using mobile apps for Arabic learning." As for the "age range," the analysis showed that there was a statistically significant difference between strongly agree and disagree responses. The mean difference was -0.867, and the *p*-value was 0.016. There was also a statistically significant difference between agree and disagree responses. The mean difference was -1.000, and the *p*-value was 0.004. The results also explained a statistically significant difference between neutral and disagree responses. The mean difference was -0.833, and the *p*-value was 0.041. There was also a statistically significant difference between disagree and strongly agree responses. The mean difference was 0.867, and the *p*-value was 0.016. There was also a statistically significant difference between disagree and agree responses. The mean difference was 1.000, and the *p*-value was 0.004. The results also showed a statistically significant difference between disagree and neutral responses. The mean difference was 0.833, and the *p*-value 0.041.

As for the "frequency of using the mobile apps," the analysis demonstrated that there was

a statistically significant difference between strongly agree and agree responses. The mean difference was -0.898, and the *p*-value was 0.004. There was also a statistically significant difference between strongly agree and neutral responses. The mean difference was -1.467, and the *p*-value was 0.000. The results also showed a statistically significant difference between strongly agree and disagree responses. The mean difference was -1.633, and the *p*-value was 0.018. There was also a statistically significant difference between agree and strongly agree responses. The mean difference was 0.898, and the *p*-value was 0.004. There was also a statistically significant difference between neutral and strongly agree responses. The mean difference was 1.467, and the *p*-value was 0.000. The results also showed a statistically significant difference between disagree and strongly agree responses. This means that the majority of the students were satisfied with the use of MALL apps in learning Arabic. Their choices were high for strongly agree and low for disagree responses. The mean difference was 1.633, and the *p*-value was 0.018.

Summary: Satisfaction. The results revealed that the majority of students strongly agreed with the statement "I am satisfied with using mobile apps for Arabic learning." The results also showed there was no relation between students' satisfaction of using mobile apps in learning Arabic and the level of Arabic class, whether it was Arabic 101 or Arabic 102. The results also suggested that the student's educational level (graduate or undergraduate), their purpose for learning Arabic, and their grades for the out-of-class speaking activities have no connection with students' satisfaction of using mobile apps in learning Arabic. However, the results revealed that there was a statistically significant difference between students' satisfaction and the variables "age range" and "frequency of using the mobile apps," which means there was a statistically significant difference between the mean values. This statistically significant

difference was most likely noticed because the majority of the participants were young. They were active and used the mobile apps many times in their learning.

Availability. Table 4.23 exhibits the *p*-value for the variable "Apps can be accessed at anywhere at any time."

Table 4.23
RQ1: Sub-question b: Apps can be accessed at anywhere at any time

Dependent Variable	Independent Variable	*P*-value (Sig.)
Apps can be accessed at anywhere at any time	Age range	.000*
	Frequency of using the mobile apps	.903
	Native language	.**
	Arabic level	.689
	Educational level	.000*
	Purpose for learning Arabic	.835
	Task 3 score	.073

*Note. *There was a statistically significant difference. **The p-value was not calculated.*

Summary: Availability. The results showed that the students' high responses were between strongly agree and agree that MALL apps can be accessed anywhere at any time. The results also revealed there was no relationship between the dependent variable "at anywhere at any time" and the dependent variable "Arabic class," whether it was Arabic 101 or Arabic 102. The results also showed that there were statistically non-significant differences between the dependent variable "at anywhere at any time" and the other variables, such as "frequency of using the mobile apps," "purpose for learning Arabic," and "out-of-class communicative task 3 score." However, the results were statistically significant for the variables "age range" and "educational level," which means there was a statistically significant difference between the mean values. This statistically significant difference was most likely detected because the majority of the participants were between 18-25 years old. People of this age range tend to be rather active users of technology and used the mobile apps several times in their learning, no matter if the students were graduate or undergraduate.

Sufficiency. The dependent variable "Apps provide sufficient Arabic words and phrases" was measured versus all the following independent variables: "student's age range," "frequency of using the mobile apps," "Arabic level," "educational level," "purpose for learning Arabic," and "out-of-class communicative task 3 score." All the results were statistically non-significant, which indicated there was no association between these variables. The *p*-value was not calculated for "language" because all the participants (100%) were non-native speakers of Arabic. The *p*-value was 0.157 for the age range, 0.366 for the frequency of using the mobile apps, 0.659 for the Arabic level, 0.949 for the educational level, 0.118 for the purpose for learning Arabic, and 0.595 for the out-of-class communicative task 3 score (see Appendix J).

Summary: Sufficiency. When asked if mobile apps provide sufficient Arabic words and phrases, the highest percentage of students' responses was between strongly agree and agree. The results also revealed that there was no association between the variable "Apps provide sufficient Arabic words and phrases" and the students' ages or their frequency of using mobile apps in learning Arabic. There was also no association between the class level, the students' education levels, the reason to study Arabic, the final score, or the sufficiency of mobile apps to provide enough Arabic words and phrases.

Affordability. The dependant variable, "Apps are affordable" was also used versus all the following independent variables: "student's age range," "frequency of using the mobile apps," "Arabic level," "educational level," "purpose for learning Arabic," and "out-of-class communicative task 3 score." The results revealed that there was no statistically significant difference between all variables. The case was the same here that the *p*-value was not calculated for "language" because all the participants (100%) were native speakers of English. The *p*-value was 0.986 for the "age range," 0.081 for the "frequency of using the mobile apps," 0.104 for the

"Arabic level," 0.914 for the "educational level," 0.534 for the "purpose for learning Arabic," and 0.078 for the "out-of-class communicative task 3 score" (see Appendix J).

Summary: Affordability. When asked if mobile apps are affordable, the highest percentage of students' responses was between strongly agree and agree. The results also revealed that there was no statistically significant association between the variable "Apps are affordable" and the students' ages, their frequency of using mobile apps in learning Arabic, class level, the students' education levels, the reason to study Arabic, or the final score. This means that there was no connection between the cost of apps and the students' ages, frequency of using apps, education, Arabic class, the purpose of studying Arabic, and the score.

Usefulness. Table 4.24 displays the *p*-value for the variable "Apps are useful in learning Arabic."

Table 4.24
RQ1: Sub-question b: Apps are useful in learning Arabic

Dependent Variable	Independent Variable	*P*-value (Sig.)
Apps are useful in learning Arabic	Age range	.170
	Frequency of using the mobile apps	.029*
	Native language	**
	Arabic level	.204
	Educational level	.466
	Purpose for learning Arabic	.535
	Task 3 score	.930

*Note. *There was a statistically significant difference. **The p-value was not calculated.*

Summary: Usefulness. When asked if mobile apps are useful in learning Arabic, the highest percentage of students' responses was between strongly agree and agree. The results also revealed that there was no statistically significant association between the variable "Apps are useful in learning Arabic" and the students' ages, class level, the students' education levels, the reason to study Arabic, or the final score. However, there was a connection between the usefulness of apps and the frequency of using apps in learning Arabic. The many times the

students used apps, it was useful in learning. The more the students used apps, the more they learned.

Fun. Table 4.25 displays the *p*-value for the variable "I have fun using apps."

Table 4.25
RQ1: Sub-question b: I have fun using apps

Dependent Variable	Independent Variable	*P*-value (Sig.)
I have fun using apps	Age range	.022*
	Frequency of using the mobile apps	.009*
	Native language	**
	Arabic level	.636
	Educational level	.842
	Purpose for learning Arabic	.322
	Task 3 score	.698

*Note. *There was a statistically significant difference. **The p-value was not calculated.*

In view of the fact that there was a statistically significant difference between the dependent variable "I have fun using apps" and the independent variables "age range" and "frequency of using the mobile apps," further analysis was needed to test for differences of mean values amongst these statistically significant groups. Bonferroni post-hoc test was used to compare the differences of mean values. The results showed that 35.0% (14 participants) strongly agreed, 35.0% (14 participants) agreed, 25.0% (10 participants) were neutral, 5.0% (two participants) disagreed, and 0.00% (none of the participants) strongly disagreed with the statement "I have fun using apps." As for the "age range," the multiple comparisons analysis showed that the mean difference was 0.000 between strongly agree and agree responses, -0.400 between strongly agree and neutral, -0.500 between strongly agree and disagree, 0.000 between agree and strongly agree, -0.400 between agree and neutral, -0.500 between agree and disagree, 0.400 between neutral and strongly agree, 0.400 between neutral and agree, -0.100 between neutral and disagree, 0.500 between disagree and strongly disagree, 0.500 between disagree and agree, and 0.100 between disagree and neutral.

As for the "frequency of using the mobile apps," the analysis showed that there was a

statistically significant difference between strongly agree and disagree responses. The mean difference was -1.714, and the *p*-value was 0.036. There was also a statistically significant difference between agree and disagree responses. The mean difference was -1.714, and the *p*-value was 0.036. The results also showed a statistically significant difference between disagree and strongly agree responses. The mean difference was -1.714, and the *p*-value was 0.036. There was also a statistically significant difference between disagree and agree responses. The mean difference was 1.714, and the *p*-value was 0.036 (see Appendix J).

Summary: Fun. The results revealed that 35.0% (14 participants) strongly agreed, 35.0% (14 participants) agreed, 25.0% (ten participants) were neutral, and 5.0% (two participants) disagreed with the statement "I have fun using apps." The results showed that there was no relation between students' having fun using mobile apps in learning Arabic and the level of Arabic class, whether it was Arabic 101 or Arabic 102. The results also revealed that the students' educational level (graduate or undergraduate), their purpose of learning Arabic, and their grades for the out-of-class speaking activities have no connection with the variable "I have fun using apps" in learning Arabic. However, the results showed that there were statistically significant differences between students' having fun using mobile apps in learning Arabic and the variables "age range" and "frequency of using the mobile apps." This means there was a statistically significant difference between the mean values. This statistically significant difference was most likely noticed because the majority of the participants were not elderly. They were energetic and comfortable with using their mobile devices for fun.

Interaction. Additionally, the dependent variable "Apps help me to interact with my peers in class and outside of class" was also used versus all the following independent variables: "student's age range," "frequency of using the mobile apps," "Arabic level," "educational level,"

"purpose for learning Arabic," and "out-of-class communicative task 3 score."All the results were statistically non-significant, and this indicated a lack of relation between these variables. Once again, the *p*-value was not calculated for the variable "language" because all the participants (100%) were non-native speakers of Arabic. The *p*-value was 0.577 for the "age range," 0.557 for the "frequency of using the mobile apps," 0.333 for the "Arabic level," 0.882 for the "educational level," 0.945 for the "purpose for learning Arabic," and 0.442 for the "out-of-class communicative task 3 score" (see Appendix J).

Summary: Interaction. When asked if mobile apps helped the students to interact with their peers in class and outside of class, the highest percentage of their responses was between agree and neutral. The results also revealed that there was no statistically significant difference between the variable "apps help me to interact with my peers in class and outside of class" and the students' ages, the frequency of using apps in learning Arabic, class level, the students' education levels, the reason to study Arabic, or the final score. The students' interaction, whether in class and outside of class, did not impact their perceptions about the use of MALL apps in learning Arabic as a second language. They all interacted with their peers, and it did not make any difference between their ages, how often they used the apps, purpose to study Arabic, their assignments' scores, or even the format and level of education.

User-friendly. Table 4.26 displays the *p*-value for the variable "Apps are user-friendly."

Table 4.26
RQ1: Sub-question b: Apps are user-friendly

Dependent Variable	Independent Variable	*P*-value (Sig.)
Apps are user-friendly	Age range	.143
	Frequency of using the mobile apps	.310
	Native language	**
	Arabic level	.049*
	Educational level	.189
	Purpose for learning Arabic	.959
	Task 3 score	.557

*Note. *There was a statistically significant difference. **The p-value was not calculated.*

Summary: User-friendly. When asked if mobile apps are user-friendly, the highest percentage of the students' responses was between strongly agree and agree. The results also revealed that there was no statistically significant difference between the variable "apps are user-friendly" and the students' ages, the students' education levels, the reason to study Arabic, or the final score. However, there was a correlation between user-friendly variable and the class level of learning Arabic, whether Arabic 101 or Arabic 102. Due to the many times the students used apps, it was easy for them to get used to practice with apps in learning. In both levels of Arabic, the students liked the user friendly-apps, as they helped them to practice more speaking scenarios.

Interesting. Table 4.27 displays the *p*-value for the variable "Apps are interesting."

Table 4.27
RQ1: Sub-question b: Apps are interesting

Dependent Variable	Independent Variable	*P*-value (Sig.)
Apps are interesting	Age range	.051*
	Frequency of using the mobile apps	.165
	Native language	**
	Arabic level	.139
	Educational level	.872
	Purpose for learning Arabic	.933
	Task 3 score	.278

*Note. *There was a statistically significant difference. **The p-value was not calculated.*

Summary: Interesting. When asked if mobile apps are interesting, the highest percentage of the students' responses was between strongly agree and agree. The results also revealed that there was no statistically significant difference between the variable "apps are interesting" and the frequency of using apps in learning Arabic, the class level, the students' education levels, the reason to study Arabic, or the final score. However, there was a relation between how apps were interesting to the students based on their ages. Results showed that the younger population of participants liked the apps and that they were very interested in them, but

the case was not the same for the older population. The older population thought the apps were too flashy and colorful.

Enjoyable. Table 4.28 displays the *p*-value for the variable "I very much enjoyed using the mobile apps in my Arabic class this semester."

Table 4.28

RQ1: Sub-question b: I very much enjoyed using the mobile apps in my Arabic class this semester

Dependent Variable	Independent Variable	*P*-value (Sig.)
I very much enjoyed using the mobile apps in my Arabic class this semester	Age range	.014*
	Frequency of using the mobile apps	.001*
	Native language	**
	Arabic level	.222
	Educational level	.651
	Purpose for learning Arabic	.241
	Task 3 score	.216

*Note. *There was a statistically significant difference. **The p-value was not calculated.*

Since there was a statistically significant difference between the dependent variable "I very much enjoyed using the mobile apps in my Arabic class this semester" and the independent variables "age range" and "frequency of using the mobile apps," Bonferroni post-hoc test was used to compare the differences of mean values. The results showed that 30.0% (12 participants) strongly agreed, 37.0% (15 participants) agreed, 25.0% (10 participants) were neutral, 7.5% (three participants) disagreed, and 0.00% (none of the participants) strongly disagreed with the statement "I very much enjoyed using the mobile apps in my Arabic class this semester." As for the "age range," the analyses showed that there was a statistically significant difference between strongly agree and disagree responses. The mean difference was -0.667, and the *p*-value was 0.044. There was also a statistically significant difference between agree and disagree responses. The mean difference was -0.667, and the *p*-value was 0.038. There was also a statistically significant difference between disagree and strongly agree responses. The mean difference was

0.667, and the *p*-value was 0.044. There was also a statistically significant difference between disagree and agree responses. The mean difference was 0.667, and the *p*-value was 0.038.

As for the "frequency of using the mobile apps," the analysis showed that there was a statistically significant difference between strongly agree and agree responses. The mean difference was -0.833, and the *p*-value was 0.030. There was also a statistically significant difference between strongly agree and neutral responses. The mean difference was -1.067, and the *p*-value was 0.008. The results also showed a statistically significant difference between strongly agree and disagree responses. The mean difference was -1.833, and the *p*-value was 0.002. There was also a statistically significant difference between agree and strongly agree responses. The mean difference was 0.833, and the *p*-value was 0.030. There was also a statistically significant difference between neutral and strongly agree responses. The mean difference was 1.067, and the *p*-value was 0.008. There was also a statistically significant difference between disagree and strongly agree responses. The mean difference was 1.833, and the *p*-value was 0.002 (See Appendix J).

Summary: Enjoyable. The results revealed that 30.0% (12 participants) strongly agreed, 37.0% (15 participants) agreed, 25.0% (ten participants) were neutral, and 7.5% (three participants) disagreed with the statement "I very much enjoyed using the mobile apps in my Arabic class this semester." The results showed that there was no statistically significant difference between students' enjoying the use of mobile apps in learning Arabic and the level of Arabic class, the students' educational level, the reason of studying Arabic, or their grades for task 3 speaking activity. On the contrary, the results showed that there were statistically significant differences between students' enjoying the use of mobile apps and the variables "age range" and "frequency of using the mobile apps." This means there was a statistically significant

difference between the mean values. Once again, this statistically significant difference was perhaps detected because the majority of the participants were young. They were eager to use their mobile devices for several different usages.

Summary: RQ1. Sub-question (b). RQ1. Sub-question (b) was addressed by conducting a one-way ANOVA test between the survey questions Q1-8 (except Q7: Select your Arabic class format) and the variables from Q9 "Rate each statement below based on your experience using mobile apps for Arabic learning in class and outside of class" (except for the variable "I will continue to use apps for Arabic learning even when the class ends"). Several of the results were statistically non-significant. This means that there was no relation between the variables. The statistically non-significant results suggested that there was no evidence that the variables "purpose for learning Arabic" and "out-of-class communicative tasks scores" impacted the students' perception about the use of MALL apps in learning Arabic as a second language.

There was a statistically significant result between the dependent variable "I am satisfied with using mobile apps for Arabic learning" and the variables "age range," and "frequency of using the mobile apps," which means there was a statistically significant difference between the mean values. Similarly, there was a statistically significant difference between the dependent variable "I have fun using apps" and the variables "age range" and "frequency of using the mobile apps." Likewise, the results showed a statistically significant difference between the dependent variable "I very much enjoyed using the mobile apps in my Arabic class this semester" and the variables "age range" and "frequency of using the mobile apps." This means that the age range and the frequency of using MALL apps in learning Arabic are very important factors for students' satisfaction, fun, and enjoyment.

The other statistically significant results were between the dependent variable "apps can

be accessed at anywhere at any time" and the variables "age range," and "educational level." Accessing MALL apps at any time from anywhere was impacted by the students' age range and education. Furthermore, the other statistically significant results were between the dependent variable "apps are useful in learning Arabic" and the variable "frequency of using the mobile apps." This means that MALL apps are very useful in learning Arabic as long as students use them frequently. The other statistically significant results were between the dependent variable "apps are user-friendly" and the variable "Arabic level." Apps were user-friendly for both Arbic levels (Arabic 101 and Arabic 102). Furthermore, the results showed a statistically significant difference between the dependent variable "apps are interesting" and the variable "age range." The apps were very interesting to younger population.

RQ1: Sub-question (c):

To answer the third sub-question (c) "What are the factors that influence the students' desire to continue or discontinue using the MALL apps technology in learning Arabic as a second language?", a five-point Likert-type scale (5 = strongly agree; 4 = agree; 3 = neutral; 2 = disagree; and 1 = strongly disagree) was used to measure the perceived usefulness and perceived ease of use of the mobile apps technology in learning Arabic a second language. To answer this third sub-question, ANOVA was used to measure the following dependent variable from Q9 "I will continue to use apps for Arabic learning even when the class ends" against the independent variable Q1-8 in the questionnaire. The ANOVA was used to test for differences of mean values between these groups. The ANOVA test are summarized in Table 4.29:

Table 4.29
RQ1: Sub-question c: I will continue to use apps for Arabic learning even when the class ends

Dependant Variable (Q9)	Independent Variable	*P*-value (Sig.)
I will continue to use apps for Arabic learning even when the class ends	Age range	.302
	Frequency of using the mobile apps	.000*
	Native language	.**
	Arabic level	.473
	Educational level	.946
	Purpose for learning Arabic	.786
	Tasks 3 score	.165

*Note. *There was a statistically significant difference. **The p-value was not calculated.*

Summary: RQ1. Sub-question (c). A one-way ANOVA was used to measure the following dependent variable from Q9 "I will continue to use apps for Arabic learning even when the class ends" against the independent variable Q1-8 in the questionnaire. All the results were statistically non-significant, except for the variable "frequency of using the mobile apps," which were statistically significant. As seen in Table 4.29, the statistically non-significant results showed that there was no realistic evidence to support the idea that there were no factors that influence the students' desire to continue or discontinue using the MALL apps technology in learning Arabic as a second language. On the other hand, the statistically significant results indicated that the factor "frequency of using the mobile apps" influenced the students' desire to continue using the mobile apps in learning Arabic. The more the students use MALL apps, the better they learn. This will encourage them to continue using the mobile apps in learning Arabic.

RQ1: Sub-question (d):

To answer the fourth sub-question (d) "What are the differences and similarities of online and on-ground students' perceptions toward the use of MALL apps in learning Arabic?," ANOVA was also used to measure all the dependent variables from Q9 "Rate each statement below based on your experience using mobile apps for Arabic learning in class and outside of class" against the independent variable Q7 "Select your Arabic class format" in the

questionnaire.

Moreover, the following question was used to collect the QUAL data: "As an online or on-ground student, what has been your learning experience toward the use of mobile apps in learning Arabic?" To share the participants' learning experience, common themes emerged and participants' quotes were selected from the QUAL data to support in answering this sub-question. The participants' quotes were coded as (OP#, 2014) for online students and (GP#, 2014) for on-ground students.

RQ1: Sub-question (d): Quantitative Data Analysis. The results from the QUAN data showed that 55.0% (22 students) were on-ground (in-class) students and that 45.0% (18 students) were online students. To test for differences of mean values between the variables, a one-way ANOVA was used to measure the dependent variables from Q9 in the questionnaire against the independent variable of class format, whether it was online or on-ground (Q7 in the questionnaire). All the results were statistically non-significant, which indicated a lack of association between these variables. The *p*-value was 0.114 for "I am satisfied with using mobile apps for Arabic learning," 0.425 for "Apps can be accessed at anywhere at any time," 0.137 for "Apps provide sufficient Arabic words and phrases," 0.489 for "Apps are affordable," 0.327 for "Apps are useful in learning Arabic," 0.490 for "I have fun using apps," 0.298 for "Apps help me to interact with my peers in class and outside of class," 0.894 for "Apps are user-friendly," 0.881 for "Apps are interesting," 0.075 for "I very much enjoyed using the mobile apps in my Arabic class this semester," 0.176 for "I will continue to use apps for Arabic learning even when the class ends," 0.150 for "Apps enhance my communication skills," 0.470 for "Apps help me to compare Arabic linguistics with my native language," 0.248 for "Using apps to learn Arabic helps me to connect with my peers and other majors of study," 0.245 for "Apps help me

to use the language both within and beyond the class community," and 0.956 for "Apps help me understand the Arabic culture."

Based on the quantitative analysis, there were no statistically significant differences in mean values between the online and on-ground students. However, only 11 out of the 18 online participants preferred the method of using mobile apps in learning Arabic. In contrast to this, all on-ground learners (21) preferred it. The missing data were 2.5% because one participant did not respond to this question (see Appendix J).

RQ1: Sub-question (d): Qualitative data Analysis. As it is mentioned earlier in Chapter Three, the analysis of the QUAL data began with recurring readings of responses to each of the open-ended questions to get a better understanding of the data. This step is described by methodologists as a very important step for the researchers because it helps with identifying the patterns in the data (Creswell, 2013). After the step of recurring readings, key statements were taken out, then grouped together to create meaningful units and common themes (Schram, 2006).

To answer RQ1: sub-question (d), common themes emerged and participants' quotations were selected from the QUAL data to share the students' learning experience of using mobile apps in learning Arabic. The participants' quotes were coded as (OP#: SQ#, 2014) for online students and (GP#: SQ#, 2014) for on-ground students. O stands for online, P stands for participant, S stands for survey, and Q stands for question. The "2014" in each code refers to the year in which the data were collected. The total number of participants in this study was 40, but only 38 responded to this question. The missing data included only 5.00% (two students) who did not answer this question. The results and analyses will be reported in detail in the following sections.

RQ1-Survey Question 12 Analysis. Question 12 in the questionnaire was used to collect

the QUAL data to support in answering RQ1: sub-question (d). Question 12 asks, "As an online or on-ground student, what has been your learning experience toward the use of mobile apps in learning Arabic?" This question was read several times and then coded for themes as they emerged. Common themes included "helpful," "fun," "flexibility," and "negative quality." It is worth mentioning here that the positive themes were divided into three different common themes ("helpful," "fun," and "flexibility") due to the high number of positive responses. However, the negative themes were not divided into different themes due to the low number of negative responses. Moreover, a few participants did not answer this question, and hence, the participants' percentage for those who gave no response is also reported in the analysis. These themes are explained in the following sections:

Theme 1: Helpful. Words or phrases that were included in the category of "helpful" included: "online apps are helpful," "applications are always helpful," "can help as a guide toward learning many other languages," "help if I was having trouble with anything in class," "interaction with the language and culture," "provide much more vocabulary," "helpful and simple to use," "apps are a useful tool in the future in language learning," and others. The theme of "helpful," which was mentioned by 62.5% (25 participants), was the dominant theme in this category. The use of technology and mobile learning system are often cited as helpful for language learning (Chen, & Tsai, 2009; Nguyen & Pham, 2011; Ogata et al., 2004; Yang & Chen, 2012; Cavus & Ibrahim, 2008; Osman & Chung, 2010). The majority of students' responses mentioned that the apps were useful and helpful in learning. The results indicated that apps were helpful for both online and in-class students.

Theme 2: Fun. The use of technology and mobile apps makes learning fun, effective, and collaborative (Khaddage, Lattemann, & Bray, 2011; Shockoe, 2014; Steel, 2012; Rossing et

al., 2012). "Fun" was the second theme that emerged in this section. Words and phrases used by students included "I enjoy using the apps," "pretty positive experience," "user friendly," and "more fun, and easy way of doing homework and learning Arabic." In this category, the theme of "fun" was only mentioned by 7.5% (three participants). The results here explained that apps were also fun to use for learning a second language.

Theme 3: Flexibility. Mobile technology is flexible and convenient for learners to use outside the classroom and to facilitate a remote participation (Ally, Samaka, Ismail, & Impagliazzo, 2013; Huang et al., 2012; Barker et al., 2005; Kukulska-Hulme, 2006; Miangah & Nezarat, 2012; Godwin-Jones, 2008; Steel, 2012). "Flexibility" was the third theme that emerged in this section. The participants used the following words and phrases: "study the language outside of class," "when class ends I am able to continue practicing the language," "can access these apps whenever I want to," "access Middle Eastern recipes," "look it up on my own," and "Arabic Everywhere." In this category, the theme of "flexibility" was mentioned by 15.00% (six participants). The results showed that apps could be accessed anywhere at any time. Even when the class ended, the students were able to use the apps for further language learning.

Theme 4: Negative Quality. "Negative quality" was the fourth theme that emerged in this section. Mobile devices can be used to improve the quality of learning (Mitra, 2011). The elements of quality of learning experience include: satisfaction, engagement, positive effect, enjoyment, concentration, and motivation with cooperative learning activities (Shengmei, 2014). Wang (2014) conducted a study about the "collaboration factors and quality of learning experience on interactive mobile assisted social learning," and the findings were statistically significant. In Wang's study, the students liked the information sharing via mobile apps. Moreover, Kukulska-Hulme (2005) said that "mobile learning is now moving beyond short-term,

small-scale pilot projects and is ready to tackle issues of scale, sustainability, accessibility, evaluation, cost effectiveness and quality in the mainstream of education and training" (pp. 3-4).

Despite these studies that emphasized the positive quality of using mobile apps in learning, the participants in the current study shared the negative quality of using mobile apps in learning based on their learning experiences. The theme here focused on the negative responses that the students reported. The words and phrases that the students used included: "apps should be reserved for work and practice outside of the classroom," "classroom replacement," "conversation differs," and "not positive." In this category, the theme of "negative quality" was mentioned by 10.00% (four participants).

RQ1: Sub-question (d): Students' Selected Quotes. It is worth mentioning here that the results from the qualitative data showed that the online and on-ground students were almost the same in their responses and that the researcher did not see any statistically significant differences between the two groups. Most of the participants from both groups preferred the method of using mobile apps in learning Arabic. However, there were several positive responses, a few negative responses, and a few others that were neutral. Selected participants' quotes were also selected from the QUAL data to support answering this research question and to illustrate the positive, negative, and neutral responses.

Students' Positive Quotes. Although, the time was short and the lessons of learning were only six, several students liked the method of using mobile apps in learning Arabic because they were helpful, useful, fun, and easy to use anywhere at any time. The following quotes were selected from both online and in-class students to exemplify the students' positive perceptions about the use of mobile apps in learning Arabic as a second language:

One on-ground participant, for example, said:

> I wish I had more exposure, but the experience I had was nothing to complain about. Apps, along with other technological devices and applications are always helpful since we live in a technological world. (GP5: SQ12, 2014)

Another on-ground participant who had also a positive learning experience said:

> As an on-ground student my learning experience with mobile apps has been positive. They have given me a nicely organized environment from which to review course material. (GP7: SQ12, 2014)

An online participant who also liked it said:

> Being an online student, the apps make it possible to follow along and get interaction with the language and culture that is lost by not having face to face interactions every day. (OP15: SQ12, 2014)

Another online participant said:

> I think they are very useful. Being an online student, it is helpful that I can use the app to go over words that I learned in class while I'm at home. If I forgot how to say a word or phrase, they were all there for me to look up. I think apps are a useful tool in the future in language learning. (OP19: SQ12, 2014)

Students' Negative Quotes. Based on the participants' learning experience, there were also a few negative perceptions about the use of mobile apps technology in learning Arabic. One on-ground participant (GP33: SQ12, 2014) just said "not positive" but did not give any more of an explanation why his learning experience was not positive. Another participant, who was studying Arabic online, shared his learning experience by just saying, "They are almost a classroom replacement in some ways" (OP16: SQ12, 2014). He did not give any more of an explanation why he thought that the mobile apps would replace the classroom. As the researcher indicated earlier in both the literature review chapter and the methodologies chapter, apps would not replace the classroom or the instructor's roles, but would only be an additional supplemental tool to help with learning.

Students' Neutral Quotes. As for the neutral responses, there were also a few participants who both liked and disliked the method of using mobile apps in learning Arabic in

one way or another. The results showed that some apps were in Arabic dialect and not in Modern Standard Arabic (MSA), which made it hard for some students to understand the similarities and differences between the different dialects of Arabic and MSA. Those participants also emphasized the importance of the instructor's role in classroom as a facilitator of learning and teaching. This view was supported by the literature, as Kukulska-Hulme (2006) indicated that mobile technologies were only supplemental and instructional tools for learning and improving language instructions, but were not meant to replace the instructor. The following quotes were also selected from both online and in-class students to represent the students' neutral perceptions toward the use of mobile apps in learning Arabic:

One online participant, for example, said:

> I'm on the fence. I can see the appeal/need to use them, but many of the apps come from different countries, meaning that the conversation differs, or something about the delivery changes in both speech and what is being said. (OP17: SQ12, 2014)

Another online student said:

> I find them helpful but would not want to solely depend on them to sharpen my language skills. (OP28: SQ12, 2014)

Moreover, an on-ground student indicated that his learning experience and perceptions toward the use of mobile apps in learning Arabic had been changed due to the professor's guidance in classroom. Thus, he said:

> I would say my experience with the mobile apps in learning Arabic when I first started looking for them was bad. This was because there were so many out there and I did not know which ones really worked and were good to learn the language. After I got instruction with the apps and feedback from the professor on which ones were good my experience was a lot better and helpful. (GP34: SQ12, 2014)

Another on-ground student, who emphasized the importance of using a variety of techniques in learning and picking the right apps to use for studying, said:

> I am an on-ground student. Using the mobile apps is helpful especially when we discuss them in class and find out which apps are better, because not all apps are great. Some apps help with learning the alphabet, others with learning, or speaking or learn culture. Again it is great variety. (OP35: SQ12, 2014)

Summary: RQ1. Sub-question (d). The QUAN analysis showed that 55.0% (22 students) were on-ground (in-class) students and that 45.0% (18 students) were online students. The results also showed that there were no statistically significant differences in mean values between the online and on-ground students. Twenty-one on-ground learners preferred the method of using mobile apps in learning Arabic, but only 11 out of the 18 online participants preferred it. The missing data comprised 2.5% because one participant did not respond to this question.

As for the QUAL data, the analysis also showed that the students' responses were nearly similar in themes. Most of the online and in-class participants preferred the method of using mobile apps in learning Arabic. Four common themes emerged from their responses, and those themes were coded as "helpful," "fun," "flexibility," and "negative quality." The participants shared their learning experience based on their usage of mobile apps in-class and beyond the classroom. Several of these learning experiences were positive, and some others were either neutral or negative. The positive experience focused on how apps were helpful, fun, easy to use, and could be accessed at anywhere at any time. A few participants thought that the apps would be a classroom replacement, and a few others emphasized the instructor's role as the main facilitator in learning. The statistically non-significant results reported that there was no reliable evidence that there were differences between the online and on-ground students' perceptions toward the use of MALL apps in learning Arabic because most of the themes that emerged from the students' responses were rather similar. Both QUAN and QUAL data showed the majority of students liked the use of MALL apps in learning Arabic. The students reported that the apps were helpful, fun and convenient. Whether online or on-campus, the participants were satisfied

with the method of using MALL apps in learning Arabic. This could be related to the notion that the apps are user-friendly, interesting, and affordable. This helps us to see the triangulation between the QUAN and QUAL data and how they support each other.

RQ1 Summary. The results showed that the participants' perceptions about the use of MALL apps in learning Arabic as a second language were positive. The majority of the participants liked the method of using MALL apps when learning Arabic because it helped them to enhance their speaking skills and to interact with their classmates, in-class and beyond the classroom.

This study showed that the use of MALL apps technology impacted the learning of Arabic by non-native speaking students. MALL apps helped the participants to improve their communication, to compare their own native language and culture with Arabic language and culture, and to connect them with their, in-class and beyond the classroom, community.

The study also showed that the student's age and the frequency of using mobile apps were very important factors, and they played a vital role in students' satisfaction about the use of MALL apps technology in learning Arabic. The result showed that the younger population liked the use of MALL technology, and they used it very frequently to improve their Arabic learning.

Moreover, the results showed that there was no significant difference between the online and on-ground students' perceptions of the use of MALL apps in learning Arabic. The majority of the participants, whether online and on-ground, agreed that the MALL apps were helpful, interesting, accessible, enjoyable, fun, convenient, useful, user-friendly, and affordable. These factors led to their satisfaction and desire to continue using MALL apps technology in learning Arabic as a second language.

Answering RQ2:

To address RQ2, "Do students prefer learning with or without the use of MALL apps as a supplementary tool, and why?", Fisher's Exact Test was used to measure the dependent variable from Q10 against Q1-8 in the questionnaire. Q10 asks, "Which method of teaching did you prefer? Instructor uses much Arabic and little English and all supplemental materials and tools, but *without* including the mobile apps, or the instructor uses much Arabic and little English and all supplemental materials and tools, but *with* including the mobile apps)." Questions 1-8 ask: "Select your age range"; "How often did you use mobile apps for learning Arabic during the three weeks?"; "What is your native language?"; "Why are you studying Arabic?"; "Are you currently an undergraduate or graduate student?"; "Select your Arabic class level"; and "What was your out-of-class communicative tasks final score (Task 3)?"

Fisher's Exact Test was defined by MathWorld (2014) as "a statistical test used to determine if there are nonrandom associations between two categorical variables" (para. 1). Fisher's Exact Test was used to produce counts between two categorical variables (2 X 2) and to allow for trend analysis with conditional probabilities or crosstabs to determine if these variables were independent or related. The researcher used Fisher's Exact Tests and not the Chi-square analyses because of the small number of participants. The sample data did not meet the requirements for conducting the Chi-square tests, as low frequencies were detected in the sample data. The Fisher's Exact Test is "significantly more accurate in evaluating the difference between groups when there are small numbers of observation" (D'Souza, 2011, p. 13).

To answer RQ2, common themes emerged from the QUAL data to share the participants' learning experience. The researcher also selected participants' quotes to demonstrate the participants' perceptions toward the method of using mobile apps in learning Arabic. The

following question was used to collect the QUAL data: "Based on your answer to question 10, please state the reason behind your teaching preference."

RQ2: Quantitative Data Analysis. The results from the quantitative data showed that 17.5% (seven participants) preferred the method of teaching *without* using the mobile apps in learning, but 80.0% (32 participants) preferred the method of teaching *with* using the mobile apps in learning. The missing data consisted of 2.5% because one participant did not respond to this question. The results revealed the majority of participants preferred the use of mobile apps in learning.

***Age Range*.** In the crosstab Table 4.30, 30 students who were between the ages of 18–25 years old preferred the mobile apps method. However, five participants who belonged to the same age range of 18–25 did not like it. As for the age range of 26–34, there were two participants who did not like it, but there was one other participant who did like it. There was also one participant who was over the age of 35, and this participant preferred the use of mobile apps. The total number of participants was 40, but one participant did not answer this question. This falls under the missing data category, which did not affect the overall results, as displayed in Table 4.30.

Table 4.30
Age Range Crosstab

Age range	Which method of teaching you prefer	
	Method without mobile apps	Method with mobile apps
18 – 25	5	30
26 – 34	2	1
35 – 44	0	1

The results also showed that there were no statistically significant differences between the method of preference and the participants' ages. The *p*-value was 0.821 for the Fisher's Exact Test, which is larger than 0.05. This means there was no association between the students' ages

and the method they preferred in learning Arabic (see Appendix J).

Frequency of Using Mobile Apps. Table 4.31 illustrates that the crosstab frequencies of how often the students used the mobile apps when learning Arabic. The crosstab table shows that five students preferred the mobile apps method. They used the mobile apps in learning "Very Frequently." Of the participants who used mobile apps in learning "Frequently," eleven of them preferred the mobile apps method but one did not. Of the participants who used mobile apps in learning "Occasionally," twelve of them preferred the mobile apps method, but five did not. Of the participants who used mobile apps in learning "Rarely," four of them preferred the mobile apps method, but one did not. There was only one missing response from the 40 total responses, which did not affect the results.

Table 4.31
Frequency of Using Mobile Apps Crosstab

	Which method of teaching you prefer	
Frequency of using mobile apps	Method without mobile apps	Method with mobile apps
Very frequently	0	5
Frequently	1	11
Occasionally	5	12
Rarely	1	4

Similarly, statistically significant differences were not seen between the variables of students' preference method and the frequency of using mobile apps in learning. The *p*-value was 0.094 for the Fisher's Exact Test, which was larger than 0.05. The statistically non-significant results showed that there was no credible evidence that there was any relation between the variables (see Appendix J).

Language. Furthermore, the results showed there were statistically no significant differences between the method of teaching preference and language. The *p*-value was not calculated for the Fisher's Exact Test, as all the participants (100%) were native speakers of the

English language. This means that no statistics were computed because the language variable was constant. Table 4.32 illustrates the Fisher's Exact Test value with the crosstabs. In this table, we see that 32 students liked the mobile apps method but seven participants did not. The case was the same here as before that there was one only piece of missing data, which did not affect the analysis.

Table 4.32
Language Crosstab

Language	Which method of teaching you prefer	
	Method without mobile apps	Method with mobile apps
English	7	32

Reason for Studying Arabic. In addition, the crosstab Table 4.33 shows that six of the students who preferred the mobile apps method were studying Arabic as it was required for graduation. Ten participants who preferred the mobile apps method studied Arabic for job-related purposes. Twelve other participants who also preferred the mobile apps method studied Arabic because they were interested in the language and culture. Seven of the participants were also interested in the Arabic language and culture, but they did not prefer the method of mobile apps. Those seven students who did not prefer the method of mobile apps were studying Arabic online. Four participants preferred the mobile apps method, and they studied Arabic for other reasons, such as religion or military purposes. Once again, there was only one missing response, which did not affect results in general. Table 4.33 illustrates that the crosstab counts.

Table 4.33
Reason for Studying Arabic Crosstab

Reason for Studying Arabic	Which method of teaching you prefer	
	Method without mobile apps	Method with mobile apps
Required for degree graduation	0	6
For job related purposes	0	10
Interested in the language and culture	7	12
Other	0	4

As shown in Table 4.34, the Fisher's Exact Test revealed that there was a statistically significant difference between the dependent variable "Which method of teaching the students prefer" and the independent variable "Why the students study Arabic." The *p*-value was 0.016 for the Fisher's Exact Test, which was less than 0.05. There were seven online students and 12 in-class students who were interested in the Arabic language and culture. The others were taking Arabic either for degree graduation, job related, or other purposes. It is worth mentioning here that this statistically significant result may not truly generalizable because of the small data set. However, this study could be replicable for a larger population.

Table 4.34
Reason for Studying Arabic: Fisher's Exact Test

	Value	Df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Likelihood Ratio	8.441	1	.004		
Fisher's Exact Test				.029	.016
Linear-by-Linear Association	5.783	1	.016		
N of Valid Cases	39				

Educational level. Moreover, the crosstab in Table 4.35 indicated that 30 undergraduate students and two graduate students preferred the mobile apps method, but only seven undergraduate students did not prefer it. As for the missing data, there was only one participant who did not answer this question.

Table 4.35
Educational Level Crosstab

Undergraduate or graduate student	Which method of teaching you prefer	
	Method without mobile apps	Method with mobile apps
Undergraduate	7	30
Graduate	0	2

Results from the Fisher's Exact Test showed there were no statistically significant differences between the dependent variable "Which method of teaching the students prefer" and the "educational level" variable, whether the participants were graduate or undergraduate

students. The *p*-value was 0.669 for the Fisher's Exact Test, which was larger than 0.05. The statistically non-significant results demonstrated that there was no realistic evidence of there being any relation between the variables due to the small number of participants (see Appendix J).

Arabic Class Level. As shown in the crosstab Table 4.36, 16 participants from beginner Arabic 101 preferred the method of using mobile apps, but six did not. Sixteen participants from High Beginner Arabic 102 preferred it, but one did not. The missing data consisted of only one participant who did not give any preference to any method and left the question unanswered.

Table 4.36
Arabic Class Level Crosstab

Arabic class level	Which method of teaching you prefer	
	Method without mobile apps	Method with mobile apps
Beginner (Arabic 101)	6	16
High Beginner (Arabic 102)	1	16

Similarly, results from the Fisher's Exact Test showed there were no statistically significant differences between the dependent variable "Which method of teaching the students prefer" and the independent variable the "Arabic class level," whether Arabic 101 or Arabic 102. The *p*-value was 0.094 for the Fisher's Exact Test, which was larger than 0.05. Once again, the statistically non-significant results revealed that there was no reliable evidence of there being a connection between the two variables (see Appendix J).

Arabic Class Format. The crosstab Table 4.37 shows that 21 on-ground students preferred the mobile apps method. It also shows that 11 online participants preferred the mobile apps method, but seven of the online students did not prefer it. With regard to the missing data, only one participant did not answer this question.

Table 4.37
Arabic Class Format Crosstab

Arabic class format	Which method of teaching you prefer	
	Method without mobile apps	Method with mobile apps
On-ground	0	21
Online	7	11

In addition, Fisher's Exact Test detected a statistically significant difference between the dependent variable "Which method of teaching the students prefer" and the "Arabic class format" variable. The *p*-value was 0.002 for the Fisher's Exact Test, which is less than 0.05. The most important thing here is that this statistically significant result is in fact not generalizable due to the small data set. However, this study could be replicable for a larger population. Table 4.38 exemplifies this statistically significant value.

Table 4.38
Arabic Class Format: Fisher's Exact Test

	Value	Df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Likelihood Ratio	12.651	1	.000		
Fisher's Exact Test				.002	.002
Linear-by-Linear Association	9.698	1	.002		
N of Valid Cases	39				

Task 3 Score. The researcher only looked at Task 3 score because he wanted to see if there was any improvement in the participants' performance. As shown in the crosstab Table 4.39, the results revealed that 25 participants received an A (Superior) grade on their task 3 completion. However, out of those 25 participants, 20 preferred the mobile apps, and five did not. Three participants received a B (Advanced) grade on their task 3 completion, and all of them preferred the mobile apps method. One participant received a C (Intermediate) grade on his task 3 completion, and that participant preferred the mobile apps method. Six participants received a D (Novice) grade on their task 3 completion, and all six participants preferred the mobile apps method. Four participants reported that they received an "Other" grade, of which two preferred

the mobile apps method and the other two did not. Only one participant did not report his/her grade for the task 3.

Table 4.39
Task 3 Score Crosstab

Task 3 Score	Which method of teaching you prefer	
	Method without mobile apps	Method with mobile apps
Superior (A)	5	20
Advanced (B)	0	3
Intermediate (C)	0	1
Novice (D)	0	6
Other	2	2

Also, statistically significant differences were not seen for the variables "Which method of teaching the students prefer" and "Task 3 score." The *p*-value was 0.654 for the Fisher's Exact Test, which was larger than 0.05. Again, the statistically non-significant results showed that there was no dependable proof that there was a link between the two variables (see Appendix J).

RQ2: Qualitative Data Analysis. To answer RQ2, QUAL data were also collected to give more explanation of the students' method preference. Thus, common themes emerged to share the participants' learning experience, and participants' quotes were selected to share the students' positive, negative, and neutral perceptions toward the method of using mobile apps in learning Arabic. As indicated earlier, the total number of participants in this study was 40. Not all of them responded to this question, as 2.5% (one student) left this question unanswered. The following question was asked to collect the QUAL data: "Based on your answer to question 10, please state the reason behind your teaching preference."

***RQ2-Survey Question 11 Analysis*.** Question 11 asks "Based on your answer to question 10, please state the reason behind your teaching preference." Question 11 was read several times and then coded for themes as they emerged. Once again, the common themes that emerged were "helpful," "fun," "flexibility," and "negative quality." The following sections report the results

and analyses:

Theme 1: Helpful. The first common theme that emerged from this section is "helpful." Words or phrases that were included in the category of "helpful" included: "it helps my understand of listening to the language," "beneficial," "very helpful in translating the Arabic language," "good to use mobile apps because it's a visual learning device," "easily make the mental and visual connection from the meaning to the Arabic written word," "extremely helpful," "useful in the classroom," "save class time," "look words and phrases up very quickly," "mobile applications better help with speaking difficult words," "comfortable," "easier in the online class," "having extra visuals from the apps when doing homework or studying helps more," "efficient," "helps with pronunciation outside the classroom," "very helpful when trying to communicate with Arabs," "apps helped to retain some of the information that we had done in class," and others. The theme of "helpful," which was mentioned by 47.5% (19 participants), was the dominant theme in this category. Mobile technology has been cited by several researchers as a helpful tool for language learning (Chen, & Tsai, 2009; Nguyen & Pham, 2011; Ogata et al., 2004; Yang & Chen, 2012; Cavus & Ibrahim, 2008; Osman & Chung, 2010).

Theme 2: Fun. The use of mobile apps technology makes learning fun, effective, and collaborative (Khaddage, Lattemann, & Bray, 2011; Shockoe, 2014). "Fun" was the second theme that emerged in this section. Words and phrases used included: "variety is the spice of life," "more interactive," "makes it interesting," and others. In this category, the theme of "fun" was only mentioned by 10% (four participants).

Theme 3: Flexibility. Mobile technologies can be used at any time and from any place. They are flexible and convenient for learners to use outside the classroom practices and to facilitate remote participation (Ally, Samaka, Ismail, and Impagliazzo, 2013; Huang et al., 2012;

Barker et al., 2005; Kukulska-Hulme, 2006; Miangah & Nezarat, 2012; Godwin-Jones, 2008). "Flexibility" was the third theme that emerged in this section. The words and phrases, used by the students included: "apps allow me to work at my own pace," "a matter of accessibility of information," "able to access the lesson info at home," "applications can be utilized at anytime," "allowed me to further study Arabic outside the classroom," "gives me something more beyond classroom to refer to," "learn and practice Arabic anywhere outside of class," and others. In this category, the theme of "flexibility" was mentioned by 17.5% (seven participants).

Theme 4: Negative Quality. "Negative quality" was the fourth theme that emerged in this section. Mobile devices can be used to improve the quality of learning (Mitra, 2011). The elements of quality of learning experience include satisfaction, engagement, positive effect, enjoyment, concentration, and motivation with cooperative learning activities (Shengmei, 2014). Wang (2014) conducted a study about the "collaboration factors and quality of learning experience on interactive mobile assisted social learning." In his study, Wang found statistically significant results demonstrating that the students liked the use of mobile apps to share information. Moreover, Kukulska-Hulme (2005) said that "mobile learning is now moving beyond short-term, small-scale pilot projects and is ready to tackle issues of scale, sustainability, accessibility, evaluation, cost effectiveness and quality in the mainstream of education and training" (pp. 3-4). Despite these studies, some of the students in this study shared negative perceptions toward the use of mobile apps in learning Arabic. Words and phrases used included: "apps can be utilized by students themselves," "takes away from the teacher to student interaction," "bought a book that had drills for both writing and listening," "more in control," "poor quality stream," "study out of a book than technical devices," "lack of consistency, practice, or rules," "did not provide sufficient phrases and words," and others. In this category,

the theme of "negative quality" was mentioned by 22.5% (nine participants).

***RQ2-Survey Question 11: Students' Selected Quotes*.** Although the majority of students preferred the method of using mobile apps technology in learning Arabic, there were a range of positive, negative, and neutral responses, which were detected from RQ2 qualitative data. These responses were reported based on the students' perceptions toward the method they liked or disliked. To exemplify these positive, negative, and neutral responses, participants' responses were quoted from the QUAL data.

Students' Positive Quotes. Both online and on-ground students shared their positive learning experience of how apps helped them to work at their own pace at any time from anywhere without needing to be around other people. The apps also helped the students with improving their pronunciation and speaking proficiency, as they could play the apps and listen to the words and phrases as many times as they wanted to. The following were quoted to illustrate the students' positive learning experience:

One on-ground participant, for example, said:

> Apps allow me to work at my own pace and not have to interact with people while I learn as I get very anxious and embarrassed if I say something incorrectly around other people. Using apps outside of class allows me to remain calm as I learn. (GP2: SQ11, 2014)

Another on-ground participant who had also a positive learning experience said:

> When we incorporated apps into the lessons, I was able to access the lesson info at home by using the app and so it was easier to study. It was also helpful to listen to the recordings and help my pronunciation with the apps we used. (GP9: SQ11, 2014)

One more on-ground student shared the flexibility of using mobile apps from anywhere by saying:

> Using apps allows one to learn and practice Arabic anywhere outside of class,

> connecting what we learn in class to our own practice and study. (GP39: SQ11, 2014)

An online participant, who also preferred the method of using mobile apps in learning Arabic, said:

> Apps give you another way to learn outside of the classroom. They also help if you were not able to understand how an Arabic word was pronounced in class, you can listen to the word again in an app and learn how pronounce it. There are many apps to help learn Arabic so it's just nice having that option to learn about the apps and learn from them as well. (OP12: SQ11, 2014)

Another positive statement from an online participant was:

> It was an interesting change to use the mobile apps during class. It allowed me to hear the Arabic language spoken by another person besides my professor; this person would sometimes have different pronunciation. Also, the apps presented scenarios where I could hear conversations and connect the Arabic words and phrases to real conversations. (GP19: SQ11, 2014)

Students' Negative Quotes. Although apps were useful and helpful for most of the participants, they were not for a few others. The results revealed that the negative responses came from only the students who were studying Arabic online. These negative responses, then, were probably due to the difficulty that those a few students faced in finding other classmates to interact with and to complete the speaking scenarios beyond the classroom. Some students felt that they were controlled and lacked the interaction with their instructor and peers. A few others found that some apps were loud and difficult to access. Therefore, they were not in favor of the method of using mobile apps technology in learning Arabic. One student, for example, said:

> Using apps I feel like it takes away from the teacher to student interaction. I feel students go to class to learn things that they can't learn on their own and I think apps hinder that. (OP11: SQ11, 2014)

Another student also expressed his/her negative learning experience and said:

> With the apps I feel a little more in control of what I learn and it solidifies what I'm learning. (OP26: SQ11, 2014)

Another student shared the weaknesses of some apps by saying:

> The apps presented in class have each their own strong points. The problem is the lack of consistency, practice, or rules. Other apps are loud and obnoxious which makes using them frustrating. Finally some apps are only available on apple, Android, or windows based OS which creates problems with accessibility. (GP31: SQ11, 2014)

Students' Neutral Quotes. As for the neutral responses, there were also a few participants who liked the method of using mobile apps in learning Arabic in some ways and disliked them in others. Some students believed that apps were helpful and a good supplemental tool, but they could be used only beyond the classroom. Others just had a personal preference of disliking apps, as they were less comfortable with using technology. The following remarks were quoted to illustrate the students' neutral learning experience:

One online participant, for example, said:

> Since the apps can be utilized by students themselves, it would be more beneficial to use the time in class to go over things that the apps may not cover or to provide supplemental material to go along with the lesson being taught through the apps, using the app as more of a secondary tool than primary. (OP20: SQ11, 2014)

Another online student said:

> I tend to be technology-shy and am less comfortable with apps in general. This is merely a personal preference, but I can see the benefit that apps would have for someone who is comfortable using them. (OP24: SQ11, 2014)

RQ2 Summary. Both QUAN and QUAL data were used to answer RQ2. The QUAN analysis showed that 17.5% (seven participants) did not prefer the use of mobile apps method in learning Arabic. However, 80.0% (32 participants) preferred it and expressed interest in continuing to use them. The missing data consisted of only 2.5% because one participant did not answer this question. The Fisher's Exact Test results also detected that there were statistically significant results between the method of using mobile apps preference and the variables "Why are you studying Arabic" and "Arabic class format." This statistically significant result indicated

that there was a relation between the class formats (online or on-ground) and the reason for studying Arabic. A few online students did not like the method of MALL apps when learning Arabic, but all the on-ground students liked it.

As for the QUAL analysis, the results showed that four common themes emerged from the students' responses. Those themes were "helpful," "fun," "flexibility," and "negative quality." There was also a range of positive, negative, and neutral responses toward the use of mobile apps as a supplemental tool in learning Arabic. Most students liked the use of mobile apps in learning because they were useful, fun to use, helpful, user-friendly, affordable, and accessible. In describing the mobile apps method and how a variety of learning techniques could be useful, one student, for example, said that "variety is the spice of life." This shows that QUAL data completes the QUAN data. It explains the positive results from the QUAN data. Both QUAL and QUAN data supported the method of using MALL apps in learning Arabic.

Answering RQ3:

To address RQ3, "In what ways do the homework assignments using MALL apps assist the students' learning about the Arabic language and culture?", the following questions were used: "In what ways did the use of mobile apps help you to learn more about Arabic language and culture?," "Did you find the homework assignments using mobile apps assisted you in learning Arabic language and culture? Why or why not?," and "Any additional comments you would like to share with the researcher about the use of mobile apps in learning Arabic language and culture."

QUAL data were collected to answer RQ3. The researcher read the students' responses multiple times and extracted common words and phrase. The researcher grouped these words and phrases in common themes. These emerged themes shared the participants' learning experience

toward the use of mobile apps in learning Arabic language and culture. The researcher also selected participants' quotes to support answering this research question. The themes and the selected quotes are reported in the following sections.

RQ3: Qualitative Data Analysis. The researcher used Creswell's (2013) strategies in analyzing the qualitative data of students' shared learning experience. Q13, Q14, and Q15 below were used to measure RQ3 as follows:

RQ3-Survey Question 13 Analysis. Question 13 asks, "In what ways did the use of mobile apps help you to learn more about Arabic language and culture?" Question 13 was read several times and then coded for themes. The emerged common themes were "helpful," "fun," "flexibility," and "negative quality." The total participants who answered this question were only 95.00% (38 participants). The missing data included 5.00% (two students) who did not answer this question. The results and analyses will be reported in detail in the following sections.

Theme 1: Helpful. The first common theme that emerged from this section is "helpful." Words and phrases included in the "helpful" category were: "it has helped me acquire listening skills," "it definitely helped me in pronunciation," "the apps helped me translate, properly speak the language," "it allowed me to hear the phrases contextually," "I learned more about the Qu'ran and interpretation," "I gained more culture knowledge," "I used apps to help me learn the Arabic alphabet," "useful for remembering vocab words," "easier to understand," "taught me about Arab proverbs and culture," "the apps help me with dialogue between two people," "familiarization of speech with music," "the apps just provided me a reliable way to study," "exposing me to aspects of the culture," "they give good repetition for vocabulary review and pronunciation," "they helped most by providing audio so that one can hear Arabic more often," "it almost put me in an Arabic interpersonal communication scenario," and others. The theme

"helpful," which was mentioned by 72.5% (29 participants), was the central theme in this category. Researchers, such as Chen, & Tsai (2009), Nguyen & Pham (2011), Ogata et al. (2004), Yang & Chen (2012), Cavus & Ibrahim (2008), and Osman & Chung (2010), all cited language learning via mobile technologies as being helpful.

Theme 2: Fun. The use of mobile apps technology makes learning fun, efficient, and collaborative (Khaddage, Lattemann, & Bray, 2011; Shockoe, 2014; Steel, 2012; Rossing et al., 2012). "Fun" was the second theme emerged in this section. For this theme, the participants used words and phrases, such as "fun" and "easy to follow." In this category, the theme of "fun" was only mentioned by 5.00% (two participants).

Theme 3: Flexibility. Mobile technologies have the advantage of being flexible and convenient for learners, as they can facilitate remote participation beyond the classroom (Ally, Samaka, Ismail, and Impagliazzo, 2013; Huang et al., 2012; Barker et al., 2005; Kukulska-Hulme, 2006; Miangah & Nezarat, 2012; Godwin-Jones, 2008). "Flexibility" was the third theme that emerged in this section. Words and phrases used included "work at my own pace," "it gave me the ability to have an instructor like persona with me at all times," "in my free time I can look through phrases that I would like to know and learn them out of the classroom," and "provided me a reliable way to study." In this category, the theme of "flexibility" was mentioned by 10% (four participants).

Theme 4: Negative Quality. "Negative quality" was the fourth theme that emerged in this section. As mentioned earlier, the elements of quality of learning experience include satisfaction, engagement, positive effect, enjoyment, concentration, and motivation with cooperative learning activities (Shengmei, 2014). Mobile devices can be used to improve the quality of learning (Mitra, 2011). Researchers, such as Wang (2014) and Kukulska-Hulme (2005), conducted

studies on the quality of mobile technology in education, and their research results proved to be positive. Despite these studies that emphasized the positive quality of using of mobile apps in learning, the researcher in the current study focused on the negative aspect of quality in this category. He shared the negative quality of using mobile apps in learning based on the students' learning experience. Words and phrases used included: "did not appreciate the apps," "not positive," and "they don't focus on culture much." In this category, the theme of "negative quality" was mentioned by 7.5% (three participants).

RQ3-Survey Question 13: Students' Selected Quotes. The researcher gave the participants assignments to complete using mobile technology. He asked them to share their learning experience regarding whether they felt mobile apps to be helpful when learning more about Arabic language and culture. The results revealed that there were several positive responses, a few negative responses, and a few others that were neutral. The researcher also shared participants' quotes, which were selected from the QUAL data to support in answering RQ3.

Students' Positive Quotes. Both online and on-ground students shared their positive experience toward the use of mobile apps in learning Arabic language and culture. The students stated that the apps helped them to learn about Arabic dialects and different cultural aspects. The following responses were quoted to illustrate the students' positive learning experience:

One on-ground participant, for example, said:

> The explanations included in the dialogue sections were very informative and prompted our teacher to explain more about them in class. It also allowed me to try again if I said something incorrectly and work at my own pace. (GP2: SQ13, 2014)

Another on-ground participant who had also a positive learning experience said:

> It helps me to pronounce the words correctly and the different types of dialects

> there are in the Arabic Language. There are different cultural apps where you can learn different Arabic recipes which is interesting. (GP6: SQ13, 2014)

Another positive response from an on-ground student was:

> I gained more culture knowledge through apps that used conversation-based lessons because they formulated conversations as native speakers would. (GP9: SQ13, 2014)

One more student who was studying Arabic on-ground reported that the mobile apps method helped him with learning Arabic language and culture. Therefore, he/she said:

> The mobile apps helped me understand the Arabic language in many ways. Some apps helped with learning more about the culture, while most worked on developing reading and listening skills which was really helpful. (GP32: SQ13, 2014)

An online participant who also liked the mobile apps method said:

> The apps have helped me pronounce certain words, especially when they say them slower the second time around. It has also taught me different aspects of the culture that I did not know beforehand. (OP21: SQ13, 2014)

Another online participant said:

> The apps introduced in class offered a lot of additional vocabulary and useful phrases which are key to learning a foreign language. (OP22: SQ13, 2014)

One more online student who also preferred the method of using mobile apps in learning Arabic said:

> The apps just provided me a reliable way to study. I always have my phone with me, a mobile app is so much more simple. (OP24: SQ13, 2014)

Students' Negative Quotes. Based on the participants' learning experience, there were also a few negative perceptions about the use of mobile apps technology in learning Arabic language and culture. One on-ground participant just said "not positive," but this student did not explain why his/her learning experience was not positive. Another participant who was studying Arabic online shared his negative learning experience and said:

> YouTube as an app helps a lot, and is very informational. It has videos of people who are from Arab culture teaching you, along with comments that can direct you to other videos that may interest you. For learning my letters, I did not appreciate the apps, because the way of writing some of the characters was different from either the professor, or the book. (OP15: SQ13, 2014)

Perhaps this student did not understand that the main purpose of using mobile apps was as an additional source of learning and not just a source to be used by itself for learning a foreign language. YouTube, mobile apps, and any other technology tool are all useful supplemental resources for learning.

Students' Neutral Quotes. As for the neutral responses, there were participants who reported that apps helped them in learning Arabic language and culture in one way or another. A few students indicated that the apps helped them with learning new words and phrases. Others indicated that apps assisted them with pronunciation but that the apps did not add much to what the students had already learned about language and culture in the traditional method. Some participants said that apps did not provide much information about culture. The following remarks were quoted to illustrate the students' neutral learning experiences:

An online student said:

> The apps didn't so much help me learn about the culture but they did help with the language. If I didn't get something in class, I could get on an app and then practice with it and whatnot. (OP11: SQ13, 2014)

One on-ground participant said:

> It definitely helped me in pronunciation. Also giving many different ways to say different things. I do not necessary know if the apps enhanced my learning beyond what I would have accomplished with regular teaching methods but I do know that I learned different phrases and pronunciation. (GP3: SQ13, 2014)

Moreover, an on-ground student shared his/her neutral learning experience and perceptions about the use of mobile apps in learning Arabic language and cultural by saying:

> The apps definitely helped me learn and understand the Arabic language better,

> especially with pronunciation. However, the apps did not teach me much about the Arabic culture. (GP33: SQ13, 2014)

Another on-ground student said:

> This is the one thing lacking in most apps. They don't focus on culture much but they do focus on the language a lot which is good to learn the language not the culture. (GP31: SQ13, 2014)

Another neutral response was from a student who was also studying Arabic on-ground. The student said:

> The language apps were pretty solid, although I wish there were more lessons about verb usage rather than sample vocabulary words. As for culture, I would have liked to see more highlights of Arabic culture. (GP37: SQ13, 2014)

RQ3-Survey Question 14 Analysis. Question 14 asks, "Did you find the homework assignments using mobile apps assisted you in learning Arabic language and culture? Why or why not?" The researcher read the students' responses to question 14 in the survey several times. He then extracted words and phrases and coded them for themes as they emerged. Common themes included: "helpful," "flexibility," and "negative quality." The total number of participants who answered this question was only 92.5% (37 participants). The missing data consisted of 7.5% (three students) who did not answer this question. The results and analyses will be reported in detail in the following sections.

Theme 1: Helpful. Once again, "helpful" was the emerged theme from question 14. Words and phrases that were included in the category of "helpful" included: "helps with my pronunciation," "pushed me to work on my speaking abilities," "encouraged me to do more and to increase my learning," "they provided a trustworthy database," "it made the language seem more real and approachable to me," "learning phrases in the context of a situation or conversation helps in remembering," "apps assisted greatly with homework," "apps assisted in learning and retaining the language," "broaden my vocabulary," "apps helped to generate

vocabulary," "useful," and others. The theme of "helpful," which was mentioned by 67.5% (27 participants), was the dominant theme in this category. Several different studies conducted by Chen, & Tsai (2009), Nguyen & Pham (2011), Ogata et al. (2004), Yang & Chen (2012), Cavus & Ibrahim (2008), and Osman & Chung (2010) revealed that the use of mobile learning system was helpful for language learning.

Theme 2: Flexibility. Mobile apps are very flexible and suitable tools for learners, as they can be accessed at any time from anywhere. They also make remote participation possible. They are convenient for outside the classroom's practices (Ally, Samaka, Ismail, and Impagliazzo, 2013; Huang et al., 2012; Barker et al., 2005; Kukulska-Hulme, 2006; Miangah & Nezarat, 2012; Godwin-Jones, 2008). "Flexibility" was the second theme that emerged in this section. Words and phrases used included: "right there with me," "it is like having a professor with you," and "apps got us to practice speaking outside the classroom." In this category, the theme of "flexibility" was mentioned by 7.5% (three participants).

Theme 3: Negative Quality. "Negative quality" was the third theme that emerged in this section. Mobile devices can be used to improve the quality of learning (Mitra, 2011). The quality of mobile apps is a very important factor for both educators and learners. The apps are useless if they are not useful for learning practices and classroom activities. The quality of mobile apps, whether good or bad, can be seen in the students' satisfaction, engagement, positive effect, enjoyment, concentration, and motivation with cooperative learning activities (Shengmei, 2014). Others studies, such as Wang (2014) and Kukulska-Hulme (2005), reported that learning via mobile devices moved beyond short-term and tackled quality issues in the industry of education and training.

Despite those studies that emphasized the quality of using mobile apps in learning, the

researched focused on sharing the participants' negative learning experience. Words and phrases used included "I am not sure about this," "apps were somewhat inconsequential to the overall learning of the class," "least satisfactory," "I wish the activities that the apps presented were more interactive," and others. In this category, the theme of "negative quality" was mentioned by seven or 17.5% participants.

RQ3-Survey Question 14: Students' Selected Quotes. Similar to question 13, analysis of question 14 revealed that there were several positive responses, a very few negative responses, and a few others that were neutral. Additionally, the researcher shared below a few quotes from participants, which were selected from the QUAL data to support in answering RQ3 and to report the positive, negative, and neutral responses.

Students' Positive Quotes. The majority of online and on-ground students had a positive learning experience in using mobile apps in completing their homework assignments. Some students reported that the apps encouraged them to practice more beyond the classroom. Others reported that the apps were reliable sources to depend on in completing the required assignments. Others stated that the apps' audio and video features were useful for more repetition, which helped them to improve their pronunciation and speaking proficiency. The following statements were quoted to demonstrate the students' positive learning experience:

One on-ground participant, for example, said:

> Outside the classroom it is sometimes hard to do self study, so having apps as a means to facilitate that encouraged me to do more and to increase my learning in both areas. (GP3: SQ14, 2014)

Another on-ground participant who had also a positive learning experience said:

> The mobile apps assisted me in completing homework assignments in that they provided a trustworthy database from which to reference. (GP5: SQ14, 2014)

Another positive response from an on-ground student was:

> I found the mobile applications very useful because the device allowed me to hear the correct pronunciation as much as needed. I used to have to search through web page after web page to find a credible link with an audio feature. (GP28: SQ14, 2014)

One more student who was also studying Arabic on-ground reported that the homework assignments were helpful for language learning. The student stated:

> I did find the homework assignments helpful especially the ones that quizzed you on the vocabulary after you learned it. The reinforcement and repetition was great and something I liked a lot. (GP30: SQ14, 2014)

The learning experience for the online students was no different from the on-ground students. The online students reported that they liked the method of using mobile apps in learning. They also reported that the homework assignments were useful in learning more about the language and culture. One online participant, for example, said:

> The assignments using the apps helped to generate vocabulary through dialogue in a question and answer format. This opened the opportunity for speaking and interpretive listening which is very helpful in learning Arabic. (OP21: SQ14, 2014)

One more online student said:

> With the repetition of conversation that we had learned in class, I was able to remember bits of the video, and what it meant by re-recording it after class, so that aspect is great. So in this way homework assignments using apps assisted in learning and retaining the language. (OP14: SQ14, 2014)

Students' Negative Quotes. Based on the participants' learning experience, there were also a few negative perceptions toward the homework assignments' completion via mobile apps. One online participant, for instance, said:

> Unfortunately, I was not a fun of this method. I have found group project the least satisfactory. It's difficult to coordinate time to meet with group partners often. (GP37: SQ14, 2014)

Students' Neutral Quotes. As for the neutral responses, there were also a few participants who thought that the homework assignments were helpful in some ways and not helpful in others

when learning about the Arabic language and culture. The following remarks were quoted to illustrate the students' neutral learning experience:

One online participant, for example, said:

> Sort of. For the most part I thought the homework using the apps were just a recitation of what we already went over. (OP10: SQ14, 2014)

Another online student said that he/she felt that the apps helped only "mildly, I think they would have been better used if I looked at the more often." Moreover, one on-ground student shared his/her learning experience and perceptions. The student said:

> Yes and no. I got the gist of communicating with others in a controlled environment, but I wish the activities that the apps presented were more interactive. (GP36: SQ14, 2014)

RQ3-Survey Question 15 Analysis. Question 15 asks, "Any additional comments you would like to share with the researcher about the use of mobile apps in learning Arabic language and culture." Responses to question 15 were also read several times and then coded for themes as they emerged. As was the case with the survey questions Q11, Q12, Q13, and Q14, the emerged common themes were "helpful," "fun," "flexibility," and "negative quality." The total participants who responded to this question were only 92.5% (37 participants). The missing data consisted of only 7.5% (three students) who left the question unanswered. Seven participants or 17.5% did not give any other suggestions or comments when they answered this question. They just simply said either not applicable "N/A" or "no." The results and analyses will be reported in detail in the following sections.

Theme 1: Helpful. The use of technology and mobile learning system are often cited as helpful for language learning (Chen, & Tsai, 2009; Nguyen & Pham, 2011; Ogata et al., 2004; Yang & Chen, 2012; Cavus & Ibrahim, 2008; Osman & Chung, 2010). The first common theme that emerged from this section was "helpful." Words and phrases that were included in the

category of "helpful" included: "it helps me practice at home, especially with listening skills," "helpful," "beneficial," "assist in language learning," "help students to retain information," "very useful tool," "apps are a great tool to learn the Arabic language," "a good supplemental resource," "essential," and others. The theme "helpful," which was mentioned by 45.00% (18 participants), was the main theme in this category.

Theme 2: Fun. Researchers, such as Khaddage et al. (2011), Shockoe (2014), Steel (2012), and Rossing et al. (2012), claimed that the use of mobile apps technology makes learning fun, valuable, and collaborative. "Fun" was the second theme that emerged in this section. Words and phrases used included: "apps are cheap and a nice way to learn," "creative and fun way to learn," and "I enjoy using mobile apps." In this category, the theme of "fun" was only mentioned by 7.5% (three participants).

Theme 3: Flexibility. Mobile technologies are portable. This means that they can be taken anywhere very easily due to their light weight and small size. They can also be used at anytime as they are flexible and convenient tools for their users. They are also handy to facilitate remote learning and to be used outside the classroom practices (Ally, Samaka, Ismail, and Impagliazzo, 2013; Huang et al., 2012; Barker et al., 2005; Kukulska-Hulme, 2006; Miangah & Nezarat, 2012; Godwin-Jones, 2008). "Flexibility" was the third theme that emerged in this part. Words and phrases used included: "apps should be used for outside independent study" and "apps provide an extra professor for each student at anytime." In this category, the theme of "flexibility" was mentioned by 5.00% (two participants).

Theme 4: Negative Quality. "Negative quality" was the fourth theme that emerged in this section. Mobile devices can be used to improve the quality of learning (Mitra, 2011). The quality of mobile apps is either good or bad. Literature showed that mobile learning was effective and

satisfactory for most learners and educators (Shengmei, 2014; Wang, 2014; Kukulska-Hulme, 2005). However, the researcher wanted to share the theme of the negative quality of mobile technology in this section, as the positive quality was explained in the "helpful," "fun," and "flexibility" themes. Words and phrases used included: "not all students have easy access to a mobile device or tablet," "find two or three which you think would really stick with students," "one of the apps we used with songs didn't seem as helpful," "perhaps try apps that work on android or even just in the browser as well," "there needs to be more culture apps," "provide anytime anywhere assistance," and "struggled to access the apps." In this category, the theme of "negative quality" was mentioned by seven or 17.5% participants.

RQ3-Survey Question 15: Students' Selected Quotes. Additionally, the results from the qualitative data revealed that the responses received from both the online and in-class participants were mostly positive. The researcher did not see much difference between the two groups' perceptions. For the most part, the participants from both groups preferred the method of using mobile apps in learning Arabic. The apps helped them with language learning and obtaining more knowledge about culture. The researcher noticed that there were several positive responses, a very few negative responses, and a few others that were neutral. The majority of students were in favor of the mobile apps method. The researcher shared below participants' quotes to depict the positive, negative, and neutral responses.

Students' Positive Quotes. The students' positive perceptions included that the apps helped them with their listening skills. Some of the students responded positively about the fact that the apps could also be accessed from home. Other students recommended the apps to other language instructors, as they were very helpful.

As for the positive perceptions, one in-class participant, for example, said:

> I like the use of apps in addition to learning the traditional way. It helps me practice at home, especially with listening skills and being able to pronounce the words in Arabic. (GP1: SQ15, 2014)

Another student who was studying Arabic on-ground reported that the mobile apps method helped him/her with learning Arabic language and culture. The student said:

> Using mobile apps is essential to my comprehension of the Arabic language and culture. This method of learning is great in today's society and culture. (GP33: SQ15, 2014)

An online participant who also had a positive learning experience said:

> I think that using the apps to assist in learning a language is something that instructors in all language departments should look into to help their students. (OP12: SQ15, 2014)

Another online participant who also liked the mobile apps method said:

> I've really enjoyed learning about the apps and they have been really helpful to my learning. I probably would not have thought to download any if we were not told about them in class. (OP11: SQ15, 2014)

Likewise, another online participant said:

> I think it is a very useful tool. I had never used apps before so I was a little doubtful about their help. However, I was pleasantly surprised at their ability to help me and further my learning Arabic. I do think that over time, mobile apps will help me become more familiar with the language and better able to speak and apply it to my life. (OP16: SQ15, 2014)

One more online student who preferred the method of using mobile apps in learning Arabic language and culture said:

> Applications are a good supplemental resource to have, especially in an online class. I feel that all online language courses should have applications that the students can download to better assist them with phrases and culture. (OP20: SQ15, 2014)

Students' Negative Quotes. There are many apps available in the app store for learning Arabic. However, some of these apps are just for children, others for only adult students, and others could be used for both. However, it is still the person's preference of what app he/she

likes or dislikes. Based on their real learning experience, the participants in the current study shared their thoughts about the apps they used in-class and out-of-class. Some did not like the songs or the sounds in the apps that were associated with the learning activities. Others reported the possible issue of not being able to access the apps easily. Below are samples of students' quotes to show their perceptions toward the use of mobile apps in learning Arabic language and culture.

One an on-ground participant, for example, said:

> One of the apps we used with songs didn't seem as helpful as others because it seemed that the app was geared more towards small children. I think apps geared towards students and adults will be best for university students. (GP9: SQ15, 2014)

Another participant who was studying Arabic online shared his/her learning experience by saying:

> Mobile apps are cheap and a nice way to learn but there's always the danger that an app won't be accessible to a certain kind of phone which could really be detrimental for the progress of the student. (OP23: SQ15, 2014)

Students' Neutral Quotes. As for the neutral responses, the participants shared their comments about the method of using mobile apps in learning. Some of them recommended the use of apps along with the text. This is a good suggestion that the language texts' authors may consider, to design apps to cover different activities in the textbooks. Others reported that the apps were useful, but they could only be used beyond the classroom. Of these neutral perceptions, some students declared the necessity to have more apps that focus on culture or developing writing skills. The following quotes were selected to depict the students' neutral perceptions.

One online participant, for example, said:

> In addition to the mobile apps, do not forget that you have a base book that has

> drills and assignments that will also help student retain information. So use both of them. Homework should be given out in every class period, and reviewed in the next. Using mobile apps is not a catch all, and students will not learn the basics better because of it. Use both forms of technology; don't neglect one for the other. (OP14: SQ15, 2014)

Moreover, a few on-ground students shared their neutral learning experience and perceptions toward the use of mobile technology in learning Arabic language and culture. Thus, one of the participants said:

> My personal opinion is that mobile apps should be used for outside independent study and not as much in-class. The professor should require homework or other such things to be used through apps but apps should not be an in-class teaching mechanism. (GP3: SQ15, 2014)

Another on-ground participant claimed that:

> There needs to be more culture apps a long with an app that allows you to create a dialogue with it so you can react to it and hear it yourself speak. In addition to this, there needs to be an app where you can practice your writing within the app. (OP29: SQ15, 2014)

RQ3 Summary. The QUAL analysis showed that the online and on-ground students were almost the same in their responses. The majority of the participants from both formats preferred the method of using mobile apps in learning Arabic. Most of the participants preferred the use of the speaking scenarios inside and beyond the classroom, as it gave them the opportunity to practice the language and improve their speaking proficiency and expand their cultural knowledge.

Additionally, several common themes emerged from their responses. These themes were "helpful," "fun," "flexibility," and "negative quality." Most of the participants reported that apps were very helpful and that they were useful tools for language learning. They also indicated that the apps were user-friendly, interesting, and fun to use. They were also convenient for learners, as the students were able to use their mobile devices anywhere at any time. Students had the ability to work with their classmates inside and outside the classroom. The apps helped them to

improve their speaking and listening skills. Culture aspects were also present in the learning activities via mobile learning. However, the participants also shared their negative learning experience toward the mobile learning. Negative perceptions were often due to the difficulty of interaction between students beyond the classroom or the difficulty of accessing the apps. Therefore, there was a range of positive, negative, and neutral perception in the students' responses toward the use of mobile apps as a supplemental tool in learning Arabic and culture.

Chapter 4: Summary of Analysis and Findings

This chapter covers the analysis of QUAN and QUAL data. The findings were exciting. The majority of the participants, whether online or on-ground, liked the method of using MALL apps when learning Arabic. Thus, the mobile learning method could be recommended for other instructors and learners who are interested in the Arabic language and culture. This chapter answers all three main research questions and all four sub-questions. Frequencies, one-way ANOVA, and Fisher's Exact Test were used to measure the QUAN data. Common themes emerged and students' quotes were selected to answer the QUAL research questions. These themes were "helpful," "fun," "flexibility," and "negative quality." The results suggested that most of the students' learning experiences were positive.

The results also revealed that the high number of students' perceptions was positive. MALL apps were helpful, interesting, accessible, enjoyable, fun, convenient, useful, user-friendly, and affordable. Because of these advantages, the participants shared their desire to continue using MALL apps in learning Arabic. The majority of their responses were between strongly agree and agree about the use of MALL apps in learning Arabic.

With regard to the 5Cs, the results showed that MALL apps helped the participants to improve their communication, to compare their own native language and culture with Arabic

language and culture, and to connect them with their, in-class and beyond the classroom, community.

In the next chapter, the researcher presents a relation of the findings to previous research, followed by limitations of the study, and then ends with the concluding remarks and recommendations for further research.

CHAPTER 5: DISCUSSION

The contribution of this study is to understand how students use mobile apps to support their Arabic learning. Today, many students are digital natives, and they use their smart devices very frequently (Parton, 2014). Mobile language learning is becoming a vital part of higher education because of the wider availability of mobile devices and the factor of "anywhere" and "anytime" learning (Bayyurt, Ercetin, & Karatas, 2014). Educators are concerned with "how to keep students interested in what they are learning" (Liu, Navarrete, Maradiegue, & Wivagg, 2014, p. 4). Thus, understanding students' perceptions will be the key to knowing how to keep them interested in the learning process.

This chapter summarizes the findings, notes the limitations of the study, and ends with conclusions and recommendations for further research. This chapter explains the meaning of the findings and integrates the results of the study with the literature. It also shares the researcher's teaching method and his point of view.

The Study Findings and Previous Research

This section summarizes the findings and also explains the meanings of these findings. It also clarifies how the study's results relate to previous research. Many students face several challenges when they learn Arabic. Although many learning techniques have been developed for several languages, such as English, Spanish, German, French, Chinese, and Japanese, Arabic has fewer techniques available for enhancing learners' communication abilities. Despite the availability of several language learning mobile apps to enhance communication in Arabic, the actual use of mobile assisted language learning (MALL) apps technology in teaching and learning Arabic inside and outside the classroom has not yet been examined by researchers. This research attempts to fill in the gap in the literature of using mobile apps technology to enhance

the learning of Arabic. Mobile learning will enhance the future of learning Arabic in the United States and other countries.

As stated earlier, the main goal of this study was to examine students' use of MALL apps technologies as supplemental tools to improve their Arabic learning and to identify their perceptions of the use of MALL apps in the learning of Arabic as a second language. The findings from both the quantitative (QUAN) and qualitative (QUAL) data were very interesting and positive. The majority of students preferred the use of MALL apps when learning Arabic. Obviously, the mobile apps technology is available to use at any time from anywhere. This is the primary advantage that motivated educators and learners to shift to using MALL instead of computer assisted language learning (CALL). Therefore, the mobile learning method could be recommended for other instructors and learners who are interested in the language and culture. In this study, the researcher collected the responses of 40 participants who were non-native speakers of Arabic to share their learning experience and perceptions of the use of mobile apps in learning Arabic. The participants represented a wide range of demographic factors, including ages, graduate and undergraduate status, online and on-campus students, students from three different schools, and students with varying purposes for studying Arabic.

The researcher believes that the use of the student-centered learning pedagogy and that giving students more speaking scenarios inside and outside the classroom will help educators and learners achieve their objectives. It will also help the student to acquire the language successfully. The use of mobile learning aids the students in communicating in the language with their fellow students or with native speakers. It also helps them to compare their own native language with the target language that they are learning. By implementing the mobile learning pedagogy, the instructor can create an environment where students are able to learn more about

other cultures and to connect with their instructors, classmates, and community members. Based on their age range and how often they used the apps, the participants reported that they were satisfied with the quality of the apps for learning Arabic. They had positive perceptions about the mobile apps' efficiency. They reported that the apps were fun to use in learning. This finding supports such studies as Khaddage et al. (2011), Shockoe (2014), Steel (2012), and Rossing et al. (2012), which all claim that the use of mobile apps technology makes learning fun, valuable, and collaborative.

Additionally, the majority of the participants, whether undergraduate or graduate, strongly agreed that MALL apps can be accessed from anywhere at any time. This finding demonstrates Kukulska-Hulme's (2006) point of view that mobile technologies have the advantage of anywhere and anytime. Students can access mobile apps to assist them with learning on the go or at home. The mobile apps function as a private tutor to assist the learners at any time from any place. When asked if mobile apps were useful in learning Arabic, the highest percentage of students' responses was between strongly agree and agree. These positive perceptions match with the literature (Almasri, 2013; Huang & Lin, 2007; Hung & Lin, 2007; Kallamarthodi & Vaithiyanathan, 2011; Kiernan & Aizawa, 2004). The findings also support the notion that mobile apps are user-friendly, which parallels previous mobile assisted language learning studies (Almasri, 2013; Gilgen, 2004). The findings were also consistent with previous research like Almasri (2013), Korkmaz (2010), and Shockoe (2014), which indicate that mobile technology is interesting to use when learning.

The researcher proposes that the students' ages play a vital role in the frequency of using the mobile apps in learning. The younger populations, the digital natives, like to use technology more often in their daily practices. This fact affects the learning pedagogy, as younger students

are more likely to utilize technology because they may see it as fun, but the older generations may find it not useful in learning. The researcher recommends that the selection and development of apps have to be based on the students' goals and ages. In addition, the factor "frequency of using the mobile apps" influenced the students' desire to continue using the mobile apps in learning Arabic. Students need to use the apps often to be helpful. In this respect, the finding of this data analysis corresponded to previous studies (DeWitt, Siraj, & Alias, 2014; Stockwell, 2013; Stockwell, 2007), which revealed that there was a correlation between frequency and mobile learning.

Moreover, the findings also showed that there were not many differences between the online and on-ground students' perceptions. However, online students did not get the cultural experience as the classroom students. The schools that offer Arabic online may have to add an Arab cultural class for the online students. The classroom students could see the instructor's facial and hand gestures more clearly than the online students did. Due to this fact, there were a few online students who reported that they were not in favor for the use of MALL apps in learning Arabic.

The students' responses, whether online and on-ground, were not completely different in themes. Most of the participants preferred the mobile apps method in learning. This finding is consistent with previous research that indicated that there were no significant differences in students' perceptions in either mode of study (Ali & Elfessi, 2004; Benson et al., 2005; Brown, 2002; McLaren, 2004; Stansfield et al., 2004; Ury et al., 2005). The students preferred the mobile learning method based on their reasons to study Arabic and their class mode, whether online or in-class.

As for the qualitative analysis, the findings showed that the majority of participants had

positive learning experiences. The common themes that emerged from the students' responses were "helpful," "fun," "flexibility," and "negative quality." In this respect, the finding of this data analysis corresponded to previous studies, which revealed that the use of mobile technology makes learning helpful, flexible, fun, valuable, effective, satisfactory and collaborative (Barker et al., 2005; Cavus & Ibrahim, 2008; Chen & Tsai, 2009; Godwin-Jones, 2008; Huang et al., 2012; Khaddage et al., 2011; Kukulska-Hulme, 2006; Miangah & Nezarat, 2012; Nguyen & Pham, 2011; Ogata et al., 2004; Osman & Chung, 2010; Rossing et al., 2012; Shockoe, 2014; Steel, 2012; Yang & Chen, 2012). Despite the students' positive experiences, there were a few students who had a negative learning experience, as well as a few others who had neutral learning experiences. The negative and neutral perceptions were due to the difficulty of interaction with others beyond the classroom or the difficulty of accessing the apps. There were only seven online students who did not like the method of using MALL apps in learning Arabic due to the difficulty they had in finding someone to work with beyond the classroom. The online students were impacted as they did not have the chance to meet their peers face-to-face. This made it hard for them to arrange with others in order to complete the speaking scenarios assignments beyond the classroom. The majority of the findings were between strongly agree and agree how MALL apps method was helpful, except with the interaction variable, which was between agree and neutral. Moreover, the reason those seven students, who were taking Arabic online, did not prefer the method of using MALL apps in learning Arabic was probably due to the misunderstanding that they had about the method. They probably thought this method would replace the instructor's role, but in fact it did not. The purpose of using MALL apps was as a supplemental tool to improve the methods of learning Arabic.

Pedagogical Implications of the Study

The computer is not the only technological tool that educators and learners may use to facilitate the process of learning; MALL apps technology can also be used to enhance the learning of any modern language.

Those who could benefit from the findings of this study are the educational administrators at institutions that offer instruction in Arabic, the instructors of Arabic, and the students who are learning Arabic in the United States. However, the ones who have the power to take action based on these findings are the instructors and administrators. Arabic teachers might find this study helpful as they seek to improve or modify the teaching methods they use in order to gain the best results in the learning process. The results of the study might also be of great value to communication software developers, apps programmers, mobile technology providers, and textbook writers. Business investors might also find this study helpful to guide their investments in the development of more mobile apps technologies for language learning purposes.

Students of Arabic can learn more quickly and effectively through the use of MALL. They attend Arabic classes for multiple reasons, such as an interest in the language and culture, in satisfying job or degree requirements, or for military, or religious reasons. However, they face a difficulty in being able to use the language properly, especially as they get to the advanced level. That makes them feel frustrated. Therefore, this study might provide some help in overcoming the frustration and strengthen the approach of teaching and learning Arabic. The use of MALL can enhance the students' speaking, reading, writing, and listening skills.

Arabic is crucial for Americans to learn as not many U.S. citizens can speak it or even understand the Arab culture. Literature shows that interest in the language has increased since

the 1990s and Arabic has since become one of the languages in demand. To the researcher's best knowledge and based on his teaching experiences at several U.S. universities, the traditional method used in teaching Arabic in most of the US universities is to use the textbook and the in-class technology, such as the computer, document camera, projector, etc. However, the use of the traditional method can cause many students to face challenges when trying to apply Arabic in real world situations. This problem is real and serious, as those students need a way to learn that fits their contemporary lifestyle. The researcher's mobile approach to teach Arabic via mobile devices is possible and feasible as he used it himself in his classes. It did not cost him or the students much. He used his own mobile technology (iPad and iPhone) in his classes, and most of the students (80%) reported that they liked learning by using apps and wanted to continue using them in future classes. The researcher tested the participants' speaking proficiency, and the results were very promising. The findings were about 62.5% superior, 10% advanced, 2.5% intermediate, 15% novice, and 10% did not report their scores.

The researcher is aware that instructors and learners may face challenges in how to implement the mobile method in-class and beyond the classroom. However, this study provided recommendations to overcome such challenges by providing practical ways to implement the mobile method for both online and on-ground classes (see Appendix H). Most students look for new methods to support their learning, but some instructors are not aware of possible technological enhancements. In addition, instructors have to be aware of what apps their students are using and learn how to use these apps. This dissertation provides an additional tool that the instructors and learners of Arabic can use to boost their learning. This dissertation demonstrates that the participants perceived the use of mobile methods positively in the learning of Arabic.

The researcher's recommendation is that school administrators and instructors of Arabic

need to look for other ways of teaching and implement the mobile learning in their education strategy. Instructors can provide different activities and diverse learning resources based on the students' learning needs regardless of their language acquisition level (Liu, Navarrete, Maradiegue, & Wivagg, 2014).

To sum up, the results of this study showed that the use of mobile apps technology serves as a positive additional supplemental tool in learning Arabic as a second language. The majority of participants perceived that MALL is helpful, fun, and flexible. Abdous et al. (2009) stated that MALL can lead to better learning if proper pedagogy was used. MALL can support the students with speaking, reading, writing, listening, and knowing more about culture. Over time, if the mobile method is used in an interesting way, it will ensure the students' desires to continue learning and achieve better results in learning.

Limitations of the Study

The number of participants who completed the questionnaire was 40 students. They were selected from three small universities in the state of Pennsylvania. The Arabic program in these three schools was not big enough to recruit more students. The students were recruited from Arabic 101 (one online class and one on-ground class) and Arabic 102 (one online class and one on-ground class). There were not students from the Advanced levels of Arabic. This small sample size made it hard for the researcher to look for more statistically significant results and generalize the study, or to run other statistics tests, such as the Chi-square test.

A mixed method approach was used to strengthen the study. This study was primarily a quantitative study, but it also included qualitative data due to the smaller number of participants. The mixed method approach assisted in determining comprehensive results from the findings.

Recommendations for Future Research

Several other studies could be generated from this research. These studies are summarized in the following paragraphs:

A researcher may study the teachers' perceptions on the use of mobile apps in learning Arabic as a second language. This study may include teachers of Arabic who teach in U.S. universities and overseas. It may cover such issues, as whether they have used mobile learning in their teaching and how they would implement that in or beyond their classrooms. The findings of such a study would be useful for the teachers who are specialized in the field of teaching foreign languages. Out of this recommended study about teachers' perceptions, two more studies could be conducted to focus only on teachers of Arabic in U.S. universities and another one on teachers of Arabic who teach overseas.

Another study could be conducted on the effectiveness of mobile assisted language learning (MALL) as a conversational tool in improving Arabic speaking proficiency. This study could include the use of the mobile learning approach for a semester and then compare the students' speaking performance score to measure how MALL was effective in improving the students' speaking abilities in Arabic.

Furthermore, a study could be conducted to collect the mobile app designers' perceptions of Arabic language learning and examine how they could improve their services for better apps designs that help students with their communication and learning needs.

Finally, a study could also be conducted to investigate the factors and elements that affect the students' perceptions toward the use of mobile learning in learning Arabic. These factors may include gender, work, race, and their technological background. The findings will help app designers to build high-quality apps based on the students' needs.

Conclusions

Mobile learning refers to the education that can be delivered through the use of mobile technologies. This type of education is flexible for educators and learners, as it can be accessed from anywhere at any time. Mobile apps are one of many technologies that can be designed for educational purposes. This technology is instantly accessible no matter the time or location. There are many MALL apps designed for learning Arabic. These apps include activities that focus on language learning and culture. Some apps have exercises or game play for interaction and practice. Mobile learning is ubiquitous and can be done by using different types of devices, such as smartphones, handheld PCs, tablets, iPads, iPods, and PDAs. Since several small and portable devices can be used for mobile learning, this learning is mobile and allows the teachers and learners to continue learning and interacting beyond the traditional classroom.

Although mobile learning is very convenient for faculty and students, there are challenges with the use of mobile devices in learning. These challenges include but are not limited to screen sizes and the expense of smartphones and data plans, which is excessive for some students. To overcome these challenges, schools may provide students with mobile devices and free apps to use for learning.

Mobile technologies and their uses are increasing very quickly. This growth will promote and encourage mobile learning. Quick access to data, wherever and whenever questions arise, will lead administrators, faculty, and learners to change their teaching and learning techniques.

This study adds new knowledge to the body of literature on mobile assisted language learning. It focuses on students' perceptions on the use of mobile apps technology in learning Arabic as a second language. It creates the first solid foundation to conduct further studies in order to better understand the problem and strengthen the methods of learning Arabic in the U.S.

Therefore, the results of the study ought to be of great value to communication software developers, apps programmers, mobile technology providers, school administrators, language educators, learners, and textbook writers. Arabic teachers might find this study helpful as they seek to improve or modify the teaching methods they use in order to gain the best results in the learning process. Business investors might also find this study helpful when decided to invest in and develop more mobile apps technologies for language learning purposes.

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APPENDIX A: DESCRIPTION OF THE STUDY AND CONSENT FORM

Dear Participants,

My name is Razak Abedalla, and I am currently enrolled in the Doctor of Science program in Information Systems and Communications at Robert Morris University. The aim of my research is to examine students' use of mobile assisted language learning (MALL) apps technologies as supplemental tools to improve their Arabic language learning (ALL), and to identify students' perceptions toward using mobile apps technologies in enhancing second language learning.

During the time of the study, the participants will have six sessions of Arabic instruction using the MALL apps technology. Part of the instruction will be the instructor giving the participants three communicative tasks to complete beyond the classroom setting. The participants will also be given a questionnaire (approximately 10 minutes) immediately after the six sessions to share their perceptions towards the use of MALL apps in enhancing the learning of Arabic language. All the information collected in this study will be kept confidential in my research discussions and the participants' names will be kept anonymous, and will not be identifiable in any way in the final research project. The participants' responses will be stored in a password protected file or under lock and key. The participants' responses will be used only for the purpose of the research and will not affect their grades in the Arabic class at all. This study has been approved by the IRB of Robert Morris University. The participants have the absolute rights to withdraw from the study at anytime without any reason. At the end of the study, the participants will have the opportunity to enter into a drawing for a $20 Starbucks gift card per class.

If you have any questions, please feel free to reach me at my contact information below or the Institutional Review Board (IRB) at Robert Morris University at 412-397-6227.

Thank you so much for your cooperation.

Researcher's Signature _____Date_____

Razak Abedalla
Doctoral Student and Researcher
Robert Morris University
razak.abedalla@gmail.com
Cell: 412-537-4812

Robert Morris University Institutional Review Board
Approval Date: 3/19/2014
Renewal Date: 4/8/2014
IRB Number: 140303

CONSENT TO ACT AS A PARTICIPANT IN A RESEARCH STUDY

TITLE: Students' Perceptions of the Use of Mobile Applications Technology in Learning Arabic as a Second Language

PRINCIPAL INVESTIGATOR: Razak Abedalla,
Robert Morris University
6001 University Blvd
Moon Township, PA 15108
(412)-537-4812

****

Consent Form

I have been informed that my participation in this study regarding "Students' Perceptions of the Use of Mobile Applications Technology in Learning Arabic as a Second Language" is completely voluntary, and that I have the right to withdraw from the study at anytime without any reason or consequences. I have also been informed that there are no foreseeable risks to me that are associated with participating in this research project. I understand that all of my responses will be kept confidential and will not be identifiable in any way in the final research project. I have been informed that responses will be stored in a password protected file or under lock and key. In addition, I have been made aware that the number of learning sessions will be six and I will fill out a questionnaire (approximately 10 minutes), complete the communicative tasks required only for the purpose of the study and they will not affect my grade in the Arabic course in any way.

I have been informed that the purpose of filling out the questionnaire, and completing the tasks required is simply to examine students' use of MALL apps technologies as supplemental tools to improve their Arabic language learning (ALL), and to identify the students' perceptions toward using mobile apps technologies in enhancing the learning of Arabic.

I understand that my responses for the questionnaire and tasks will only be used by the researcher and his advisor for the purpose of the research project and will not be distributed to anyone else. I have also been given the opportunity to ask questions about this process and have had my questions answered to my satisfaction. I have also been informed that I have the absolute rights to withdraw from the study at anytime without any reason. At the end of the study, I will have the opportunity to enter into a drawing for a $20 Starbucks gift card.

I have read the statement above and understand that by signing this form, I am agreeing to participate in this research project. I also agree to give my permission for the researcher to use my responses, tasks completion only for purpose of this research project.

_____
Participant Name (printed)

_____
Participant Signature

_____
Date

APPENDIX B: IRB APPROVAL AND ADDENDUM

M E M O R A N D U M

6001 University Boulevard
Moon Township, PA 15108-1189

412-397-3000 phone
www.rmu.edu

TO: Razak Abedalla
School of Communications and Information Systems

FROM: Frederick G. Kohun, Ph.D.
Chair, Institutional Review Board
Robert Morris University

DATE: March 19, 2014

SUBJECT: IRB #140303–**Students' Perceptions of the Use of Mobile Applications Technology in Second Language Learning**

The above-referenced protocol has been approved through an expedited review procedure by the Institutional Review Board. This protocol meets all the necessary requirements and is hereby designated as exempt under section 45 CFR 46.101 (b)(2). Expedited protocols are approved for a period of three years. If you wish to continue the research after that time, a new application must be submitted.

Approval Date: March 19, 2014
Expiration Date: March 18, 2017

Please know that this IRB will be closed in the IRB database after 3 years.

cc: Dr. Jamie Pinchot

/lpn

M E M O R A N D U M

6001 University Boulevard
Moon Township, PA 15108-1189

412-397-3000 phone
www.rmu.edu

TO: Razak Abedalla
School of Communications and Information Systems

FROM: Frederick G. Kohun, Ph.D.
Chair, Institutional Review Board
Robert Morris University

DATE: April 8, 2014

SUBJECT: **ADDENDUM TO IRB #140303–Students' Perceptions of the Use of Mobile Applications Technology in Second Language Learning**

The above-referenced addendum has been approved through a review procedure by the Institutional Review Board. This change to your research submitted on April 8, 2014 will be filed with your original application.

Approval Date: March 19, 2014
Addendum Date: **April 8, 2014**
Expiration Date: March 18, 2017

cc: Dr. Jamie Pinchot

/lpn

APPENDIX C: QUESTIONNAIRE

Survey of Students' Perceptions of the Use of Mobile Applications Technology in Learning Arabic as a Second Language

1) Select your age range

- ❍ 18 - 25
- ❍ 26 - 34
- ❍ 35 - 44
- ❍ 45 - 50
- ❍ 51 and up

2) How often did you use mobile apps for learning Arabic during the three weeks?

- ❍ Very frequently
- ❍ Frequently
- ❍ Occasionally
- ❍ Rarely
- ❍ Never

3) What is your native language?

- ❍ Arabic
- ❍ English
- ❍ Other (please specify) …….

4) Why are you studying Arabic?

- ❍ Required for degree graduation
- ❍ For job related purposes
- ❍ Interested in the language and culture
- ❍ Other (please specify) …….

5) Are you currently an undergraduate or graduate student?

- ❍ Undergraduate
- ❍ Graduate
- ❍ Other (please specify) ……..

6) Select your Arabic class level:

- ❍ Beginner (Arabic 101)
- ❍ High Beginner (Arabic 102)
- ❍ Intermediate (Arabic 201)
- ❍ High Intermediate (Arabic 202)
- ❍ Advanced (Arabic 301)
- ❍ High Advanced (Arabic 302)
- ❍ Other (please specify) ……..

7) Select your Arabic class format:

- ❍ On-ground (In-class)
- ❍ Online

8) What was your out-of-class communicative tasks final score (Task 3)?

- ❍ Superior (A)
- ❍ Advanced (B)
- ❍ Intermediate (C)
- ❍ Novice (D)
- ❍ Other (please specify) …….

9) Rate each statement below based on your experience using mobile apps for Arabic learning in class and outside of class:

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
I am satisfied with using mobile apps for Arabic learning	❑	❑	❑	❑	❑
Apps can be accessed at anywhere at anytime	❑	❑	❑	❑	❑
Apps provide sufficient Arabic words and phrases	❑	❑	❑	❑	❑
Apps are affordable	❑	❑	❑	❑	❑
Apps are useful in learning Arabic	❑	❑	❑	❑	❑
I have fun using apps	❑	❑	❑	❑	❑
Apps help me to interact with my peers in class and outside of class	❑	❑	❑	❑	❑
Apps are user-friendly	❑	❑	❑	❑	❑
Apps are interesting	❑	❑	❑	❑	❑
I very much enjoyed using the mobile apps in my Arabic class this semester.	❑	❑	❑	❑	❑
I will continue to use apps for Arabic learning even when the class ends	❑	❑	❑	❑	❑
Apps enhance my communication skills	❑	❑	❑	❑	❑
Apps help me to compare Arabic linguistics with my native language	❑	❑	❑	❑	❑
Using apps to learn Arabic helps me to connect with my peers and other majors of study	❑	❑	❑	❑	❑
Apps help me to use the language both within and beyond the class community	❑	❑	❑	❑	❑
Apps help me understand the Arabic culture	❑	❑	❑	❑	❑

10) Which method of teaching did you prefer?

- Instructor uses much Arabic & little English and all supplemental materials and tools, but without including the mobile apps
- Instructor uses much Arabic & little English and all supplemental materials and tools, but with including the mobile apps

11) Based on your answer to question 10, please state the reason behind your teaching preference:

12) As an online or on-ground student, what has been your learning experience towards the use of mobile apps in learning Arabic?

13) In what ways did the use of mobile apps help you to learn more about Arabic language and culture?

14) Did you find the homework assignments using mobile apps assisted you in learning Arabic language and culture? Why or why not?

15) Any additional comments you would like to share with the researcher about the use of mobile apps in learning Arabic language and culture:

Thank you for participating in this survey!

APPENDIX D: ILR RUBRIC FOR INITIAL AND FINAL ASSESSMENT

Using the ILR scale provided below, please check the appropriate box according to the student's language skills (Multilingual Solutions, 2014).

Levels of Listening Proficiency		
☐	**L-0**	• No Proficiency.
Survival Proficiency		
☐	**L-0+**	• Able to understand short phrases based on memorized material. Slightly longer phrases must be repeated and include frequent pauses to be understood.
Minimal Functional Proficiency		
☐	**1**	• Able to understand face-to face conversations concerning some familiar situations and many basic needs in a speech that is slow and clear., such as basic directions and instructions, simple statements about a person′s background, questions and answers about basic survival needs (meals, lodging, transportation, time) and about himself/herself, his/her job, and immediate family. • Repetition and slower speech are necessary for understanding.
Minimal Functional Proficiency, Plus		
☐	**L-1+**	• Able to understand short conversations about all survival needs and limited social demands; however, understanding of descriptions and the ability to give precise information is limited. • Developing flexibility evident in understanding a range of circumstances beyond immediate survival needs. • Understanding is largely limited to a series of short, discrete utterances and limited vocabulary necessitates repetitions for understanding.
Limited Functional Proficiency		
☐	**L-2**	• Able to understand most routine conversations spoken at a normal pace relating to social and occupational situations, and everyday topics, such as common personal and family news, and well-known and uncomplicated stories about current, past, and future events. • Able to understand spoken descriptions of different places, for instance geography of a country or location that is familiar. • Able to understand some details from announcements made over a loudspeaker and the main ideas and basic facts from a short news report on the radio or television. • Some difficulty understanding common structures and vocabulary remains; occasional repetition is still needed.
Limited Functional Proficiency, Plus		
☐	**L-2+**	• Able to understand most routine social demands and most conversations on work requirements as well as some discussions on concrete topics related to particular interests and special fields of competence. • Often shows remarkable ability and ease of understanding; however may display weakness or deficiency due to inadequate vocabulary base or less than secure knowledge of grammar and syntax. • Some ability to understand implications and detect emotional overtones.
General Functional Proficiency		
☐	**L-3**	• Able to understand almost all conversations spoken among native speakers at normal pace without repetitions, paraphrasing, or explanations. • Able to understand someone′s opinion, detect attitudes and feelings, and correctly infer meanings that are not

		directly stated. • Understands speech in a professional setting concerning his/her fields of expertise or some technical subjects such as lectures or panel discussions. • Readily understands phone conversations and broadcasts, but still experiences some difficulty with very fast speech, slang and cultural references.
General Functional Proficiency, Plus		
☐	**L-3+**	• Able to comprehend most of the content and intent of a variety of forms and styles of speech pertinent to professional needs, as well as general topics and social conversation. • Able to understand many sociolinguistic and cultural references; however, may miss some subtleties and nuances. • Increased ability to comprehend unusually complex structures in lengthy utterances, many distinctions in language tailored for different audiences and to understand native speakers talking quickly, using nonstandard dialect or slang; however, comprehension is not complete.
☐	**L-4**	• Able to understand almost all forms and styles of speech pertinent to professional needs that involves the use of extensive and precise vocabulary, including subtle distinctions between word choices. • Readily and accurately infer meanings and implications. • Increased ability to comprehend unusually complex structures in lengthy utterances, many distinctions in language tailored for different audiences and to understand native speakers talking quickly, using non-standard dialect or slang at public gatherings such as meetings seminars, task groups or conferences; however, comprehension is not complete.
Comments:		

Levels of Reading Proficiency		
☐	**R-0**	• No Proficiency.
Survival Proficiency		
☐	**R-0+**	• Able to recognize and identify all letters/elements/commonly occurring characters in the printed version of an alphabetic/syllable-based/character writing system. • Able to read some isolated words and phrases such as numbers, place names, and street or store signs, menus, advertisement (no connected prose).
Minimal Functional Proficiency		
☐	**R-1**	• Able to understand very simple connected printed material, short written descriptions of some familiar persons, places and things like those found in tourist pamphlets, and simple instructions such as straightforward street directions. • Able to get a main idea of short, frequently encountered materials and simple texts, such as personal notes, business advertisements, public announcements, invoices, maps, and charts.
Minimal Functional Proficiency, Plus		
☐	**R-1+**	• Able to understand simple discourse in printed form for informative social purposes such as announcements of public events, simple prose containing biographical information or narration of events, and straightforward newspaper headlines. • Able to get some main ideas, locate routine information of professional significance in more complex texts, and guess at unfamiliar vocabulary if highly contextualized; however may have to read materials several times for understanding. • Basic grammatical relations are often misinterpreted, and temporal reference may rely primarily on lexical items as time indicators.
Limited Functional Proficiency		
☐	**R-2**	• Able to understand with some misunderstanding straightforward familiar factual material, and descriptive or narrative writings such as news reports of events, simple biographic information, descriptions, standard business letters, and simple technical material written for the general reader. • Able to understand the main ideas of clearly organized short texts about familiar places, people, and current/past events. • Able to understand simple typed correspondence in familiar contexts, including descriptions of events, feelings, wishes, and future plans as well as the main ideas of authentic prose on familiar topics (due to work experience or interest).
Limited Functional Proficiency, Plus		
☐	**R-2+**	• Able to understand most factual material in non-technical prose and some discussions on concrete topics related to special professional interests. • Has a broad active reading vocabulary, is markedly more proficient at reading materials on a familiar topic, and is able to use linguistic context and real-world knowledge to make sensible guesses about unfamiliar material. • Able to get the gist of main and subsidiary ideas in texts which could only be read thoroughly by persons with much higher proficiencies. • Weaknesses include slowness, uncertainty, inability to discern nuance and/or intentionally disguised meaning.
General Functional Proficiency		
☐	**R-3**	• Able to read with almost complete comprehension a variety of prose material on familiar and unfamiliar topics. • Can typically understand news stories similar to wire service reports, routine correspondence, general reports, and technical material in the reader′s professional field. • Able to understand contemporary expository essays and recent literary prose, all materials in a major newspaper, "read between the lines" and understand meanings not directly stated in publications containing editorial or opinions. • Able to understand the author′s intent and follow the line of reasoning in texts that include hypothesis persuasion, supported opinion or argument for a position with little or no use of a dictionary.
General Functional Proficiency, Plus		

☐	**R-3+**	• Able to comprehend a variety of styles and forms pertinent to professional needs and rarely misinterprets such texts or rarely experiences difficulty relating ideas or making inferences. • Able to comprehend many sociolinguistic and cultural references; however, may miss some nuances and subtleties. • Able to comprehend a considerable range of intentionally complex structures, low frequency idioms, and uncommon connotative intentions, however, accuracy is not complete. • Able to read with facility, understand, and appreciate contemporary expository, technical or literary texts which do not rely heavily on slang and unusual items.
General Functional Proficiency, Plus		
☐	**R-4**	• Able to read fluently and accurately all styles and forms of the language pertinent to professional needs or personal interest without reference to a dictionary and understand long and complex analyses, factual reports, and literary texts. • Understands both the meaning and intent of most uses of idioms, cultural references, word play, sarcasm, and irony in even highly abstract and culturally "loaded" texts. • Able to understand language that has been especially adjusted for different situations, audiences or purposes, such as a political essay, humorous anecdote or joke, sermon, or inflammatory broadside, and can appreciate distinctions in style.
Comments:		

Levels of Speaking Proficiency		
☐	**S-0**	**No Proficiency.**
Survival Proficiency		
☐	**S-0+**	• Able to satisfy immediate needs such as lodging, meals and transportation, using memorized or rehearsed speech only. No fluency.
Minimal Functional Proficiency		
☐	**S-1**	• Able to satisfy minimum courtesy requirements and maintain very simple conversations on familiar or rehearsed topics. • Able to ask and answer simple questions about date and place of birth, nationality, marital status, occupation, etc. • Able to tell/ask someone for directions, order simple meals, arrange for a hotel room or taxi ride, purchase bus/train ticket, groceries, or clothing. • Experiences frequent misunderstandings. • Can exchange greetings, elicit predictable information and explain routine procedures in a restricted way.
Minimal Functional Proficiency, Plus		
☐	**S-1+**	• Able to initiate and maintain predictable face-to-face conversations and satisfy limited social demands; speech however largely consists of a series of short, discrete utterances. • The speaker at this level may hesitate, have to change subjects due to lack of language resources, and repeat utterances to be understood. • Range and control of the language are limited. Accuracy in basic grammatical relations is evident, although not consistent.
Limited Functional Proficiency		
☐	**S-2**	• Able to handle confidently, but not fluently, routine daily interactions limited in scope and most social conversations on such familiar topics as current events, work, family, etc. • Able to give brief autobiography (including immediate plans and hopes), detailed information about family, house, community. • Able to describe a familiar person or place, report facts recently seen on television news or read in the newspaper, and talk about a trip or other everyday event that happened in the recent past or will happen soon. • Able to describe present and most recent job or activity in some detail, ask and answer predictable questions in the workplace as well as receive and provide straightforward direction, and interview an employee, take care of details such as salary, qualifications, hours, and specific duties.
Limited Functional Proficiency, Plus		
☐	**S-2+**	• Able to satisfy most work requirements with language usage that is often, but not always, acceptable and effective. • Often shows a high degree of fluency and ease of speech, unless under pressure. • The individual can typically participate in most social, formal, and informal interactions, but limitations either in range of contexts, cultural/local references; types of tasks or level of accuracy hinder effectiveness. • He/she is generally strong in either structural precision or vocabulary, but not in both.
General Functional Proficiency		
☐	**S-3**	• Able to speak the language with sufficient fluency and accuracy to participate effectively in most formal and informal conversations on practical, social and professional topics, reliably elicit information and informed opinion from native speakers, and defend personal opinions. • Can typically discuss particular interests and special fields of competence with ease (i.e. able to use the language as part of normal professional duties such as responding to objections, clarifying points, justifying decisions, conducting meetings, delivering briefings, etc. • Able to use the language to speculate at length about abstract topics such as how some change in history or the course of human events would have affected his/her life or civilization. • Rarely unable to finish a sentence due to linguistic limitations; however, noticeable linguistic and cultural imperfections that limit the individual's ability to participate in more sophisticated interactions such as high-level negotiations exist (i.e. grammatically features not perfected).

General Functional Proficiency, Plus		
☐	**S-3+**	• Often able to use the language to satisfy professional needs in a wide range of sophisticated and demanding tasks. • Despite obvious strengths, may exhibit some hesitancy, uncertainty, effort or errors which limit the range of language-use.. • Occasional patterned errors occur in low frequency and highly-complex structures.
General Functional Proficiency, Plus		
☐	**S-4**	• Able to consistently use the language in a sophisticated and nuanced way to effectively communicate with great precision and eloquently represent a point of view other than his/her own. • Can carry out any job assignment as effectively as in his/her native language, naturally integrate appropriate cultural and historical references in his/her speech, and practically never make a grammatical mistake. • Able to lead the direction of a discussion and effectively persuade someone to take a course of action in a sensitive situation such as to improve his/her health, reverse a decision or establish a policy. • Able to prepare and give a lecture at a professional meeting about his/her area of specialization, debate complex aspects with others.
Comments:		

APPENDIX E: ACTFL PROFICIENCY ASSESSMENT GUIDELINES 2012

Proficiency Level*	Global Tasks and Functions	Context / *Content*	Accuracy	Text Type
Superior	Discuss topics extensively, support opinions and hypothesize. Deal with a linguistically unfamiliar situation.	Most formal and informal settings. *Wide range of general interest topics and some special fields of interest and expertise.*	No pattern of errors in basic structures. Errors virtually never interfere with communication or distract the native speaker from the message.	Extended discourse
Advanced	Narrate and describe in major time frames and deal effectively with an unanticipated complication.	Some informal settings and a limited number of transactional situations. *Predictable, familiar topics related to daily activities.*	Understood, with some repetition, by speakers accustomed to dealing with non-native speakers.	Paragraphs
Intermediate	Create with language, initiate, maintain, and bring to a close simple conversations by asking and responding to simple questions.	Some informal settings and a limited number of transactional situations. *Predictable, familiar topics related to daily activities.*	Understood, with some repetition, by speakers accustomed to dealing with non-native speakers.	Discrete sentences
Novice	Communicate minimally with formulaic and rote utterances, lists, and phrases	Most common informal settings. *Most common aspects of daily life.*	May be difficult to understand, even for speakers accustomed to dealing with non-natve speakers.	Individual words and phrases

Source (ACTFL, 2012)

APPENDIX F: ARABIC ALPHABET

Name	Transcription	Initial	Medial	Final	Isolated
Alif	Aa	ا	ـا ـأ	ـا ـأ	ا
Baa	B	بـ	ـبـ	ـب	ب
Taa	T	تـ	ـتـ	ـت	ت
Thaa	Th	ثـ	ـثـ	ـث	ث
Jim	J	جـ	ـجـ	ـج	ج
Haa	H	حـ	ـحـ	ـح	ح
Kha	Kh	خـ	ـخـ	ـخ	خ
Daal	D	د	ـد ـد	ـد ـد	د
Thaal	Th	ذ	ـذ ـذ	ـذ ـذ	ذ
Raa	R	ر	ـر ـر	ـر ـر	ر
Zai	Z	ز	ـز ـز	ـز ـز	ز
seen	S	سـ	ـسـ	ـس	س
sheen	Sh	شـ	ـشـ	ـش	ش
Saad	S	صـ	ـصـ	ـص	ص
Daad	D	ضـ	ـضـ	ـض	ض
Taa	T	طـ	ـطـ	ـط	ط
dhaa	Dh	ظـ	ـظـ	ـظ	ظ
'aiyn	'	عـ	ـعـ	ـع	ع
ghain	Gh	غـ	ـغـ	ـغ	غ
faa	F	فـ	ـفـ	ـف	ف

qaaf	Q	قـ	ـقـ	ـق	ق
kaaf	K	كـ	ـكـ	ـك	ك
laam	L	لـ	ـلـ	ـل	ل
meem	M	مـ	ـمـ	ـم	م
noon	N	نـ	ـنـ	ـن	ن
haa	H	هـ	ـهـ	ـه ه	هـ
waw	W	و	ـو و	ـو و	و
yaa	Y	يـ	ـيـ	ـي	ي

APPENDIX G: QUANTITATIVE DATA CODEBOOK

Question	Short Data Keys	Value	Value Label	Type of Data
1) Select your age range	Age	1 1 2 2 2	□ 18 - 25 □ 26 - 34 □ 35 - 44 □ 45 - 50 □ 51 and up	Nominal
2) How often did you use mobile apps for learning Arabic during the three weeks?	Frequency	1 1 2 2 2	□ Very frequently □ Frequently □ Occasionally □ Rarely □ Never	Ordinal
3) What is your native language?	Native Language	1 2 2	□ Arabic □ English □ Other (please specify) …	Nominal
4) Why are you studying Arabic?	Purpose	1 1 2 2	□ Required for degree graduation □ For job related purposes □ Interested in the language and culture □ Other (please specify) …	Nominal
5) Are you currently an undergraduate or graduate student?	Education	1 2 2	□ Undergraduate □ Graduate □ Other (please specify) …	Nominal
6) Select your Arabic class level:	Arabic Level	1 2 2 2 2 2 2	□ Beginner (Arabic 101) □ High Beginner (Arabic 102) □ Intermediate (Arabic 201) □ High Intermediate (Arabic 202) □ Advanced (Arabic 301) □ High Advanced (Arabic 302) □ Other (please specify) …	Ordinal
7) Select your Arabic class format:	Class Format	1 2	□ On-ground (In-class) □ Online	Nominal
8) What was your out-of-class communicative tasks final score (Task 3)?	Score	1 1 2 2 2	□ Superior (A) □ Advanced (B) □ Intermediate (C) □ Novice (D) □ Other (please specify) …	Ordinal

9) Rate each statement below based on your experience using mobile apps for Arabic learning in class and outside of class:			A five-point Likert-type scale (5 = strongly agree; 4 = agree; 3 = neutral; 2 = disagree; and 1 = strongly disagree)	Ordinal
9.a I am satisfied with using mobile apps for Arabic learning	Satisfaction	5 43 2 1		
9.b Apps can be accessed at anywhere at anytime	Access	5 43 2 1		
9.c Apps provide sufficient Arabic words and phrases	Sufficient	5 43 2 1		
9.d Apps are affordable	Affordable	5 43 2 1		
9.e Apps are useful in learning Arabic	Useful	5 43 2 1		
9.f I have fun using apps	Fun	5 43 2 1		
9.g Apps help me to interact with my peers in class and outside of class	Interaction	5 43 2 1		
9.h Apps are user-friendly	User-friendly	5 43 2 1		
9.i Apps are interesting	Interesting	5 43 2 1		
9.j I very much enjoyed using the mobile apps in my Arabic class this semester	Enjoyable	5 43 2 1		
9.k I will continue to use apps for Arabic learning even when the class ends	Continue	5 43 2 1		
9.l Apps enhance my communication skills	Communication	5 43 2 1		
9.m Apps help me to compare Arabic linguistics with my native language	Comparison	5 43 2 1		
9.n Using apps to learn Arabic helps me to connect with my peers and other majors of study	Connection	5 43 2 1		
9.o Apps help me to use the language both within and beyond the class community	Community	5 43 2 1		
9.p Apps help me understand the Arabic culture	Culture	5 43 2 1		
10) Which method of teaching did you prefer?	Method of teaching preference	1 2	☐ Instructor uses much Arabic & little English and all supplemental materials and tools, but <u>without</u> including the mobile apps ☐ Instructor uses much Arabic & little English and all supplemental Materials and tools, but <u>with</u> including the mobile apps	Nominal

APPENDIX H: WAYS TO SHARE THE MALL APPS WITH ON-GROUND AND ONLINE CLASSES

Use Video Graphics Array (VGA) Cable. By using a Video Graphics Array (VGA) cable, instructors of Arabic language can hook up their mobile devices in the same way the computer hooked the whiteboard. However, with this way, there is not enough mobility for the device and it has to be placed in one location and the instructor has to be close to it to navigate through the apps. The types of cables the instructors will need for such type of connection are: Apple iPad dock connector to VGA adapter, lighting to VGA adapter, and IPEVO point 2 view (P2V) USB document camera.

Use a wireless TV. Using Apple, Android, or any wireless TV gives more mobility to the instructor because the TVs work wirelessly. This way enables the instructors to take their mobile devices wherever they want in their classroom. To have this mobility in classroom, an HDMI cable can be used to connect the TV to the projector, and then the mobile device has to be connected to the TV wirelessly. An adapter like Kanex ATVPRO AirPlay Mirroring for VGA Projector will be needed if the classroom projector does not support HDMI.

Use AirServer or Reflector. AirServer or Reflector is a free application, which helps the instructors and presenters to stream their mobile devices to a Mac/PC. For this method, the same network has to be used when connecting both the computer and the mobile device. The researcher used the VGA adapter to share his iPad screen and the mobile apps in his on-ground classes, but he used the AirServer program with his online classes. The AirServer program is available online on http://www.airserver.com/Download.

APPENDIX I: GLOSSARY OF KEY TERMS

Asynchronous Learning "enables communication and collaboration over a period of time through a different time-different place mode. An example of asynchronous communication is sending an email" (Kaplan & Ashley, 2003, para, 2).

Computer-Assisted Language Learning (CALL) is defined as 'the search for and the study of applications of the computer in language teaching and learning" (Levy, 1997, p. 1).

Computer-Mediated Communication (CMC) is defined "as any communicative transaction that takes place by way of a computer, whether online or offline" (McQuail, 2005, p. 552).

Culture: Geertz (1973) defined culture as "a system of inherited conceptions expressed in symbolic forms by means of which men communicate, perpetuate, and develop their knowledge about and attitudes toward life" (p. 89).

Diglossia is defined by Wright (2008) as "the distinction between the two forms of a language such as Arabic, German, French and Greek, separating the formal 'outer' High form (eg Classical Arabic, Hochdeutsch, French) and the Low informal 'inner' form (e.g. Egyptian Arabic, Schwyzertutsch, Haitian Creole)" (p. 264).

Distance Learning (DL) "is a formalized teaching and learning system specifically designed to be carried out remotely by using electronic communication. Because distance learning is less expensive to support and is not constrained by geographic considerations, it offers opportunities in situations where traditional education has difficulty operating. Students with scheduling or distance problems can benefit, as can employees, because distance education can be more flexible in terms of time and can be delivered virtually anywhere" (Rouse, 2005, para. 1).

Electronic learning (e-learning): Naidu (2006) defines electronic learning (e-learning) as "commonly referred to the intentional use of networked information and communications technology in teaching and learning. A number of other terms are also used to describe this mode of teaching and learning. They include *online learning*, *virtual learning*, *distributed learning*, *network* and *web-based learning*. Fundamentally, they all refer to educational processes that utilize information and communications technology to mediate asynchronous as well as synchronous learning and teaching activities" (p. 1).

Ethics is defined "as a method, procedure, or perspective for deciding how to act and for analyzing complex problems and issues" (Resnik, 2011, para. 5).

Generalizability is "the extension of research findings and conclusions from a study conducted on a sample population to the population at large" (Writing@CSU Guide, 2014, para. 2).

Intelligent Computer-Assisted Language Learning (Intelligent CALL, or ICALL) is defined "in a number of ways, but one understanding of the term is that of CALL incorporating language technology (LT); for example, analyzing language learners' language production, in order to provide the learners with more flexible—indeed, more 'intelligent'—feedback and guidance in their language learning process" (Borin, 2002, p. 61).

Learning Effectiveness refers to those "learners who complete an online program receive educations that represent the distinctive quality of the institution. The goal is that online learning is at least equivalent to learning through the institution's other delivery modes, in particular through its traditional face-to-face, classroom-based instruction" (Sloan Consortium, cited by Swan, 2003, p. 1).

Mixed Method Research Approach. Creswell (2009) also defines the mixed method

research approach as "an approach to inquiry that combines or associates both qualitative and quantitative forms" (p. 4).

Mobile Learning (m-Learning): Sharples et al. (2007) define mobile learning (m-Learning) as a "process of coming to know through conversations across multiple contexts among people and personal interactive technologies" (p. 225).

Mobile Apps Technology is "a type of application software designed to run on a mobile device, such as a smartphone or tablet computer. Mobile applications frequently serve to provide users with similar services to those accessed on PCs [personal computers]. Apps are generally small, individual software units with limited function. This use of software has been popularized by Apple Inc. and its App Store, which sells thousands of applications for the iPhone, iPad and iPod Touch. A mobile application also may be known as an app, Web app, online app, iPhone app or smartphone app" (Techopedia, 2013, p. 1).

Mobile Assisted Language Learning (MALL). The term MALL is a subset of both mobile learning (m-Learning) and computer-assisted language learning (CALL), and it "describes an approach to language learning that is assisted or enhanced through the use of a handheld mobile device" (Valarmathi, 2011, p. 2).

Modern Standard Arabic (MSA) "is the variety of Arabic most widely used in print media, official documents, correspondence, education, and as a liturgical language. It is essentially a modern variant of Classical Arabic, the language of the Quran. Standard Arabic is not acquired as a mother tongue, but rather it is learned as a second language at school and through exposure to formal broadcast programs, such as the daily news, religious practice, and print media. Because it is not acquired as a native language, the number of speakers of the language is difficult to determine, and degrees of proficiency range widely, from the ability to

follow news broadcasts but no reading, writing, or speaking skills, to the ability to speak and write the language with a minimum of grammatical errors. The geographical center of the language can be said to encompass the northernmost part of Africa from Mauritania to Egypt, the Levant, the Arabian Peninsula, and Iraq. It is estimated that some 165,000,000 people throughout the Islamic world have some knowledge of Standard Arabic" (UCLA Language Materials Project, 1992, para. 1).

On-Ground or Face-To-Face Course is defined as "a traditional classroom delivery model used in typical residence programs in higher education. This is a synchronous method of instruction where students attend regularly scheduled classes in campus or satellite (off-campus) meeting rooms" (Ury et al., 2005, p. 2).

Online Course: Ury et al. (2005) define online course as "a course delivery method that is provided in an asynchronous mode through Internet technologies" (p. 2).

Perception. American English in Oxford dictionary (2014) tells us that perception is "the ability to see, hear, or become aware of something through the senses" (para. 1).

Proficiency is defined as "the ability to communicate in another language in a meaningful way" (Bobb & Gist, 2009, p. 4).

Qualitative Research is "a means for exploring and understanding the meaning individuals or groups ascribe to a social or human problem. The process of research involves emerging questions and procedures, data typically collected in the participant's setting, data analysis inductively building from particulars to general themes, and the researcher making interpretations of the meaning of the data" (Creswell, 2009, p. 4).

Quantitative Research is "a means for testing objective theories by examining the relationship among variables. These variables, in turn, can be measured, typically on

instruments, so that numbered data can be analyzed using statistical procedures" (Creswell, 2009, p. 4).

Reflexivity. Creswell (2013) defines reflexivity as "an approach in writing qualitative research in which the writer is conscious of the biases, values, and experience that he or she brings to a qualitative research study" (p. 300).

Reliability is "about consistency; it is the expectation that there won't be different findings each time the measures are used, assuming that nothing has changed in what is being measured" (Nardi, 2006, p. 60).

Statistical Package for the Social Science (SPSS) is "an integrated family of products that addresses the entire analytical process, from planning to data collection to analysis, reporting and deployment. With more than a dozen fully integrated modules to choose from, you can find the specialized capabilities you need to increase revenue, outperform competitors, conduct research and make better decisions" (IBM, n.d., para. 1).

Synchronous Learning "enables real-time communication and collaboration in a same time-different place mode. An example of synchronous communication is video conferencing" (Kaplan & Ashley, 2003, para, 1).

The American Council on the Teaching of Foreign Languages (ACTFL) is "a national membership organization of foreign language professionals dedicated to promoting and fostering the study of languages and cultures as an integral component of American education and society. ACTFL strives to provide effective leadership for the improvement of teaching and learning of languages at all levels of instruction and in all languages. Its membership of more than 12,000 language professionals includes elementary, secondary, and post-secondary teachers; administrators; specialists; supervisors; researchers, and others concerned with language

education. ACTFL represents all languages and all levels of language instruction" (ACTFL, 2012, p. 3).

The Interagency Language Roundtable (ILR). ILR is defined as "an unfunded Federal interagency organization established for the coordination and sharing of information about language-related activities at the Federal level. It serves as the premier way for departments and agencies of the Federal government to keep abreast of the progress and implementation of techniques and technology for language learning, language use, language testing and other language-related activities" (ILR, 2013, p. 1).

Triangulation means "researchers make use this interpretive framework, investigators, and theories to provide corroborating evidence for validating the accuracy of their study" (Creswell, 2013, p. 302).

Validity is "about *accuracy* and whether the operationalization is correctly indicating what it's supposed to" (Nardi, 2006, p. 58).

APPENDIX J: ADDITIONAL TABLES FROM THE STATISTICAL ANALYSIS

Apps enhance my communication skills (RQ1.a)

Dependent Variable (5Cs)	Independent Variable	*P*-value (Sig.)
Communication	Q7. Arabic class format	.247
	Q10. Which method of teaching you prefer	.231

Apps help me to compare Arabic linguistics with my native language (RQ1.a)

Dependent Variable (5Cs)	Independent Variable	*P*-value (Sig.)
Comparison	Q7. Arabic class format	.739
	Q10. Which method of teaching you prefer	.556

Using apps to learn Arabic helps me to connect with my peers and other majors of study (RQ1.a)

Dependent Variable (5Cs)	Independent Variable	*P*-value (Sig.)
Connection	Q7. Arabic class format	.429
	Q10. Which method of teaching you prefer	.053

Apps help me to use the language both within and beyond the class community (RQ1.a)

Dependent Variable (5Cs)	Independent Variable	*P*-value (Sig.)
Community	Q7. Arabic class format	.508
	Q10. Which method of teaching you prefer	.101

Apps help me understand the Arabic culture (RQ1.a)

Dependent Variable (5Cs)	Independent Variable	*P*-value (Sig.)
Culture	Q7. Arabic class format	.083
	Q10. Which method of teaching you prefer	.473

Multiples Comparisons (Bonferroni): Satisfaction (RQ1.b)

Dependent Variables	Independent Variables		Mean Difference	Sig.
Age range	Strongly Agree	Agree	.133	1.000
		Neutral	-.033	1.000
		Disagree	-.867*	.016
	Agree	Strongly Agree	-.133	1.000
		Neutral	-.167	1.000
		Disagree	-1.000*	.004
	Neutral	Strongly Agree	.033	1.000
		Agree	.167	1.000
		Disagree	-.833*	.041
	Disagree	Strongly Agree	.867*	.016
		Agree	1.000*	.004
		Neutral	.833*	.041
Frequency of using the mobile apps	Strongly Agree	Agree	-.898*	.004
		Neutral	-1.467*	.000
		Disagree	-1.633*	.018
	Agree	Strongly Agree	.898*	.004
		Neutral	-.569	.519
		Disagree	-.735	.939
	Neutral	Strongly Agree	1.467*	.000
		Agree	.569	.519
		Disagree	-.167	1.000
	Disagree	Strongly Agree	1.633*	.018
		Agree	.735	.939
		Neutral	.167	1.000

*Note. *The mean difference is statistically significant at the 0.05 level.*

RQ1: Sub-question b: Apps provide sufficient Arabic words and phrases

Dependent Variable	Independent Variable	*P*-value (Sig.)
Apps provide sufficient Arabic words and phrases	Age range	.157
	Frequency of using the mobile apps	.366
	Native language	**
	Arabic level	.659
	Educational level	.949
	Purpose for learning Arabic	.118
	Task 3 score	.595

*Note. **The p-value was not calculated for language because all the participants (100%) were non-native speakers of Arabic.*

RQ1: Sub-question b: Apps are affordable

Dependent Variable	Independent Variable	*P*-value (Sig.)
Apps are affordable	Age range	.986
	Frequency of using the mobile apps	.081
	Native language	**
	Arabic level	.104
	Educational level	.914
	Purpose for learning Arabic	.534
	Task 3 score	.078

*Note. **The p-value was not calculated for language because all the participants (100%) were non-native speakers of Arabic.*

Multiples Comparisons (Bonferroni): Fun (RQ1.b)

Dependent Variables	Independent Variables		Mean Difference	Sig.
Age range	Strongly Agree	Agree	.000	1.000
		Neutral	-.400	.077
		Disagree	-.500	.488
	Agree	Strongly Agree	-.000	1.000
		Neutral	-.400	.077
		Disagree	-.500	.488
	Neutral	Strongly Agree	.400	.077
		Agree	.400	.077
		Disagree	-.100	1.000
	Disagree	Strongly Agree	.500	.488
		Agree	.500	.488
		Neutral	.100	1.000
Frequency of using the mobile apps	Strongly Agree	Agree	.000	1.000
		Neutral	-.714	.196
		Disagree	-1.714*	.036
	Agree	Strongly Agree	.000	1.000
		Neutral	-.714	.196
		Disagree	-1.714*	.036
	Neutral	Strongly Agree	.714	.196
		Agree	.714	.196
		Disagree	-1.000	.631
	Disagree	Strongly Agree	1.714*	.036
		Agree	1.714*	.036
		Neutral	1.000	.631

*Note. *The mean difference is statistically significant at the 0.05 level.*

RQ1: Sub-question b: Apps help me to interact with my peers in class and outside of class

Dependent Variable	Independent Variable	*P*-value (Sig.)
Apps help me to interact with my peers in class and outside of class	Age range	.577
	Frequency of using the mobile apps	.577
	Native language	**
	Arabic level	.333
	Educational level	.882
	Purpose for learning Arabic	.945
	Task 3 score	.442

*Note. **The p-value was not calculated for language because all the participants (100%) were non-native speakers of Arabic.*

Multiples Comparisons (Bonferroni): I very much enjoyed using the mobile apps in my Arabic class this semester (RQ1.b)

Dependent Variables	Independent Variables		Mean Difference	Sig.
Age range	Strongly Agree	Agree	.000	1.000
		Neutral	-.300	.373
		Disagree	-.667*	.044
	Agree	Strongly Agree	-.000	1.000
		Neutral	-.300	.306
		Disagree	-.667*	.038
	Neutral	Strongly Agree	.300	.373
		Agree	.300	.306
		Disagree	-.367	.807
	Disagree	Strongly Agree	.667*	.044
		Agree	.667*	.038
		Neutral	.367	.807
Frequency of using the mobile apps	Strongly Agree	Agree	-.833*	.030
		Neutral	-1.067*	.008
		Disagree	-1.833*	.002
	Agree	Strongly Agree	.833*	.030
		Neutral	-.233	1.000
		Disagree	-1.000	.205
	Neutral	Strongly Agree	1.067*	.008
		Agree	.233	1.000
		Disagree	-.767	.682
	Disagree	Strongly Agree	1.833*	.002
		Agree	1.000	.205
		Neutral	.767	.682

*Note. *The mean difference is statistically significant at the 0.05 level.*

RQ1: Sub-question d: The differences and similarities of online and on-ground students

Dependant Variable (Q9)	Independent Variable	*P*-value (Sig.)
I am satisfied with using mobile apps for Arabic learning	Arabic class format (On-ground or online)	.114
Apps can be accessed at anywhere at any time	Arabic class format (On-ground or online)	.425
Apps provide sufficient Arabic words and phrases	Arabic class format (On-ground or online)	.137
Apps are affordable	Arabic class format (On-ground or online)	.489
Apps are useful in learning Arabic	Arabic class format (On-ground or online)	.327
I have fun using apps	Arabic class format (On-ground or online)	.490
Apps help me to interact with my peers in class and outside of class	Arabic class format (On-ground or online)	.298
Apps are user-friendly	Arabic class format (On-ground or online)	.894
Apps are interesting	Arabic class format (On-ground or online)	.881
I very much enjoyed using the mobile apps in my Arabic class this semester.	Arabic class format (On-ground or online)	.075
I will continue to use apps for Arabic learning even when the class ends	Arabic class format (On-ground or online)	.176
Apps enhance my communication skills	Arabic class format (On-ground or online)	.150
Apps help me to compare Arabic linguistics with my native language	Arabic class format (On-ground or online)	.470
Using apps to learn Arabic helps me to connect with my peers and other majors of study	Arabic class format (On-ground or online)	.248
Apps help me to use the language both within and beyond the class community	Arabic class format (On-ground or online)	.245
Apps help me understand the Arabic culture	Arabic class format (On-ground or online)	.956

Age Range: Fisher's Exact Test (RQ2)

	Value	Df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Likelihood Ratio	.401	1	.526		
Fisher's Exact Test				1.000	.821
Linear-by-Linear Association	.219	1	.640		
N of Valid Cases	39				

Frequency of Using Mobile Apps: Fisher's Exact Test (RQ2)

	Value	Df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Likelihood Ratio	3.320	1	.068		
Fisher's Exact Test				.113	.094
Linear-by-Linear Association	2.903	1	.088		
N of Valid Cases	39				

Educational Level: Fisher's Exact Test (RQ2)

	Value	Df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Likelihood Ratio	.815	1	.367		
Fisher's Exact Test				1.000	.669
Linear-by-Linear Association	.449	1	.503		
N of Valid Cases	39				

Arabic Class Level: Fisher's Exact Test (RQ2)

	Value	Df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Likelihood Ratio	3.320	1	.068		
Fisher's Exact Test				.113	.094
Linear-by-Linear Association	2.903	1	.088		
N of Valid Cases	39				

Task 3 Score: Fisher's Exact Test (RQ2)

	Value	Df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Likelihood Ratio	.001	1	.981		
Fisher's Exact Test				1.000	.654
Linear-by-Linear Association	.001	1	.981		
N of Valid Cases	39				